867. **Absorption of calcium and magnesium by the fruiting body of the cultivated mushroom Hypsizigus marmoreus (Peck) bigelow from sawdust culture media.**
Tabata, T. and Ogura, T.
Journal of Food Science 68(1): 76-79. (2003); ISSN: 0022-1147
Descriptors: absorption/ calcium/ calcium carbonate/ calcium phosphates/ culture media/ growth/ magnesium/ magnesium carbonate/ magnesium chloride/ magnesium sulfate/ mycelium/ sawdust/ Basidiomycetes/ Basidiomycota/ calcium phosphate/ Hypsizygus/ Hypsizygus marmoreus/ magnesium sulphate/ Tricholomataceae
Abstract: H. marmoreus was cultivated in potato-sucrose-agar (PSA) and in sawdust media supplemented with Ca or Mg salts. The radial growth of mycelia was determined. The mushroom spawn did not grow on PSA supplemented with Ca carbonate, Mg carbonate, or Mg hydroxide. However, the mycelia grew well on sawdust media supplemented with Ca phosphate, Ca carbonate, or Mg sulfate. Ca of the fruiting body was increased 4.0 to 5.6 times by 1 to 5% of Ca phosphate or Ca carbonate. Mg was increased 1.4 times by 0.5% of Mg sulfate or Mg chloride.

868. **Accelerated cultivation of Siberian Iris (Iris sibirica L.) in an unheated plastic tunnel.**
Pogroszewska, E.
Folia Universitatis Agriculturae Stetinensis, Agricultura 70: 95-104. (1998).
Notes: Original title: Przyspieszona uprawa kosacca sybery jskiego (Iris sibirica L.) w nie ogrzewanym tunelu foliowym.
Descriptors: cut flowers/ flowering/ mulching/ ornamental bulbs/ ornamental plants/ pine bark/ plastic tunnels/ protected cultivation/ sawdust/ anthesis/ cultivation under glass or plastic/ ornamentals
Abstract: One-year-old plants were planted in autumn and mulched with composted pine bark and sawdust. Results indicated that I. sibirica was suitable for accelerated cultivation in an unheated plastic tunnel. Cut flowers were ready to market 1-3 weeks earlier and yields and quality were higher than from plants grown outdoors. Mulching plants grown outdoors with bark and sawdust also increased cut flower yields.

869. **Agricultural use of wood ash in California.**
Meyer, Roland D.
Oakland, CA: University of California, Agriculture and Natural Resources; 12 pp. (1999).
Notes: Includes bibliographical references (p. 12)
NAL Call #: S654 .A38 1999
Descriptors: wood ash / agriculture/ California

870. **Alteration of soil temperature and moisture through mulching on the morpho-physiological differentiation in maize.**
Awal, M. A. and Khan, M. A. H.
Pakistan Journal of Biological Sciences (Pakistan) 2(4): 1164-1167. (Oct. 1999)
NAL Call #: QH301 .P355; ISSN: 1028-8880.
Descriptors: mulching / soil/ wood waste/ maize
Abstract: Mulching effects of sawdust, ash, rice straw and water hyacinth on the morpho-physiological differentiation of maize (Zea mays L.) and to relate these with soil environment were described. Water hyacinth and rice straw mulches had significant promotive effects on shoot elongation, root penetration, LAI and DM accumulation. All mulches conserved soil moisture but water hyacinth and rice straw retained comparatively greater amount. Water hyacinth and rice straw mulches reduced soil temperature fluctuations in all soil depths (5 to 15 cm) and retained higher soil temperatures at the early hours of the day (02 to 06 hrs) which were considered to be the decisive factor for the rapid development of maize plants. Sawdust mulch due to the lower soil temperature had retardive effects on all morpho- physiological attributes. Ash mulch ranked intermediate between the rice straw or water hyacinth and the control.

871. **Alterations in the physical and physico-chemical properties of a substrate based on composted sawdust and perlite with polycyclic tomato crops.**
Favaro, J. C. and Marano, R. P.
Spanish Journal of Agricultural Research 1(3): 105-109. (2003); ISSN: 1695-971X
Descriptors: bulk density/ cations/ composts/ electrical conductivity/ growing media/ perlite/ pH/ protected cultivation/ sawdust/ soilless culture/ substrates/ tomatoes/ cultivation under glass or plastic/ hydrogen ion concentration/ potential of hydrogen/ potting composts/ rooting media
Abstract: Vegetable crops grown continuously in greenhouse are vulnerable to phytosanitary problems or changes in the physical and chemical conditions of the soil such as salinization. One alternative to minimize these problems is to grow crops without soil using different substrates. A mixture of perlite and composted willow sawdust has been used successfully with tomatoes (Lycopersicon esculentum) but the behaviour of this substrate when reused is unknown. Factorial trials with tomato pot crops cv. Topacio were developed, and in each experiment, water content at 10, 50 and 100 cm, bulk density, pH, electrical conductivity and exchangeable cations were determined. From a physical perspective, reuse of the substrate did not substantially modify the total available water and aeration was higher than that considered as ideal. Reuse caused a light acidification and increased the C/N ratio with a loss of exchangeable cation capacity for Ca2+ and Na+. This modification of the substrate did not affect the yield.

872. **Alternatives to chemical nematicides for the control of Meloidogyne incognita infesting beans [Phaseolus vulgaris L. Brazil].**
Santiago, D. C.; Homechin, M.; Montalvan, R.; Krzyzanowski, A. A.; and Favoretto, L.
Nematologia Mediterranea (Italy) 30(2): 175-180. (Dec. 2002)
NAL Call #: QL391.N4N42; ISSN: 0391-9749.
Notes: Original title: Alternative ai nematocidi chimici per la lotta a Meloidogyne incognita infestante il fagiolo [Phaseolus vulgaris L. Brazil]. 4 tables; 26 ref. Summary (En). Citation notes: IT (Italy).
Descriptors: Phaseolus vulgaris/ Brazil/ field experimentation/ nematode control/ Meloidogyne incognita/ sugarcane/ sawdust/ Pennisetum purpureum/ industrial wastes/ organic amendments/ cultivation yeilds/ physicochemical properties/ soil biology / infestation
Abstract: Studies were carried out to assess the effect of crystallized and brown sugars, elephant grass cv Cameroon, filter cake, sugarcane juice and Pinus elliottii sawdust for the control of Meloidogyne incognita infesting the bean (Phaseolus vulgaris) cv Carioquinha. Observations were made on their effect on nematode natural enemies, such as yeasts, actinomycetes, sporulating bacteria and cellulolytic and phosphate solubilizing fungi. Filter cake (30,000 kg/ha) and P. elliottii (10,000 kg/ha) were the best treatments for the control of M. incognita population. The sawdust soil cover resulted in greater yield weight averages and in healthier root systems. The soil amendments influenced soil microflora and soil chemical properties in the field.

873. **Alternatives to polyethylene mulch film: A field assessment of transported materials in capsicum (Capsicum annuum L.).**
Olsen, J. K. and Gounder, R. K.
Australian Journal of Experimental Agriculture. 2001; 41(1): 93 103 41(1): 93-103. (2001)
NAL Call #: 23 Au792; ISSN: 0816-1089
Descriptors: crop weed competition/ crop yield/ Ferralsols/ fruits/ growth/ mulches/ mulching/ Oxisols/ paper/ polyethylene film/ sawdust/ soil types/ sugarcane trash/ toxicity/ weight/ mulching materials/ Ustox
Abstract: Materials used as mulches may be either transported to the farm then laid on the soil surface or grown in situ. To assess biodegradable alternatives to non-degradable polyethylene film, the response of capsicum (Capsicum annuum cv. Target) grown in soil beds covered with hessian (burlap), hardwood sawdust, sugarcane (Saccharum spp.) trash, paper film, black biodegradable polymer film, white polyethylene film, or left uncovered was investigated in a field trial during the autumn-winter growing season in Queensland, Australia during 1999. Use of a split-plot design (mulch whole plots with weeded or unweeded subplots) permitted both weed growth and the effect of weed competition on fruit yield to be measured. The presence of substances within the materials that were possibly detrimental to plant growth was assessed in a separate experiment. The weight of marketable fruit was highest for capsicum plants grown in the weeded subplots of biodegradable polymer and polyethylene, although the yields from these subplots were not different from those for plants grown in the weeded subplots of the paper and sawdust or the unweeded subplots of the biodegradable polymer and paper. The reduction in weight of marketable capsicum fruit from weed competition was ranked for the various mulch treatments as follows: paper < biodegradable polymer < cane trash < polyethylene < hessian < sawdust < bare soil. More hours at optimum soil temperature for root growth (18.9-30 degrees C) before canopy closure probably accounted for the variation in marketable yield of the capsicum crop. Results from the mulch toxicity experiment indicated that the mulch materials were unlikely to contain phytotoxic substances. Provided the practical difficulties of laying paper film can be overcome and the high cost of biodegradable polymer is reduced, these materials appear to be the best of the biodegradable alternatives tested to polyethylene film.

874. **Amendment of crude oil contaminated soil with sawdust and chromoleana leaves for optimum plant protection.**
Offor, U. S. and Akonye, L. A.
African Journal of Biotechnology 5(9): 770-774. (2006)
NAL Call #: TP248.13 .A37; ISSN: 1684-5615
Descriptors: bioremediation/ cowpeas/ crop residues/ diesel oil/ growth/ growth rate/ leaf area/ leaves/ maize/ net assimilation rate/ plant protection/ polluted soils/ sawdust/ soil amendments/ soil pollution/ soil types/ waste utilization/ black eyed peas/ corn/ crop protection/ NAR/ southern peas
Abstract: A study on the effectiveness of sawdust and chromoleana leaves as soil restorative measures to optimize plant growth at two intensities of crude oil contamination showed that both restore parity on the growth parameters (leaf area, leaf ratio, relative leaf growth rate, relative growth rate, and net assimilation rate) of crops tested compared to control. However, chromoleana leaves was found to be more effective than sawdust. The test crops Zea mays and Vigna unguiculata differed with respect to their response to amendments applied. V. unguiculata showed better response than Z. mays in most of the parameters tested.

875. **Ammonia emissions from composting hog manure amended with sawdust under continuous and intermittent aeration.**
Elwell, D. L.; Hong, J. H.; Keener, H. M.; and Michel, F. C.
In: Air Pollution from Agricultural Operations. Proceedings of the Second International Conference.Des Moines, Iowa, USA.); pp. 157-162; 2000.
Descriptors: aeration / air flow/ amendments/ ammonia/ composting/ odour abatement/ odour emission/ pig manure/ sawdust/ odor abatement/ odor emission
Abstract: Ammonia emissions during composting of hog manure mixed with sawdust were studied in four runs comprising a total of 22 pilot-scale reactor vessels. These four runs extended previous work and both verified and extended the previous conclusions. The pilot-scale vessels were 205 L, insulated, stainless steel drums that were aerated either continuously (high/low thermostatically controlled fans) or intermittently (5 min high fan, 55 min off). Temperatures, ammonia emissions, air flow rates, carbon dioxide production and oxygen utilization, moisture and dry matter reduction, and initial and final chemical compositions were measured. Ammonia emissions from the intermittently

aerated vessels were only about 50% as great as those from the continuously aerated ones, but this was found to be a result more related to total air flow than to aeration technique. All of the data for total ammonia emissions versus total air flow were fitted with a linear regression line, y=0.1309x+29.835 where y is ammonia expressed as g of N and x is air flow in kg, with R2=0.6808. This general trend indicates that about 50% reduction in ammonia emissions can be achieved with 75% reduction in air flow. For the aeration techniques used, the minimum oxygen level in the exhaust gas from the vessels was 5%, and this is probably a reasonable lower limit constraining air flow reduction. However, within this constraint, lower air flow now appears to be a technique that can reduce odorous ammonia emissions.
This citation is from AGRICOLA.

876. **Ammonia, nitrous oxide, methane, carbon dioxide and water vapour emissions when weaned pigs are kept either on a sawdust or on a straw deep litter.**
Nicks, B.; Laitat, M.; Desiron, A.; Vandenheede, M.; and Canart, B.
In: 34emes Journees de la Recherche Porcine, sous l'egide de l'Association Franccaise de Zootechnie.Paris, France.); pp. 149-154; 2002.
Notes: Original title: Emissions d'ammoniac, de protoxyde d'azote, de methane, de gaz carbonique et de vapeur d'eau lors d'elevage de porcelets sevres sur litiere accumulee de paille et de sciure.
Descriptors: air pollution/ ammonia/ carbon dioxide/ litter/ methane/ nitrogen balance/ nitrous oxide/ piglets/ sawdust/ straw/ ventilation/ water vapour/ atmospheric pollution/ hogs/ swine/ water vapor
Abstract: Five batches of 40 weaned pigs were reared successively on a sawdust or on a straw deep litter. The same amount of litter dry matter, i.e. 5 kg/pig, was used in the 2 cases. The gases concentrations were measured 6 times, at about 1 month interval during 6 consecutive days with one measurement every 30 minutes. The ventilation rates were continuously recorded. Rearing pigs on the sawdust deep litter produced 4 times less ammonia than rearing pigs on straw deep litter (0.33 vs 1.29 g/pig per day), 2 times less methane (0.87 vs 1.79 g/pig per day) and 3.5 times more nitrous oxide (1.70 vs 0.47 g/pig per day). Carbon dioxide emissions (458 vs 465 g/pig per day) and water vapour emissions (1088 vs 913 g/pig per day) were not significantly different. According to the N balance, 66% of the N in pigs' manure were lost by gas emissions. N_2 contributed for 79% of the total gas N emissions.
This citation is from AGRICOLA.

877. **Application of wood ash compared with fertigation for improving the nutritional status and fruit production of kiwi vines.**
Merino, A.; Otero, V.; Omil, B.; Lastra, B.; Piñeiro, V.; and Gallego, P. P.
Journal of Plant Nutrition and Soil Science 169(1): 127-133. (2006)
NAL Call #: 384 Z343A; ISSN: 14368730 [JNSSF].
Notes: doi: 10.1002/jpln.200520518.
Descriptors: acid soils/ fertigation/ heavy metals/ kiwifruit/ wood ash/ actinidia chinensis/ actinidia deliciosa
Abstract: Application of wood ash can potentially improve the fertility of acid soils and the nutritional status of crops. However, there is limited information about the effectiveness of this practice with fruit trees. The application of wood ash as a fertilizer in a kiwifruit plantation - both with and without fertigation/irrigation - was compared with that of a conventional fertigation program in a completely randomized field experiment on an acid soil in northwest (NW) Spain. The effects on plant nutritional status and on fruit yield, as well as environmental effects, were evaluated over a period of 2 y. The application of wood ash led to modest increases in soil pH and extractable nutrients (phosphorus, P; calcium, Ca; magnesium, Mg; potassium, K; boron, B). However, no consistent effects in foliar nutrient concentrations were found. Ash application led to an increase of up to 45% in the number of fruits produced, which was mainly attributed to the inputs of Ca and Mg. Although moderate increases in soil available manganese (Mn) and nickel (Ni) after ash application were recorded, there were no changes in heavy-metal concentrations in leaves or fruits. From the results of the study it can be concluded that wood ash can be used to improve the growth conditions of kiwi vines on acidic soils. Wood ash should be applied at rates adapted to the liming needs of the soil, while also taking into account the chemical composition of the ash. © 2006 Wiley-VCH Verlag GmbH & Co. KGaA.

878. **Application of wood ash to acidic boralf soils and its effect on oilseed quality of canola.**
Patterson, S. J.; Acharya, S. N.; Thomas, J. E.; and Bertschi, A. B.
Agronomy Journal 96(5): 1344-1348. (Sept. 2004-Oct. 2004)
NAL Call #: 4 AM34P; ISSN: 0002-1962
Descriptors: Brassica rapa/ canola/ crop yield/ wood ash/ soil amendments/ acid soils/ application rate/ crop quality/ canola oil/ chlorophyll/ protein content/ glucosinolates/ soil fertility/ boron/ zinc/ nutrient uptake/ mineral content/ Alberta
Abstract: Acidic Typic Cryoboralf soils amended with wood ash can raise soil pH and can supplement plant growth by adding minerals and micronutrients. However, presence of other elements in soils such as Cd, S, and Zn can affect plant growth and seed quality. In an earlier paper, we have shown that wood ash applications on Typic Cryoboralf and Typic Cryocrept soils in Alberta, Canada, increased canola (Brassica rapa L.) yield by 72%. In this study, the effect of a single application of 0, 6, 12.5, and 25 t ha(-1) (dry weight) wood ash on oilseed quality, based on oil, protein, chlorophyll, and glucosinolate content, was examined over three growing seasons from 1998 to 2000. Seed oil and protein content of ash-treated plots either increased or remained the same as controls. In contrast, significant increases ($p < 0.05$) in tissue concentrations of S and seed oil glucosinolates were observed in ash-amended plots. While these changes remained within acceptable limits for canola, seed oil and tissue quality were lower than the average level found in Canada no. 1 grade canola. During the 3-yr period, average Zn content of the oilseed was not different from control plots ($P > 0.05$). Levels of B in ash-treated soils were different from each other but not from the controls ($P < 0.05$). Cadmium levels were below detection

limits for the instrumentation used (0.08 mg kg(-1)). These results indicate that use of wood ash on acidic soils has the potential to increase seed oil content but may adversely affect quality of the oilseed produced.
This citation is from AGRICOLA.

879. **Are your stalls comfortable? The surface of the stall: Part 4.**
Ferrouillet, C. and Carrier, J.
Producteur de Lait Quebecois 24(6): 47-49. (2003); ISSN: 0228-1686.
Notes: Original title: Vos stalles sont elles confortables? La surface de la stalle: 4^{e} partie.
Descriptors: cow housing/ cows/ dairy cows/ floors/ litter/ sand/ sawdust/ straw/ cowsheds/ flooring
Abstract: The ideal stall surface in the cow shed should be non-slip, soft enough to cushion shocks and reduce pressure, and non-abrasive; it should also limit fluid accumulation and bacterial growth. The importance of organic litter (straw or sawdust) or sand in this respect in discussed. The animals should have sufficient space to lie and get up comfortably. Farmers are advised to conduct the 'knee test' by kneeling on the floors of their cow sheds to assess the comfort factor for themselves.
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880. **Artificial production technology of Auricularia delicata in Manipur.**
Devi, M. B. and Singh, N. I.
Journal of Mycopathological Research 43(2): 283-284. (2005)
NAL Call #: QK600.J68 ; ISSN: 0971-3719
Descriptors: calcium carbonate/ cultivation/ edible fungi/ rice/ rice bran/ rice straw/ sawdust/ spawn/ straw/ substrates/ sucrose/ Auricularia delicata/ Auriculariaceae/ paddy/ saccharose
Abstract: Auricularia delicata, an edible fungus collected locally, was tested for artificial production at the Aerobiology, Microbiology and Plant Pathology Laboratory, Department of Life Sciences, Manipur University (India) in an attempt to generate additional income for the socially weaker people of Manipur. Paddy straw soaked overnight in water supplemented with 4% rice bran and partially decomposed sawdust (prepared by mixing and watering ingredients such as sawdust (78%); rice bran (20%); $CaCO_3$ (1%); and sucrose (1%)) were used as the substrates for the production of this jelly fungus. Prior to cultivation, both substrates were autoclaved and spawned at the rate of 2% on a wet weight basis. Results showed that the partially decomposed sawdust substrate produced better yield (433 g/2 kg wet weight) than the commonly used substrate paddy straw (280 g/2 kg wet weight). It is concluded that large-scale artificial production of A. delicata is possible in Manipur.
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881. **Assessment of sawdust-based substrates of Salicaceae (Salix sp.): Composted for plant production.**
Favaro, J. C.; Buyatti, M. A.; and Acosta, M. R.
Investigacion Agraria Produccion y Proteccion Vegetales 17(3): 367-373. (2002); ISSN: 0213-5000.
Notes: Original title: Evaluacion de sustratos a base de serrin de Salicaceas (Salix sp.) compostados para la produccion de plantones.
Descriptors: sawdust/ willow/ seedlings/ germination/ growth
Abstract: The cost of seedlings grown in trays with large cells is highly correlated to the price of the substrate, and in particular to peat, its main component. Sawdust of willow has been used successfully to replace peat in soil-less cultivation. The aim of this work was to evaluate the use of composted sawdust to produce seedlings. Sawdust of willow mixed in different proportions with perlite (25, 50, 75% v/v), or peat and perlite (33% of each one) was compared to commercial substrates. Polystyrene trays were sown with seeds of tomato cv. BHN 81. Germination, height, and number of leaves of the plant, weight, and dry matter partition were evaluated. The percent germination was the same in all treatments. However, plants in commercial substrate had greater size. The treatments containing sawdust had a higher dry matter percentage and more partition to the root system, probably because they had problems to retain water in the substrate. When the perlite content exceeded 50% in the mix, there were problems to extract the plants and surrounding substrate preserving the tray cell shape. The use of composted sawdust could have possibilities for seedling production, replacing partially or totally the commercial substrate. The initial contents of macro and micronutrients should be adjusted, and to avoid water stress and get better growth, irrigation must be done carefully.

882. **Assessment of three substrata for maize seed testing.**
Ajayi, S. A.; Fakorede, M. A. B.; and Owolabi, B. A.
African Crop Science Journal 8(4): 441-445. (2000); ISSN: 1021-9730
Descriptors: emergence/ germination/ maize/ rooting/ sand/ sawdust/ seed testing/ seeds/ soil/ sterilizing/ substrates/ corn
Abstract: Three substrata: topsoil, sand and sawdust, each with sterilized and unsterilized treatments were assessed as potential media for maize seed testing. Seeds of Oba Supa 1, a tropical white maize hybrid, were used. One hundred seeds were planted in plastic containers per replicate, each substratum was replicated three times and data were collected on fifty seedlings per replication per substratum. Traits assessed were germination percentage, emergence index, number of primary roots, and root and shoot lengths. The experiment was repeated four times. Substratum had highly significant effect on number of primary roots and root and shoot lengths but not on germination percentage and emergence index. Sterilization significantly favoured shoot length but not other traits. Sand, sterilized or unsterilized, gave more uniform and reproducible test results than sawdust and topsoil. These results support the conclusion that any of the substrata may be used for the purpose of assessing the germinability of a seedlot. Seed testing involving seedling evaluation or measurements of seedling root and shoot lengths should, however, be done with sterilized sand.
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883. **Availability of nutrients in wood ash amended tropical acid soils.**
Nkana, J. C. V.; Demeyer, A.; and Verloo, M. G.
Environmental Technology 19(12): 1213-1221. (1998)
NAL Call #: TD1.E59; ISSN: 0959-3330
Descriptors: acid soils/ acidity/ amendments/ availability/ dry matter/ indicator plants/ lime/ manganese/ models/ neutralization/ nutrient availability/ nutrient uptake/ nutrients/ phosphorus/ rye/ soil/ soil acidity/ soil amendments/ soil ph/ trace elements/ treatment/ tropics/ ultisols/ uptake/ wood ash/ zinc/ microelements/ Mn/ plant indicators/ tropical countries/ tropical zones
Abstract: A greenhouse study was conducted to assess nutrient availability in wood ash when applied to surface soil samples of three tropical acid soils (Kandiudult) from Cameroon. Amendments were applied at rates to attain target pH values of 5.5, 6.0 and 6.5. Lime treatments were included as a control. Ryegrass (Lolium perenne) was grown as an indicator plant for three successive cycles of 40 days each. Data on total harvested dry matter, nutrient uptake, nutrient additions and extractable soil nutrients from treated soils have been used for availability investigations. Application of wood ash resulted in neutralisation of soil acidity, increased exchangeable nutrient bases and decreased extractable micronutrients. Wood ash was in general more effective than lime in increasing dry matter production, mainly because of higher P and K uptake. Phosphorus, Ca, Mg, K, Mn, Zn and Cu from wood ash were used by plants. Wood ash application increased the availability of P, Ca, Mg and K and decreased that of Mn and Zn for plant uptake. Both nutrient additions and nutrient extractions from treated soils provided a reliable measure for plant available nutrients. Soil pH and effective cation exchange capacity affected the availability of P, Ca, Mg and K positively and that of Mn and Zn negatively.
This citation is from AGRICOLA.

884. **Bacillus cereus in free-stall bedding.**
Magnusson, M.; Svensson, B.; Kolstrup, C.; and Christiansson, A.
Journal of Dairy Science 90(12): 5473-82. (Dec. 2007)
NAL Call #: 44.8 J822 ; ISSN: 1525-3198
Descriptors: animal welfare/ animals/ bacillus cereus: growth & development: isolation & purification/ bedding and linens: microbiology: standards: veterinary/ cattle/ colony count, microbial veterinary/ dust/ enterobacteriaceae: growth & development: isolation & purification/ environmental microbiology/ feces: microbiology/ female/ floors and floorcoverings: standards/ housing, animal/ hydrogen ion concentration/ risk factors/ soil/ spores, bacterial/ urine: microbiology/ wood
Abstract: To increase the understanding of how different factors affect the bacterial growth in deep sawdust beds for dairy cattle, the microbiological status of Bacillus cereus and coliforms in deep sawdust-bedded free stalls was investigated over two 14-d periods on one farm. High counts of B. cereus and coliforms were found in the entire beds. On average, 4.1 log(10) B. cereus spores, 5.5 log(10) B. cereus, and 6.7 log(10) coliforms per gram of bedding could be found in the upper layers of the sawdust likely to be in contact with the cows' udders. The highest counts of B. cereus spores, B. cereus, and coliforms were found in the bedding before fresh bedding was added, and the lowest immediately afterwards. Different factors of importance for the growth of B. cereus in the bedding material were explored in laboratory tests. These were found to be the type of bedding, pH, and the type and availability of nutrients. Alternative bedding material such as peat and mixtures of peat and sawdust inhibited the bacterial growth of B. cereus. The extent of growth of B. cereus in the sawdust was increased in a dose-dependent manner by the availability of feces. Urine added to different bedding material raised the pH and also led to bacterial growth of B. cereus in the peat. In sawdust, a dry matter content greater than 70% was needed to lower the water activity to 0.95, which is needed to inhibit the growth of B. cereus. In an attempt to reduce the bacterial growth of B. cereus and coliforms in deep sawdust beds on the farm, the effect of giving bedding daily or a full replacement of the beds was studied. The spore count of B. cereus in the back part of the free stalls before fresh bedding was added was 0.9 log units lower in stalls given daily bedding than in stalls given bedding twice weekly. No effect on coliform counts was found. Replacement of the entire sawdust bedding had an effect for a short period, but by 1 to 2 mo after replacement, the counts of B. cereus spores in the beds had increased about 2 log units and were as high as they were before bed replacement. Therefore, free-stall management could, to a limited extent, reduce the content of B. cereus spores in the beds by daily bedding and entire bed replacement.
This citation is from PubMed.

885. **Bacterial counts associated with sawdust and recycled manure bedding treated with commercial conditioners.**
Hogan, J. S.; Bogacz, V. L.; Thompson, L. M.; Romig, S.; Schoenberger, P. S.; Weiss, W. P.; and Smith, K. L.
Journal of Dairy Science 82(8): 1690-1695. (Aug. 1999)
NAL Call #: 44.8 J822 ; ISSN: 0022-0302 [JDSCAE]
Descriptors: dairy cows/ sawdust/ alkali treatment/ acid treatment/ plate count/ Gram negative bacteria/ Klebsiella/ Streptococcus/ pH/ teats/ antibacterial properties/ duration/ litter (bedding)/ cattle manure/ slaked lime/ coliform count/ conditioning
Abstract: Bacteria counts associated with untreated organic bedding materials were compared with those of bedding treated with either an alkaline commercial bedding conditioner, acidic commercial bedding conditioner, or hydrated lime. Bedding materials were recycled manure and kiln-dried sawdust. The effects of bedding treatments on bacteria counts differed between bedding types. Each of the bedding treatments significantly reduced bacteria in recycled manure prior to use. The alkaline conditioner and hydrated lime effectively inhibited bacteria in recycled manure for 1 d. Bedding counts and teat swabs of cows housed on recycled manure treated with the alkaline conditioner were reduced on d 2. The use of the acid conditioner in recycled manure had little effect on bacteria in bedding. Sawdust differed from recycled manure in that bacteria in untreated sawdust prior to use were minimal, and populations increased rapidly during the first 2 d after use as bedding. The acid conditioner had a bacteriostatic effect in sawdust, evident by the reduction of bacteria on d 2. The alkaline conditioner and hydrated lime did not alter bacteria counts in sawdust compared with untreated sawdust. Antibacterial activity of each conditioner deteriorated between d 2 and d 6 in both beddings. The

antibacterial activities of conditioners were related to the pH of bedding materials. The use of commercial bedding conditioners initially reduced bacterial counts; however, the antibacterial effects had diminished between d 2 and 6 after use in bedding.
This citation is from AGRICOLA.

886. **Bacterial counts in bedding and on teat ends of cows housed on sand and sawdust.**
Zdanowicz, M.; Shelford, J. A.; Tucker, C. B.; and Weary, D. M.
Journal of Dairy Science 85(Supplement 1): 376. (2002)
NAL Call #: 44.8 J822; ISSN: 0022-0302
Descriptors: bedding/ sawdust/ dairy/ bacteria

887. **Bacterial counts in sawdust bedding.**
Hogan, J. S. and Smith, K. L.
Special Circular Ohio Agricultural Research and Development Center 163: 32-36. (1998); ISSN: 0736-8003
Descriptors: bacterial diseases/ bovine mastitis/ calcium carbonate/ cattle housing/ disease control/ lime/ litter/ microbial flora/ pH/ sawdust / teats/ bacterial infections/ bacterioses/ cattle sheds/ hydrogen ion concentration/ microflora/ potential of hydrogen/ United States of America
Abstract: Bacterial counts in untreated sawdust bedding were compared with those in sawdust bedding after the addition of lime and after daily replacement of bedding in the back one-third of cow stalls. Addition of 1 kg of lime to 10 kg of sawdust before use as bedding reduced Gram-negative bacteria, coliforms, Klebsiella spp., and streptococci. Sawdust treated with lime also showed decreases in bacterial counts when compared with sawdust that was replaced daily and control bedding after one day in the stall. The decrease in bacterial populations was related to an increase in bedding pH. Mean pH in sawdust that contained lime was greater before use and was greater after day one in the stall compared with other treatments. After 2 and 6 days in stalls, bacterial counts and pH were similar among treatments. Dry matter content of bedding did not differ among bedding treatments. Bacterial counts in bedding were positively correlated with those of teat skin swabs. Gram-negative bacterial and Klebsiella spp. counts on teat swabs were lower for cows housed on bedding treated with lime on day 2 than for cows housed on control bedding and bedding that was replaced daily. Addition of lime to sawdust in the back one-third of the stalls caused a decrease in exposure of teats to environmental mastitis pathogens in bedding for one day.

888. **Bacterial populations on teat ends of dairy cows housed in free stalls and bedded with either sand or sawdust.**
Zdanowicz, M.; Shelford, J. A.; Tucker, C. B.; Weary, D. M.; and Von Keyserlingk, M. A. G.
Journal of Dairy Science 87(6): 1694-1701. (June 2004)
NAL Call #: 44.8 J822 ; ISSN: 0022-0302
Descriptors: dairy cows/ teats/ bacterial colonization/ plate count/ litter (bedding)/ sawdust/ sand/ free stalls/ cattle housing/ coliform bacteria/ Klebsiella/ Streptococcus/ bovine mastitis/ animal pathogenic bacteria/ udders/ udder cleanliness/ stall cleanliness
Abstract: The main objectives of the experiment were: 1) to compare bacterial populations of mastitis-causing organisms on the teats of lactating dairy cattle housed on sand and sawdust bedding and, 2) to examine the relationship between bacterial counts present in the 2 bedding types with those on teat ends. Sixteen lactating Holstein cows were housed on either sand or sawdust-bedded free stalls using a crossover design with 3 wk per bedding type. Bedding samples were collected on d 0 (prior to animals lying on the bedding), 1, 2, and 6. Teat ends were sampled prior to the morning milking on d 1, 2, and 6. All samples were analyzed to determine coliform, Klebsiella spp., and Streptococcus spp. populations. There were 2 times more coliforms and 6 times more Klebsiella bacteria on teat ends of cows housed on sawdust compared with those housed on sand. In contrast, there were 10 times more Streptococcus spp. bacteria on teat ends of cows when housed on sand compared with sawdust. In both sawdust and sand bedding, coliforms, Klebsiella and Streptococcus counts increased over each experimental week, although patterns varied with bedding and bacteria type. Bacterial counts on teat ends were correlated with bacterial counts in sawdust (r = 0.47, 0.69, and 0.60 for coliforms, Klebsiella spp., and streptococci, respectively) and in sand (r = 0.35 for coliforms and r = 0.40 for Klebsiella spp.). In conclusion, coliforms and Klebsiella spp. on teat ends were more numerous when cows were housed on sawdust bedding, but Streptococcus spp. were more numerous on teat ends of cows housed on sand.
This citation is from AGRICOLA.

889. **Bagasse as a possible substrate for Pleurotus ostreatus (Fr.) Kummer cultivation for the local mushroom farms in the northeast of Thailand.**
Vetayasuporn, S.; Chutichudet, P.; and Cho Ruk, K.
Pakistan Journal of Biological Sciences 9(13): 2512-2515. (2006)
NAL Call #: QH301 .P355; ISSN: 1028-8880
Descriptors: bagasse/ crop yield/ cultivation/ edible fungi/ lactic acid bacteria/ mycelium/ sawdust/ substrates/ yeasts/ Lentinaceae/ Poriales
Abstract: Substrate combinations of sawdust and bagasse were used for P. ostreatus cultivation in the farmer's mushroom house in the northeast of Thailand, and 6-9 flushes were obtained from these substrates. The substrate combination of 50% bagasse+50% sawdust accelerated the mushroom-growing processes. The mycelial completed colonization, primordium initiation and fruiting body formation were found within 22, 27 and 32 days, respectively. The 100% sawdust+15% effective microorganisms (bacteria that produce lactic acid, yeasts, photosynthetic bacteria, actinomycetes and fungi) solution gave the maximum mushroom yield (536.85 g/1000 g substrate) but this yield was insignificantly different from those found from 100% sawdust substrate+tap water (control; 508.98 g), 75% bagasse+25% sawdust (524.28 g) and 50% bagasse+50% sawdust (494.05 g) at a confidence level of 95%. However, 107.61 and 106.89% of the biological efficiency values were revealed in 75% bagasse+25% sawdust and 50% bagasse+50% sawdust, respectively. The substrate combination of sawdust and

bagasse has shown great potential for use as a raw material since this mixed substrate provides an economically acceptable production alternative for P. ostreatus cultivation.
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890. **Barley biomass and grain yield and canola seed yield response to land application of wood ash.**
Patterson, S. J.; Acharya, S. N.; Thomas, J. E.; Bertschi, A. B.; and Rothwell, R. L.
Agronomy Journal 96(4): 971-977. (July 2004-Aug. 2004)
NAL Call #: 4 AM34P; ISSN: 0002-1962
Descriptors: Hordeum vulgare/ barley/ dry matter accumulation/ grain yield/ Brassica rapa/ canola/ crop yield/ wood ash/ soil amendments/ application rate/ acid soils/ nitrogen fertilizers/ fertilizer application/ Alberta
Abstract: Wood ash is considered a waste product that accumulates from the burning of wood waste for energy production. Field studies were conducted on acidic Boralf and Eutrochrept soils and in the greenhouse using material from the surface of these soils in randomized complete block designs to evaluate the effectiveness of wood ash as a liming material for improving crop production. For the greenhouse study, soil was treated with the equivalent of 0 to 200 t ha(-1) (w/w) wood ash. Barley (Hordeum vulgare L.) yielded up to 50% more dry matter in this study. Based on these findings, a 3-yr field study was done to determine the effect of single applications of 6, 12.5, and 25 t ha(-1) wood ash to Boralf soils in central Alberta. Significant increases in barley dry matter and grain yield and oil seed yields of canola (Brassica rapa L.) were observed when soil was supplemented with 12.5 or 25 t ha(-1) along with N fertilizer. Increases of 72 and 50% in barley dry matter and grain yield were observed while canola oilseed yield increased 124% due to wood ash application. Applications up to 25 t ha(-1) did not have a deleterious effect on biomass or seed production in barley or canola crops. Results show that land application of wood ash increased pH and nutrient content of acid soils while having a beneficial effect on crop production. Land application of wood ash can provide timber companies with a viable alternative to landfill disposal.
This citation is from AGRICOLA.

891. **Barley dry matter yield, crop uptake, and soil nutrients under fresh and composted manure containing straw or wood-chip bedding.**
Miller, J. J.; Beasley, B. W.; Larney, F. J.; and Olson, B. M.
Canadian Journal of Plant Science 84(4): 987-999. (2004)
NAL Call #: 450 C16; ISSN: 00084220 [CPSLA]
Descriptors: barley yield/ bedding/ compost/ fresh manure/ nutrient uptake/ soil nutrients/ barley/ compost/ fertilizer application/ manure/ nutrient uptake/ yield/ alberta/ canada/ great plains/ North America/ western hemisphere/ world/ bos taurus/ hordeum/ hordeum vulgare/ hordeum vulgare subsp. vulgare
Abstract: Limited information exists on the effect of fresh versus composted beef cattle manure containing straw or wood chips on barley (Hordeum vulgare) yield, nutrient uptake, and soil nutrient status in the Great Plains region of North America. Barley was grown on an irrigated clay loam soil in southern Alberta from 1999 to 2001. The treatments were three rates (13, 39, 77 Mg dry material per hectare) of fresh manure (FM) or composted manure (CM) containing either straw (ST) or wood-chip (WD) bedding, one inorganic (IN) fertilizer treatment (100 kg N ha-1, 17 kg P ha-1), and a control treatment; applied in the fall of 1998, 1999, and 2000. Dry matter yield was not significantly (P > 0.05) influenced by manure type or bedding material. Crop protein was 7% higher under FM (12.7 g kg-1) than CM (11.9 g kg -1) in 2001, and crop N uptake was 11 to 13% higher for CM-ST (171.3 kg ha-1) and FM-WD (174.9 kg ha-1) than CM-WD (154.7 kg ha-1) over the 3 yr. Soil available N was 20 to 261% higher for FM than CM at the 39 and 77 Mg ha-1 rates, and it was 62 to 199% higher for FM than CM in 2000 and 2001. Soil available N was 48 to 57% higher for ST than WD at the two higher application rates, and it was 26 to 65% higher for ST than WD in all 3 yr. Overall, manure type and bedding influenced certain crop and soil parameters, and higher available soil N under FM and ST indicated a potential for greater mineralization under these treatments.

892. **Bedding and within-pen location effects on feedlot pen runoff quality using a rainfall simulator.**
Miller, J. J.; Olson, E. C.; Chanasyk, D. S.; Beasley, B. W.; Yanke, L. J.; Larney, F. J.; McAllister, T. A.; Olson, B. M.; and Selinger, L. B.
Journal of Environmental Quality 35(2): 505-15. (Mar. 2006-Apr. 2006)
NAL Call #: QH540.J6; ISSN: 0047-2425
Descriptors: Alberta/ animal husbandry/ animals/ cattle/ chlorides: analysis/ colony count, microbial/ enterobacteriaceae: isolation & purification/ escherichia coli: isolation & purification/ hydrogen-ion concentration/ nitrogen: analysis/ oxygen: analysis/ phosphorus: analysis/ potassium: analysis/ quaternary ammonium compounds: analysis/ rain/ sodium: analysis/ sulfates: analysis/ water microbiology/ water movements/ water pollutants: analysis
Abstract: Soluble salts, nutrients, and pathogenic bacteria in feedlot-pen runoff have the potential to cause pollution of the environment. A 2-yr study (1998-1999) was conducted at a beef cattle (Bos taurus) feedlot in southern Alberta, Canada, to determine the effect of bedding material [barley (Hordeum vulgare L.) straw versus wood chips] and within-pen location on the chemical and bacterial properties of pen-floor runoff. Runoff was generated with a portable rainfall simulator and analyzed for chemical content (nitrogen [N], phosphorus [P], soluble salts, electrical conductivity [EC], sodium adsorption ratio [SAR], dissolved oxygen [DO], and pH) and populations of three groups of bacteria (Escherichia coli, total coliforms, total aerobic heterotrophs at 27 degrees C) in 1998 and 1999. Bedding had a significant (P < or = 0.05) effect on NH4-N concentration and load in 1999, SO4 load in 1998, SO4 concentration and load in 1999, and total coliforms in both years; where these three variables were higher in wood than straw pens. Location had a significant effect on EC and concentrations of total Kjeldahl nitrogen (TKN), Na, K, SO4, and Cl in 1998, and total coliforms in both years. These seven variables were higher at the bedding pack than pen floor location, indicating that bedding packs were major reservoirs of TKN, soluble salts, and total coliforms. Significantly higher dissolved reactive phosphorus (DRP),

total P, and NH4-N concentrations and loads at the bedding pack location in wood pens in 1998, and a similar trend for TKN concentration in 1999, indicated that this bedding-location treatment was a greater source of nutrients to runoff than the other three bedding-location treatments. Bedding, location, and their interaction may therefore be a potential tool to manage nutrients, soluble salts, and bacteria in feedlot runoff.
This citation is from PubMed.

893. **Bedding on geotextile mattresses: How much is needed to improve cow comfort?**
Tucker, C. B. and Weary, D. M.
Journal of Dairy Science 87(9): 2889-95. (Sept. 2004)
NAL Call #: 44.8 J822; ISSN: 0022-0302
Descriptors: animals/ bedding and linens: veterinary/ behavior, animal/ cattle: physiology/ female/ housing, animal/ posture/ textiles/ wood
Abstract: The objective of our study was to evaluate how the amount of sawdust bedding on mattresses affects dairy cattle behavior and preferences. Eleven nonlactating, multiparous cows were housed individually in pens with access to 3 free stalls. Each stall was fitted with a geotextile mattress covered with either 0, 1, or 7.5 kg of kiln-dried sawdust. The experiment began with 7 d of acclimatization to all 3 stalls. Cows were then allowed access to only 1 of the 3 stalls at a time, each for 3 d (restriction phase). At the end of this restriction phase, cows were allowed free access to all 3 stalls for 3 d (free-choice phase). Time spent lying and the number of lying bouts increased significantly with the amount of bedding, from 12.3 +/- 0.53 h lying and 8.5 +/- 0.62 bouts per 24 h on bare mattresses to 13.8 +/- 0.53 h lying and 10.0 +/- 0.62 bouts per 24 h on mattresses with 7.5 kg of sawdust. In addition, the animals spent less time standing with only the front hooves in the stalls when more sawdust was present. When allowed free access to all 3 options, all 11 animals spent a majority of their time lying and standing in the 7.5-kg option. In conclusion, cows preferred mattresses bedded with 7.5 kg of sawdust, on which they spent more time lying down and less time standing with only the front hooves in stalls. These results indicate that more sawdust bedding improves cow comfort in stalls with geotextile mattresses.
This citation is from PubMed.

894. **Beneficial use of wood ash as an agricultural soil amendment: Case studies from the United States forest products industry.**
Vance, E. D. and Mitchell, C. C.
In: Land Application of Agricultural, Industrial, and Municipal By-Products.
Madison, Wis., USA : Soil Science Society of America, 2000; pp. 567-582.
Descriptors: application to land/ field crops/ soil amendments/ soil properties/ trees/ waste utilization/ wastes/ wood ash/ woody plants/ land application/ United States of America
Abstract: Six case studies of individual forest products companies who have developed successful ash application programmes in Louisiana, Washington, Wisconsin and Alabama are discussed. Results from programme research trials and demonstration plots on the effects of ash on soil properties and crop and tree growth are also summarized.
This citation is from AGRICOLA.

895. **Beneficial use of wtp residuals and wood ash on agricultural and forest lands.**
Vance, E.
In: Proceedings of the 2000 NCASI West Coast Regional Meeting.
Portland, OR; pp. 195-197; 2000.
Notes: Conference code: 60432.
Descriptors: agricultural engineering/ fertilizers/ land fill/ leaching/ moisture/ weed control/ wood products/ forest lands/ forestry/ agriculture/ fertilizers/ forestry/ land fill/ leaching/ moisture/ weed control/ wood products
Abstract: The beneficial use of WTP residuals and wood ash on agricultural and forest lands was discussed. Some of the advantages of land application as a beneficial use are reduced landfill costs, minimal processing and increased forest productivity. Various factors related to the Willamette program were presented.

896. **Biodegradation of nonlignocellulosic substances. II. Physical and chemical properties of sawdust before and after use as artificial soil.**
Horisawa, S.; Sunagawa, M.; Tamai, Y.; Matsuoka, Y.; Miura, T.; and Terazawa, M.
Journal of Wood Science 45(6): 492-497. (1999); ISSN: 1435-0211
Descriptors: sawdust/ lignocellulose/ biodegradation/ growing media / water holding capacity/ physicochemical properties/ mechanical damage/ anatomy and morphology/ ultrastructure/ municipal solid waste/ waste treatment/ specific gravity/ cellulose/ adhesion/ porosity/ abrasion/ evaluation/ hollocellulose
This citation is from AGRICOLA.

897. **Biofiltration using partially stabilized hog manure compost.**
Hong, J.-H.; Keener, H. M.; and Elwell, D. L.
In: 2000 ASAE Annual Intenational Meeting, Technical Papers: Engineering Solutions for a New Century.; Vol. 2.
Milwaukee, WI.; pp. 4543-4555; 2000.
Notes: Conference code: 62828.
Descriptors: aeration / ammonia emission/ biofiltration/ composting/ decomposition/ odors/ stabilization/ ammonia/ composting/ decomposition/ filtration/ moisture/ odors/ raw materials/ sawdust/ stabilization/ aeration/ ammonia emissions/ biofiltration/ continuous aeration (ca)/ manures
Abstract: Hog manure amended with sawdust (moisture 56-60% wet basis, C/N 19-21) was composted in pilot-scale vessels using continuous aeration (CA) and intermittent aeration (IA) for 3 and 4 weeks. In two subsequent runs of the same duration, composts resulting from each of the first runs were used as a biofilter on the output air from newly composting material. Conditions between each of these paired sets appeared to be similar. Ammonia was released from the biofilter material during the first week of stabilization while the compost produced ammonia after the first week of composting. In both cases substantial absorption, 61-82%, of ammonia production from the composting raw material was achieved in the stabilizing material during the final weeks of operation and indicates use of the stabilizing hog manure/sawdust compost as a biofilter can reduce ammonia emissions. Total NH3-N

emissions during run 2 for IA was less than two thirds that of the CA process. Dry solids loss for the stabilized compost (6-8 weeks) was 20-45%.

898. **Biological activity of deflated chestnut soils treated with bark, sawdust, and straw composts in the Baikal region.**
Korsunova, Ts D. Ts and Chimitdorzhieva, G. D.
Agrokhimiya 4: 15-19. (2008); ISSN: 0002-1881
Descriptors: chestnut / soil/ sawdust/ wood waste/ biological processes
Abstract: The work is devoted to search for alternate sources of organic fertilizers stimulating biological processes in the soil. Changes in biological activity of chestnut soil under the effect of waste from timber and woodworking industries and agricultural production (bark, sawdust, and straw) were studied. The increase in biological activity of soil under the effect and aftereffect of composts suggests that these wastes are highly efficient organic fertilizers and can be used for increasing soil fertility.

899. **Botanical composition, herbage production and plant mineral contents as affected by application of chemical fertilizer and fermented sawdust pig manure on Cheju brown volcanic ash pasture soil.**
Kim, MoonChul; Hyun, HaeNam; and Lee, SungCheol
Journal of the Korean Society of Grassland Science 20(2): 131-138. (2000)
NAL Call #: SB202.K6H352; ISSN: 1013-9354
Descriptors: application rates/ biomass production/ botanical composition/ composts/ crop yield/ grasslands/ nitrogen fertilizers/ pig manure/ sawdust/ sown grasslands/ South Korea/ sown pastures
Abstract: In trials at Cheju Island, Korea Republic from September 1997 to October 1998 the effect of pig manure composted with sawdust (PMC) application on the herbage production on a mixed sown grassland of Dactylis glomerata, Lolium perenne and Trifolium repens in the Cheju brown volcanic ash soil was investigated. Split plot design (main plot: 3 nitrogen application rates of 0, 150 and 300 kg/ha; sub plot: 4 PMC rates of 0, 3, 6 and 12 tons/ha) was used. Plant height and dry matter yield increased significantly with increase in N and PMC rates. There was no difference in the botanical composition of grasses as affected by PMC application rate, but herbage yields of grass species were increased by N application. Proportion of T. repens in the sward decreased with increase in N application, but increased with increase of PMC rate. Percentages of weeds were not affected by application rates of N fertilizer and PMC in the mixed species pasture. N, P and K contents of species in the pasture significantly increased with increasing application rates of N fertilizer. It is considered optimum to apply 150 kg N/ha and either 3 or 6 tons/ha of PMC for production of mixed sown grassland on Cheju Island.
This citation is from AGRICOLA.

900. **Bovine mortality composting in northern Utah.**
Trinca, L. A.; Miller, B.; and Beard, F. R.
In: ASAE/CSAE SCGR Annual International Meeting.Toronto, Ontario, Canada.); pp. 11 pp; 1999.
Descriptors: application to land/ carcasses/ characterization/ climate/ composting/ composts/ decomposition/ mortality/ sawdust/ straw/ temperature/ treatment/ wheat/ wheat straw/ death rate/ land application/ United States of America
Abstract: The objectives of this project were to develop methods of bovine mortality composting that would perform effectively within Northern Utah's (USA) arid climate and be acceptable to local dairy operators from an economic and labour perspective. Ten adult Holstein mortality compost trial replicates were established in June of 1998, five using wheat straw and five using coarse sized soft-wood sawdust as co-composting material. After 15 and 23 weeks, each replicate was opened, photographed, characterized as to carcass decomposition, aerated and re-covered. Interior temperatures of piles reached their operating peak near 60 C and 48.8 C for sawdust and straw piles, respectively. Piles maintained temperatures equal to or above ambient conditions through December. The study showed that either composting material effectively disposed of the carcass. The straw treatments decomposed more rapidly even though the operating temperatures was lower. In May of 1999, the compost treatments were land-applied and incorporated on agricultural ground.
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901. **Broiler litter supplementation improves storage and feed-nutritional value of sawdust-based spent mushroom substrate.**
Kwak, W. S.; Jung, S. H.; and Kim, Y. I.
Bioresource Technology 99(8): 2947-2955. (May 2008)
NAL Call #: TD930.A32; ISSN: 0960-8524
Descriptors: broiler litter/ storage/ feed-nutritional value/ sawdust/ mushroom
Abstract: A study was conducted to determine the effect of broiler poultry litter (BL) supplementation to spent mushroom substrate (SMS) on its storage and feed-nutritional value improvement. In Exp. 1, the sawdust-based SMS from a king oyster mushroom (Pleurotus eryngii) farm was mixed with BL at 0%, 25%, 50%, 75% and 100% levels on a wet basis and deepstack stored for short-term (1-wk) and long-term (3-wk). At 1-wk of short-term deepstack storage, SMS with more than 50% BL levels showed favorable conservation. At 3-wk of long-term storage, all treatments except for BL 100% had a serious fungal problem. Based on chemical parameters, BL-blending to SMS practically improved the feed-nutritional value of the mixtures. Since the deepstacking method was not effective for long term storage, in Exp. 2 SMS ensiled with or without BL was attempted to improve long-term (3-wk) storage. All the ensiled treatments (SMS 100%, SMS 75%+BL 25% and SMS 50%+BL 50%) had desirable fermentation. As in deepstacking, BL-blending to SMS improved the nutritive value of the ensiled mixtures. The populations of total bacteria, lactic acid bacteria and yeast were highest (P <0.05) when 75% SMS was blended with 25% BL. In conclusion, blending 50% or more BL with SMS was effective for the short-term (1-wk) deepstack storage. For long-term (3-wk) storage of SMS, an ensiling method was effective with or without the addition of BL.
This citation is from AGRICOLA.

902. **Broiler performance on different types of litter at different depths in summer.**
Malakar, P. K.; Fouzder, S. K.; Ahmed, M.; and Wahid, M. A.
Bangladesh Veterinarian 19(1): 34-38. (2002); ISSN: 1012-5949
Descriptors: animal welfare/ broiler performance/ broilers/ chicks/ depth/ litter/ poultry/ poultry housing/ rice/ rice husks/ rice straw/ sawdust/ straw/ summer/ animal rights/ chickens/ domesticated birds/ paddy/ rice hulls
Abstract: A total of 144 day-old straight-run Shaver Starbro broiler chicks were reared on sawdust, chopped rice straw and rice husk litter at different depths (5.08, 6.35 and 7.62 cm) for a period of 49 days to examine the influence of the type and depth of litter on broiler performance. Results indicate that body weight, feed consumption, feed conversion and production number were not significantly affected by litter type and depth. Livability was influenced by the type of litter. No pathological symptoms were found to be detrimental to the survivability of birds and no visual indications of breast blisters or leg abnormalities were found. Major production variables (weight gain, feed intake, feed efficiency, survivability and cost of litter/kg meat) indicate that chopped rice straw with a depth of 6.35 cm is the most suitable litter for raising broilers during summer.

903. **Carbon addition alters vegetation composition on ex-arable fields.**
Eschen, R.; Mortimer, S. R.; Lawson, C. S.; Edwards, A. R.; Brook, A. J.; Igual, J. M.; Hedlund, K.; and Schaffner, U.
Journal of Applied Ecology 44(1): 95-104. (2007)
NAL Call #: 410 J828; ISSN: 0021-8901
Descriptors: abandoned land/ arable land/ botanical composition/ carbon/ forbs/ immobilization/ nitrate/ nutrient availability/ sawdust/ sugar/ wood chips/ Britain/ microbial communities/ restoration ecology/ United Kingdom
Abstract: Recent changes in European agricultural policy have led to measures to reverse the loss of species-rich grasslands through the creation of new areas on ex-arable land. Ex-arable soils are often characterized by high inorganic nitrogen (N) levels, which lead to the rapid establishment of annual and fast-growing perennial species during the initial phase of habitat creation. The addition of carbon (C) to the soil has been suggested as a countermeasure to reduce plant-available N and alter competitive interactions among plant species. To test the effect of C addition on habitat creation on ex-arable land, an experiment was set up on two recently abandoned fields in Switzerland and on two 6-year-old restoration sites in the UK. Carbon was added as a mixture of either sugar and sawdust or wood chips and sawdust during a period of 2 years. The effects of C addition on soil parameters and vegetation composition were assessed during the period of C additions and 1 year thereafter. Soil nitrate concentrations were reduced at all sites within weeks of the first C addition, and remained low until cessation of the C additions. The overall effect of C addition on vegetation was a reduction in above-ground biomass and cover. At the Swiss sites, the addition of sugar and sawdust led to a relative increase in legume and forb cover and to a decrease in grass cover. The soil N availability, composition of soil micro-organisms and vegetation characteristics continued to be affected after cessation of C additions. Synthesis and applications. The results suggest that C addition in grassland restoration is a useful management method to reduce N availability on ex-arable land. Carbon addition alters the vegetation composition by creating gaps in the vegetation that facilitates the establishment of late-seral plant species, and is most effective when started immediately after the abandonment of arable fields and applied over several years.

904. **Changes in chemical properties and temperature during the composting of tobacco waste with other organic materials, and effects of resulting composts on lettuce (Lactuca sativa L.) and spinach (Spinacea oleracea L.).**
Adediran, J. A.; Mnkeni, P. N. S.; Mafu, N. C.; and Muyima, N. Y. O.
Biological Agriculture and Horticulture 22(2): 101-119. (2004)
NAL Call #: S605.5.B5 ; ISSN: 0144-8765
Descriptors: cattle dung/ composting/ composts/ electrical conductivity/ lettuces/ microbial activities/ mineralization/ nitrogen/ organic wastes/ pH/ pig manure/ poultry manure/ sawdust/ spinach/ temperature/ tobacco/ wood shavings/ hydrogen ion concentration/ potential of hydrogen/ poultry litter
Abstract: This study: (i) investigated changes that take place during the composting of tobacco wastes with other organic materials in Eastern Cape, South Africa; (ii) characterized the resulting composts; and (iii) evaluated their agronomic effectiveness. Four composts were made, all of which contained tobacco waste and sawdust/wood shavings but differed in the third ingredient, which was either cow dung, pig dung, poultry manure or cabbage waste. Changes in pH and electrical conductivity (EC) during composting were consistent with those generally observed, in spite of the presence of toxic tobacco wastes. Changes in temperature regime and the results of a bioassay (germination test) suggested that compost maturity was achieved after 45-59 days in all four composts. Mixing of tobacco waste with other organic wastes reduced the nicotine content of tobacco wastes from 12180 mg kg-1 to 4872 mg kg-1 by dilution while composting reduced it further to <160 mg kg-1 in the final composts. Tobacco waste had a depressing effect on microbial activity in soil but the composts stimulated it, possibly as a result of their lower EC and reduced nicotine and related alkaloid levels. All final composts had C:N ratios <17 and so were considered conducive to N mineralization and thus suitable for horticultural use. However, they had high electrical conductivity (6.0 to 9.3 mS cm-1) and may not be ideal for salt-sensitive crops or as sole components in horticultural growing media without modification. Application of the composts to soil (to supply 80 mg N kg-1) improved the growth of lettuce relative to the control and uncomposted tobacco waste but full growth potential was not attained due to inadequate nitrogen supply. A subsequent experiment with spinach designed to

address the N limitation revealed that satisfactory yields could be obtained by the application of 20 t ha-1 cow dung compost or 10 t ha-1 compost in combination with NPK fertilizer supplying 50 kg N ha-1.
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905. **Changes in concentrations of malodorous compounds during controlled aeration composting.**
Elwell, D. L.; Borger, D. C.; Blaho, D. V.; Fahrni, J. K.; Keener, H. M.; and Willett, L. B.
Compost Science and Utilization 12(2): 102-107. (2004)
NAL Call #: TD796.5.C58 ; ISSN: 1065-657X
Descriptors: acetates / aeration/ air flow/ ammonia/ animal manures/ ash / butyrates/ carbon dioxide/ carbon nitrogen ratio/ composting/ dairy wastes/ fatty acids/ odours/ oxygen/ P cresol/ pH/ phenolic compounds/ propionates/ sawdust/ skatole/ temperature/ methylindole/ methylphenol/ hydrogen ion concentration/ odors/ potential of hydrogen/ smells
Abstract: Effects of composting on odorous chemicals in dairy manure were investigated in replicated pilot-scale studies. Three 16-day composting trials were conducted, using 205 L vessels containing 83 kg mass. Fresh or 12-day-aged manure, from lactating cows, was mixed with sawdust (3man:1saw w/w). Vessels were either aerated continuously with high (2.3 kg/hr)/low (0.8 kg/hr) air flow controlled by thermostats or intermittently on a 5 min high air flow/55 min off clock controlled cycle. Six vessel replicates were conducted on each manure/air flow treatment combination. Temperatures, air flow, O_2 consumption, and CO_2 production were recorded every 10 minutes. Trapped NH_3 emissions were determined daily. Exhaust air was passed through water-cooled condensers to analyze emitted volatiles, and condensate volume, pH, and volatile fatty acids (VFAs) were quantified at 12 or 24 hour intervals. Solids were collected from each vessel initially, at remix at the end of day 7, and at the end of each trial (day 16) for analysis of moisture, pH, ash, C/N, and odorants. Phenolics and indolics were extracted with ethyl ether. VFAs were recovered with pH 2.0 water. Analysis was by flame or mass selective detection gas chromatography. Temperature increased most rapidly in continuously aerated vessels yet maintained a lower mean temperature (49 vs 58 degrees C) than intermittent aeration. Both returned to near ambient temperature by day 16. Continuous aeration nearly doubled (11 vs 18 L) the amount of condensate released over 16 days. Fresh manure/sawdust mixes contained 6553, 795, 77, 51, 19, and 17 micro g/g of acetate, propionate, isobutyrate, isovalerate, phenol, and p-cresol. Aged manure mixes contained 9350, 3397, 2810, 445, 285, 441, 34, 176, and 18 micro g/g acetate, propionate, butyrate, valerate, isobutyrate, isovalerate, phenol, p-cresol, and skatole, as well as a number of C_{11} to C_{17} fatty acids. Both aeration methods maintained conditions that resulted in the destruction of most of the odorous chemicals studied in the composting mass in 7 days with only small quantities of acetate, isobutyrate, and skatole present by the end of day 16. Continuous aeration, as opposed to intermittent, more than doubled (115 vs 55 g) the emissions of NH3-N and increased the emissions of VFAs in condensate four-fold. Whereas, limited aeration did not destroy the odorants as rapidly, they remained in the compost until destruction.
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906. **Changes in fungal communities in abandoned farmland soil enriched with pine sawdust.**
Sierota, Z. and Kwasna, H.
Folia Forestalia Polonica Seria A, Lesnictwo 40: 85-94. (1998); ISSN: 0071-6677
Descriptors: abandoned land/ agricultural land/ agricultural soils/ calcium/ nitrogen/ plant pathogenic fungi/ plant pathogens/ plant pathology/ potassium/ sawdust/ soil amendments/ soil chemistry/ soil fungi/ soil organic matter/ Coelomycetes/ Diapleella coniothyrium/ farmland/ Hyphomycetes/ isolates/ mitosporic fungi/ Mortierella alpina/ Mortierellaceae/ Myxotrichaceae/ Onygenales/ organic matter in soil/ Paecilomyces marquandii/ Penicillium adametzii/ Penicillium janczewskii / Penicillium jensenii/ Penicillium spinulosum/ Penicillium vinaceum/ phytopathogens/ phytopathology/ Pseudogymnoascus/ Pseudogymnoascus roseus/ Zygomycetes
Abstract: In autumn 1995, pine sawdust was applied to abandoned farmlands in Poland not cultivated for 3 years and chemical and mycological analyses were performed. Two years later, the soil was re-examined and results were compared. Before sawdust application 350 fungal isolates belonging to 58 species were found in soil samples (the most common were Paecilomyces marquandii, Penicillium janczewskii, Pseudogymnoascus roseus, Coniothyrium fuckelii and Penicillium jensenii). Two years later, 246 isolates from 27 species (the most common were P. marquandii, C. fuckelii, Penicillium adametzii, P. verruculosum and P. vinaceum) were found in the control soil samples (without sawdust), and 186 isolates from 40 species (the most common were Mortierella alpina, Trichoderma harzianum, Penicillium spinulosum, P. chrysogenum and C. fuckelii) were found in the treated soil (with sawdust). In the treated soil a significant increase in carbon, nitrogen, potassium and calcium content as well as C/N ratio was also recorded.
This citation is from AGRICOLA.

907. **Changes in physico-chemical and biochemical parameters of soil following addition of wood ash: A field experiment.**
Perucci, Piero; Monaci, Elga; Onofri, Andrea; Vischetti, Costantino; and Casucci, Cristiano
European Journal of Agronomy 28(3): 155-161. (Apr. 2008); ISSN: 1161-0301
Descriptors: wood ash / waste disposal/ soil physical properties/ soil chemical properties/ soil biological properties/ electrical conductivity/ soil ph/ soil microorganisms/ carbon/ nitrogen/ enzymatic hydrolysis/ field experimentation / temporal variation/ application rate/ carbon nitrogen ratio/ enzyme activity/ microbial activity/ waste management/ Italy
Abstract: Here we have investigated the effects of the addition of two different wood ash sizes at two different doses (5 and 20t/ha) on the physico-chemical, microbiological and biochemical properties in the surface soil (0-30cm) of an Italian agricultural system. Over 24

months, the pH, electrical conductivity, soil microbial biomass-C and -N, and total hydrolytic activity were periodically tested, together with alkaline phosphatase, arylsulphatase and o-diphenoloxidase activities. Analysis of variance (ANOVA) was performed to consider the effects of sampling time and wood ash addition on the parameters tested and to reveal possible interactions between the two variables. For electrical conductivity, pH, soil microbial biomass-C and total hydrolytic activity the ANOVA showed a significant 'wood ash typex sampling time' interaction, while no interaction was found for the other enzymatic activities. Significant increases in pH and in electrical conductivity were seen over the first months in all of the treated samples, which were more pronounced at the higher dose. Decreases in microbial biomass-C and changes in the microbial C/N ratios were seen for all of the treatments, which were more pronounced at the higher dose. Increases in soil microbial activity were seen over the first 8 months. The alkaline phosphatase and arylsulphatase activities were significantly inhibited for the first 4 months of soil treatment. The significant increases seen in o-diphenoloxidase activity over the first 8 months under all of the treatments appear to be related to the increases in electrical conductivity. After 12 months, the levels of all of the parameters tested in the treated soils returned to the levels of the untreated soils indicating that the disposal of up to 20t/ha of wood ash per year in Italian agricultural soil does not result in long-term changes in any of these parameters.
This citation is from AGRICOLA.

908. **Characteristics of functional and nutritious soilless culture substrate for vegetables.**
Zhu, S.; Xu, W.; and Zhao, G.
Journal of Applied Ecology 13(4): 425-8. (Apr. 2002); ISSN: 1001-9332 .
Notes: Article in Chinese. Original journal title: Ying Yong Sheng Tai Xue Bao.
Descriptors: Cucumis sativus: growth & development/ culture media: chemistry/ Lycopersicon esculentum: growth & development/ nitrogen: metabolism / phosphorus: metabolism/ potassium: metabolism/ vegetables: growth & development
Abstract: A functional and nutritious substrate for soilless culture, which consists of peanut shell, sawdust, vermiculite, chicken manure, coal cinder, etc, was used to grow cucumbers, tomatoes and peppers in this experiment. The results showed that the substrate was rich in organic matter, N, available P and K, in which the nutrients were basically in balance for three vegetables. High content of microorganisms and high activity of soil enzymes were propitious to the transformation of organic components in the substrate. The yields of cucumber, tomato and pepper increased by 23.83%, 27.34% and 32.98%, respectively. The production value of peppers increased by 180.85%, and its net income increased by 109.69%. The qualities of three vegetables were coincident with 'harmless vegetable' standards.
This citation is from PubMed.

909. **Characteristics of wood ash and influence on soil properties and nutrient uptake: An overview.**
Demeyer, A.; Voundi Nkana, J. C.; and Verloo, M. G.
Bioresoure Technology 77(3): 287-95. (May 2001)
NAL Call #: TD930.A32; ISSN: 0960-8524
Descriptors: hydrogen ion concentration/ industrial waste/ industry/ soil: analysis/ soil microbiology/ soil pollutants: analysis/ time factors/ waste management: methods/ wood
Abstract: Wood industries and power plants generate enormous quantities of wood ash. Disposal in landfills has been for long a common method for removal. New regulations for conserving the environment have raised the costs of landfill disposal and added to the difficulties for acquiring new sites for disposal. Over a few decades a number of studies have been carried out on the utilization of wood ashes in agriculture and forestry as an alternative method for disposal. Because of their properties and their influence on soil chemistry the utilization of wood ashes is particularly suited for the fertility management of tropical acid soils and forest soils. This review principally focuses on ash from the wood industry and power plants and considers its physical, chemical and mineralogical characteristics, its effect on soil properties, on the availability of nutrient elements and on the growth and chemical composition of crops and trees, as well as its impact on the environment.
This citation is from PubMed.

910. **Chemical and physical properties of soil amended with pecan wood chips.**
Tahboub, M. B.; Lindemann, W. C.; and Murray, L.
HortScience: A Publication of the American Society for Horticultural Science 43(3): 891-896. (June 2008)
NAL Call #: SB1.H6; ISSN: 0018-5345
Descriptors: chemical properties/ physical properties/ soil amendment/ wood chips
Abstract: The pruning wood of pecan [Carya illinoinensis (Wangenh.) K. Koch] is often burned. Chipping and soil incorporation of pruning wood is becoming more popular as a result of environmental constraints on burning. The objective of our research was to determine how pecan wood incorporation into soil affects the soil chemical and physical properties. Pecan wood chips were incorporated into a silty clay soil at rates of 0, 4484, 8968, 13,452, and 17,936 kgp"ha-1 in Summer 2002, 2003, and 2004. Some plots received nitrogen at a rate of 0, 15.2, 30.5, 45.7, and 61.0 kgp"ha-1 to adjust the C : N ratio of trimmings to 30 : 1. Ammonium sulfate, as a nitrogen source to balance the C : N ratio of pecan wood chips, reduced soil pH. However, the wood chip amendments alone did not reduce soil pH. Soil salinity (as determined by electrical conductivity) and bulk density were unaffected by wood chip incorporation regardless of application rate or number of applications. Incorporation of pecan chips had little effect on soil moisture content, but the soil had an inherently high waterholding capacity. Pecan wood chip incorporation significantly increased soil organic matter content and aggregate stability, particularly at the higher application rates and with repeated amendment. The incorporation of pecan pruning wood into the soil appears to improve soil tilth and aggregation while providing growers with an environmentally acceptable means of disposal.
This citation is from AGRICOLA.

911. **Chemical and physicochemical characterization of humic acid -like materials from composts.**
Ouatmane, A.; D'Orazio, V.; Hafidi, M.; and Senesi, N.
Compost Science and Utilization 10(1): 39-46. (2002)
NAL Call #: TD796.5.C58 ; ISSN: 1065-657X
Descriptors: chemical composition/ composts/ farmyard

manure/ fulvic acids/ humic acids/ nitrogen/ organic wastes/ sawdust/ FYM
Abstract: Humic acid (HA)-like materials were extracted from composts prepared from domestic organic wastes (HADu), sawdust (HASc), used coffee (HACf), and farmyard manure (HAFm). The HA-like fractions were characterized for elemental composition, E_4/E_6 ratio, and structural and functional properties by Fourier-transform infrared (FTIR), fluorescence and electron spin resonance (ESR) spectroscopies. Elemental composition and E_4/E_6 ratios were similar to those characteristic of young humic matter. Nitrogen content was related to that in the initial waste being high for HADu and HACf and low for HAFm and HASc. FTIR spectra of HADu and HACf were dominated by absorptions of N-containing groups (1650 and 1540 cm-1), whereas those of HASc and HAFm were dominated by bands of aromatic structures (1595, 1511, 1418 and 1125 cm-1). Data from ESR and fluorescence spectroscopy were similar for all the HA-like fractions analysed. The low free radical concentrations and type of fluorescence patterns suggested simple structural components, low degree of aromatic polycondensation and low level of conjugated chromophores. In conclusion, HA-like substances obtained from composted materials exhibited an elemental composition related to the nature of the initial wastes and general characteristics close to those of soil fulvic acids rather than soil HAs.

912. **Chemical effects of wood ash on plant growth in tropical acid soils.**
Nkana, J. C. V.; Demeyer, A.; and Verloo, M. G.
Bioresource Technology 63(3): 251-260. (1998)
NAL Call #: TD930.A32 ; ISSN: 0960-8524
Descriptors: acid soils/ calcium fertilizers/ effects/ lime/ potassium fertilizers/ soil ph/ trace elements/ tropical soils/ Ultisols/ wood ash/ microelements/ potash fertilizers
Abstract: A greenhouse study was conducted to compare chemical effects of wood ash and $CaCO_3$ on the growth of rye grass (Lolium perenne) in three tropical acid soils (Kandiudults) from the forest zone of Central Cameroon. Amendments were applied at rates to attain target pH values of 5.5, 6.0 and 6.5. Generally, plants grown on ash-amended soils showed higher biomass production than did plants grown on lime and control treatments. After wood ash application, plants benefited from Ca and K supplementation, the synergy K-NO_3- and from changes in soil chemistry similar to lime application: higher ECEC and reduced Al and Mn toxicity. Therefore, wood ash appeared at the same time as a neutralizer of soil acidity and as a supplier of nutrients for tropical acid soils.
This citation is from AGRICOLA.

913. **Co-composting of poultry manure with low quantities of carbon-rich materials.**
Silva, M. E.; Lemos, L. T.; Cunha-Queda, A. C.; and Nunes, O. C.
Waste Management Resources 27(2): 119-28. (Mar. 2009); ISSN: 0734-242X
Descriptors: composting/ poultry manure/ carbon-rich materials
Abstract: To study the feasibility of co-composting poultry manure with low quantities of high-value, carbon-rich materials experiments to characterize three pilot-scale piles were carried out. The piles comprised poultry manure (pile 1), poultry manure and straw (pile 2) and poultry manure and sawdust (pile 3), using wood chips as bulking agent. Pile 1 presented the highest losses of organic matter and nitrogen contents (>/= 92.9% and 92.0%, respectively). Although a thermophilic phase (temperature > 40 degrees C) was not verified for this pile, the final compost was stable (class IV) and free of pathogen indicator micro-organisms but it was the most phytotoxic, and presented a humic and fulvic acids ratio (HA/FA) that was less than 1. In contrast, piles 2 and 3 sustained thermophilic phases and produced stable (class V) and mature (HA/FA > 1) composts. Pile 2 showed the lowest loss in nitrogen content (88.9%) and produced the final compost with the highest C/N ratio (14.7) and the lowest value of electrical conductivity (3.9 mS cm(-1)). This study showed that it is possible to reduce the costs of poultry manure composting, namely the costs associated with the use of carbon-rich materials, given that the final co-composts presented parameters within the range of those recommended by the Second Draft Proposal for compost quality.
This citation is from PubMed.

914. **Co-composting solid swine manure with pine sawdust as organic substrate.**
Zhang, Yun and He, Yong
Bioresource Technology 97(16): 2024-2031. (2006)
NAL Call #: TD930.A32; ISSN: 0960-8524
Descriptors: aeration / carbon nitrogen ratio/ chemical composition/ composting/ composts/ decomposition/ electrical conductivity/ humidity/ leaves/ moisture content/ nitrogen/ organic carbon/ organic matter/ pH/ phosphorus/ physicochemical properties/ pig manure/ pines/ plant residues/ sawdust/ sludges/ substrates/ tea/ temperature/ urea/ waste management/ waste utilization/ hydrogen ion concentration/ potential of hydrogen
Abstract: The main objectives of this work were to investigate the evolution of the principal physicochemical properties, i.e., bulk temperature, pH, electrical conductivity (EC), moisture content, total organic matter, total nitrogen and total phosphorus, in co-composting pine sawdust with increasing percentages of fresh solid swine manure, and thus to evaluate the most desirable manure proportion for producing organic substrates in consideration of the quality of the resulted compost. The composting was in four identical 100.5 l lab vessels, using 5% each tea leaves and herb residues as conditioners. The swine manure was added in the trials at 20%, 30%, 40%, respectively, and was substituted in the control with 30% lake sludge corrected by 0.5% urea. The initial humidity of each treatment was 60+or-2%. While being aerated actively at approximately 0.3 m3/min at intervals of 10 min/h, the mixture was composted for 29 days. The results indicated that N and P decomposition primarily occurred in the mesophilic phase, while organic carbon decomposed in the thermophilic phase and 30% swine manure with initial C/N ratio of about 40 was more desirable for composting organic substrates.
This citation is from AGRICOLA.

915. **Comparative short-term effects of different quality organic resources on maize productivity under two different environments in Zimbabwe.**
Mtambanengwe, F.; Mapfumo, P.; and Vanlauwe, B.
Nutrient Cycling in Agroecosystems 76(2/3): 271-284. (2006)
NAL Call #: S631 .F422; ISSN: 1385-1314
Descriptors: application rates/ biomass/ biomass production/ cattle husbandry/ clay loam soils/ crop yield/ green manures/ maize/ maize stover/ nitrogen/ nitrogen fertilizers/ nutrient availability/ nutrient content/ sandy soils/ sawdust/ soil types/ sunn hemp/ cattle management/ corn
Abstract: Major challenges for combined use of organic and mineral nutrient sources in smallholder agriculture include variable type and quality of the resources, their limited availability, timing of their relative application and the proportions at which the two should be combined. Short-term nutrient supply capacity of five different quality organic resources ranging from high to low quality, namely Crotalaria juncea, Calliandra calothyrsus, cattle manure, maize stover and Pinus patula sawdust were tested in the field using maize as a test crop. The study was conducted on two contrasting soil types at Makoholi and Domboshawa, which fall under different agro-ecological regions of Zimbabwe. Makoholi is a semi-arid area (<650 mm year-1) with predominantly coarse sandy soils containing approximately 90 g kg-1 clay while Domboshawa (>750 mm year-1) soils are sandy clay loam with 220 g kg-1 clay. Each organic resource treatment was applied at low (2.5 tonnes C ha-1) and high (7.5 tonnes C ha-1) biomass rates at each site. Each plot was sub-divided into two with one half receiving 120 kg N ha-1 against zero in the other. At Makoholi, there was a nine-fold increase in maize grain yield under high application rates of C. juncea over the unfertilized control, which yielded only 0.4 tonnes ha-1. Combinations of mineral N fertilizer with the leguminous resources and manure resulted in between 24 and 104% increase in grain yield against sole fertilizer, implying an increased nutrient recovery by maize under organic-mineral combinations. Maize biomass measured at 2 weeks after crop emergence already showed treatment differences, with biomass yields increasing linearly with soil mineral N availability (R2=0.75). This 2-week maize biomass in turn gave a positive linear relationship (R2=0.82) with grain yield suggesting that early season soil mineral N availability largely determined final yield. For low quality resources of maize stover and sawdust, application of mineral N fertilizer resulted in at least a seven-fold grain yield increase compared with sole application of the organic resources. Such nutrient combinations resulted in grain harvest indices of between 44 and 48%, up from a mean of 35% for sole application, suggesting the potential of increasing maize productivity from combinations of low quality resources with mineral fertilizer under depleted sandy soils. At Domboshawa, grain yields averaged 7 tonnes ha-1 and did not show any significant treatment differences. This was attributed to relatively high levels of fertility under the sandy clay loam during this first year of the trial implementation. Differences in N supply by different resources were only revealed in grain and stover uptake. Grain N concentration from the high quality leguminous resources averaged 2% against 1.5% from sawdust treatments. We conclude that early season soil mineral N availability is the primary regulatory factor for maize productivity obtainable under poor sandy soils. Maize biomass at 2 weeks is a potential tool for early season assessment of potential yields under constrained environments. However, the likely impact on system productivity following repeated application of high N-containing organic materials on different soil types remains poorly understood.

916. **A comparative study of root activity and mycorrhizal infection incidence of blueberry in different soil conditions.**
Tang XueDong; Li YaDong; Li ShiJu; Wu Lin; and Zhang ZhiDong
Journal of Jilin Agricultural University 27(1): 43-47. (2005); ISSN: 1000-5684
Descriptors: blueberries/ endomycorrhizas/ mycorrhizal fungi/ mycorrhizas/ organic amendments/ peat/ roots / sawdust/ soil amendments/ sulfur/ vesicular arbuscular mycorrhizas/ elemental sulphur/ sulphur
Abstract: The effects of soil amendments with moss, peat, sawdust, stillage and element S on root activity and mycorrhizal infection incidence of blueberry cv. Northland were studied in pot and field experiments. The root activity and mycorrhizal infection incidence had significant difference. In the pot experiment, the root activity of Northland with moss+peat treatment was 82.6% higher than the control. Mycorrhizal infection incidence was highest with 1 kg S treatment. In the field experiment, mycorrhizal infection of Northland with moss treatment was the highest, and in sawdust and moss+peat treatments, mycorrhizal infections were respectively 106.3% and 65.1% higher than the control. The root activity in moss+peat and moss treatments was respectively 46.7% and 23.0% higher than the control.

917. **Comparative study on cultivation and yield performance of oyster mushroom (Pleurotus ostreatus) on different substrates (wheat straw, leaves, saw dust).**
Shah, Z. A.; Ashraf, M.; and Ishtiaq Ch, M.
Pakistan Journal of Nutrition 3(3): 158-160. (2004); ISSN: 1680-5194
Descriptors: crop yield/ cultivation/ edible fungi/ growth/ leaves/ medicinal fungi/ sawdust/ spawn/ straw/ wheat/ wheat straw/ Lentinaceae/ Poriales
Abstract: The experiment was carried out to investigate the cultivation of Oyster mushroom on the following substrates: 50% sawdust + 50% wheat straw, 75% sawdust + 25% leaves, 50% wheat straw + 50% leaves, 100% sawdust, 100% wheat straw and 100% leaves. The temperature was kept at 25 degrees C for spawn running and 17-20 degrees C for fruiting body formation. The time for the completion of mycelial growth, appearance of pinheads and maturation of fruiting bodies on the different substrates were recorded. The number of fruiting bodies and the biological efficiency of substrates were observed. The results show that spawn running took 2-3 weeks after inoculation, while small pinhead-like structures formed 6-7 days after spawn running. The fruiting bodies appeared 3-6 weeks after pinhead formation and took 27-34 days later after spawn inoculation. Sawdust at 100% produced the highest yield

(646.9 g), biological efficiency (64.69%) and the number of fruiting bodies (22.11). Therefore, sawdust is recommended as the best substrate for Oyster mushroom cultivation. Reproduced with permission from the CAB Abstracts database.

918. **Comparative study on the growth and yield of Pleurotus ostreatus mushroom on different lignocellulosic by-products.**
Obodai, M.; Cleland-Okine, J.; and Vowotor, K. A.
Journal of Industrial Microbiology and Biotechnology 30(3): 146-9. (Mar. 2003); ISSN: 1367-5435
Descriptors: agriculture: methods/ cellulose: metabolism/ culture media: chemistry/ lignin: metabolism/ pleurotus: growth & development: metabolism
Abstract: Eight lignocellulosic by-products were evaluated as substrates for cultivation of the oyster mushroom, Pleurotus ostreatus (Jacq. ex. fr) Kummer. The yields of mushroom on the different substrates were 183.1, 151.8, 111.5, 87.8, 49.5, 23.3, 13.0 and 0.0 g for composted sawdust of Triplochiton scleroxylon, rice straw, banana leaves, maize stover, corn husk, rice husk, fresh sawdust, and elephant grass, respectively. The biological efficiency (BE) followed the same pattern and ranged from 61.0% for composted sawdust to 0.0% for elephant grass. The yield of mushroom was positively correlated to cellulose (r(2) =0.6), lignin (r(2) =0.7) and fibre (r(2) =0.7) contents of the substrates. Based on the yield and BE of the substrates tested, rice straw appeared to be the best alternate substrate for growing oyster mushrooms.
This citation is from PubMed.

919. **Comparing wood pulp and sawdust as media for field crops and the glasshouse.**
Trolove, S. N. and Reid, J. B.
Agronomy New Zealand 35: 118-128. (2005); ISSN: 0110-6589
Descriptors: available water/ greenhouses/ growing media/ nitrogen/ nutrient deficiencies/ nutrient uptake/ nutrients/ onions/ plant nutrition/ protected cultivation/ radishes/ sawdust/ silt loam soils/ soil types/ sulfur/ water holding capacity/ wood pulp/ Capparales/ cultivation under glass or plastic/ elemental sulphur/ glasshouses/ potting composts/ rooting media/ sulphur
Abstract: Partially composted kraft wood pulp and sawdust were trialled as media for establishing seeds in the glasshouse as well as for establishing and growing onions in the field in a system designed to give growers some control over the nutrient uptake of their crops. Wood pulp stored twice as much easily available water as a silt loam and sawdust, but only half as much as peat. Fast-growing seedlings (radishes) showed symptoms of nitrogen deficiency when grown in wood pulp, even with NutricoteReg. added at 2 g/L (5.7 mgN/plant). Previously we used sawdust in a similar system to grow low sulphur (S) onions in the field on a moderately high S soil (Trolove and Reid, 2003). The wood pulp experiments showed that wood pulp contained too much plant-available S to be used in a system to reduce S uptake by plants; but in other respects it proved to be an effective medium, producing an onion crop with yield and composition of other nutrients similar to crops grown in sawdust. Sawdust contained low amounts of all plant nutrients, but had a poor water-holding capacity and was susceptible to being blown away by wind. Further research is needed to find a medium that would be suitable for use in the system designed to control the S uptake of a field-grown crop.
This citation is from AGRICOLA.

920. **Comparison of ammonia emission rates from three types of broiler litters.**
Atapattu, N. S.; Senaratna, D.; and Belpagodagamage, U. D.
Poultry Science 87(12): 2436-40. (Dec. 2008); ISSN: 0032-5791
Descriptors: ammonia: metabolism/ animal welfare/ animals/ chickens: genetics: physiology/ floors and floorcoverings/ housing, animal/ hydrogen ion concentration/ nitrogen: metabolism/ Oryza sativa/ plant leaves/ tea/ water/ wood
Abstract: The objective of this study was to compare the emission of NH(3) from 3 types of broiler litters. Three litter materials (refused tea, RT; sawdust, SDT; and paddy husk, PH) were randomly assigned into 18 cages. Twenty-day-old broiler chicks (n = 216) were randomly allocated into cages and were fed a commercial broiler finisher diet from 21 to 42 d. Three litter samples were taken from each cage on 36 and 42 d. Three subsamples taken from each cage were pooled and analyzed for moisture, pH, and N. Litter samples were incubated for 5 h, and the emitted NH(3) was trapped with boric acid and then titrated with HCl to determine the NH(3) emissions. The emission of NH(3) from RT litter (13.2 mg/kg of litter per h) on d 36 was 61% less than that from SDT and PH. The NH(3) emission rate of RT litter on d 42 (13.0 mg/kg per h) was very similar to that on d 36 (13.2 mg/kg per h). However, emission rates of SDT and PH on d 36 increased by 57.8 and 33%, respectively, when determined on d 42. Emission of NH(3) from RT litter on d 42 (13.0 mg/kg per h) was significantly ($P < 0.05$) less than that from SDT (54 mg/kg per h) and PH (44 mg/kg per h) litters. When the emission rate was computed as grams of NH(3)/hour/animal unit (AU), the emission rates of RT litter on d 36 (3.4 g/h per AU) and 42 (5.1 g/h per AU) were significantly ($P < 0.05$) less than that of SDT and PH. The N contents of the RT litter on 36 and 42 d were 6.6 and 6.7%, respectively, and were significantly ($P < 0.001$) greater than the respective values of SDT and PH. It was concluded that emission of NH(3) from poultry houses could be reduced substantially by using RT as a litter material.
This citation is from PubMed.

921. **Comparison of chemical composition of maitake (Grifola frondosa (Fr.) S. F. Gray) cultivated on logs and sawdust substrate.**
Tabata, T.; Yamasaki, Y.; and Ogura, T.
Food Science and Technology Research 10(1): 21-24. (Feb. 2004); ISSN: 1344-6606
Descriptors: mushrooms/ mushroom growing/ logs/ sawdust/ proximate composition/ free amino acids/ 5' nucleotidase/ protein content/ vitamin D/ moisture content/ lipid content/ ash content/ carbohydrate content/ sensory evaluation / taste
This citation is from AGRICOLA.

922. **Comparison of chemical compositions of shiitake (Lentinus edodes (Berk.) Sing) cultivated on logs and sawdust substrate.**
Tabata, T.; Tomioka, K.; Iwasaka, Y.; Shinohara, H.; and Ogura, T.
Food Science and Technology Research 12(4): 252-255. (Nov. 2006); ISSN: 1344-6606
Descriptors: Lentinula edodes/ mushrooms/ cultivars/ sawdust/ logs/ dried vegetables/ chemical composition/ proximate composition/ free amino acids/ protein content/ umami/ sweetness/ fruiting bodies
This citation is from AGRICOLA.

923. **A comparison of sawdust and wood shavings as litter materials for broilers.**
Boa Amponsem, K. and Osei Somuah, A.
Ghana Journal of Agricultural Science 33(2): 171-175. (2000); ISSN: 0855-0042
Descriptors: broiler performance/ broilers/ crop/ digestive tract/ feed conversion efficiency/ feet/ gizzard/ growth rate/ litter/ liveweight gain/ moisture/ mortality/ poultry/ sawdust/ trauma/ wood shavings/ chickens/ death rate/ domesticated birds/ gastrointestinal tract/ impaction / liveweight gains/ organ weight/ traumas
Abstract: The suitability of sawdust as litter material for broilers was assessed by comparing broiler performance on it with performance on wood shavings in a 49-day trial. Criteria for assessment included body weight at 21, 35, 42 and 49 days of age, feed efficiency, organ data, mortality, litter moisture and foot pad damage. Broilers raised on shavings were heavier than those raised on sawdust at 49 and 42 days of age for males and females, respectively. Feed conversion efficiency was similar for broilers raised on sawdust and shavings. The heavier gastrointestinal tract (GIT) and gizzard of broilers raised on sawdust, and the higher mortality due to crop impaction of these birds suggest that consumption of sawdust may be the main cause of lowered growth rate. Rate of increase of moisture in litter was higher for shavings than for sawdust which explains the higher incidence of foot pad damage on broilers raised on wood shavings. It was concluded that for short-cycle broiler production programmes (6 weeks), sawdust is less suitable.
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924. **Comparison of two litter materials, sawdust and a straw-sawdust mixture for fattening pig on deep litter.**
Nicks, B.; Desiron, A.; and Canart, B.
Annales de Zootechnie (France) 47(2): 107-116. (1998); ISSN: 0003-424X.
Notes: Article in French. Original title: Comparaison de l' utilisation de la sciure ou d' un melange paille sciure comme materiau de litiere accumulee pour porcs charcutiers.
Descriptors: litter/ sawdust/ straw/ fattening/ pigs/ deep litter

925. **Comparison on using different materials to cultivate Pleurotus eryngii.**
Wan, NanAn
Edible Fungi of China 23(4): 24-25. (2004); ISSN: 1003-8310
Descriptors: bagasse/ cotton waste/ cottonseed husks/ crop yield/ cultivation/ edible fungi/ growing media/ growth/ hyphae/ rice/ rice straw/ sawdust/ straw/ Lentinaceae/ paddy/ Poriales/ potting composts / rooting media
Abstract: P. eryngii was inoculated on 6 culture media, as follows: control A (78% sawdust), B (78% rice straw powder), C (78% cotton seed hulls), D (78% bagasse), E (78% cotton stalk powder) and F (40% cotton seed hulls + 38% bagasse). Hyphal growth and mushroom yield on the different culture media were investigated. Hyphal growth rate was ranked as C>F>D>E>B>A. Yield was ranked as F>C>E>D>A>B. The biological conversion efficiencies in A, B, C, D, E and F were 43.5, 42.0, 72.4, 64.6, 67.1 and 74.2%, respectively. Hence, using a mixture of cotton seed hulls and bagasse as the main culture materials might result in better cultivation, as compared with their single use.
Reproduced with permission from the CAB Abstracts database.

926. **Compost use in commercial citrus in Florida.**
Litvany, M. and Ozores Hampton, M.
HortTechnology 12(3): 332-335. (2002)
NAL Call #: SB317.5.H68; ISSN: 1063-0198
Descriptors: cellulose/ composting/ food wastes/ lignin/ nitrogen/ nutrient availability/ organic fertilizers/ plant residues/ sawdust/ sewage sludge/ Rutales/ United States of America
Abstract: Commercial citrus (Citrus sp.) groves in Florida use an average of 150 lb/acre (168 kg.ha-1) of elemental nitrogen (N) per year. There are about 853,000 acres (345,000 ha) of commercial citrus requiring about 63,975 tons (62,652 t) of N. At an average analysis of 12% N, about 533,125 tons (483,811 t) of blended nitrogenous fertilizers are applied to citrus annually. To meet this annual N demand from compost, it would be necessary to produce 3,198,750 tons (2,901,906 t) of 2% N compost. The market for high-quality compost products in Florida is far greater than the current or projected production capacity of the state. As long as the cost benefits of compost are clear to citrus growers, demand will always exceed supply. Not all composts are equal in their nutrient availability. The best composts for use as fertilizers are derived from sewage sludge or biosolids, municipal solid waste and sludge, food waste, and/or animal manure combined with a bulking agent such as sawdust or wood chips. Composts made from wood waste as their only feedstock contain large amounts of lignin and cellulose to break down within a reasonable period to directly offset chemical fertilizers. Ultimately, they will mineralize in the soil and provide all of the benefits described earlier, but their rates of availability are in years rather than months, like the other composts.
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927. **Composted sawdust as a carrier for Bradyrhizobium, Rhizobium and Azospirillum in crop inoculation.**
Kostov, O. and Lynch, J. M.
World Journal of Microbiology and Biotechnology 14(3): 389-397. (July 1998)
NAL Call #: QR1 .M562 ; ISSN: 0959-3993 [WJMBEY]

Descriptors: composting/ nitrogen fixing bacteria/ Glycine max/ Arachis hypogaea/ Medicago sativa/ Lotus corniculatus/ crop yield
This citation is from AGRICOLA.

928. **Composting cattle manure from zero grazing system with agro-organic wastes to minimise nitrogen losses in smallholder farms in Kenya.**
Gichangi, E. M.; Karanja, N. K.; and Wood, C. W.
Tropical and Subtropical Agroecosystems 6(2): 57-64. (2006)
Descriptors: ammonia/ biomass production/ cattle manure/ coffee pulp/ composting/ covers/ crop yield/ filter cake/ maize/ maize stover/ nitrogen/ nitrogen content/ nitrogen retention/ nutrient uptake/ organic amendments/ organic wastes/ polyethylene film/ sawdust/ seedlings/ small farms/ soil fertility/ volatilization/ zero grazing/ clarification mud/ corn/ soilage
Abstract: Livestock manure is a valuable source of plant nutrients for crop production in the Central Kenyan highlands but its quality in terms of available nitrogen (N) is low due to considerable N losses through ammonia volatilization. This study aimed at assessing the potential of agro-organic wastes to reduce N losses from manure heaps during the storage period. Three organic amendments selected from a laboratory simulation experiment were evaluated under farmers' conditions in Karura, Kiambu District for their ability to reduce N losses from cattle manure heaps. The effect of a polyethylene sheet covering of manure heaps on N retention was also determined. There were eight treatments that comprised three agro-organic amendments (maize stover, coffee pulp and sawdust) and the control, with or without a polyethylene cover. Agronomic effectiveness of the "treated" manure samples and N uptake by maize seedlings was evaluated in a glasshouse experiment. Total N content of manure amended with organic materials ranged from 1.26 to 1.85%. The N in manures with organic amendments at the start and at the end of storage was significantly different (p<=0.05). Cumulative N loss ranged from 1.60 to 6.80 g kg-1 depending on the type of amendment. Nitrogen lost from non-amended manure was 2.74 g kg-1 with polyethylene cover and 6.80 g kg-1 without the polyethylene cover, which represented 19 and 46% of the initial N respectively. Maize growth improved significantly (p<=0.05) with increasing rates of manure irrespective of the organic treatments except for manure amended with sawdust. Treatments that received the recommended rate of N at 100 kg N ha-1 had significantly higher (p<=0.05) biomass (21.55 g plant-1) than the control which produced only 2.78 g/plant. Nitrogen uptake increased with increasing rates of manure and was higher (p<=0.05) with manure amended with coffee pulp. Covering manure heaps to reduce moisture loss was also beneficial in reducing N losses.
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929. **Composting characteristics of three bedding materials.**
Swinker, A. M.; Tanner, M. K.; Johnson, D. E.; and Benner, L.
Journal of Equine Veterinary Science 18(7): 462-466. (1998); ISSN: 0737-0806
Descriptors: aeration / ammonium sulfate/ comparisons/ composting/ composts/ litter/ materials/ microbial activities/ moisture content/ paper/ sawdust/ straw/ temperature/ wheat/ ammonium sulphate/ United States of America
Abstract: A comparison is made of the composting characteristics for recycled chopped phone book paper, sawdust and wheat straw bedding used as bedding for horses. Manure and soiled bedding types were collected daily and separated prior to composting in bins constructed from wooden pallets (10 cm slats). Temperatures of the composts were taken on the first and every fourth day over the 65-day trial to determine the need for water additions and aeration to keep the composting process active. On Day 37 the C:N ratio was adjusted by the addition of ammonium sulfate, 0.1 kg, 0.1 kg and 0.14 kg for sawdust, phone book paper and straw piles, respectively. Mean standard error and range for compost temperatures (degrees C) were: phone book paper, 33.17 +or-10.33 (13-52); sawdust, 45.6 +or-9.35 (27-58); straw, 30.42 +or-6.57 (16-39). The sawdust composted more readily as compared to the phone book paper or straw. The paper and straw had poorer structure, which caused compaction of the material when moistened thereby adversely affecting the porosity, oxygen supply and microbial activity during the composting process.
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930. **Composting hog manure/sawdust mixtures using intermittent and continuous aeration: Ammonia emissions.**
Elwell, D. L.; Hong, J. H.; and Keener, H. M.
Compost Science and Utilization 10(2): 142-149. (2002)
NAL Call #: TD796.5.C58 ; ISSN: 1065-657X
Descriptors: aeration / ammonia/ animal manures/ composting/ composts/ emission/ pig manure/ sawdust
Abstract: Odorous emissions from manures have become a significant problem. Preliminary work on composting hog manure with sawdust had indicated that intermittent aeration could reduce ammonia emissions during this process. This paper presents results from four additional runs with a total of 22 pilot-scale vessels that have confirmed that ammonia emissions are affected by aeration. The pilot-scale vessels consisted of insulated, stainless steel, 205 L drums that either received continuous (high/low rate, thermostatically controlled blowers) or intermittent (5 min on high rate, 55 min off) aeration. Ammonia emissions, air flow rates, carbon dioxide production, oxygen utilization, and temperatures at four locations in each vessel were monitored. Ammonia emissions under intermittent aeration were roughly 50% less than those from the continuously aerated vessels. However, this appeared to result more from total air flow than from the aeration technique used. A linear regression of emissions versus total air flow data for all vessels yielded a fit of y=0.1309x+29.385 (y being total ammonia emitted [in g of N] and x being total air flow [in kg]) with an R2=0.6808. Since air flow termination was relatively arbitrary, this only means basically, that ammonia emissions were doubled for a quadrupling of air flow. Under intermittent aeration, the minimum oxygen level in the exhaust air occasionally dropped to as low as 1%. So the aeration pattern used probably represents the lowest one

suitable for maintaining aerobic conditions. Within this constraint, however, lower air flow appears to be suitable for reducing odorous ammonia emissions.
This citation is from AGRICOLA.

931. **Composting of fish waste with wood by-products and testing compost quality as a soil amendment: Experiences in the Patagonia region of Argentina.**
Laos, F.; Mazzarino, M. J.; Walter, I.; and Roselli, L.
Compost Science and Utilization 6(1): 59-66. (Winter 1998)
NAL Call #: TD796.5.C58 ; ISSN: 1065-657X
Descriptors: composting/ fish waste/ wood shavings/ sawdust/ composts/ physicochemical properties/ nitrogen/ phosphorus/ mineralization/ Andisols/ Mollisols/ nutrient availability/ bulking agents/ Argentina/ release/ stability/ quality
This citation is from AGRICOLA.

932. **Composting of swine feces with tea grounds as bulking agents.**
Sakai, T.; Wakiya, Y.; and Iwanaga, M.
Japanese Journal of Swine Science 41(3): 153-161. (2004); ISSN: 0913-882X
Descriptors: ammonia/ bulking agents/ composting/ decomposition/ emission/ nitrogen/ organic matter/ phosphorus fertilizers/ pig manure/ potassium fertilizers/ sawdust/ tea/ temperature/ phosphate fertilizers/ potash fertilizers
Abstract: In order to evaluate the application of tea grounds as bulking agents, the composted performance of swine faeces mixed with dry tea grounds was investigated, and the effect of tea grounds was examined for material temperature, bulk weight, ammonia emission, and ingredients. Three sets of compost were mixed with a variety of bulking agents; tea grounds only (TG), sawdust only (S), tea grounds and sawdust mixed at a ratio of 1:1 (M). An admixture of swine faeces and bulking agents was composted in an experimental composting apparatus for 28 days. The temperatures of M and S did not vary, although that of Tea grounds increased later than that of the other sets. Material temperatures of TG, M, and S were amounted to 7668.7, 8135.0 and 8024.6 C, respectively. Initial bulk weights were about 0.57 kg/l. As time passed, bulk weights of M and S decreased to about 0.30 kg/l, while that of TG remained at more than 0.40 kg/l. Data indicate that with the addition of tea grounds only, swine faeces fermentation decreased because of low ventilation inside compost of higher bulk weight, and that with the addition of both TG and S, fermentation did not decrease at all. Ammonia emission of TG decreased with the deterioration of fermentation under lower ventilation conditions because of the absence of deodorizing agents in tea grounds. There was no significant difference in the decomposition rate of organic matter during composting. The addition of tea grounds increased manure ingredients such as nitrogen, phosphate, and potash in the compost. Tea grounds did not interfere with Komatsuna seed germination tests. These results suggested that it is possible to make swine composts using tea grounds as bulk agents by supplementary mixing sawdust, and that this compost, which is rich in manure ingredients, does not pose a problem for crops.
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933. **Conserving N from high N crop residues under field conditions by using on and off farm organic biological waste materials.**
Chaves, B.; Piulats, L. M.; Neve, S. de; Hofman, G.; and Cleemput, O. van
Acta Horticulturae 700: 249-254. (2006)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: carbon nitrogen ratio/ composts/ crop residues/ immobilization/ microbial flora/ mineralization/ nitrogen/ organic wastes/ sandy loam soils/ sandy soils/ sawdust/ soil compaction/ soil texture/ soil types/ microbial biomass/ microflora
Abstract: The objective of this study was to test organic biological waste (OBW) materials for their potential to immobilize N under field conditions. Two field experiments (randomized block design with 3 replicates) were set up: one on a heavy sandy loam and one on a sandy soil in Belgium. Each plot received cauliflower residues and an OBW material (green waste compost (GWC) or sawdust), which were incorporated into the soil with a rotavator. At regular times soil samples were taken to a depth of 0.90 m in 4 layers. The mineral N and microbial N content of the soil samples were determined. In both soils, the mineral N content in OBW treatments was more or less similar to that in the cauliflower treatment, and no significant differences could be determined. The microbial biomass analysis showed that no extra N was immobilized in the OBW treatments compared to the cauliflower treatment. So, neither the GWC nor the saw dust immobilized N released from the cauliflower residues despite their high C:N ratio. Apparently, some factors other than the OBW composition had an effect on the N immobilization. Some of these factors might be the structure of the OBW materials, the degree of mixing between crop residues and OBW materials, a good incorporation into the soil, weather conditions, soil texture and soil compaction.
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934. **The content and protein yield of winter wheat in the conditions of consecutive effect of waste.**
Wiater, J.
Annales Universitatis Mariae Curie Skodowska Sectio E, Agricultura 59(2): 579-587. (2004)
NAL Call #: 512 L96AE ; ISSN: 0365-1118.
Notes: Original title: Zawartosc i plon biaka pszenicy ozimej w warunkach nastepczego oddziaywania odpadow.
Descriptors: crop yield/ farmyard manure/ green manures/ oats / potatoes/ protein content/ sawdust/ straw/ sugar factory waste/ waste utilization/ wheat/ wheat straw/ winter wheat/ FYM/ sugar factory effluent
Abstract: Studies were conducted in the third year of two field experiments in Poland, in which wastes such as slops, straw, sawdust, sugar factory lime and farmyard manure were applied. Waste was applied once during the first year. Hull-less oats, yellow lupin (as a green manure), and potatoes were the forecrop for winter wheat in the first experiment, while chickling vetch and potatoes were the forecrops in the second experiment. In grain and straw samples, the content of total and specific protein was determined. The protein yield of wheat was calculated based on the grain and straw yield, and protein contents. It was found that the secondary effect of waste influenced the total protein content more strongly than the kind of forecrop

and the specific protein content to a smaller degree. All applied waste influenced, in a secondary way, a higher total and specific protein yield. Yellow lupin, used as a fertilizer for winter wheat forecrop, had a more positive effect than chickling vetch straw on the yield of both protein forms. Reproduced with permission from the CAB Abstracts database.

935. **Control of gaseous emissions of ammonia and hydrogen sulphide from cow manure by use of natural materials.**
Luo, J.; Kulasegarampillai, M.; Bolan, N.; and Donnison, A.
New Zealand Journal of Agricultural Research 47(4): 545-556. (2004)
NAL Call #: 23 N4892; ISSN: 0028-8233
Descriptors: aerobic conditions/ ammonia/ anaerobic conditions/ cattle manure/ emission/ hydrogen sulfide/ odour emission/ odours/ pine bark/ sawdust/ soil/ waste management/ waste treatment/ wood shavings/ hydrogen sulphide/ odor emission/ odors/ smells
Abstract: Winter management practices involving the use of stand-off pads to reduce problems due to cows grazing on wet soils may require storage of cow manure for extended periods prior to field application. Gaseous losses of nitrogen (N) and sulphur (S) from stored cow manure can be considerable, and these gases are offensive and undesirable. Laboratory incubation studies were conducted to measure gaseous loss of ammonia (NH_3) and hydrogen sulphide (H_2S) from stored cow manure under aerobic and anaerobic conditions. The potential of adding a range of natural materials, including soil, untreated pine bark, sawdust and wood savings, to the manure to reduce these gaseous emissions was investigated. Aerobic incubation of manure resulted in a higher emission of NH_3 than anaerobic incubation, while anaerobic incubation resulted in higher emissions of H_2S. The effectiveness of natural materials in reducing losses of NH_3 was investigated under anaerobic conditions, and pine bark was found to be the most effective. However, all materials reduced NH_3 to some degree. Therefore, the addition of natural materials, such as pine bark and soil, as amendments to cow manure during storage offers potential for reducing emissions of NH_3 and H_2S.
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936. **Control of groundnut Kalahasti malady (Tylenchorhynchus brevilineatus) through organic and inorganic soil amendments.**
Naidu, P. H.; Mosas, G. J.; and Sitaramaiah, K.
Journal of Mycology and Plant Pathology 30(2): 180-183. (2000); ISSN: 0971-9393
Descriptors: farmyard manure/ groundnuts/ neem extracts/ nematicidal plants/ nematicides/ nematode control/ organic amendments/ plant parasitic nematodes/ poultry manure/ sawdust/ yield increases/ eelworms/ FYM/ neem/ peanuts/ poultry litter/ Secernentea/ Tylenchida
Abstract: Amendment of Kalahasti malady (Tylenchorhynchus brevilineatus Williams) infested soil with organic manures viz., poultry manure (50 q ha-1), farmyard manure (100 q ha-1) and sawdust (25 q ha-1) was found effective in reducing the population of T. brevilineatus and disease severity, and in increasing groundnut pod yield over non-amended control plots. Neem green leaves at 25 q ha-1 could reduce only the nematode population but could not increase groundnut pod yield. Highest degree of nematode control (33.5%) and highest increase in pod yields (50.3%) were obtained in poultry manure amendment (50 q ha-1) followed by neem cake (10 q ha-1) with a 30.3 per cent decrease in nematode population and 42 per cent increase in pod yield. Farmyard manure (100 q ha-1) was found second best in the reduction of nematode population and disease severity and also in the increase of pod yield. The increase in yield was related to the decrease in nematode population. The application of poultry manure was highly economical with a benefit cost ratio of 8.7 followed by farmyard manure with 3.6.
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937. **Control of pollutants using stand-off pads containing different natural materials.**
Luo, J.; Donnison, A.; Ross, C.; Ledgard, S.; and Longhurst, B.
Proceedings of the New Zealand Grassland Association 68: 315-320. (2006); ISSN: 0369-3902
Descriptors: ammonia/ animal manures/ carbon/ dairy farms/ drainage water/ excreta/ faecal coliforms/ nitrogen/ pine bark/ pollutants/ polluted water/ pollution control/ public health/ sawdust/ volatilization/ water pollution/ water quality/ wood chips/ zeolites/ fecal coliforms/ water composition and quality
Abstract: Farmers are increasingly using management systems such as moving cows out of paddocks onto stand-off pads to protect wet soils from damage during winter. Studies were carried out to investigate nutrient and faecal bacterial retention or loss from stand-off pad materials. A preliminary laboratory study found that a range of natural materials, including crushed pine bark, wood chips, zeolite and soil can retain between 66% and 76% of applied cows' excreta nitrogen (N). Zeolite was found to be particularly good at reducing ammonia (NH_3) volatilisation losses from the columns. A field-scale standoff pad study at a Waikato dairy farm, in the winter season of 2005, indicated that carbon (C)-rich materials including both bark and sawdust can be used as standoff pad materials with effective retention of N and faecal bacteria. Both bark and sawdust pads retained about 60% of deposited excreta N. Substantially more Escherichia coli were recovered in the drainage from the bark pad (total yield 3.1x1011E. coli) than from the sawdust pad (total yield 7.5x109E. coli) demonstrating that sawdust was more effective than bark in retaining these faecal bacteria.
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938. **The control of weed biomass in a realistic field plot study by using an agronomic mulch of Quercus borealis sawdust.**
Kessans, S. A.
In: AAAS Annual Meeting and Science Innovation Exposition.; Vol. 168.; pp. A75; 2002.
Descriptors: weed control/ biomass/ field plot study/ mulch/ Quercus borealis/ sawdust

939. **Correlation of the properties of several lignocellulosic substrates to the crop performance of the shiitake mushroom Lentinula edodes.**
Philippoussis, A. N.; Diamantopoulou, P. A.; and Zervakis, G. I.
World Journal of Microbiology and Biotechnology 19(6): 551-557. (2003)
NAL Call #: QR1 .M562 ; ISSN: 0959-3993
Descriptors: crop yield/ earliness/ edible fungi/ electrical conductivity/ maize cobs/ mycelium/ pH/ salts/ sawdust/ strains/ straw/ substrates/ wheat/ wheat straw/ hydrogen ion concentration/ potential of hydrogen/ Tricholomataceae
Abstract: Two selected Lentinula edodes strains (S4080 and SIEF0231) were cultivated on oak-wood sawdust (OS), wheat straw (WS) and corn-cobs (CC) substrates in order to examine the influence of those residues on mycelium growth and on basidiomata production. For both strains, mycelial growth measurements conducted in 'race tubes' demonstrated faster colonization of OS and WS media. Lag-phase and complete colonization periods were correlated to mycelium extension rates in the three substrates tested. Similar patterns of pH and electrical conductivity (Ec) changes were detected in all media and for all strains tested; the pH decreased steadily throughout the colonization process to reach values of 4.49-5.06; Ec increased by the end of mycelium colonization, and it presented the highest and lowest values in the WS and OS media respectively. In addition, a negative correlation was established between final salt content of the substrates and mycelium extension rates. Subjecting fully colonized substrates to a cold-shock treatment resulted in fruiting 58-65 days after inoculation in tubes; WS and CC promoted earlier sporophore initiation than OS. Monitoring CO_2 emissions by strain SIEF0231 in pilot-scale cultivation on synthetic blocks, revealed higher respiration rates from OS and CC than from WS, which were further correlated with substrate colonization rates. Among residues colonized by the same strain, WS appeared to promote earliness and crop productivity (BE 54.17%) by presenting shorter cropping periods and equal yield distribution among flushes, while on OS and CC maximum yields were obtained within the first two flushes. Moreover, heavier basidiomata were produced by WS and OS substrates. Reproduced with permission from the CAB Abstracts database.

940. **Cucumber plant growth and yield as affected by using sawdust and peat moss mixes for seedlings production under protected cultivation.**
Sawan, O. M.; Eissa, A. M.; and Abou Hadid, A. F.
Egyptian Journal of Horticulture 25(3): 321-334. (1998); ISSN: 0301-8164
Descriptors: chlorophyll/ composts/ crop residues/ cucumbers/ cucurbit vegetables/ fruit vegetables/ fruits/ growing media/ heavy metals/ iron/ manganese/ peat/ plant height/ plant residues/ protected cultivation/ residues/ sawdust/ seasons/ seedlings/ vegetables/ vermiculite/ zinc/ cultivation under glass or plastic/ gherkins/ Mn/ potting composts/ rooting media/ vegetable crops
Abstract: Greenhouse experiments were carried out over 2 growing seasons (1993/94 and 1994/95) in Egypt to examine sawdust as substitute medium for peatmoss in cucumber seedling production. Twenty-five combinations of peatmoss, vermiculite, composted sawdust and crop residues compost were used as soil media for seedling production (cv. Katia). Seedlings grown in sawdust media were either similar or superior to the control (peatmoss + vermiculite, 1:1 v/v) for plant height, number of leaves, chlorophyll content and fruit yield. The greatest plant growth and, subsequently, the highest total yield were obtained by combining the control medium (peat:vermiculite, 1:1) with sawdust and compost in a 2:2:1 (v/v/v) mixture, i.e. reducing the peatmoss volume from 50% to 20% in the mixture. These results indicate that sawdust can be used as a substitute for high percentages of peatmoss in media for cucumber seedling production. Nutrient contents (N, P, K, Fe, Mn, Zn and Cu) and heavy metals contents (Pb, Cd, Ni, Cr and Co) were determined in the cucumber leaves and fruits.
This citation is from AGRICOLA.

941. **Cultivation of cabbage in pine sawdust treated with Agaricales strains.**
Valenzuela F. E. and Andrade S. N.
Boletin Micologico 17: 75-79. (2002); ISSN: 0716-114X.
Notes: Original title: Cultivo de repollo en aserrin de pino tratado con cepas de Agaricales.
Descriptors: cabbages / clay soils/ cultivation/ height/ leaves/ organic amendments/ red soils/ sawdust/ seedling emergence/ soil types/ substrates/ survival/ Basidiomycetes/ Capparales/ Cortinariaceae/ Cortinariales/ Gymnopilus/ Gymnopilus spectabilis/ Pleuroflammula croceosanguinea/ red earths
Abstract: The cultivation of cabbage in Pinus radiata sawdust pretreated with Agaricales strains UACHMGs-99 (Gymnophilus spectabilis [Gymnopilus spectabilis]) and UACHMPc-280 (Pleuroflammula croseosanguinea [P. croceosanguinea]) was tested. Pretreated sawdust was mixed with clayey red soil (1:1 v/v), while the untreated sawdust, clayey red soil and a mixture of both were used as control. Triplicated substrates kept in containers with 50 cabbage seeds (in each container) were sown and cultivated for one month in a chamber under a photoperiod of 16/8 h (light/darkness), 4000 lux, 10-24+or-1 degrees C (night/day). Sixty plantlets per treatment were studied to determine the emergence and survival percentage, radicle length, number of leaves and dry weight. A statistical analysis was performed on the results using a variance analysis and a Tukey test. In the cabbage plantlets cultivated in the substrates with pretreated sawdust the highest survival (97.3-100%), plant height (17.6-19.2 cm) and radicle length (15.4 cm) were determined. A significant difference was obtained for cabbage plantlets cultivated in substrates that included pretreated sawdust as compared with the control. Thus, the pretreated P. radiata sawdust could be used for the cultivation of cabbage plantlets.
This citation is from AGRICOLA.

942. **Cultivation of cauliflower mushroom (Sparassis crispa) by use of steam-treated coniferous sawdusts.**
Park Hyun; Lee BongHun; Ka KangHyeon; Bak WonChull; Oh DeukSil; Park JunMo; and Chun WooJae
Journal of the Korean Wood Science and Technology 34(3): 84-89. (2006); ISSN: 1070-0715
Descriptors: crop production/ cultivation/ growing media/ growth/ mycelium/ non wood forest products/ sawdust/ waste utilization/ minor forest products/ non timber forest products/ potting composts/ rooting media/ Sparassidaceae/ Sparassis/ Sparassis crispa
Abstract: An efficient method of cauliflower mushroom

(Sparassis crispa) cultivation was developed to minimize the problem with steam-treated sawdust media of Larix leptolepis [L. kaempferi], Pinus densiflora and P. koraiensis. By the treatment, mycelial growth was stimulated by 10% compared to that of untreated sawdust media of L. leptolepis and P. koraiensis and the productivity of cauliflower mushroom was improved from 12.5% (50.1 g/400 g) to 16.7% (66.7 g/400 g) with the sawdust medium of P. densiflora from first harvest in case of KFRI644. Steam treatment is thought to be a good method for cultivation of cauliflower mushroom by minimizing culturing period and increasing productivity, which is an effective way of utilization of coniferous sawdust.
This citation is from AGRICOLA.

943. **Cultivation of greenhouse tomato using sawdust. Part II: Fruit yield, content of organic substances and organic carbon in soil and content of nutrients in soil and leaves.**
Mokrzecka, E.
Roczniki Nauk Rolniczych Seria A, Produkcja Roslinna 114(3/4): 17-30. (2001)
NAL Call #: 20.5 R59 SER. A; ISSN: 0080-3650.
Notes: Original title: Uprawa pomidora szklarniowego z zastosowaniem trocin. Cz II: Plon owocow, zawartosc substancji organicznej, wegla organicznego w glebie oraz skadnikow pokarmowych w glebie i lisciach.
Descriptors: application rates/ crop yield/ nitrogen fertilizers/ protected cultivation/ sawdust/ soil amendments/ soil organic matter/ tomatoes/ cultivation under glass or plastic/ organic matter in soil
Abstract: In an experiment in an unheated plastic tunnel, tomatoes were grown in a mixture of sawdust and soil (30 dm3 sawdust per 1 m2 of soil) and given 45, 90 or 135 g N m-2. Adding sawdust to the soil increased the organic matter and carbon contents of the soil but reduced the mineral N, K Ca and Mg. Tomato yield was highest (26.2 kg m2) with 90 g N m-2.
This citation is from AGRICOLA.

944. **Cultivation of greenhouse tomato with use of sawdust. Part I: Effect of sawdust on physical properties of soil.**
Mokrzecka, E
Roczniki Nauk Rolniczych Seria A, Produkcja Roslinna 114(3/4): 9-16. (2001)
NAL Call #: 20.5 R59 SER. A; ISSN: 0080-3650.
Notes: Original title: Uprawa pomidora szklarniowego z zastosowaniem trocin. Cz I: Wpyw trocin na wasciwosci fizyczne gleby.
Descriptors: sawdust/ soil air/ soil physical properties/ soil water content/ tomatoes/ physical properties of soil/ soil amendments/ soil atmosphere
This citation is from AGRICOLA.

945. **Cultivation of himematsutake (Agaricus blazei) in saw-dust media.**
Taguchi, T.; Kawachi, S.; and Meguro, S.
Bulletin of the Faculty of Agriculture, Miyazaki University 54(1): 13-18. (2008); ISSN: 0544-6066
Descriptors: casing/ cultivation/ cultural methods/ culture media/ growing media/ mushroom casing soils/ rice bran/ sawdust/ temperature/ water content/ Agaricaceae/ Agaricus blazei/ potting composts/ rooting media
Abstract: Cultivation of himematsutake (A. blazei) in sawdust and rice bran media instead of the regular cultivation in a compost media was attempted for commercial mushroom production at a low cost. Mushroom could be produced in the media containing sawdust:rice bran at 1:1 with water content of 75%. Lowering the temperature to 15 degrees C from 25 degrees C at 5-10 days after casing the media with soil was effective for producing mushrooms. The period of low temperature treatment also affected the production of young fruit bodies; the optimum period was at ~10 days after casing. The highest level of mature fruit body production was recorded by casing the media with unsterilized soil and sprinkling water.
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946. **Cultivation of shiitake using sawdust from widely available local woods in Argentina.**
Pire, D. G.; Wright, J. E.; and Alberto, E.
Micologia Aplicada International 13(2): 87-91. (July 2001); ISSN: 1534-2581
Descriptors: Lentinula edodes/ strains/ Nothofagus/ Pinus elliottii/ Eucalyptus camaldulensis/ Araucaria angustifolia/ Salix babylonica/ sawdust/ wheat bran/ millets/ seeds/ chalk/ mushroom growing/ growing media/ fruiting/ plant growth/ crop yield/ Argentina/ Internet resource
This citation is from AGRICOLA.

947. **Cultivation of the basidiomycete Hericium erinaceus (Bull. ex. Fr.) Pers.**
Ehlers, S. and Schnitzler, W. H.
Angewandte Botanik 72(1/2): 43-47. (1998); ISSN: 0066-1759.
Notes: Original title: Untersuchungen zum Wachstum des Basidiomyceten Hericium erinaceus (Bull. ex. Fr.) Pers.
Descriptors: cultivation/ cultural methods/ edible fungi/ growing media/ growth/ medicinal fungi/ plant development/ production/ sawdust/ vegetables / wheat/ wheat bran/ Basidiomycetes/ Hericiaceae/ Hericiales/ Hericium/ Hericium erinaceus/ Oleales/ potting composts/ rooting media/ vegetable crops
Abstract: H. erinaceus is a Chinese edible and medicinal fungus. Mycelium growth and fruiting body production of different strains (obtained from USA, Thailand, China and Taiwan) were investigated on 4 substrates (Malt peptone agar (MPA) and mixtures of sawdust (ash or beech) + wheat bran). Yields were in the range 100-300 g/kg substrate (wet weight). Similar yields were obtained from all strains on fine beech sawdust + wheat bran (~250 g/kg). Over all media, the strain from USA had the best yield and a mean biological efficiency of 73.6%. The highest number of fruiting bodies was produced by this strain.
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948. **Cultivation of the monkey head mushroom (Hericium erinaceus) in Egypt.**
Hassan, F. R. H.
Journal of Applied Sciences Research: 1229-1233. (Oct. 2007); ISSN: 1816-157X
Descriptors: chemical composition/ crop residues/ crop yield/ edible fungi/ growing media/ herbal drugs/ lignocellulose/ medicinal fungi/ nutritive value/ phenols/ phytochemicals/ sawdust/ straw/ substrates/ traditional Chinese medicines/ traditional medicines/ waste utilization/

wheat/ wheat straw/ herbal medicines/ Hericiaceae/ Hericiales/ Hericium/ Hericium erinaceus/ nutritional value/ potting composts/ quality for nutrition/ rooting media
Abstract: Hericium erinaceus a Chinese edible and medicinal mushroom (newly introduced to Egypt from China) was grown under local conditions in Egypt using the available lignocellulosic wastes as growing media. Incubation time, yield, biological efficiency (BE%) were determined through three consecutive growing seasons. Also, chemical composition of fruit bodies were estimated. The incubation time for the tested growing media ranged from 37 to 46 days. The highest yield of H. erinaceus (184 g/1 kg media) and BE 50.3% were obtained when grown on sawdust. Also, using a mixture of sawdust with wheat straw as growing medium gave a good yield (165 g/1 kg medium) and BE of 46.5%. H. erinaceus mushroom grown on different media in Egypt contained 24.07-26.8% crude protein. Cultivation of H. erinaceus in Egypt is a very important achievement, since this mushroom type is highly prized for their nutritive and medicinal benefits.

949. **The deep litter system for heavy pig production: Comparison between the use of straw and sawdust.**
Zoccarato, I.; Gasco, L.; Lussiana, C.; Bergese, R.; and Ferrero, S.
Rivista di Suinicoltura 41(10): 135-140. (2000); ISSN: 0035-662X.
Notes: Original title: La lettiera permanente nella produzione del suino pesante: confronto tra l'impliego di paglia o segatura.
Descriptors: air quality/ carcass quality/ deep litter housing/ fat/ fattening performance/ fatty acids/ pig housing/ sawdust/ straw/ hogs/ piggeries/ sties/ swine/ swine housing
Abstract: 24 Large White x Landrace pigs were reared on slatted floors, wheat straw or sawdust from 31 to 141 kg. All pigs were fed the same diet on a restricted basis. Weight gain and feed and water intake were recorded twice a month and NH_3, H_2S, CO_2 and litter temperature were recorded once a week. Dressing percentage, backfat thickness and pH_{45} were measured at slaughter and a backfat sample was also taken for analysis of fatty acids. There was no difference among the groups in fattening performance although pigs reared on sawdust had lower backfat thickness than those reared on the slatted floor (22 vs. 29 mm). Pigs reared on the deep litter systems had a higher proportion of linoleic acid in their back fat than those reared on the slatted floor (13.26, 13.25 and 10.64% for straw, sawdust and slatted floor). Air quality was superior in the deep litter systems than the slatted floor with sawdust having the lowest levels of gases. The sawdust system had a higher evaporation rate and a lower running cost than the straw system.
This citation is from AGRICOLA.

950. **Development of non-routine feeds for rabbits and their application.**
Liang, XingLong; Ren, KeLiang; and Yang, JinQing
Chinese Journal of Rabbit Farming 3: 18-19, 24. (2005)
Descriptors: agricultural byproducts/ agricultural wastes/ agroindustrial byproducts/ brewery byproducts/ byproducts/ feeds/ fermentation wastes/ industrial wastes/ kitchen waste/ maize cobs/ maize meal/ organic wastes/ products/ sawdust/ sources/ waste utilization/ wood dust/ wood residues/ farm wastes/ plant waste
Abstract: In rabbit farming, feed occupied >70% of total costs. In order to decrease the costs, it is important to develop rabbit feeds using by-products from various industries, including by-products from the production of sugar, malt, beer, vinegar, medicines and wine, and using cobs, water melon skins, residues of sunflower and mushroom culture, sawdust and corn protein meal. Details for the application of each of these materials as rabbit feed are described.

951. **Does amendment of soak solution with sucrose and urea increase production of shiitake mushrooms on sawdust blocks?**
Sabota, C.; Beyl, C.; and Ghale, G.
HortTechnology 14(3): 393-397. (July 2004)
NAL Call #: SB317.5.H68; ISSN: 1063-0198
Descriptors: mushrooms/ Lentinula edodes/ sucrose/ urea/ soaking/ sawdust
Abstract: This study evaluated whether adding either sucrose or urea to the soak water could enhance production of shiitake mushrooms (Lentinula edodes) on sawdust blocks. For both sucrose and urea experiments, sawdust blocks inoculated with "QR" and "26" strains of L. edodes were placed in the soak water amended with either sucrose or urea at the first soaking only, at the second soaking only, or at all six soakings. Control blocks were soaked in tap water. In Experiment I, blocks were soaked in water containing 0, 20,000, or 40,000 ppm (mg.L(-1)) sucrose. Strain 26 produced significantly more mushrooms and greater mushroom weight than QR. Addition of sucrose to the soak water resulted in fewer mushrooms harvested and lower yields than controls. There was a significant interaction between the sucrose rate and strain for both mushroom number and biological efficiency (BE). Both strains produced fewer mushrooms and less BE as the concentration of sucrose in the soak water increased; however, QR was less affected by the increasing concentration of sucrose. In Experiment II, sawdust blocks inoculated with QR and 26 strains of shiitake were soaked in water containing 0, 2400, or 3600 ppm (mg.L(-1)) urea. Strain 26 produced significantly more mushrooms and greater BE than QR. The addition of 2400 ppm of urea to the soak water resulted in more mushrooms per block harvested and a 12% increase in BE over the control. The 2400 ppm rate added at each soak produced more mushrooms and mushroom weight than the control and also produced more mushrooms than any of the blocks in the higher rate of urea (3600 ppm) treatments. Adding 16.9 oz (480 g) of urea per tank to obtain 2400 ppm urea in the soak water results in the minimal increase in cost of about $0.20 per soak (52 sawdust blocks), but potentially increases the value of the mushrooms harvested from each block by $0.75. In an average-sized shiitake mushroom block production facility containing 500 blocks, continuous addition of 2400 ppm urea to the soak water would provide an increased return of about $375 over the entire season.
This citation is from AGRICOLA.

952. **Dry matter yield of Japanese millet (Echinochloa crusgalli var. Frumentacea (Roxb.) Wight), chemical properties and microbial population of soil as affected by the application of fermented sawdust swine manure in Cheju volcanic ash soil area.**
Kim, M. C.; Kim, T. G.; Lee, J. E.; and Moon, B. C.
Journal of the Korean Society of Grassland Science 25(3): 159-168. (2005)
NAL Call #: SB202.K6H352; ISSN: 1013-9354
Descriptors: calcium/ chemical composition/ dry matter accumulation/ exchangeable potassium/ herbage/ magnesium/ nitrogen fertilizers/ phosphorus/ phosphorus fertilizers/ pig manure/ plant composition/ potassium/ potassium fertilizers/ sawdust/ soil chemical properties/ soil ph/ soil types/ volcanic ash soils/ chemical constituents of plants/ chemical properties of soil/ microbial communities/ phosphate fertilizers/ potash fertilizers/ South Korea
Abstract: This experiment was carried out during May to October 1998 to determine the effect of fermented sawdust swine manure application (SSM) on the herbage production of Japanese millet (Echinochloa crus-galli var. frumentacea) and soil properties in the Cheju brown volcanic ash soil, Korea Republic. The treatments were: T1: basic chemical fertilizer, N 200 kg/ha + P_2O_5 300 kg/ha + K_2O 200 kg/ha; T2: 1/2 basic chemical fertilizer, N 100+P_20_5 150 + K_2O 100 kg/ha; T3: 1/2 basic SSM, N 100 kg/ha; T4: basic SSM, N 200 kg/ha; T5: 2 times basic SSM, N 400kg/ha; T6: 4 times basic SSM, N 800 kg/ha. At the same application level of N 200 kg/ha, the application of 100% chemical fertilizer (T1) had significantly lower dry matter yield than that of 50% chemical fertilizer and 50% SSM (T2) or 100% SSM (T4). Dry matter yield increased with an increase of SSM to N 400 kg/ha, but decreased at N 800 kg/ha. P, K and Ca contents of Japanese millet tended to decrease with an increase in SSM level. The application of chemical fertilizer lowered the P and K content of Japanese millet in comparison with that of SSM. pH, available phosphorus, exchangeable potassium, Ca, Mg content of soil showed a significant increase with an increase of SSM application level. However, at the same application level of N 200 kg/ha, there was no statistically significant difference between chemical fertilizer and SSM in the soil. The bacterial number of soil among microbial population increased with an increase of SSM level in June 1988, but there was no regular tendency in October. The ratio of bacteria to fungus in soil had a tendency to decrease with an increase of SSM level. It is recommended to use N 400 kg/ha of SSM or N 100 kg/ha of chemical fertilzer + N 100 kg/ha of SSM for Japanese millet.
This citation is from AGRICOLA.

953. **Ecological resistance of strawberry cultivars and possibility of its improvement.**
Trunov, I. A. and Bryukhina, S. A.
Sadovodstvo i Vinogradarstvo 6: 11-12. (2007); ISSN: 0235-2591
Descriptors: cold resistance/ crop quality/ crop yield/ disease resistance/ fungal diseases/ mulches/ pest resistance/ plant diseases/ plant pathogenic fungi/ plant pathogens/ sawdust/ strawberries/ stress/ varietal reactions/ cold hardiness/ Hyphomycetes/ mulching materials/ phytopathogens/ resistance to disease
Abstract: Resistance of 15 strawberry cultivars to low temperature, fungal and bacterial diseases, as well as cultivar productivity and fruit quality were studied in the Tambov Region, Russia, in 2000-06. Cultivars Lirovidnaya, K-106, Korona and Divnaya are highly resistant against botrytis [Botrytis cinerea] disease. Cultivars Gardian and Korona have the highest yield of 163.7 and 139.7 t/ha. Cultivars Lirovidnaya, K-106, Korona, Gardian and Divnaya have stable yields and the highest fruit quality. Effect of mulch application on strawberry ecological resistance is discussed and sawdust mulch application is recommended. Reproduced with permission from the CAB Abstracts database.

954. **Effect of amended growth media on the production of Coffea canephora seedlings in the nursery.**
Adeyemi, E. A. and Daniel, M. A.
In: 21st International Conference on Coffee Science.Montpellier, France.); pp. 1209-1211; 2007.
Descriptors: coffee/ growing media/ leaf area/ leaves/ NPK fertilizers/ plant height/ sawdust/ seedlings/ stems/ topsoil/ potting composts/ rooting media
Abstract: Five growing media namely; topsoil sawdust (cured) topsoil+sawdust (1:1 ratio), topsoil+sawdust+N.P.K at two levels: 60:30:30 and 30:15:15 kg/ha were used in raising pre-germinated two-leaf stage coffee seedlings in the nursery. The assay of the growth media was taken prior to the experimentation. Treatments were arranged in randomized complete block design in four replicates. Agronomic data were taken at two months interval for six months on plant height, number of leaves, leaf area and stem diameter. Data obtained were analyzed using analysis of variance (ANOVA) and means separated with Duncan's Multiple Range Test (DMRT). Results indicated that, topsoil was not significantly different (P<=0.05) from topsoil+sawdust (1:1 ratio) and topsoil+sawdust+N.P.K 60:30:30 kg/ha in all growth parameters measured. Least performance was observed in 100% sawdust, which was significantly different from other treatments. Topsoil+sawdust (1:1 ratio) could therefore be preferred in the raising of coffee seedlings thereby reducing the amount of topsoil that will be excavated from the field annually. Reproduced with permission from the CAB Abstracts database.

955. **Effect of amount of reutilized sawdust after enokitake cultivation on growth and yield of tomato plants (Lycopersicon esculentum Mill) in recycled or non-recycled hydroponics.**
Lee SangWoo; Sim SangYeon; Lee SuYeon; Seo MyeongWhoon; Lim JaeWook; Lee HaeGil; and Park KuenWoo
Korean Journal of Horticultural Science and Technology 23(4): 372-376. (2005); ISSN: 1226-8763
Descriptors: blossom end rot/ calcium/ crop yield/ culture media/ growth/ hydroponics/ leaves/ magnesium/ phosphorus/ plant disorders/ porosity/ potassium/ sawdust/ soilless culture/ stems/ tomatoes
Abstract: A study was carried out to investigate the possibility of reusing wood sawdust substrates after enokitake (Flammulina velutipes) cultivation as culture medium for tomato production in hydroponics. Tomato plants cultivated in 2, 4, and 8 l of reused substrates of enokitake (RSE)/plant were compared with those in perlite medium. In the first cultivation, tomato plants were cultivated in recycled hydroponics. Growth elements such as leaf width and length, and stem diameter were increased when the amount of RSE was increased, but marketable

yields in RSE were lower by 25% than those in perlite medium due to higher occurrence of blossom-end rot in RSE. In the second cultivation, non-recycled hydroponics reduced the occurrence of blossom-end rot in RSE compared to recycled hydroponics. Marketable yields of tomato plants grown in 4 l of RSE on non-recycled hydroponics was 6% higher than those in perlite medium on recycled hydroponics. Total porosity and container capacity of RSE were higher. Moreover, the amounts of P, K, Mg and Ca in RSE after tomato cultivation were also higher than those in perlite medium, but did not affect the yields of tomato.
This citation is from AGRICOLA.

956. **The effect of amount of sawdust on the impact force of the stall measured with a new test apparatus.**
Takeuchi, M.; Morita, S.; Takahashi, K.; Hoshiba, S.; Haruta, T.; and Shimada, T.
Journal of Rakuno Gakuen University, Natural Science 30(2): 239-244. (2006); ISSN: 0388-001X
Descriptors: acceleration/ accelerometers/ apparatus/ cow housing/ forces/ impact strength/ impact tests/ sawdust/ stalls/ cowsheds
Abstract: This study was conducted to examine the influence of the amount of sawdust on impact force with a new test apparatus that used the accelerometer. In the new test apparatus, the accelerometer was attached to a 4.75 kg drop-mass and dropped from the height of 200 mm. Data was recorded from the accelerometer with a personal computer via the interface. The impact force was calculated from the maximum acceleration when drop-mass collided with the stall. Measurement was operated at 16 points, 8 points in front and 8 points in rear. Using sawdust as floor material, the examination was operated with 0, 1.3, 3.0 and 4.3 kg/m3 of sawdust. The correlation between the amount of sawdust and impact force was negative, in front and in rear. It was shown that the impact force when sawdust was not used and the effect of decreasing impact force when 1 kg/m2 sawdust was used were different in front and in rear of the stall. When amount of sawdust was 0 kg/m2, the average impact force was 4100 N. To decrease the impact force of this stall to 2400 N, that is the impact force in the rubber chip mattress used for one year, it is suggested to use sawdust of 3 kg/m2. When the amount of sawdust was 1.3 kg/m2 and 3.0 kg/m2, the coefficient of variation was larger than in the cases of 0 kg/m2 and 4.3 kg/m2. Therefore, it is necessary to use a large amount of sawdust of 4.3 kg/m2 to decrease the impact force of the stall. The impact force of the stall was decreased by increasing sawdust, and the comfort when dairy cows are lying can be adjusted by using a large amount of sawdust. However, it is difficult to always keep the sawdust of 4.3 kg/m2. Therefore, it is necessary to improve this rubber chip mattress including cow comfort.
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957. **Effect of applying different substrates and sulphur on mineral nutrition of blueberry leaves and cultivated soil.**
Tang XueDong; Li YaDong; Ding ShaoWen; Wu Lin; Zhang ZhiDong; and Dou Sen
Journal of Jilin Agricultural University 29(3): 279-283. (2007); ISSN: 1000-5684
Descriptors: application rates/ blueberries/ iron/ leaves/ mineral content/ nitrogen/ nitrogen content/ peat/ phosphorus/ pot experimentation/ protected cultivation/ sand/ sawdust/ soil fertility/ substrates/ sulfur fertilizers/ cultivation under glass or plastic/ sulphur fertilizers
Abstract: In an experiment conducted to determine the mineral element content of blueberry leaves and cultivated soil, the different substrates (moss, peat, sawdust, distiller and sand) and different S rates changed the soil mineral element content, which influenced leaf mineral element absorption of blueberry. The soil N and P concentrations were 160.8 and 15.46 mg/kg, respectively. The leaf N, P and Fe concentrations were 1.42%, 1.30% and 731 mg/kg, respectively, when moss and peat treatment was conducted in pot experimentation. The soil and leaf concentrations of N and P were 3.89 and 3.07 mg/kg, and 1.684 and 0.109%, respectively, when 2.0 kg S/m3 and 2.5 kg S/m3 were added in the greenhouse.
Reproduced with permission from the CAB Abstracts database.

958. **Effect of C/N on composting of pig manure with sawdust.**
Huang, G. F.; Wong, J. W.; Wu, Q. T.; and Nagar, B. B.
Waste Management 24(8): 805-13. (2004); ISSN: 0956-053X
Descriptors: animals/ bacteria, aerobic/ biodegradation, environmental/ carbon: analysis: metabolism/ manure/ nitrogen: analysis: metabolism/ refuse disposal/ sodium chloride/ swine/ wood
Abstract: The aim of this composting trial was to evaluate the effect of C/N on the composting process of pig manure with the purpose of reducing the amount of sawdust normally used as co-composting materials. Two aerobic static piles were prepared consisting of pig manure mixed with sawdust at an initial C/N of 30 (pile A) and 15 (pile B), respectively. Pile B containing larger amount of pig manure showed a slower rise in temperature, lower maximum temperature, and shorter thermophilic phase than pile A. It also resulted in higher pH and electrical conductivity (EC) values, and even higher contents of soluble NH4-N and volatile solids throughout the composting period. Chemical and biological parameters including dissolved organic carbon (DOC) (4932 mg kg(-1)), soluble NH4-N (371 mg kg(-1)), C/Nsolid (18.3), C/Naquoeus (5.8) and seed germination index (GI) (66.5%) indicated that pile A achieved maturity after 49 days of composting. After 63 days of composting, pile B contained 5352 and 912 mg kg(-1) of DOC and soluble NH4-N content, respectively, which was much higher than the criterion of 5% and 400 mg kg(-1), indicating its immature nature. Pile B showed a relatively low GI value of 46%, which may be due to its high indigenous EC value as a result of larger amount of pig manure. Therefore, co-composting of pig manure with sawdust at a low initial C/N would require a composting longer than 63 days, and, the high salinity due to the large amount of pig manure would pose a potential inhibition on plant growth.
This citation is from PubMed.

959. **Effect of C:N ratio on numbers and types of fungi in Egyptian soil.**
Shaban, G. M.; Fadl Allah, E. M.; and Yaser, M.
Egyptian Journal of Microbiology 33(3): 339-352. (1998); ISSN: 0022-2704

Descriptors: amendments/ carbon/ carbon nitrogen ratio/ cellulose/ chitin/ clay soils/ glucose/ loam soils/ sandy soils/ sawdust/ soil/ soil fungi/ soil treatment/ soil types/ starch/ testing/ dextrose/ Hyphomycetes
Abstract: Amendment of three different soil types (loamy, clay and sandy) with different carbon sources (glucose, cellulose, starch, chitin and sawdust) increased the total count of fungi in comparison with non-amended soil. Treatment with chitin increased densities of Trichoderma harzianum. Testing the effect of different C:N ratios (5:1, 10:1, 40:1) on soil fungi in a loamy soil sample using glucose or cellulose and $NaNO_3$ showed that a narrow C:N ratio better stimulated the development of the fungal flora in presence of glucose. While a wide C:N ratio was more favourable, when cellulose was used as a carbon source it showed that sugar fungi and cellulose decomposers responded differentially. Trichoderma was favoured by a wide C:N ratio (40:1) using either glucose or cellulose as the carbon source.

960. **Effect of compost and manure soil amendments on nematodes and on yields of potato and barley: A 7-year study.**
Kimpinski, J.; Gallant, C. E.; Henry, R.; Macleod, J. A.; Sanderson, J. B.; and Sturz, A. V.
Journal of Nematology 35(3): 289-293. (2003); ISSN: 0022300X
Descriptors: bacterial-feeding nematodes/ barley/ beef manure/ clover cyst nematode/ compost/ cull potato/ diplogaster lheritieri/ heterodera trifolii/ potato/ root-knot nematode/ root-lesion nematode/ sawdust/ bacteria (microorganisms)/ diplogaster/ heterodera trifolii/ hordeum/ hordeum vulgare/ hordeum vulgare subsp. vulgare/ meloidogyne/ meloidogyne hapla/ meloidogyne javanica/ nematoda/ pratylenchus/ pratylenchus penetrans/ solanum/ solanum tuberosum/ trifolium
Abstract: A 7-year study located in Prince Edward Island, Canada, examined the influence of compost and manure on crop yield and nematode populations. The compost used in this study consisted of cull waste potatoes, sawdust, and beef manure in a 3:3:1 ratio, respectively. No plant-parasitic nematodes were detected in samples collected from windrow compost piles at 5- and 30-cm depths prior to application on field plots. Low population densities of bacterial-feeding nematodes were recovered from compost windrows at the 5-cm depth. Field plots of potato (Solanum tuberosum cv. Kennebec) received compost applied at 16 metric tonnes per hectare, or beef manure applied at 12 metric tonnes per hectare. An adjacent trial with barley (Hordeum vulgare cv. Mic Mac) received only the compost treatment. In both trials the experimental design was a complete randomized block with four replicates. Data averaged over seven growing seasons indicated that population levels of root-lesion nematodes (primarily Pratylenchus penetrans) were higher in root-zone soil in potato plots treated with either compost or manure compared to the untreated control plots. The soil amendments did not affect root-knot nematode (Meloidogyne hapla) population densities in the potato plots, but clover-cyst nematodes (Heterodera trifolii) were more numerous in the root-zone soils of barley treated with compost compared to the untreated plots. Numbers of bacterial-feeding nematodes (primarily Diplogaster lheritieri) were greater in soil in potato plots treated with manure and in soil around barley roots than in untreated plots. Total yields of potato tubers averaged over seven growing seasons increased by 27% in the plots treated with either compost or manure. Grain yields of barley also were increased by 12% when compost was applied. These results indicated that organic amendments increased crop yields, but the impacts on different nematode species varied and usually increased soil population levels.

961. **Effect of conifer sawdust bedding on calf housing conditions.**
Szyndler, J. and Kaczor, A.
Roczniki Naukowe Zootechniki 30(2): 389-396. (2003); ISSN: 0137-1657.
Notes: Original title: Wpyw gebokiej scioki z trocin drzew iglastych na warunki utrzymania cielat.
Descriptors: acidity/ animal behaviour/ behaviour/ body weight/ calf housing/ calves/ deep litter housing/ environmental temperature/ hygiene/ litter/ microclimate/ sawdust/ straw/ animal behavior/ behavior
Abstract: The effects of using deep litter from conifer sawdust on housing conditions of Simmental calves grouped and kept in pens from 4 to 6 months of age were investigated. The calves were kept on deep litter of sawdust supplemented with Stalosan F biopreparation (group II), on deep litter (50% sawdust + 50% straw by volume; group III) and on shallow straw bedding (control group K). The behaviour, weight gains, and cleanliness of the calves and house microclimate were studied. Chemical analyses and measurements of sawdust and sawdust manure acidity, temperature inside the manure, and consumption of sawdust per bedding were done. Ethological observations showed no negative effect of conifer sawdust bedding on the behaviour of the calves. Lying time (48-50% of 24 h) and feeding time (20-22% of 24 h) conformed to the standard for this age group. Cleanliness of calves kept on sawdust bedding was similar and in some cases slightly better than with straw housing. Measurements of basic parameters of microclimate and harmful gas admixtures in the calf house did not show any deviations from the standard. Type of bedding had no effect on weight gains of the calves. The results of sawdust acidity before bedding out (pH < 6) and sawdust manure (pH >8) disproved the common view that sawdust bedding acidified the soil when used as a fertilizer in field crops. It is concluded that conifer sawdust is useful as a bedding material for calves.

962. **The effect of continuous and intermittent aeration on composting hog manure amended with sawdust: Progress report.**
Hong, J. H.; Keener, H. M.; and Elwell, D. L.
In: ASAE Annual International Meeting.Orlando, Florida, USA.); 21pp.; 1998.
Descriptors: aeration / ammonia/ biotechnology/ composting/ decomposition/ emission/ manures/ nitrogen/ odour abatement/ odours/ pig manure/ sawdust/ odor abatement/ odors/ smells
Abstract: The effects of using intermittent aeration during composting on ammonia emissions and dry matter loss were determined during composting of hog manure amended with sawdust. Composting trials lasted 3 weeks

and used 4 pilot-scale 200 litre vessels. The experimental design used replication of 2 treatments, continuous aeration (CA) and intermittent aeration (IA), in 2 series of experiments (total of 8 tests). In the CA sequence, compost temperatures were controlled at 60 degrees C using feedback control on high and low air flow fans while the IA sequence consisted of 5 minutes of air flow followed by 55 minutes of rest. Mixing ratios of pig manure to sawdust were 1:1.1 and 1:1.7 dry weight basis with resulting C/N ratios of 18.2 +or- 1.2 and 23.7 +or- 2.2 for the 2 series of tests. Airflow reduction was 63% for IA compared to CA. Percentage nitrogen loss between treatments were moderately statistically different (alpha = 0.14) with average nitrogen loss 29.7% for CA and 23.0% for IA. Nitrogen loss as ammonia-N was higher for CA than IA (25.9 versus 14.3) but was not statistically different. No significant differences existed in dry solids loss between treatments and the physical and chemical properties of the compost produced from IA were similar to that from CA for each series. Results showed that IA compared to CA may be a practical way to reduce nitrogen loss and ammonia emissions during composting of pig manure with sawdust.
This citation is from AGRICOLA.

963. **Effect of continuous application of compost made from cattle waste and sawdust on the growth and nitrogen uptake of spinach (Spinacia oleracea L.).**
Kodashima, R.; Takahashi, M.; Hiraka, M.; Ono, T.; Ae, N.; and Matsumoto, S.
Horticultural Research Japan 5(4): 389-395. (2006); ISSN: 1347-2658
Descriptors: ammonium nitrate/ cattle manure/ composts/ leaf area index/ leaves/ manures/ nitrate/ nitrogen/ nitrogen fertilizers/ nutrient uptake / phosphorus fertilizers/ plant morphology/ potassium nitrate/ sawdust/ seedling growth/ soil fertility/ spinach/ LAI/ phosphate fertilizers
Abstract: Spinach (S. oleracea) is one of the major agricultural products in Iwate prefecture, Japan. To evaluate the effect of compost made from cattle waste and saw dust, the growth and nitrogen (N) uptake of spinach were examined between 1998 and 2001, compared to those with standard fertilizer application using a chemical fertilizer. The compost was applied annually at a rate of 45 g N.m-2 before sowing, then spinach was cultivated 2-4 times per year without supplemental N application. In the standard fertilizer application using ammonium nitrate, super phosphate and potassium chloride, N, P_2O_5 and K_2O were applied to the soil at rates of 16-20 g.-2, 20-24 g.-2 and 16-20 g.m-2, respectively. Morphological index, i.e. leaf length, leaf width and number of spinach leaves in plants receiving compost were comparable to those of plants treated with chemical fertilizer. Dry matter production and N uptake in spinach applied with the compost was higher than that applied with chemical fertilizer, while the concentration of inorganic N in soil treated with compost was much lower than that treated with chemical fertilizer after every cultivation. Furthermore, the proportion of nitrate to total N in spinach receiving compost was much lower than that in spinach treated with chemical fertilizer, a though N uptake was higher in spinach treated with compost than that treated with chemical fertilizer. These findings suggest that N uptake in spinach would not be fully explained by the concentration of inorganic N in soil. However, concentration of phosphate buffer extractable organic N, which is considered an easily decomposable organic N, increased in soil treated with compost compared to that in soil treated with chemical fertilizer.
This citation is from AGRICOLA.

964. **Effect of continuous soil amendment with coniferous sawdust on nematodes and microorganisms.**
Brzeski, M. W. and Szczech, M.
Nematologia Mediterranea 27(1): 159-166. (1999)
NAL Call #: QL391.N4N42; ISSN: 0391-9749
Descriptors: amendments/ ecology/ effects/ free living nematodes / microorganisms/ nematology/ sandy soils/ sawdust/ soil amendments/ soil density/ succession/ Aphelenchida/ Hyphomycetes/ micro organisms/ Secernentea/ Tylenchida
Abstract: Sandy soil was amended for 6 consecutive years with coniferous sawdust at the rate of 8 metric tonnes/ha. The treatment resulted in a considerable increase in the population of fungi, including Trichoderma spp., while there was no apparent effect on bacteria. This was associated with an increase in the density of microbivorous nematodes. Among bacterial feeders, cephalobids increased more than rhabditids. Among fungal feeders succession was observed where Aphelenchoides spp. increased after the first treatment and decreased later; this was followed by Ditylenchus spp., and later by Filenchus spp. The treatment also improved soil density and capillary binding of water, and is considered beneficial for soil biotic and abiotic conditions.
This citation is from AGRICOLA.

965. **Effect of culture medium and its physico-chemical properties on bulblet growth of Lilium Oriental Hybrid.**
Woo, JinHa; Sim, YongGu; Han, YounYol; Nam, HyoHoon; Choi, KyeongBae; and Kim, KiuWeon
Journal of the Korean Society for Horticultural Science 42(4): 465-468. (2001)
NAL Call #: SB13.H28; ISSN: 0253-6498
Descriptors: bulk density/ carbohydrates/ chlorophyll/ culture media/ growth/ nitrogen/ nutrient content/ peat soils/ physicochemical properties/ sawdust/ soil/ water content/ saccharides
Abstract: This study was carried out to search for suitable media for enhancing the growth of scale-propagated lily bulblets of Lilium sp. cultivars Casa Blanca and Marco Polo. The physico-chemical properties of media were also investigated. pH of upland soils was 7.6, and ranged between 4.0-5.4 in all other media. Organic contents were above 27.8% in all media except upland soils (4.2%). In upland soils, bulk density was higher than the other media but water content differed. The TKS-2 + peatmoss mixture gave most vigorous shoot growth of Casa Blanca and sawdust was most effective for Marco Polo. Casa Blanca grown under TKS-2 + peatmoss mixture was high in chlorophyll content (1.40 mg.g-1). Chlorophyll content of Marco Polo grown under sawdust + TKS + peatmoss mixtures gave an even higher chlorophyll content of 1.45 mg.g-1. The sawdust mixture gave lowest chlorophyll

content. The sawdust+TKS mixture gave a high C/N ratio as well as contents of carbohydrate and nitrogen compound in both cultivars.
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966. **Effect of culture parameters on the production of the edible mushroom Grifola frondosa (maitake) in tropical weathers.**
Barreto, S. M.; Lopez, M. V.; and Levin, L.
World Journal of Microbiology and Biotechnology 24(8): 1361-1366. (2008)
NAL Call #: QR1 .M562 ; ISSN: 0959-3993
Descriptors: barley/ crop yield/ edible fungi/ environmental factors/ maize/ medicinal fungi/ rice/ rotation/ sawdust/ substrates/ tropical climate/ Coriolaceae/ corn/ Grifola/ Grifola frondosa/ paddy/ Poriales
Abstract: Hitherto, little effort has been directed to improve culture conditions for commercial development of maitake (Grifola frondosa), an edible and medicinal fungus, due to the short history of cultivation, particularly in tropical weathers. The purpose of this research was analyzing the environmental factors required for successful basidiome development on synthetic substrates in Colombia. We evaluated different cereal grains (corn, barley, sorghum and rice) for spawn production; and industrial by-products (such as coffee spent-ground and oak-sawdust) as substrates for mushroom production. Exploiting these residues for G. frondosa solid culturing would primarily provide edible mushroom and simultaneously help in resolving their disposal problem. The use of corn grains as substrate for spawn production results an important factor for reducing crop cycle time. A cold shock to 10 degrees C was requisite for basidiome formation. Coffee spent-ground was a good substrate for mycelial growth, but not for mushroom production. When using oak sawdust plus corn bran as substrate, we obtained consistent yields with combined high biological efficiency (BE) (35.3%), best quality mushrooms, and a crop cycle of 12-14 weeks. The results achieved in this investigation contribute to expand the knowledge on this fungus, and compare favorably with previous works in the northern hemisphere with respect to BE, mushroom quality and crop cycle time.
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967. **The effect of different cultivation media on the yield of Flammulina velutipes (Curtis: Fries) Singer.**
Pawlak, R. and Siwulski, M.
Vegetable Crops Research Bulletin 54(2): 93-96. (2001); ISSN: 1506-9427
Descriptors: crop yield/ cultivars/ culture media/ edible fungi/ genetic variation/ plant residues/ sawdust/ substrates/ cultivated varieties/ genetic variability/ genotypic variability/ genotypic variation
Abstract: Yielding of two Flammulina velutipes cultivars (F-01 and F-04) on sawdust cultivation media was evaluated. Sterilized pine or beech sawdust as well as a mixture of both types were used. It was found that cultivation media influenced the yield of Flammulina velutipes. Both cultivars yielded best on the mixture of pine and beech sawdust, worse on the beech sawdust and worst on the pine sawdust. Higher yield was obtained with F-04 cv. than F-01 cv. with the exception of the beech sawdust medium, where both cultivars gave the same yield.
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968. **The effect of different growing media on cucumber seedling production, fruit yield and quality under greenhouse conditions.**
Sawan, O. M.; Eissa, A. M.; and Abou Hadid, A. F.
Acta Horticulturae 491: 369-376. (1999)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: chlorophyll/ composts/ crop residues/ cucumbers/ cucurbit vegetables/ fruit vegetables/ fruits/ growing media/ heavy metals/ iron/ manganese/ peat/ plant height/ quality/ residues/ sawdust/ seedlings/ vegetables/ vermiculite/ yield components/ yields/ zinc/ gherkins/ Mn/ potting composts/ rooting media/ vegetable crops
Abstract: Twenty-five combinations of peat, vermiculite, composted sawdust (composted for 1, 2, 3 or 4 months) and crop residues compost were used as growing media for cucumber (cv. Katia) seedling production. Seedlings grown in sawdust media were either similar to or superior to controls grown in peat + vermiculite (1:1, v/v) for each of the parameters plant height, number of leaves, chlorophyll content and fruit yield (both early and total), as well as number of fruits per plant. The best plant growth and the highest yield were obtained by mixing the control medium with sawdust and plant residues compost 2:2:1 (v/v/v), i.e. reducing the peat volume from 50% to 20% in the mixture. These results indicate that sawdust can be used as a substitute for high percentages of peat in media for cucumber seedling production. Nutrient contents (N, P, K, Fe, Mn, Zn and Cu) and heavy metals contents (Pb, Cd, Ni, Cr and Co) were determined in the cucumber fruits.
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969. **The effect of different kind of litter on the broiler performance.**
Ogan, M.
Veteriner Fakultesi Dergisi, Uludag Universitesi 19(3): 1-6. (2000); ISSN: 1301-3173.
Notes: Original title: Farkl altlk materyalinin broyler performansna etkisi.
Descriptors: body weight/ broiler performance/ broilers/ chicks/ feed conversion/ litter/ moisture content/ pH/ poultry/ rice husks/ sawdust/ straw/ wheat/ wheat straw/ wood shavings/ chickens/ domesticated birds/ hydrogen ion concentration/ potential of hydrogen/ rice hulls
Abstract: The study was conducted to investigate the effects of using wood shavings, chopped wheat straw, sawdust, mixture of sawdust and whole wheat straw, rice hulls and whole wheat straw as litter material on broiler production performance. For each litter group, a 11.2 m2 division was separated and 150 day-old Avian Farm chicks were placed in each division in accordance with 14 chicks/m2. Six week body weights of broilers housed on the litter groups of wood shavings, chopped wheat straw, sawdust, mixture of sawdust and whole wheat straw, rice hulls and whole wheat straw were 2210, 2235, 2171, 2136, 2075 and 2040 g (P<0.05); and feed conversions were 1.64, 1.65, 1.80, 1.71, 1.77 and 1.98 kg, respectively. The litter pH values and moisture ratios showed increases

during the trial. The best results were obtained with the broiler groups housed on chopped wheat straw and mixture of sawdust and whole wheat straw. In conclusion, these litters could be an alternative to wood shavings.

970. **Effect of different levels of soil moisture, soil amendment with sawdust and soil treatment with straw burning and chemicals on the incidence of damping-off of seedlings from true potato seed.**
Islam, M. R.; Dey, T. K.; Islam, M. T.; Saifullah, M.; and Khorsheduzzaman, A. K. M.
Bangladesh Journal of Plant Pathology 16(1/2): 57-59. (2000); ISSN: 1012-9279
Descriptors: burning/ captan/ chemical control/ cultural control/ fungal diseases/ plant disease control/ plant diseases/ plant pathogenic fungi/ plant pathogens/ potatoes/ sawdust/ seedlings/ soil water/ straw/ Athelia rolfsii/ Atheliaceae/ Corticiaceae/ flaming/ formalin/ Hyphomycetes/ Peronosporomycetes/ phytopathogens/ Pythiaceae/ soil moisture/ Stereales/ Straminipila
Abstract: An experiment was conducted during 1995-96 and 1996-97 in Bangladesh on true potato seed (FPS) seed line HPS- IIX13. The treatments were soil moisture at 40, 60, and 80% field capacity (FC), soil amendment with sawdust (0.75 t/ha), soil treatment with straw burning (15 cm thick), formalin (1%), Vitavax 200 (0.2%), ridomil MZ 72 (0.2%), apron 35SD (0.2%) and captan (0.2%) at 5 litres a.i./m2. Five soil-borne fungal pathogens (Sclerotium rolfsii, Rhizoctonia solani and F. solani) were identified to be associated with damping off of seedlings from TPS. All the treatments were effective in reducing the damping-off disease of potato seedlings in TPS but their efficacy significantly differed. Formalin and Vitavax 200 showed excellent performance in controlling the disease. Soil moisture at 60% FC, straw burning and sawdust amendments also reduced damping-off incidence.

971. **Effect of different media on propagation of bi-color Bougainvillea cuttings.**
Rahman, N.; Hussain, I.; and Awan, A. A.
Pakistan Journal of Biological Sciences 2(3): 877-878. (July 1999)
NAL Call #: QH301 .P355; ISSN: 1028-8880.
Descriptors: propagation media/ sand/ silt/ sawdust/ Bougainvillea/ cuttings
Abstract: The maximum sprouting percentage (70.83%), plant survival (51.16%) and plant height (19.03 cm) was recorded in silt. Similarly maximum root length (10.33 cm) and root number (9.33) was noted in sand. Minimum plant height (3.50 cm) was recorded in sawdust whereas minimum root length (3.33 cm) and root number (2.66) was recorded in mixture of sand, silt and clay (1:1:1). F.Y.M. give zero survival.

972. **The effect of different methods of soil mulching on the quality and yield of garlic.**
Rekowska, E.
Roczniki Akademii Rolniczej w Poznaniu, Ogrodnictwo 27: 251-256. (1998); ISSN: 0137-1738.
Notes: Original title: Wpyw roznych sposobow sciokowania gleby na wielkosc oraz jakosc plonu czosnku.
Descriptors: bulbs/ crop yield/ garlic/ mulching/ peat/ plastic film/ rye/ sawdust/ size/ straw/ vegetables/ vegetable crops
Abstract: In a field experiment at Szczecin in 1986-88, garlic cv. Nizinny Topolski was planted out on 20 October and mulched with transparent or black plastic mulch, rye straw, sawdust or peat. Mulching increased bulb yields. Marketable yields were highest with transparent or black plastic (5.74 or 5.58 t/ha, respectively). Bulb quality was also highest in these treatments.

973. **The effect of different mixtures of organic and inorganic materials and growing positions on vegetative growth of aubergine (Solanum melongena L.) grown in bag culture in greenhouse.**
Uzun, S.; Balkaya, A.; and Kandemir, D.
Ondokuz Mays Universitesi, Ziraat Fakultesi Dergisi 22(2): 149-156. (2007); ISSN: 1300-2988
Descriptors: application rates/ aubergines/ biomass production/ coal/ composts/ crop residues/ dry matter accumulation/ dry matter distribution/ farmyard manure/ growth/ hazelnuts/ husks/ leaves/ organic amendments/ pine needles/ plant height/ rice husks/ roots/ sawdust/ soil amendments/ stems/ tobacco/ biomass distribution/ brinjal/ eggplants/ FYM/ hulls/ rice hulls
Abstract: The aim of this study was to determine the effect of different mixtures of organic and inorganic materials and plant growing positions provided by utilizing wooden benches with different heights on vegetative growth of aubergine (Solanum melongena) grown in bag culture in unheated plastic greenhouse for late autumn growing season, at The University of Ondokuz Mays, Faculty of Agriculture, in the Black Sea region, Turkey. The organic and inorganic materials used in the study were decomposed farmyard manure, hazelnut husk, rice hull, decomposed pine leaves, tobacco waste, sawdust, decomposed bark, sieved garden soil, sand of 2 mm, coal dust and coal ash. Cv. Megal F1 of aubergine was used in the study. Six different mixtures of organic and inorganic materials were blended and used in horizontal growing bag culture. The experiment was carried out at three different heights in the greenhouse, namely 0, 25 and 50 cm from the ground. Plant height (cm), stem diameter (mm), leaf number per plant, dry matter partitioning to leaf, stem and root of the plants (g) were investigated as well as determining plant canopy light interception (%). In general, the best results were obtained from the mixtures named A (decomposed farmyard manure, sieved garden soil, hazelnut husk, rice hull, sand of 2 mm, decomposed pine leaves, tobacco waste, coal ash and coal dust as ratios of 2:1:1:1:1/3:1:1/2:1/2:1/4, respectively), F (Decomposed farmyard manure, sieved garden soil and sand (2 mm), as ratios of 1:1:1, respectively) and D (rice hull, sieved garden soil, decomposed bark, decomposed farmyard manure, sand of 2 mm, decomposed pine leaves, tobacco waste, coal dust and coal ash as ratios of 2:1:1:2:1/2:1:1:1/2:1/2, respectively). At any given growing positions, the mixture named B (decomposed pine leaves, decomposed farmyard manure, saw dust, coal dust, decomposed bark, hazelnut husk, tobacco waste and coal ash, as ratios of 2:3:1:1/2:1/2:1:1:1, respectively) gave the lowest values in terms of selected plant growth parameters. There were also significant differences between growing positions in

affecting vegetative growth of aubergine depending on media such as there appeared to be a tendency of obtaining higher values at higher growing positions.
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974. **Effect of different soil media on seed germination, seedlings growth and NPK content in Caesalpinia pulcherrima and Thevetia peruviana.**
Mahmood, S. M.
University of Aden Journal of Natural and Applied Sciences 9(2): 319-330. (2005); ISSN: 1606-8947
Descriptors: diameter / growing media/ leaf area/ leaves/ nitrogen/ nutrient content/ phosphorus/ plant height/ potassium/ roots/ sand/ sawdust/ seed germination/ seedling growth/ seedlings/ seeds/ shoots/ potting composts/ rooting media
Abstract: Experiments were conducted in Yemen during May-November 2003 and May-November 2004 using four different soil media: sand; sand + soil; sand + sawdust; and sand + soil + sawdust. Caesalpinia pulcherrima and Thevetia peruviana were analysed for germination percentage, plant height, stem diameter, number of leaves per seedling, leaf area, fresh and dry weight of leaves, stem per seedlings, root length, fresh and dry weight of roots, and N, P and K content in leaves. Results showed that all observed parameters exhibited maximum values under the soil + sand medium while minimum values were observed under the soil + sawdust medium.
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975. **Effect of different types of mulches and their duration on the growth and yield of garlic (Allium sativum L.).**
Jamil, M.; Munir, M.; Qasim, M.; Jalal ud Din Baloch; and Rehman, K.
International Journal of Agriculture and Biology 7(4): 588-591. (2005); ISSN: 1560-8530
Descriptors: bulbs/ crop yield/ garlic/ mulches/ mulching/ plant height/ plastic film/ sawdust/ straw/ survival/ yield components/ mulching materials
Abstract: The effects of plastic, straw and sawdust mulches on the yield and yield components of garlic (cv. Bannu Local) were studied in Dera Ismail Khan, Pakistan, during the spring of 2003. Plants without mulch (control) were smaller by 6 and 13 cm than the plants mulched with plastic and straw, respectively. Mulching throughout the cropping season increased plant height. Bulb survival was greatest (71.83%) with plastic mulch used throughout the cropping season and lowest (50%) in the control. Bulb diameter did not significantly vary with the mulching duration (one month or throughout the cropping season). Bulb diameter was greatest with plastic mulch (4.71 cm), and lowest with sawdust mulch (4.33 cm) and in the control (4.18 cm). The type of mulch and mulching duration had no significant effects on the number of cloves per 10 bulbs and neck diameter. Straw mulch resulted in the greatest bulb weight (385.9 g) and yield (6.35 t/ha). Bulb weight was significantly correlated with yield per hectare. Straw mulch, which is cheaper and effective in enhancing garlic yield, is recommended under the agroclimatic conditions of Dera Ismail Khan.
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976. **Effect of growing media and commercial fertilizers on Furcraea macdougallii L. plants. I. Effect on vegetative growth.**
El Maadawy, E. I. and Habib, A. M. A.
Bulletin of Faculty of Agriculture, Cairo University 56(3): 543-561. (2005); ISSN: 0526-8613
Descriptors: clay/ crop residues/ fertilizers/ growing media/ growth/ sawdust/ substrates/ Furcraea macdougallii/ potting composts/ rooting media
Abstract: A pot experiment was carried out during two successive seasons 2001-02 and 2002-03 at the Experimental Nursery of the Ornamental Horticulture Department, Faculty of Agriculture, Cairo University, to study the effects of growing media and some commercial fertilizers on vegetative growth of F. macdougallii plants. The plants were grown in the following media: sand, sand + clay, sand + clay + sawdust, sand + clay + peanut shell or sand + clay + corn cob, and were sprayed every 3 weeks with Agro-top (19:19:19), Multi (12:2:43), Agro-mor (13:4:42) and Poly-feed (14:7:37) at the rate of 2 g/litre. Control plants were sprayed with tap water. The obtained results revealed that the plants grown in a mixture of sand+clay+peanut shells (1:1:1) and fertilized with Poly-feed or Multi fertilizer had the longest leaves. The plants grown in the mixture of sand + clay + corn cobs (1:1:1) and treated with Multi or Agro-mor fertilizers formed the highest number of leaves. The best leaf width was obtained as a result of growing the plants in a mixture of sand + clay + peanut (1:1:1) or sand + clay + corn cob and fertilized with Poly-feed. A mixture of sand + clay (1:1) plus Multi fertilizer produced the heaviest fresh weight of foliage. Meanwhile, plants grown in sand+clay (1:1) or sand + clay + corn cob (1:1:1) mixtures had the heaviest dry weight of foliage. The longest roots were formed on plants grown in sand + clay + sawdust (1:1:1) mixture and received the Multi fertilizer or sand medium plus Poly-feed fertilizer. Whereas, growing plants in sand + clay plus Multi fertilizer or in sand + clay + corn cob mixture with Agro-mor fertilizer gave the greatest number of roots.
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977. **Effect of growing medium on early growth and survival of Uapaca kirkiana Muell Arg. seedlings in Malawi.**
Mhango, J.; Akinnifesi, F. K.; Mng'omba, S. A.; and Sileshi, G.
African Journal of Biotechnology 7(13): 2197-2202. (2008)
NAL Call #: TP248.13 .A37; ISSN: 1684-5315
Descriptors: forest soils/ grafting/ growing media/ nitrogen fertilizers/ phosphorus fertilizers/ plant height/ potassium fertilizers/ roots/ sand/ sawdust/ seedling growth/ survival/ phosphate fertilizers/ potash fertilizers/ potting composts/ rooting media/ Uapaca/ Uapaca kirkiana
Abstract: The use of appropriate growing medium has been an important factor influencing growth and survival of seedlings in the nursery. Raising Uapaca kirkiana rootstocks from seeds has been a challenge as pencil-size stem thickness is required before grafting can be done. An experiment was carried out with the objective of determining an effective growing medium that ensures survival and rapid growth of U. kirkiana seedlings. Ten different combinations of sand, forest soil and sawdust amended with four different levels of nitrogen, phosphorus and potash fertilizer were evaluated. The result showed that

the growing medium comprising 75% forest soil and 25% sawdust produced the tallest seedlings with larger root collar diameter and higher survival at ten months after planting. Amending the same growing medium with fertilizer improved the root collar diameter of the seedlings. It is concluded that a growing medium comprising 75% forest soil and 25% sawdust and amended with NPK fertilizer was superior in improving U. kirkiana seedling growth to attain a suitable diameter for grafting within ten months.
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978. **Effect of growth media and fertilizer application on biomass allocation and survival of Uapaca kirkiana Muell Arg seedlings.**
Sileshi, G.; Akinnifesi, F. K.; Mkonda, A.; and Ajayi, O. C.
Scientific Research and Essays 2(9): 408-415. (2007); ISSN: 1992-2248
Descriptors: biomass/ diameter/ dry matter distribution/ forest soils/ growing media/ growth/ liquid fertilizers/ mortality/ plant diseases/ plant height / root shoot ratio/ sawdust/ seedlings/ soil fumigation/ survival/ biomass distribution/ death rate/ potting composts/ rooting media/ Uapaca/ Uapaca kirkiana
Abstract: The effects of potting mixture, soil and foliar fertilizer application on plant growth, biomass allocation and survival of U. kirkiana seedlings in the nursery were studied. Growth in height and diameter was greatest in plants with a root to shoot ratio of <1 or 2.5-4. Growth in height and diameter significantly differed (P<0.01) with treatment main effects and interactions. Growth was most pronounced in plants grown on unsterilized forest soil and soil, then treated with foliar fertilizer. The probability of plant mortality was significantly higher (P<0.01) in the potting mixture where sawdust was added (mean=0.47) than in the mixture without sawdust (mean=0.12). Mortality was also significantly higher (P<0.05) in unsterilized soil (mean=0.30) than in sterilized soil (mean=0.13). Potting mixtures amended with soil-applied fertilizer had lower probability of plant mortality compared to those without. Disease incidence and seedling survival were related to biomass allocation in a curvilinear manner. It was concluded that the survival of U. kirkiana seedlings in the nursery is a function of disease incidence, plant growth and biomass allocation, which in turn are functions of the growth medium and nutrient availability.
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979. **Effect of growth media on germination and seedling growth of Dacryodes edulis (Don. G. Lam H. J.).**
Okunomo, K.; Ojeifo, I M.; and Oghenerhoro, E. O.
Discovery and Innovation 18(1): 11-14. (2006); ISSN: 1015-079X
Descriptors: clay soils/ girth/ growing media/ leaves/ plant height/ sandy soils/ sawdust/ seed development/ seed germination/ seedling emergence/ seedling growth/ seedlings/ seeds/ soil types/ topsoil/ potting composts/ rooting media
Abstract: The consumption of Dacryodes edulis is high in Nigeria, however, its cultivation has not gain popularity and hence its production is in small scale because of dearth of information on its germination, seedling growth and development. Consequently, the effect of soil type on germination and seedling growth of D. edulis was investigated. Four soil types (topsoil, sawdust, sharp sand and clay soil) were used. Results showed that there were significant differences in plant height, girth, number of leaves and leaf length as influenced by various growth media. However, no significant differences were observed between topsoil and sawdust on their influence on plant height of D. edulis. It is recommended that top soil and sawdust could be utilized for germination of D. edulis seeds.
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980. **Effect of growth media on propagation of four varieties of cassava.**
Okpara, D. A. and Baiyeri, S. O.
Global Journal of Agricultural Sciences 5(2): 131-134. (2006); ISSN: 1596-2903
Descriptors: cassava/ cultivars/ growing media/ growth/ leaves/ plant height/ poultry manure/ propagation/ sawdust/ sprouting/ topsoil/ cultivated varieties/ manioc/ plant propagation/ potting composts/ poultry litter/ rooting media/ tapioca plant
Abstract: A 4x3 factorial experiment in a completely randomized design (CRD) with three replicates was conducted during 2004, in southeastern Nigeria, to evaluate the propagation (sprouting and growth) of 4 cassava cultivars (3 improved - TMS 30572, TMS 4(2) 1425 and NR8082; and one local - Nwaibibi) on 3 growth media (sawdust + poultry manure, sawdust and topsoil). On average, at 28 days after planting, number of sprouts per cutting ranged from 1.4 in topsoil to 6.7 in sawdust; plant height ranged from 1.8 cm in topsoil to 5.4 cm in sawdust + poultry manure; and number of leaves per plant ranged from 2.8 in topsoil to 5.3 in sawdust. Sawdust and sawdust + poultry manure significantly enhanced sprouting, vigour, plant height and number of leaves per plant than topsoil. The improved cultivars were superior to the local Nwaibibi in terms of all attributes measured. On average, TMS 30572 and TMS 4(2) 1425 were more vigorous than NR8082, and plants were taller in the former in sawdust + poultry manure.
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981. **Effect of inoculation with phosphate-bacteria, sawdust compost and nitrogen sources on okra yield and some properties of calcareous soil.**
Estefanous, A. N. and Sawan, O. M.
Acta Horticulturae 608: 85-94. (2003)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: application rates/ calcium nitrate/ chemical composition/ composts/ crop yield/ dry matter/ enzyme activity/ enzymes/ liquid fertilizers/ nitric acid/ nitrogen/ nitrogen fertilizers/ nutrient availability/ nutrient uptake/ okras/ oxidoreductases/ phosphorus/ plant composition/ plant nutrition/ potassium/ sawdust/ seed inoculation/ shoots/ soil bacteria/ soil organic matter/ soil ph/ urea/ yield components/ biofertilizers/ chemical constituents of plants/ organic matter in soil/ redox enzymes
Abstract: A pot experiment was conducted to study the effects of phosphate-dissolving bacterial (PDB) inoculation, sawdust compost, and N fertilizer on the growth and yield of okra cv. Esmaily grown on calcareous soil. Seeds were inoculated with Bacillus megaterium var. phosphaticum at

600 g/40 kg seeds. Sawdust compost was mixed with the soil at 2.5 or 5.0% (soil weight basis). Beginning on the third week, N (40 kg/feddan) was applied as nitric acid solution (0.1 N), nitric acid-calcium nitrate solution (1:1), calcium nitrate solution or urea solution at 2-week intervals. Changes in soil biochemical properties were also studied at 175 days after planting. PDB, sawdust compost and N application significantly enhanced shoot dry weight, fruit fresh and dry weights, fruit yield, and N and P uptake. Sawdust compost was more effective when applied at the higher rate. The greatest increase in the aforementioned parameters was recorded for inoculated plants treated with sawdust compost and N in the form of nitric acid solution. Microbial counts, PDB and dehydrogenase [oxidoreductase] activity in the soil, as well as N, P and K availability, were enhanced by sawdust compost and PDB. The incorporation of sawdust compost also increased soil organic matter and slightly reduced pH. Thus, sawdust compost and acidic N fertilizer application, along with PDB inoculation, can enhance okra yield and nutrient uptake in calcareous soil. [1 feddan=0.42 ha].
This citation is from AGRICOLA.

982. **Effect of levels of nitrogen and forms of pre-conditioned urea on grain yield and N status in plant and soil of rainfed rice (Oryza sativa).**
Lakpale, R.; Pandey, N.; and Tripathi, R. S.
Indian Journal of Agronomy 44(1): 89-93. (1999)
NAL Call #: 22 IN235; ISSN: 0537-197X
Descriptors: farmyard manure/ mineral uptake/ nitrogen fertilizers/ nutrient uptake/ rice/ rice straw/ sawdust/ soil fertility/ sources/ straw/ urea fertilizers/ FYM/ paddy
Abstract: In a field experiment during the rainy seasons of 1992 and 1993 at Raipur, Madhya Pradesh, India, rice was given 60 or 120 kg N/ha as prilled urea, urea mixed with soil (1:3) or urea + sawdust or farmyard manure or rice straw dust + soil (1:3:1). Urea + farmyard manure + soil gave the highest grain yield, N accumulation in plants, plant N content, and soil N status at harvest. Grain yield and N accumulation of rice increased significantly with increasing N rate.
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983. **Effect of media on propagation of Lilium.**
Manish Kapoor; Grewal, H. S.; and Arora, J. S.
Journal of Ornamental Horticulture New Series 3(1): 58-59. (2000)
Descriptors: bulb scales/ bulbs/ growing media/ leaves/ lilies/ perlite/ planting stock/ propagation/ roots/ sand/ sawdust/ size/ soil/ vermiculite/ nursery plants/ nursery stock/ plant propagation/ planting materials/ potting composts/ rooting media
Abstract: The effects of different growing media for the propagation of bulb scales of Lilium, cultivar Chianti, were investigated. Bulb scales were planted in pots containing sawdust, soil + sawdust (1:1), moss grass [sic], perlite, vermiculite, sawdust + moss grass (1:1) and sand. The pots were kept in a shade house and watered for 16 weeks. The highest number of bulblets/scale (6.2) was obtained with vermiculite followed by moss grass and the least was with soil + sawdust (1.7). The mean diameter and weight of the bulblets was significantly higher with vermiculite than with the other treatments. The number of leaves was significantly higher with vermiculite, moss grass, perlite and sand compared with the other treatments. Root length was greatest with vermiculite.
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984. **Effect of mulch materials on growth and yield of apple (Malus domestica Borkh.) cv. Red Delicious under rainfed conditions of Kashmir.**
Wani, G. M.; Nagoo, G. A.; Bhat, A. R.; and Lone, I. A.
Applied Biological Research 2(1/2): 135-137. (2000); ISSN: 0972-0979
Descriptors: apples/ crop quality/ crop yield/ growth/ mulches/ polyethylene/ rice/ rice straw/ sawdust/ straw/ yield components/ Kashmir/ mulching materials/ paddy/ polythene
Abstract: Five different mulch materials namely sawdust, paddy straw, cut grass, polyethylene (punched) and polyethylene (unpunched) were compared in a field experiment conducted in Jammu and Kashmir during 1990 to determine their effects on growth, yield and quality of Red Delicious variety of apple. The growth of the fruit trees in terms of shoot length was highest under cut grass in comparison with all the other treatments. Highest fruit yield, fruit weight, fruit colour and fruit size was obtained from the trees under cut grass mulch materials followed by paddy straw and polyethylene. In case of total soluble sugar and acidity, mulch materials did not play significant role.
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985. **Effect of mulching materials on growth and flowering of oriental hybrids lilies in alpine area.**
Hong SaeJin; Kim HakKi; and Park SeWon
Korean Journal of Horticultural Science and Technology 19(4): 585-590. (2001); ISSN: 1226-8763
Descriptors: bulbs/ crop quality/ crop yield/ cultivars/ cut flowers/ flowering/ foliage/ growth/ lilies/ mulches/ mulching/ plant development/ plastic film/ protected cultivation/ roots/ sawdust/ anthesis/ cultivated varieties/ cultivation under glass or plastic/ mulching materials/ South Korea
Abstract: Bulbs of Lilium Oriental hybrid cultivars Casablanca and Marco Polo were grown in a plastic house in an alpine area of Pyongchang Kangwondo, Korea Republic. Sawdust, black film, reflective film, transparent film, and white/black double film were used as mulching materials to ascertain the growth of foliage, quality of flower, and size of bulbs. Foliage weights of both lilies were higher when grown with mulching materials than with the control. There were no differences in bulb weight among the control and mulching treatments, except delayed bulb growth in black film and white/black double film. Mulching cultivation with sawdust and reflective film stimulated foliage growth, root growth and bulb production. Black film delayed the growth and development. Transparent and white/black double films showed no effects on foliage growth and bulb development than the control. Since mulching materials tended to delay lily growth, including foliage and bulb, an extension of growing term might be better to produce high quality lilies than common cultivation in an alpine area.
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986. **Effect of mulching on the growth and yield of cotton.**
Raman, R.; Kuppuswamy, G.; and Krishnamoorthy, R.
Journal of Ecobiology 16(4): 275-278. (2004)
NAL Call #: QH540.J56 ; ISSN: 0970-9037
Descriptors: coir/ cotton/ crop residues/ crop yield/ cultural control/ mulches/ mulching/ rice/ rice straw/ sawdust/ straw/ sugarcane trash/ weed control/ weeds/ coconut fibre/ Madras/ mulching materials/ paddy/ Pontederiales
Abstract: A field study was conducted in Annamalai, Tamil Nadu, India during 1999 to investigate the effect of mulching on the weed control, and growth and yield of cotton. The treatments were: no mulch; mulching with water hyacinth (Eichhornia crassipes) at 10 cm thickness; coir pith at 2 cm thickness; sawdust at 2 cm thickness; paddy straw at 10 cm thickness; and sugarcane trash at 10 cm thickness. The treatment with sugarcane trash reduced the weed number to 20 weeds/m2 and weed biomass to 15.19 g/m2. Sugarcane trash mulching increased weed control efficiency (91%), weed control index, and growth and yield of cotton (1464 kg/ha). Coir pith mulching followed sugarcane trash mulch in terms of efficiency. All mulching treatments suppressed weeds and improved seed cotton yield.

987. **Effect of mulching rates on evaporation, water and salt distribution in two soils with different texture from upper soil layer, in Derab Region, Kingdom of Saudi Arabia.**
Al Harby, A. A. B. O.; Al Darby, A. M.; and Abdel Aziz, R.
Arab Gulf Journal of Scientific Research 23(3): 140-149. (2005); ISSN: 1015-4442
Descriptors: clay loam soils/ evaporation/ horizons/ loam soils/ mulches/ mulching/ salts in soil/ sandy soils/ sawdust/ soil profiles/ soil texture/ soil types/ soil water content/ soil water retention/ spatial distribution/ waste utilization/ water conservation/ mulching materials
Abstract: This study was conducted in Saudi Arabia to determine measures on how to minimize evaporation using mulching at different rates in two soils loamy sand (S1), and sandy clay loam (S2). Sawdust mulch rates used were (zero, 2 and 4 cm) depth. Tape water was added to soil columns based on the required water to saturate soil. After the leachate (free water drainage) ceased, an evaporation experiment was carried out until stable weight of the control (no mulch) was achieved (83 days). The cumulative evaporation (E) was determined by daily weighing soil columns. Soil water and salts distribution were determined before and after evaporation experiments. Results indicated that the two soils had different hydrophysical properties such that sandy clay loam soil was higher in water retention. The study revealed that sawdust mulching reduced evaporation significantly on both soils. Mulching with 2-cm depth was enough for evaporation reduction to a rate lower than that of water flow toward soil surface. Results indicated that there is a linear relationship between evaporation and time for all mulching rates of both soils. It has been found that soil water profile distribution was significantly higher with mulched soil columns compared with the control for both soils. However, there were no significant differences between sawdust mulching with 2- or 4-cm depth. These results were reflected on the soil water storage, where mulched soil columns were higher than that of the control. In general, results of evaporation, soil water distribution and water storage proved that sawdust mulching with 2-cm depth was enough to limit evaporation and conserve water for both soils. The effect was more pronounced in loamy sand soil. Generally, the results of the electrical conductivity and salts distribution after the leachate ceased showed the salts were decreased on the upper soil layers, and increased on the lower soil layers for both soils and also in leachate. Results also showed that salts were redistributed after evaporation period, where salts, moved toward the upper soil layers especially in the control soil columns. Salt distribution reached equilibrium state in mulched soil columns of loamy sand soil, whereas sandy clay soil did not reach such equilibrium in loam soil. This study emphasizes the importance of mulching to limit evaporation, increase soil water storage and thus availability of water for plant growth. Two-cm depth and 28.41 tonnes sawdust mulch/ha were found to be enough to achieve that target.

988. **The effect of nutrient supplements on the yield of Pleurotus ostreatus mushroom grown on composted sawdust of Triplochiton scleroxylon.**
Obodai, M. and Johnson, P. N. T.
Tropical Science 42(2): 78-82. (2002); ISSN: 0041-3291 [TROSAC]
Descriptors: Pleurotus ostreatus/ yields/ mushrooms/ Leucaena leucocephala/ leaves/ sawdust/ composts/ mixtures/ NPK fertilizers/ urea/ epsom salts/ cocoa byproducts/ peanut husks/ cocoa nib dust
This citation is from AGRICOLA.

989. **Effect of organic amendments and carbofuran on population density of four nematodes and growth and yield parameters of rice (Oryza sativa L.) var. IRRI 6.**
Aly Khan and Shahid Shaukat, S.
Pakistan Journal of Zoology 32(2): 145-150. (2000); ISSN: 0030-9923
Descriptors: carbofuran/ chemical control/ farmyard manure/ horse manure/ neem extracts/ nematicides/ nematode control/ oilseed cakes/ organic amendments/ plant extracts/ plant parasitic nematodes/ population density/ poultry manure/ rice/ sawdust/ straw/ sugarcane bagasse / wheat/ wheat straw/ eelworms/ FYM/ Hoplolaimus indicus/ oil cakes/ paddy/ poultry litter/ Secernentea/ Tylenchida
Abstract: The effect of nine organic amendments, namely castor oil cake, mustard oil cake, sugarcane bagasse, farmyard manure, horse manure, sawdust, poultry manure, wheat straw and neem leaves (coarsely crushed) and a chemical nematicide carbofuran on the growth parameters of rice and population density of Hirschmanniella oryzae, Tylenchorhynchus annulatus, Hoplolaimus indicus and Pratylenchus zeae were investigated in microplot experiments. Poultry manure, horse manure and neem leaves significantly increased shoot length while root length was markedly increased by castor oil cake, poultry manure, neem leaves and horse manure as compared to the untreated control. Shoot weight was significantly increased by poultry manure and horse manure, and root weight by poultry manure over the controls. Grain yield was significantly enhanced over the controls by carbofuran,

castor oil cake, mustard oil cake, poultry manure and horse manure. Population density of H. oryzae was significantly reduced over the controls by carbofuran, neem leaves, mustard oil cake, castor oil cake, sawdust and wheat straw, that of T. annulatus by castor oil cake, mustard oil cake, carbofuran, sugarcane bagasse and farmyard manure. Population level of H. indicus was markedly reduced by castor oil cake, mustard oil cake, carbofuran, sugarcane bagasse, sawdust, horse manure, poultry manure, neem leaves and farmyard manure while that of P. zeae by castor oil cake, carbofuran, horse manure, mustard oil cake, sugarcane bagasse, poultry manure, neem leaves, wheat straw and farmyard manure.
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990. **Effect of organic amendments and solarisation on Fusarium wilt in susceptible banana plantlets, transplanted into naturally infested soil.**
Nasir, N.; Pittaway, P. A.; and Pegg, K. G.
Australian Journal of Agricultural Research 54(3): 251-257. (2003); ISSN: 0004-9409
Descriptors: ammonium nitrogen/ bananas/ cultivars/ cultural control/ fungal diseases/ organic amendments/ plant disease control/ plant diseases/ plant pathogenic fungi/ plant pathogens/ poultry manure/ sawdust/ solar radiation/ survival/ susceptibility/ ammonia nitrogen/ cultivated varieties/ Hyphomycetes/ phytopathogens/ poultry litter/ sunlight
Abstract: Despite extensive research since pathogenicity was first established in 1919, no cultural or chemical control strategy has proven effective against Fusarium wilt of bananas. The efficacy of cultural control is attributed to the suppression of pathogen activity. Yet, amending naturally infested soil with aged chicken manure has been shown to enhance disease severity, without any change in the activity of the pathogen Fusarium oxysporum f. sp. cubense (Foc) in the soil. In this study, the effect of amending soil with composted sawdust, and of solarising soil, was compared with the effect of amending soil with chicken manure. Bioassays comparing the activity of Foc in the soil with the extent of invasion of banana pseudostem tissue by Foc were used to investigate why strategies targetting pathogen survival have not proven successful in controlling this disease. The enhancement of Foc invasion of the banana plantlets was reproduced with the addition of chicken manure to the naturally infested soil. However, changes in the activity of Foc in the soil were not associated with changes in the frequency of invasion of the plantlets. Invasion of banana pseudostems in the sawdust and solarisation treatments was not significantly different from invasion in the respective control treatments, despite a reduction in the activity of Foc in the sawdust-amended soil and an enhancement in the solarised soil. Moreover, the increase in Foc activity in the solarised soil recorded during the bioassays occurred despite the effectiveness of solarisation in reducing the survival of Foc in pre-colonised banana root tips buried in the soil. Changes in the frequency of invasion were associated with changes in the availability of mineral nitrogen, particularly ammonium N. These results suggest that the physiological response of banana cultivars to ammonium N may be associated with their susceptibility to Fusarium wilt. Accordingly, cultural strategies for controlling Panama disease will only be effective if they enhance the ability of the host to resist invasion.
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991. **Effect of organic amendments for the management of Meloidogyne incognita on greengram and blackgram.**
Bornali Mahanta and Aparajita Borah
Journal of the Agricultural Science Society of North East India 11(1): 73-76. (1998)
Descriptors: chemical control/ grain legumes/ green gram/ multipurpose trees/ mustard/ neem seed cake/ nematicidal plants/ nematicides/ nematology/ oilseed cakes/ organic amendments/ plant nematology/ plant parasitic nematodes/ poultry manure/ sawdust/ trees/ woody plants/ eelworms/ mung bean/ neem/ neem seed oilmeal/ oil cakes/ poultry litter/ pulses/ Secernentea/ Tylenchida
Abstract: Sawdust, poultry manure, mustard cake and neem cake [Azadirachta indica] each at 3 doses (0.5, 1.0 and 1.5% w/w) were found to be effective for the management of M. incognita on green gram [Vigna radiata] and black gram [Vigna mungo] under screenhouse conditions. The highest dosage level was found to be the most effective. Poultry manure and neem cake were found to be most effective in reducing galls, egg masses, and increasing yield of both green gram and black gram.
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992. **Effect of organic amendments for the management of Tylenchulus semipenetrans on Khasi mandarin.**
Sinha, A. K. and Neog, P. P.
Indian Journal of Nematology 32(2): 232-233. (2002)
NAL Call #: QL391.N4I5; ISSN: 0303-6960
Descriptors: cattle manure/ cultural control/ growth/ mandarins/ mustard oilmeal/ nematode control/ nitrogen fertilizers/ organic amendments/ pest control/ phosphorus fertilizers/ plant parasitic nematodes/ plant pests/ potassium fertilizers/ roots/ sawdust/ shoots/ eelworms/ phosphate fertilizers/ potash fertilizers/ Rutales/ tangerines
Abstract: The effect of 3 organic amendments, alone or in combination with NPK, was investigated against T. semipenetrans on mandarin cv. Khasi. The treatments were: 150 g N+120 g P_2O_5+100 g K_2O (NPK), NPK+sawdust at 5 tonnes/ha, NPK+sawdust at 10 tonnes/ha, NPK+cowdung at 5 tonnes/ha, NPK+cowdung at 10 tonnes/ha, NPK+mustard oil cake at 5 tonnes/ha, NPK+mustard oil cake at 10 tonnes/ha, sawdust at 5 tonnes/ha, sawdust at 10 tonnes/ha, cowdung at 5 tonnes/ha, cowdung at 10 tonnes/ha, mustard oil cake at 5 tonnes/ha, mustard oil cake at 10 tonnes/ha, and a control (without NPK and organic amendments). Organic amendments were applied 15 days before planting of seedlings. Five-month-old seedlings raised in large cement pots containing steam-sterilized soil were transplanted singly in each pot (20x25 cm) containing 4 kg of steam-sterilized soil. Four weeks after transplanting, each seedling was inoculated with 5000 active second stage juveniles of T. semipenetrans. After 6 weeks, NPK treatments were applied in 4 split doses. Observations were recorded 12 months after inoculation. The highest fresh and dry weight

of shoots and roots, and reduction in nematode population were recorded from NPK+mustard oil cake at 10 tonnes/ha treatment, followed by NPK+sawdust at 10 tonnes/ha. All treatments were effective in increasing plant growth compared to the control.
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993. **Effect of organic amendments in the interaction of VAM fungus (Glomus fasciculatum) and root-knot nematode (Meloidogyne incognita) on greengram.**
Neog, P. P. and Gogoi, B. B.
Crop Research Hisar 26(1): 159-162. (2003)
NAL Call #: SB4.C66 ; ISSN: 0970-4884
Descriptors: cultural control/ endomycorrhizas/ galls/ green gram/ growth/ mycorrhizal fungi/ mycorrhizas/ nematode control/ organic amendments/ pest control/ plant height/ plant parasitic nematodes/ plant pests/ plant residues/ poultry manure/ roots/ sawdust/ shoots/ vesicular arbuscular mycorrhizas/ eelworms/ Glomaceae/ mung bean/ poultry litter/ Secernentea/ Tylenchida
Abstract: The effect of four organic amendments, mustard cake, sawdust, poultry manure and decaffeinated tea waste (DCTW), was studied on green gram in the presence of the vesicular arbuscular mycorrhizal (VAM) fungus, Glomus fasciculatum, and the root-knot nematode, Meloidogyne incognita. Of the different treatments, DCTW gave the highest values for the different green gram growth parameters (plant height, fresh and dry weight of shoots, and fresh and dry weight of roots) in the presence of nematode and VAM. The highest reduction in the gall number and final nematode population in soil was recorded in this treatment.
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994. **Effect of organic amendments on the population of antagonists and survival of apple seedlings under glasshouse inoculated with Dematophora necatrix.**
Ashwani Tapwal; Sharma, Y. P.; and Lakhanpal, T. N.
Indian Journal of Horticulture 61(3): 261-262. (2004); ISSN: 0019-5251
Descriptors: apples/ biological control/ biological control agents/ fungal antagonists/ fungal diseases/ inoculation/ oilseed cakes/ organic amendments/ pine needles/ plant disease control/ plant diseases/ plant pathogenic fungi/ plant pathogens/ rhizosphere fungi/ sawdust/ biocontrol agents/ biological control organisms/ Hyphomycetes/ oil cakes/ phytopathogens/ Xylariaceae/ Xylariales
Abstract: The organic amendments, sawdust, pine needles (chopped, 7-12 mm) and oil cake (powdered), were tested under glasshouse conditions with the apple root rot pathogen (Dematophora necatrix [Rosellinia necatrix]) to evaluate their effects on the population of different antagonists (Gliocladium virens, Trichoderma harzianum and T. viride strains TV1, TV2 and TV3). The amendments were mixed with fumigated soil at 5% (v/v) in nursery bags (5x9 inch). One-year-old dormant apple seedlings were transplanted into the nursery bags containing the amended soil with 5% formalin. Five grams of pathogen and antagonist inocula were mixed per nursery bag. Soil samples were collected after 30, 45, 60 and 75 days, and colony forming units (cfu) were determined by soil plate method. The population of all antagonists was higher in amended soil than in the non-amended control. Soil amended with sawdust recorded the maximum population of antagonists, followed by soil amended with pine needles and oil cake, respectively. The highest cfu was recorded in the case of TV1, followed by TV3, TV2, T. harzianum and G. virens, respectively. Maximum disease control was obtained in amended soil sawdust and pine needles and inoculated with TV1, T. harzianum and TV3. These results indicate that organic amendments increase the rhizosphere population of selected antagonists and reduce root rot of apple seedlings by inhibiting the pathogen.
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995. **Effect of organic material on soil properties, plant growth, leaf photosynthesis, nutrient uptake and mycorrhizal infection of blueberries.**
Li YaDong; Tang XueDong; Wulin ; and Zhang ZhiDong
Acta Horticulturae 715: 375-380. (2006)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: cultivars/ growth/ leaves/ mycorrhizal fungi/ mycorrhizas/ nutrient uptake/ organic amendments/ peat/ photosynthesis/ plant nutrition/ roots/ sand/ sawdust/ soil acidity/ soil ph/ soil physical properties/ soil properties/ sulfur fertilizers/ tillage/ carbon assimilation/ carbon dioxide fixation/ cultivated varieties / Kirin/ physical properties of soil/ soil cultivation/ sulphur fertilizers
Abstract: Experiments were conducted in Jilin, China, in 2001 to elucidate the relationship between soil conditions and growth, leaf photosynthesis, nutrient uptake, and mycorrhizal infection of 2 highbush blueberry (Vaccinium corymbosum) cultivars (Bluecrop and Northland). Mineral soils were amended with organic materials and sulfur in the field and in pots. For the soil amendement treatment, the organic materials were mixed with soil at 1:1 ratio in volume. Sulfur was applied at 1 kg/m3. The treatments were: (1) moss plus sulfur; (2) peat plus sulfur; (3) sawdust plus sulfur; (4) tillage plus sulfur; (5) sand plus sulfur; (6) moss and peat plus sulfur; (7) peat and sawdust plus sulfur; (8) sulfur (1 kg/m3); (9) sulfur (2 kg/m3); and (10) control. Plant growth was increased by all amendments and elemental sulfur. In the control treatment, growth appeared to be limited by high soil pH. For the sulfur treatment, a decrease in the soil pH with a concomitant increase of elemental sulfur probably stimulated plant growth. For all amendments, plant growth response was probably related to both a decrease in soil pH and an improvement in soil physical conditions. Further, organic materials and sulfur addition influenced leaf photosynthesis, nutrient uptake, root activity, and mycorrhizal infection. It was detrimental by amending soil with sulfur alone, while the mixing of organic materials with sulfur produced better plant growth. Elemental sulfur was effective in increasing soil acidity with the 1 kg/m3 rate decreasing pH by 2 units and the 2 kg/m3 rate decreasing pH by 2.7-3 units.
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996. **Effect of organic matter addition to the pen surface and pen cleaning frequency on nitrogen mass balance in open feedlots.**
Adams, J. R.; Farran, T. B.; Erickson, G. E.; Klopfenstein, T. J.; Macken, C. N.; and Wilson, C. B.
Journal of Animal Science 82(7): 2153-63. (July 2004); ISSN: 0021-8812 .
15309964

Descriptors: animal feed: analysis/ animals/ cattle: growth & development: metabolism/ dietary fiber: metabolism/ digestion/ feces: chemistry/ housing, animal/ hygiene/ male/ manure: analysis/ nitrogen: analysis/ random allocation/ weight gain: drug effects/ Zea mays
Abstract: Three finishing trials were conducted to determine the effects of dietary manipulation and management on N losses from open feedlots. In each experiment, 96 steers were assigned randomly to 12 nutrient balance pens. In Trial 1, calves were fed for 180 d during the winter/spring months; in Trial 2, yearlings were fed for 132 d in the summer. In Trials 1 and 2, N losses from pens were compared directly by adding OM to the pen surface or indirectly by feeding digestible ingredients designed to increase OM excretion. The dietary treatment (BRAN) included 30% corn bran (DM basis) replacing dry-rolled corn. Pens where OM was directly added received sawdust applications (SAWDUST) at a rate to match OM excretion from the BRAN diet. These two treatments were compared with a conventional, 75% dry-rolled corn diet (CON). Because CON and SAWDUST diets were identical, performance for both treatments was similar during Trials 1 and 2. The BRAN diet decreased (P < 0.10) gain efficiency during Trials 1 and 2 by 9.5% relative to CON. Fecal N excretion was greater (P < 0.01) for calves and yearlings when BRAN was fed compared with CON. Adding OM to the pen surface increased (P < 0.01) the amount of N in manure removed from pens and reduced (P < 0.10) N losses in Trial 1. Nitrogen losses were not significantly different among treatments in Trial 2. In Trial 3, calves were fed for 166 d during the winter/spring months. A 2 x 2 factorial design was used to evaluate pen cleaning frequency and diets similar to CON and BRAN. Pens were either cleaned monthly or once at the end of the feeding period. Daily DMI was greater (P = 0.01) and ADG was lower (P < 0.01) when cattle were fed BRAN compared with CON. Responses from all three trials indicate a negative effect of BRAN on gain efficiency. Dietary treatment and cleaning frequency interacted for N balance in the feedlot. Nitrogen losses decreased and manure N increased (P < 0.10) for cattle fed BRAN compared with CON when pens were cleaned monthly. Feeding BRAN did not affect total manure N, but resulted in higher N losses when pens were cleaned only once. For all trials, BRAN increased the amount of N remaining in composted manure. Adding OM to pen surfaces and/or cleaning pens more frequently may decrease N losses from open feedlot pens and from compost, although responses seem influenced by ambient temperature or season.
This citation is from PubMed.

997. **Effect of organic mulching on growth and yield of raspberry cv. Heritage.**
Pedreros, A.; Gonzalez, M. I.; and Manosalva, V.
Acta Horticulturae 777: 473-475. (2008)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: crop yield/ growth/ manual weed control/ mulches/ mulching/ physical control/ pine bark/ pines/ raspberries/ rice husks/ sawdust/ straw/ suckers/ weed control/ weeding/ wheat/ wheat straw/ mulching materials/ rice hulls
Abstract: Mulching to control weeds is frequently used in organic production; however, the mulching material could affect the crop. The objective of this research was to evaluate the effect of different plant materials, coming from agriculture and forest industry, as mulching on raspberry growth and yield. There were four mulch treatments: pine bark, pine sawdust, wheat straw and rice hull; plus two controls: bare soil without weeds (hand-weeded) and bare soil with weeds (weedy check). Mulches were distributed on the rows of raspberry plants and were 1 m width and 10 cm deep. Experimental design was a randomized complete block with four replicates, and the experimental unit was a 3 m long row. Treatments were applied during two seasons, in September 2003 and in August 2004, in an 8 year old organic orchard of raspberry 'Heritage', located at the Bio Bio region, Chile. The number and height of suckers, number of laterals in the floricane and yield were evaluated in the central meter of each row and only during the second season. Number of suckers in hand-weeded and weedy check was higher than in the other treatments, except for the pine sawdust mulching. The wheat straw mulching had the lowest number of suckers, only 10 suckers m-1, in contrast to the weedy check that had 38 m-1. The hand-weeded control had the tallest suckers (79 cm) and the smallest ones were in the wheat straw mulching (40.5 cm), which was significantly lower than all other treatments (P<=0.05). Number of laterals per stalk (10 in average) was not affected by treatments. The lowest fruit yield in the first harvest was obtained in the pine bark mulching treatment (2.64 t ha-1), which only differed from the pine sawdust mulching (3.69 t ha-1). In the primocane harvest the lowest yield was in the wheat straw mulching treatment (4.3 t ha-1), but it only differed from the rice hull mulching treatment (5.96 t ha-1). When summing both harvests, floricane and primocane the highest yield was in the pine sawdust treatment (9.07 t ha-1) and lowest on the wheat straw mulching (7.82 t ha-1), but they were not significantly different (P<=0.05). We conclude that wheat straw mulching affected raspberry plant growth and therefore it is not recommended.

998. **Effect of physicochemical properties of growing media on growth, nutrient uptake and soil nutrient concentration in pot plant production of asiatic hybrid lily 'Orange Pixie'.**
Choi JongJin; Lee JongSuk; and Choi JongMyung
Journal of the Korean Society for Horticultural Science 43(6): 747-753. (2002)
NAL Call #: SB13.H28; ISSN: 0253-6498
Descriptors: buds/ composts/ electrical conductivity/ flowering date/ growing media/ growth/ lilies/ nutrient uptake/ peat/ perlite/ pine bark/ plant height/ porosity/ rice husks/ roots/ sawdust/ soil air/ soil chemical properties/ soil ph/ vermiculite/ chemical properties of soil/ potting composts/ rice hulls/ rooting media/ soil atmosphere
Abstract: The effects of physicochemical properties of root media containing various ratios of organic and inorganic materials on the growth and nutrient uptake of Asiatic hybrid lily (Lilium sp.) 'Orange Pixie' were examined. Changes in the nutrient concentrations in growing media were also determined. The total porosity of growing medium containing perlite + composted sawdust + composted rice hull at 1:1:1 (v/v/v) (T_3) was 75.5% and that of growing medium containing peat moss + composted rice hull at 1:1 (v/v) (T_1) as 91.0%. The air space of growing medium containing peat moss + vermiculite at 1:1 (v/v) (T_4) was 4.6% and that of growing medium containing

composted sawdust + rice hull at 1:1 (v/v) (T_2) was 27.6%. pH of media T_2 and T_3 were higher than 6.95. pH of T_4, peat moss + vermiculite + perlite at 1:1:1 (v/v/v) (T_5), and composted rice hull + sawdust + pine bark at 1:1:1 (v/v/v) (T_6) were in the range of 5.35-5.41. However, pH of T_1 was 4.52. The electrical conductivity of T_4 and T_5 was lower than 0.25 dS/m and that of T_1, T_2 and T_3 containing composted rice hull or sawdust was >0.5 dS/m. Days to emergence, to visible flower bud and to flowering were not affected by the growing media. The highest number of leaves and fresh weight were obtained in T_6 and T_1, respectively. However, plant height and plant width did not show significant differences. T_1, T_4 and T_5, which had high container capacities, recorded higher tissue nutrient contents and medium nutrient concentrations than the other treatments.

999. **Effect of pine sawdust on the structure of fungi communities in the soils of post agricultural land.**
Sierota, Z. and Kwasna, H.
Acta Mycologica 33(1): 77-90. (1998); ISSN: 0001-625X
Descriptors: biological control agents/ communities/ forest soils/ forest trees/ plant pathology/ population dynamics/ sawdust/ trees/ woody plants/ biocontrol agents/ biological control organisms/ Hyphomycetes/ phytopathology
Abstract: Addition of sawdust to pine forest soils in Poland, resulted in an increase, one year later in 1996, of Trichoderma harzianum, T. pubescens, T. virens and numerous species of Penicillium. The presence of these Trichoderma species which are antagonistic to plant pathogenic fungal species, is considered beneficial.

1000. **Effect of plantation mulching on the growth, flowering and fructification of strawberry (Fragaria ananassa D.).**
Kesik, T and Maskalaniec, T
Annales Universitatis Mariae Curie Skodowska Sectio EEE, Horticultura 13: 243-248. (2003)
NAL Call #: SB317.63 .A55; ISSN: 1233-2127.
Notes: Original title: Wpyw sciokowania plantacji na wzrost, kwitnienie i owocowanie truskawki (Fragaria ananassa D.).
Descriptors: bark/ flowering/ fruit set/ fruiting/ growth/ inflorescences/ leaves/ mulches/ mulching/ peat/ plant development/ plastic film/ protected cultivation/ rye/ rye straw/ sawdust/ straw/ strawberries/ anthesis/ cultivation under glass or plastic/ mulching materials
Abstract: An experiment was conducted from 1994 to 1997 to investigate the effectiveness of mulching on the growth and development of strawberry cv. Senga Sengana plants under the climatic and soil conditions of the Vilnus Region in Lithuania. The strawberry plantation was covered by mulches with compost (peat and organic farm materials), rye straw, sawdust from needle trees, wood bark from needle trees and black plastic foil. Strawberries from the control plot and those covered with black plastic foil had the most number of leaves. Soil mulching with rye straw and wood bark, compared with the control, significantly decreased the number of leaves. The mean number of inflorescences was highest in plants from the control and black foil treatments, and lowest in plants from the rye straw and wood bark mulches. Among the studied mulches, black foil had the best positive effect on the rate of fruit setting.

1001. **Effect of planting time, mulching and irrigation on the growth and yield of cabbage.**
Islam, M. M.; Rahim, M. A.; and Alam, M. S
Bangladesh Journal of Training and Development 15(1/2): 169-174. (2002); ISSN: 1013-0306
Descriptors: ash/ cabbages/ crop yield/ growth/ irrigation/ mulches / mulching/ planting date/ polyethylene film/ rice husks/ sawdust/ straw mulches/ Capparales/ mulching materials/ Pontederiales/ rice hulls/ watering
Abstract: An experiment was conducted in Mymensingh, Bangladesh, from November 1999 to March 2000 to investigate the effect of planting time, mulching and irrigation on the growth and yield of cabbage cv. Atlas-70. The treatments consisted of 3 planting times, i.e. 15 November, 30 November and 15 December, and 10 levels of mulching and irrigation, i.e. no mulch and no irrigation (control), irrigation at 15 days interval, irrigation at 30 days interval, irrigation at 45 days interval, ash mulch, straw mulch, sawdust mulch, water hyacinth [Eichhornia crassipes] mulch, black polyethylene mulch, and rice husk mulch. The growth and yield of cabbage were affected by planting time. The highest gross yield (59.62 kg/plot) and marketable yield (82.10 t/ha) of cabbage were obtained from 30 November planting. Mulching and irrigation also significantly affected the growth and yield of cabbage. The highest gross yield (71.85 kg/plot) was obtained from the black polyethylene mulch followed by water hyacinth mulch (65.99 kg/plot). Considering marketable yield, both black polyethylene mulch (103.01 t/ha) and water hyacinth mulch (90.99 t/ha) exerted statistically similar effects followed by irrigation at 15 days interval (85.85 t/ha), whereas non-mulching and non-irrigated plots (control) exhibited the lowest marketable yield (38.87 t/ha). When the combined effects of planting time, mulching and irrigation were considered, different combinations of planting time and mulching, planting time and irrigation showed significant effect on the growth and yield of cabbage. The maximum gross yield (161.64 t/ha) and marketable yield (116.11 t/ha) were found in the treatment combination of 30 November planting and black polyethylene mulch.

1002. **Effect of potting materials for marigold cultivation.**
Rahman, M. J.; Begum, R. A.; Mondol, A. T. M. A. I.; Ahman, M. N. R.; and Alam, M. K.
International Journal of Sustainable Agricultural Technology 3(5): 72-76. (2007); ISSN: 1815-1272
Descriptors: cattle manure/ composts/ flowers/ pot plants/ poultry manure/ sawdust/ substrates/ poultry litter
Abstract: An experiment was conducted in the Bangladesh Agricultural Research Institute, Gazipur (Aeric Haplaquepts) to find out the suitable potting material (s) for marigold (Tagetes patula) cultivation during the winter seasons of 2002-2003 and 2003-2004. The potting

materials were T1: Soil, T2: 1 kg Sawdust+3 kg Soil, T3: 4 kg Soil+3 kg Cowdung, T4: 4 kg Soil+3 kg Compost, T5: 4 kg Soil+3 kg Poultry manure, T6: 1 kg Sawdust+3 kg Cowdung+1.5 kg Soil, T7: 1 kg Sawdust+3 kg Compost+1.5 kg Soil, T8: 1 kg Sawdust+3 kg Poultry manure+1.5 kg Soil and T9: 4 kg Sand+3 kg Cowdung. The treatment T6 (Sawdust with cowdung and soil) was found to be better as potting material for marigold cultivation in respect of flower diameter (5.62 cm in 2002-2003 and 5.93 cm in 2003-2004) and single flower weight (14.5) g in 2002-2003 and (13.5 g) in 2003-2004 followed by sawdust with poultry manure and soil.

1003. **Effect of poultry manure and sawdust on survival of sclerotia of Macrophomina phaseolina in soil.**
Shaikh, A. H. and Ghaffar, A.
Pakistan Journal of Botany 36(2): 425-428. (2004); ISSN: 0556-3321
Descriptors: plant pathogenic fungi/ plant pathogens/ poultry manure/ sawdust/ sclerotia/ survival/ Coelomycetes/ phytopathogens/ poultry litter
Abstract: Using wet sieving and dilution technique, the sclerotial population of M. phaseolina in soil amended with poultry manure and sawdust was studied. Sclerotial population declined after a 15-day period when poultry manure at 1, 3 and 5% (w/w) was used. No significant change in sclerotial population was observed when sawdust was used.
This citation is from AGRICOLA.

1004. **Effect of pre-germination treatment and substrate on seeds of orange jasmine (Murraya paniculata).**
Alvarez, R.; Gonzalez, D.; and Sivoli, N.
Proceedings of the Interamerican Society for Tropical Horticulture 45(90-91)(2001); ISSN: 0245-2528.
Notes: Original title: Efecto de la aplicacion de tratamientos pregerminativos de semillas de Murraya paniculata solterradas en diferentes sustratos.
Descriptors: acetic acid/ organic soils/ propagation/ sand/ sawdust/ seed germination/ seed treatment/ seeds/ substrates/ plant propagation/ Rutales
Abstract: We evaluated different seed treatments and substrates for the propagation of orange jasmine (M. paniculata). The best substrate was a mixture of equal parts organic soil: sand: sawdust. The most effective pretreatment was with 50% acetic acid. We do not recommend soaking seed in water prior to planting.

1005. **Effect of recycling wood ash on microbiological and biochemical properties of soils.**
Perucci, P.; Monaci, E.; Casucci, C.; and Vischetti, C.
Agronomy for Sustainable Development 26(3): 157-165. (July 2006-Sept. 2006)
Descriptors: agricultural soils/ wood ash/ soil amendments/ soil microorganisms/ soil biological properties/ soil chemical properties/ soil enzymes/ enzyme activity/ Italy/ microbial biomass/ Internet resource
This citation is from AGRICOLA.

1006. **Effect of sand and sawdust bedding materials on the fecal prevalence of Escherichia coli O157:H7 in dairy cows.**
LeJeune, Jeffrey T. and Kauffman, Michael D.
Applied and Environmental Microbiology 71(1): 326-330. (Jan. 2005); ISSN: 0099-2240
Descriptors: dairy cows/ Escherichia coli O157:H7/ population density/ feces/ litter (bedding)/ sand/ sawdust/ cattle manure/ cattle housing/ dairy farming/ bovine mastitis/ Escherichia infections/ disease prevalence
Abstract: Farm management practices that reduce the prevalence of food-borne pathogens in live animals are predicted to enhance food safety. To ascertain the potential role of livestock bedding in the ecology and epidemiology of Escherichia coli O157:H7 on farms, the survival of this pathogen in used-sand and used-sawdust dairy cow bedding was determined. Additionally, a longitudinal study of mature dairy cattle housed on 20 commercial dairy farms was conducted to compare the prevalence of E. coli O157:H7 in cattle bedded on sand to that in cattle bedded on sawdust. E. coli O157:H7 persisted at higher concentrations in used-sawdust bedding than in used-sand bedding. The overall average herd level prevalence (3.1 versus 1.4%) and the number of sample days yielding any tests of feces positive for E. coli O157:H7 (22 of 60 days versus 13 of 60 days) were higher in sawdust-bedded herds. The choice of bedding material used to house mature dairy cows may impact the prevalence of E. coli O157:H7 on dairy farms.
This citation is from AGRICOLA.

1007. **Effect of sawdust ash on nutrient status, growth and yield of cowpea (Vigna unguiculata L. walp).**
Awodun, M. A.
Asian Journal of Agricultural Research 1(2): 92-96. (2007); ISSN: 1819-1894
Descriptors: application rates
Abstract: The study investigated suitability of sawdust ash as nutrient source for cowpea. Six rates of ash: 0, 2, 4, 6, 8 and 10 t ha-1 were applied in two trials and soil and leaf nutrient composition and growth parameters were determined. Sawdust ash treatments applied to soil significantly increased soil and leaf N, P, K, Ca and Mg contents and numbers of pods, pod weight, number of branches, number of leaves and grain yield. Soil nutrient contents increased with the amount of sawdust ash up to 8 t ha-1 before it declined.

1008. **Effect of sawdust ash plus urea on maize performance and nutrient status.**
Awodun, M. A.; Otaru, M. S.; and Ojeniyi, S. O.
Asian Journal of Agricultural Research 1(1): 27-30. (2007); ISSN: 1819-1894
Descriptors: crop yield/ leaves/ maize/ nutrient content/ organic amendments/ plant height/ sawdust/ urea fertilizers/ corn
Abstract: Sawdust ash (SDA) is a waste from wood and sawmilling industries. Effect of SDA combined with urea was investigated in plant height, yield and nutrient content of leaves of maize in two experiments in Okene, in the Guinea Savanna zone of Nigeria. Treatments were a 4 t ha-

1 SDA, (b) 250 kg ha-1 urea, (c) 1 t ha-1 SDA+187.5 kg ha-1 urea/d, 2 t ha-1+125 kg ha-1 urea, (e) 3 t ha-1 SDA+62.5 kg ha-1 urea and f, untreated control. The SDA at 4 t ha-1 increased height of maize insignificantly. The 1 t ha-1 SDA+187.5 kg ha-1 urea gave highest maize yield and leaf N. Compared with untreated control, DSA, combined application of reduced rates of SDA and urea, the urea alone increased leaf N, P, k, Ca and Mg concentrations. Combined application of SDA and urea is a suitable option for maize cultivation.
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1009. **Effect of soil amendments on soil microflora with special reference to rice sheath blight pathogen (Rhizoctonia solani).**
Surulirajan, M. and Janki Kandhari
Journal of Mycopathological Research 44(2): 243-247. (2006)
NAL Call #: QK600.J68 ; ISSN: 0971-3719
Descriptors: cultural control/ farmyard manure/ plant disease control/ plant pathogenic fungi/ plant pathogens/ sawdust/ soil amendments/ soil fungi/ FYM/ Hyphomycetes/ phytopathogens
Abstract: The mean fungal and bacterial population from pots and field soil after the addition of soil amendments (sawdust 1% and FYM 1%) was increased significantly over the control two weeks after the addition of soil amendments, it further increased after 10th week of addition of soil amendments. However, 14 weeks after the addition of soil amendments, the population level drastically declined while the population of R. solani had significantly reduced over the control two weeks after soil amendments. However 10 weeks later, it declined further and after 14 weeks, there was no significant reduction in the population level of R. solani.
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1010. **Effect of soil amendments with sawdust and viability of Trichoderma harzianum in different carriers.**
Deshmukh, V. V.; Chore, N. S.; and Jiotode, D. J.
Crop Research Hisar 26(3): 508-511. (2003)
NAL Call #: SB4.C66 ; ISSN: 0970-4884
Descriptors: biological control/ biological control agents/ carriers/ charcoal/ crop residues/ farmyard manure/ fungal antagonists/ fungal diseases/ non wood forest products/ peat soils/ plant disease control/ plant diseases/ plant pathogenic fungi/ plant pathogens/ safflower/ sawdust/ seed treatment/ seeds/ substrates/ talc/ viability/ biocontrol agents/ biological control organisms/ Coelomycetes/ FYM/ Hyphomycetes/ minor forest products/ neem/ non timber forest products/ phytopathogens
Abstract: A study was conducted to investigate the effects of sawdust + soil (at sawdust:soil ratios of 1:100, 1:50 and 1:10) supplied alone or in combination with T. harzianum seed treatment (at 4 g/kg seed) on the control of root rot disease (Rhizoctonia bataticola [Macrophomina phaseolina]) on safflower. The different carriers used were 500 g each of the following: farmyard manure (FYM), peat soil, charcoal, talc powder (aluminium silicate) and finely powdered neem seed. The parameters measured included seed germination, and pre- and post-emergence mortality (at 7 and 105 days after sowing, respectively). Sawdust applied alone neither improved seed germination nor reduced pre-emergence mortality. However, the sawdust:soil ratio of 1:10 resulted in 100% germination and the lowest pre-emergence mortality (8.89%) when combined with T. harzianum. The lowest post-emergence mortality (17.58%) was obtained in the treatment 1:100 (sawdust:soil) + T. harzianum. The most rapid decrease of T. harzianum viability was observed on neem seed powder, followed by charcoal powder,
peat soil and talc powder. The lowest rate of decrease in T. harzianum viability was observed on FYM.
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1011. **Effect of soil media on peach seed germination and seedling growth in climatic conditions of Orakzai Agency (FATA).**
Hafeez ur Rahman ; Muhammad Rafiq; Ghulam Nabi; and Abdul Samad
Sarhad Journal of Agriculture 23(3): 689-691. (2007)
NAL Call #: RA565.S365 S322.P32S37; ISSN: 1016-4383
Descriptors: farmyard manure/ girth/ growing media/ peaches/ plant height/ sawdust/ seed germination/ seedling growth/ seeds/ silt/ silty soils/ soil types/ FYM/ potting composts/ rooting media
Abstract: An experiment was conducted to study the effects of different soil media on seed germination and seedling growth of peach during 2001 and 2002 in Pakistan. The different soil media, used alone and in combination, were farmyard manure (FYM), sawdust, canal silt, FYM+sawdust, FYM+canal silt, sawdust+silt and FYM+sawdust+silt. The different media showed non significant effect on seed germination of peach. However, the highest percent seed germination (44%) was observed in sawdust+canal silt, followed by silt alone (36.66%). The lowest seed germination (26.66%) was recorded in ordinary soil. Significant effect of different media was observed on seedling height and seedling girth. The maximum seedling height (98.67 cm) was recorded in FYM+sawdust, while the maximum seedling girth (5.25 cm) was found in FYM alone, closely followed by FYM+sawdust (5.24 cm). The minimum seedling height (57.00 cm) and girth (2.87 cm) were recorded in canal silt alone. The soil media used in combination improved both the germination and subsequently the growth compared to the soil media used alone.
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1012. **Effect of soil moisture conservation techniques and levels of irrigation on soil moisture retention and yield of oriental pickling melon.**
Veeraputhiran, R.; Joseph, P. A.; Nair, P. V.; Jaikumaran, U.; and Unnithan, V. K. G.
Madras Agricultural Journal 85(5/6): 215-220. (1998)
NAL Call #: 22 M262; ISSN: 0024-9602
Descriptors: canopy/ clay loam soils/ coir/ flowering/ fruit crops/ fruits/ incorporation/ irrigation/ melons/ moisture content/ plant water relations/ rice byproducts/ sandy soils/ sawdust/ soil amendments/ soil water/ wastes/ water use efficiency/ yields/ anthesis/ coconut fibre/ crown cover/ leaf canopy/ soil moisture / watering
Abstract: A field experiment conducted in the summer rice fallows at the Agricultural Research Station, Mannuthy, Kerala during 1996 revealed that incorporation of coir pith, sawdust and paddy waste into the sandy clay loam soil

increased soil moisture content over controls by 10.9, 1.6 and 7.1%, respectively and field water use efficiency (WUE) of the oriental pickling melon crop by 9.9, 5.3 and 19.9%, respectively. Consumptive use was also increased by the moisture conservation techniques. Levels of irrigation showed a negative relationship with WUE and a positive relationship with consumptive use. The peak consumptive use and crop coefficient coincided with the fullest canopy development and flowering stage of the crop. The crop depleted about 50% of soil water from the top 15-cm layer. The crop needed frequent irrigations as dictated by an IW/CPE ratio of 1.2 for maximum yield. Incorporation of paddy waste, coir pith and sawdust increased yields by 27, 17 and 10%, respectively compared with controls. It was concluded that the incorporation of moisture conservation materials can save 5 irrigations required by the crop.

1013. **Effect of some agrotechnical factors on emergence, growth and yield of Hamburg parsley, cultivated on soil subject to puddling. Part IV. Quality features of roots.**
Bazewicz Wozniak, M.
Annales Universitatis Mariae Curie Skodowska Sectio EEE, Horticultura: 89-102. (1998)
NAL Call #: SB317.63 .A55.
Notes: Original title: Wpyw czynnikow agrotechnicznych na wschody, wzrost i plonowanie pietruszki korzeniowej, uprawianej na glebie zlewnej o nietrwaej strukturze. Czesc IV. Cechy jakosciowe korzeni.
Descriptors: bark/ dry matter/ growth/ mulches/ mulching/ peat/ plant density/ plastic film/ ploughing/ root crops/ roots/ rotary cultivation/ sand/ sawdust/ seedling emergence/ size/ sowing date/ sowing depth/ tillage/ vegetables/ Araliales/ mulching materials/ plowing/ rotovation/ soil cultivation/ vegetable crops
Abstract: The effect of 3 methods of pre-sowing cultivation (ploughing, rotary tillage, cultivator tillage), 2 sowing dates, 2 sowing depths and 5 kinds of mulch (sand, peat, sawdust, bark, plastic film) on the growth and yield of Hamburg parsley cv. Berlinska was studied in 1991-94 on loess soil at Lublin-Felin. The longest parsley roots were obtained with spring ploughing. The roots had the greatest diameter and average weight and were shortest after sowing at a depth of 2 cm. Date of sowing had no significant influence on the shape of roots or on the content of dry matter. Mulching with peat, sawdust, bark and
plastic film decreased diameter and average root weight.

1014. **Effect of sprouting medium on the survival of yam peelsetts.**
Godwin Egein, M. I. and Igwilo, N. H.
International Journal of Agriculture and Biology 7(2): 315-317. (2005); ISSN: 1560-8530
Descriptors: crop residues/ fungal diseases/ growing media/ insect pests/ plant diseases/ plant pathogenic fungi/ plant pathogens/ plant pests/ sawdust/ sets/ sprouting/ straw/ phytopathogens/ potting composts/ rooting media/ setts
Abstract: The presprouting survival of yam peelsetts (Dioscorea rotundata cv. Obiaturugo; and D. alata cv. Um.680), 1 cm thick, and 2 cm2 3 cm2 and 4 cm2 periderm surfaces, in sprouting media (direct soil, soil in container, straw, river sand and sawdust) was investigated. Sprouting was achieved in all media. Optimum sprout count was observed in sawdust media and the lowest sprout count was in straw. Insect larvae (crickets), nymphs and millipedes physically ate up setts and the rot (dry and wet) conditions observed were associated with fungi (Apergillus sp., Penicillium sp., Mucor sp., Botryoplodia sp. and Fusarium sp.; and Penicillium sp., Trichoderma sp., Sclerotium sp., Mucor sp. and Fusarium sp., respectively) which were suspected to be the causative agents. The preferred medium for pre-sprouting peelsetts was sawdust, which can be hot water- or steam-sterilized for maximum results.

1015. **Effect of substrate and irrigation water acidification on the nutrition, growth, and yield of rabbiteye blueberries (Vaccinium ashei Reade).**
Ferreyra E.R.; Peralta C. J.; Sadzawka R. A.; Munoz S. C.; and Valenzuela B. J.
Agricultura Tecnica 61(4): 452-458. (2001); ISSN: 0365-2807.
Notes: Original title: Efecto de la acidificacion del sustrato y del agua de riego en la nutricion, desarrollo y produccion de arandano ojo de conejo (Vaccinium ashei Reade).
Descriptors: crop production/ crop yield/ growing media/ growth/ irrigation/ irrigation water/ manganese / organic amendments/ pH/ plant nutrition/ sawdust/ hydrogen ion concentration/ Mn/ potential of hydrogen/ potting composts/ rooting media/ watering
Abstract: An experiment was carried out in Santiago, Chile during 1990-93 to determine the effect of using a mix of soil and sawdust, and irrigation water with pH 2, 4, 5 and 7.8 (control) on the growth and production of rabbiteye blueberries (V. ashei). Foliar analysis showed that only the Mn concentration was lower compared with the control treatment. Plants irrigated with water at pH 2 did not develop chlorosis, and had better growth and production, making possible economic production under these climatic conditions.

1016. **Effect of substrates with sawdust on yielding of greenhouse tomato.**
Mokrzecka, E.
Annales Universitatis Mariae Curie Skodowska Sectio EEE, Horticultura 8: 11-18. (2000)
NAL Call #: SB317.63 .A55; ISSN: 1233-2127
Descriptors: crop yield/ growing media/ nitrogen fertilizers/ sawdust/ tomatoes/ potting composts/ rooting media
Abstract: An experiment with greenhouse tomatoes was carried out in a high unheated plastic tunnel. The following substrates were tested: sawdust from coniferous trees; grey-brown podzolic soil with a 2% humus content; sawdust mixed with soil in the ratio 3:1; sawdust mixed with soil in the ratio 1:1. N fertilizer was applied at 0.8, 1.6 or 2.4 g N.dm-3 of substrate. The tomato plants were grown till 6

clusters were formed. Plants grown in a 3:1 mixture of sawdust and soil and fertilized with 0.8 g N.dm-3 gave the highest yield (5.83 kg per plant). The content of nutrients in tomato leaves did not depend on the rates of N or on the growing medium.
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1017. **Effect of successive application of manure added sawdust and calcium cyanamide, to paddy field in yellow soils on growth and yield of rice plant [Oryza sativa], cabbage plant [Brassica oleracea] and on soil properties.**
Azuma, T.; Kakiuchi, J.; and Hayashi, Y.
Bulletin of the Wakayama Research Center of Agriculture, Forestry and Fisheries (Japan) 6: 45-56. (Mar. 2005); ISSN: 1345-5028.
Notes: Summary (Ja). Citation notes: JP (Japan).
Descriptors: successive applications/ manure/ sawdust/ calcium cyanamide/ paddy fields/ yellow soils/ growth/ yield/ rice/ Oryza sativa/ cabbage/ Brassica oleracea/ soil properties

1018. **Effect of two different thermal units and three types of mulch on weeds in apple orchards.**
Rifai, M. N.; Astatkie, T.; Lacko Bartosova, M.; and Gadus, J.
Journal of Environmental Engineering and Science 1(5): 331-338. (2002); ISSN: 1496-2551
Descriptors: 2,4 D/ apples/ bark/ burning/ chemical control/ cost benefit analysis/ costs/ crop growth stage/ cultural control/ flame cultivators/ glyphosate/ hay/ herbicides/ integrated control/ leaves/ methodology/ models/ mortality/ mulches/ mulching/ paraquat/ sawdust/ simazine/ statistical analysis/ steam/ technology/ velocity/ weed control/ weeds/ costings/ death rate/ flame weeders/ flaming/ integrated plant protection/ methods/ mulching materials/ statistical methods/ weedicides/ weedkillers
Abstract: The effect of two different thermal units (flame and hot steam) and three types of mulch on the percentage of weeds killed was studied in a series of experiments over 2 years (1998-99) in Nova Scotia, Canada. The factors studied were driving speed (2, 3, and 4 km/h), flame treatment (first, second, third), growth stage (< 6, 6-8, >8 true leaves), hot steam treatment (single, double), mulch type (none, coarse bark, sawdust, hay), and chemical application (paraquat, 2,4-D Amine [2,4-D], simazine, and glyphosate). The results suggest that a driving speed of 2 km/h kills the highest percentage of weeds, and for weed species with unprotected growth points and thin leaves, the first flame application can completely kill weeds with <6 leaves. However, a second or third flame application is required for those with 6 or more leaves. The hot steam method is effective when it is applied twice, with the second application 1 week after the first. However, there is room for improving its technology to make it cost effective for large-scale applications. Mulches after chemical herbicide application are effective for controlling weeds. However, mulching cannot be recommended with flaming because of fire hazard. The effectiveness of herbicide depends on the weed species and on whether the same herbicide was used in the preceding years. Compared to using herbicide with mulching, herbicide alone was less effective in controlling weeds and more costly in terms of cost per hectare and the environment.
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1019. **The effect of using different mulches and growth substrates on half -highbush blueberry (Vaccinium corymbosum x V. angustifolium) cultivars 'Northblue' and 'Northcountry'.**
Starast, M.; Karp, K.; and Paal, T.
Acta Horticulturae 574: 281-286. (2002)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: growing media/ growth/ mineral soils/ mulches/ peat/ sawdust/ soil types/ winter hardiness/ mulching materials/ potting composts/ rooting media/ Vaccinium corymbosum x Vaccinium angustifolium
Abstract: Much attention has been paid to the cultivation of half-highbush blueberry (Vaccinium corymbosum x Vaccinium angustifolium). At the Department of Horticulture, Estonian Agricultural University, a blueberry-growing project started in 1997. Two half-highbush blueberry cultivars 'Northblue' and 'Northcountry' were used, and different cultivation methods were employed. The experiment was carried out in Tartu County (South Estonia). Our results showed that the half-highbush blueberry grew best when peat was used (ground mixtures and peat mulch). Plastic mulch tended to increase plant growth but sawdust mulch did not favour growth. Winter hardiness of half-highbush blueberry is problematic in the Estonian climate. In the experiment, an average winter hardiness of 'Northblue' was 5.5..6.0 points. Winter hardness of 'Northcountry' was 5.4..6.7 points and the blueberry plants had more damage when plastic mulch was used. The plants did not stop growing in autumn and the herbaceous shoots were damaged when the first frosts started. 'Northcountry' hibernated better than 'Northblue'.
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1020. **Effect of various mulches and soil amendments on germination, growth and fresh rhizomes yield of ginger.**
Hussain, S. I.; Khokhar, K. M.; Amanullah Jan; and Farooq, M.
Sarhad Journal of Agriculture 17(1): 87-89. (2001)
NAL Call #: RA565.S365 S322.P32S37; ISSN: 1016-4383
Descriptors: crop yield/ farmyard manure/ germination/ ginger / mulches/ plant development/ rhizomes/ sand/ sawdust/ FYM/ mulching materials
Abstract: An experiment was conducted in Pakistan during 1993 to determine the response of various mulches (sand, sawdust and sand+sawdust) and soil amendments (soil, sand, and farmyard manure) on the germination, growth and yield of ginger. The germination percentage under different mulches and soil amendments ranged from 69 to 98% whereas the lowest percentage of germination was recorded in unmulched (control) beds. Maximum germination (98%) was observed in the beds mulched with sawdust followed by sand+sawdust and wherein soil, sand and farmyard manure were used in the ratio of 1:1:1 with 92% germination. Sawdust mulching significantly enhanced

the number of sprouts (tillers) per rhizome (4.7) and fresh rhizome yield (7.4 t/ha). Sawdust mulching and treatments with 1:1:1 soil:sand:farmyard manure increased plant height.
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1021. **Effect of various mulches on growth, flowering, fruiting, yield and quality of strawberry (Fragaria x Ananassa Duch.) cv. Chandler.**
Ram, R. B.; Dwivedi, A. K; and Yadav, A. K.
Bioved 16(1/2): 61-64. (2005); ISSN: 0971-0108
Descriptors: acidity/ ascorbic acid/ crop quality/ crop yield/ flowering/ flowering date/ fruiting/ fruits/ growth/ leaves/ maturity/ mulches/ plant height/ plastic film/ polyethylene/ rice/ rice straw/ sawdust/ straw/ straw mulches/ strawberries/ sugars/ wheat/ wheat straw/ anthesis/ Bermuda grass/ Fragaria x ananassa/ mulching materials/ paddy/ polythene/ vitamin C
Abstract: A field experiment was laid out on strawberry cv. Chandler to evaluate the effect of various mulches on growth, flowering, fruiting, yield and quality during winter-spring season of 2003-04 in Uttar Pradesh, India. Treatments were mulched with black polythene (M_1), sawdust (M_2), wheat straw (M_3), paddy straw (M_4) and doob grass (M_5) and without mulch (control) (M_6). The maximum plant height (16.53 cm), plant spread (27.73 cm), number of leaves (22.66 cm), early flowering (53.33 days) and fruit maturity (25.33 days), highest fruit weight (8.44 g), total number of fruit (13.33) and maximum average yield per plant (109.68 g) were recorded under the treatment M_1. Delayed flowering (58.33 days) was observed in M_6. Highest fruit weight (8.44 g) was recorded in (M_1). Quality parameters such as TSS (8.23 degrees B), ascorbic acid (60.93 mg/100 g), low acidity (0.633%) and maximum sugar (8.60%) was recorded under black polythene followed by paddy straw. Hence, mulch with black polythene was found to be the superior on growth, flowering, fruiting, yield and quality of strawberry cv. Chandler under Lucknow conditions.
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1022. **The effect of wood ash application on soil characteristics and plant productivity was studied using a lisimetric system .**
Cortez, N.; Madeira, M.; Marques, P.; and Araujo, M. C.
Revista de Ciencias Agrarias 24(3-4): 144-157. (2001); ISSN: 0871-018X.
Notes: Original title: Influencia da aplicacao de cinza de biomassa florestal na producao de plantas forrageiras e nas caracteristicas do solo.
Descriptors: wood ash / soil characteristics/ plant productivity lisimetric systems
Abstract: This study was carried out to compare biomass production and characteristics of a vetch (Vicia benghalensis) grown alone or in association with oats (Avena sativa), under six treatments: control, without ash or fertiliser (A); with NPK fertiliser (B); with three different amounts of ash (corresponding to 5,07, 10,14 and 20,28 t/ha) and the same amount of N that was used in B (C, D and E); with the same amount of ash as used in E, but without N (F). Dry weight of V. benghalensis biomass was significantly higher in treatment F than in treatments A, B and C; and it was slightly higher than the weight in treatment E. Dry weight of V. benghalensis X A. sativa association was similar in treatments B, C, D and E, and it was three times higher than that measured in treatment A; dry biomass in treatment F was about twice that of treatment A, but treatments B, C, D and E had even higher values. Ash application did not significantly affect N concentration in the biomass of V. benghalensis grown alone, but increased Ca and Mg concentrations, in comparison to treatments A and B. Potassium concentration in the biomass of plants of treatment A was significantly lower than in those of other treatments. Phosphorus concentration was significantly higher in plants from treatment B, when compared with plants from treatments A, C, D, E and F. Similar effects of ash plus N application, on Ca, Mg and K concentrations in biomass, were observed when V. benghalensis and A. sativa were in association. Ash application had a very strong effect on soil characteristics, increasing pH values and base cations concentration, as compared with treatments A and B, especially in the top soil layer. Extractable P and K concentrations in treatments with higher amounts of ash (E and F) were similar or higher than in NPK fertilised soil (treatment B).

1023. **Effect of wood ash application on soil solution chemistry of tropical acid soils: Incubation study.**
Voundi Nkana, J. C.; Demeyer, A.; and Verloo, M. G.
Bioresource Technology 85(3): 323-325. (Dec. 2002)
NAL Call #: TD930.A32 ; ISSN: 0960-8524 [BIRTEB]
Descriptors: soil amendments/ waste utilization/ tropical soils/ soil chemistry
Abstract: The objective of this study was to determine the effect of wood ash application on soil solution composition of three tropical acid soils. Calcium carbonate was used as a reference amendment. Amended soils and control were incubated for 60 days. To assess soluble nutrients, saturation extracts were analysed at 15 days intervals. Wood ash application affects the soil solution chemistry in two ways, as a liming agent and as a supplier of nutrients. As a liming agent, wood ash application induced increases in soil solution pH, Ca, Mg, inorganic C, SO4 and DOC. As a supplier of elements, the increase in the soil solution pH was partly due to ligand exchange between wood ash SO4 and OH- ions. Large increases in concentrations of inorganic C, SO4, Ca and Mg with wood ash relative to lime and especially increases in K reflected the supply of these elements by wood ash. Wood ash application could represent increased availability of nutrients for the plant. However, large concentrations of basic cations, SO4 and NO3 obtained with higher application rates could be a concern because of potential solute transport to surface waters and groundwater. Wood ash must be applied at reasonable rates to avoid any risk for the environment. This citation is from AGRICOLA.

1024. **The effect of wood ash applications on soil pH and production of barley and canola in central Alberta.**
Paterson, S. J.; Thomas, J. E.; Bertschi, A. B.; and Acharya, S. N.
Canadian Journal of Plant Science 81(1): 119. (2001)
NAL Call #: 450 C16; ISSN: 0008-4220
Descriptors: wood ash / soil ph/ barley/ canola/ Alberta/ Canada

1025. **Effect of wood ash extract treatment on the feeding value of sorghum (cv. Sekedo) for broiler chicks.**
Kyarisiima, C. C.; Okot, M. W.; and Svihus, B.
Muarik Bulletin 4: 30-36. (2001); ISSN: 1563-3721
Descriptors: broilers / chicks/ digestibility/ fat/ feed conversion efficiency/ feed intake/ growth rate/ nutritive value/ poultry/ protein digestibility/ tannins/ treatment/ wood ash/ chickens/ domesticated birds/ nutritional value/ quality for nutrition/ tannic acid
Abstract: Two feeding experiments were conducted to investigate the effects of treating sorghum (Sorghum bicolor), cv. Sekedo (S) with wood ash extract on its feeding value for broiler chicks. Sekedo was either soaked in water and germinated (WG), soaked in wood ash extract (AS), germinated after soaking in ash extract (AG) or left untreated (UT). The grain constituted 50% of the experimental diets. Treatment of S reduced its tannin content. In the first feeding trial (Experiment 1), significant improvements in growth rate and feed efficiency were realized only for the AG diet. There was no significant difference (P>0.05) between diets in feed intake. Ileal digestibility of dietary protein and fat were significantly (P<0.05) higher for the AS and AG diets. When maize was replaced with sorghum (Experiment 2), chicks that were fed the maize-based diet grew faster (P<0.05) than those on the sorghum-based diets. The UT diet caused a significant (P<0.05) depression in growth. Feed efficiency was similar across the four dietary treatments. Ileal digestibility dry matter and crude protein for the UT diet was inferior (P<0.05) to that of the AS and AG diets. Generally, treatment of S with wood ash extract improved its feeding value. Germination following wood ash treatment caused a further reduction in tannin content thereby improving the feeding value of the grain.
This citation is from AGRICOLA.

1026. **Effect of wood fly ash and compost on nitrification and denitrification in agricultural soil.**
Odlare, M. and Pell, M.
Applied Energy 86(1): 74-80. (2009); ISSN: 03062619 [APEND].
Notes: doi: 10.1016/j.apenergy.2008.04.004.
Descriptors: bioremediation/ compost/ heavy metals/ soil microbial indicators/ soil quality/ wood ash/ ammonium compounds/ coal ash/ denitrification/ experiments/ fly ash/ hand held computers/ heavy metals/ industrial poisons / metals/ microbiology/ microorganisms/ nitrification/ oxidation/ personal digital assistants/ soils/ toxic materials/ waste incineration/ wood/ agricultural soils/ ammonium oxidation/ anthropogenic activities/ arable soils/ bio fuels/ bioremediation/ combustion plants/ compost/ dose responses/ h igh concentrations/ household wastes/ metal contents/ microbial responses/ plant nutrients/ potential denitrification/ soil micro organisms/ soil microbial activities/ soil microbial indicators/ soil quality/ soil structure/ toxic effects/ with or without/ wood ash/ composting/ agricultural soil/ assay/ biofuel/ bioremediation/ combustion/ comparative study/ compost/ denitrification/ domestic waste/ dose-response relationship/ experimental study/ fly ash/ microbial activity/ mitigation/ nitrification/ soil amendment/ soil microorganism/ soil structure/ toxicity/ wood/ ammonium compounds/ ash/ coal/ combustion/ composting/ fly ash/ heavy metals/ microbiology/ microorganisms/ nitrification/ oxidation/ soil/ wastes/ wood
Abstract: Wood ash from biofuel combustion plants and compost from source-separated household waste are commonly spread on forest, agricultural and horticultural soils as a valuable source of plant nutrients. However, due to anthropogenic activities, wood ash may contain high concentrations of heavy metals. Heavy metals are toxic to microorganisms and therefore, soil microbial response to wood ash should be considered when soil is amended with ash. Compost is known to improve soil structure and may also act as a bioremediating agent, mitigating any toxic effects of wood ash on soil microorganisms. In the present study, the aim was to investigate whether wood ash has any toxic effect on soil microbial activity and, if this is the case, whether compost could mitigate these effects. The effect of wood fly ash on potential ammonium oxidation rate (PAO) and potential denitrification rate (PDA) in arable soil was investigated in one dose-response assay and in two pot experiments with or without plants, respectively. The treatments were amendment with wood fly ash, compost or a combination of wood fly ash and compost. PAO and PDA were assessed immediately or after 7 and 90 days in the different experiments. Wood fly ash decreased PDA to 16-56% compared to the control, while PAO varied between 82% and 205%. Sole compost addition stimulated both processes. This positive effect was also observed in the combined wood fly ash-compost treatment. In conclusion, wood ash had a toxic effect on PDA, both on an immediate, short-term and long-term basis. Amendment of compost clearly mitigated this toxic effect. The observed toxicity could be an effect of the metal content of ash.

1027. **Effectiveness of organic amendments and chemicals in controlling black scurf disease of potato.**
Dey, T. K.; Bari, M. A.; Saha, A. K.; Rahman, M.; and Ayub, A.
Bangladesh Journal of Plant Pathology 20(1/2): 17-20. (2004); ISSN: 1012-9279
Descriptors: application rates/ boric acid/ carbendazim/ carboxin/ chemical control/ crop yield/ cultural control/ fungal diseases/ fungicides/ metalaxyl/ oilseed cakes/ organic amendments/ oxycarboxin/ plant disease control/ plant diseases/ plant pathogenic fungi/ plant pathogens/ potatoes/ quintozene/ sawdust/ tubers/ carbendazol/ DCMO/ Homai/ Hyphomycetes/ MBC/ medamine/ oil cakes/ PCNB/ pentachloronitrobenzene/ phytopathogens
Abstract: Two organic amendments, i.e. sawdust (2.0, 2.5 and 3.0 t/ha) and mustard oil cake (2.0 and 2.5 t/ha), and 7 chemicals, i.e. boric acid (2.0 and 3.0%), Vitavax [carboxin] (0.15%), Bavistin [carbendazim] (0.1%), Homai (0.2%), Plantvax [oxycarboxin] (0.2%), Terraclor [quintozene] (12 and 20 kg/ha) and Apron [metalaxyl] (0.2%), were tested against stem canker or black scurf disease of potato caused by Rhizoctonia solani during 1995-96 and 1996-97 crop seasons in Gazipur, Bangladesh. All the treatments were effective in controlling black scurf disease. Among them, sawdust amendment (3 t/ha) and Terraclor (20 kg/ha) performed better in reducing black scurf disease of potato and increasing tuber yield.

1028. **Effectiveness of used true mushroom and sawdust usage in artificial mixtures when cultivated plants take root.**
Skaliy, L. P.
Izvestiya Timiryazevskoi Sel'skokhozyaistvennoi Akademii 3: 48-58. (2005); ISSN: 0021-342X
Descriptors: mushroom waste/ sawdust/ artificial soil mixtures/ cultivated plants/ rooting
Abstract: Used true mushroom and sawdust substratum's possible use in artificial mixtures was studued propagating cultivated crops with green grafts, the effectiveness of a mew substratum in comparison with the traditional turf-sand mixtures being evaluated. New substratum is believed to meet the requirements to artificial mixtures most fully.

1029. **Effects of acidification on pH changes in horticultural substrates used for highbush blueberry cultivation (Vaccinium corymbosum).**
Mikiciuk, G.; Grajkowski, J.; Ochmian, I.; Ostrowska, K.; and Chepinski, P.
Folia Universitatis Agriculturae Stetinensis, Agricultura 96: 119-124. (2004); ISSN: 1506-1973.
Notes: Original title: Wpyw zakwaszania na zmiany odczynu trzech typow podozy w uprawie borowki wysokiej (Vaccinium corymbosum).
Descriptors: acidification/ blueberries/ cocoa husks/ cultivars/ growth/ peat/ pH/ plant development/ sawdust/ soilless culture/ substrates/ sulfuric acid/ trickle irrigation/ cultivated varieties/ hydrogen ion concentration/ potential of hydrogen/ sulphuric acid
Abstract: Experiments were conducted in Poland, during 2001-03 to determine the effects of acidification on the pH changes in substrates (peat, sawdust and cocoa husk) used for highbush blueberry (Vaccinium corymbosum cultivars Patriot and Sierra) cultivation. Trickle irrigation with water at pH 3.5 was used for substrate acidification and sulfuric acid for water acidification. Irrigation with water at pH 3.5 reduced the pH of sawdust and cocoa husk. Acidification did not reduce peat pH but ensure optimum pH for the growth and development of highbush blueberry in all the substrates.

1030. **Effects of bedding quality on lying behavior of dairy cows.**
Fregonesi, J. A.; Veira, D. M.; von Keyserlingk, M. A.; and Weary, D. M.
Journal of Dairy Science 90(12): 5468-72. (Dec. 2007)
NAL Call #: 44.8 J822 ; ISSN: 1525-3198 . 18024737
Descriptors: animal welfare/ animals/ bedding and linens: standards: veterinary/ behavior, animal/ cattle: physiology/ dairying: methods/ female/ floors and floorcoverings: standards/ housing, animal/ posture/ random allocation/ video recording/ water
Abstract: Cows prefer to spend more time lying down in free stalls with more bedding, but no research to date has addressed the effects of bedding quality. Bedding in stalls often becomes wet either from exposure to the elements or from feces and urine. The aim of this study was to test the effect of wet bedding on stall preference and use. Four groups of 6 nonlactating Holstein cows were housed in free stalls bedded daily with approximately 0.1 m of fresh sawdust. Following a 5-d adaptation period, each group of cows was tested sequentially with access to stalls with either dry or wet sawdust bedding (86.4 +/- 2.1 vs. 26.5 +/- 2.1% dry matter), each for 2 d. These no-choice phases were followed by a 2-d free-choice phase during which cows had simultaneous access to stalls containing either wet or dry bedding. Stall usage was assessed by using 24-h video recordings scanned at 10-min intervals, and responses were analyzed by using a mixed model, with group (n = 4) as the observational unit. The minimum and maximum environmental temperatures during the experiment were 3.4 +/- 2.2 and 6.8 +/- 2.5 degrees C, respectively. When cows had access only to stalls with wet bedding, they spent 8.8 +/- 0.8 h/d lying down, which increased to 13.8 +/- 0.8 h/d when stalls with dry bedding were provided. Cows spent more time standing with their front 2 hooves in the stall when provided with wet vs. dry bedding (92 +/- 10 vs. 32 +/- 10 min/d). During the free-choice phase, all cows spent more time lying down in the dry stalls, spending 12.5 +/- 0.3 h/d in the dry stalls vs. 0.9 +/- 0.3 h/ d in stalls with wet bedding. In conclusion, dairy cows show a clear preference for a dry lying surface, and they spend much more time standing outside the stall when only wet bedding is available.

1031. **Effects of bedding type and within-pen location on feedlot runoff.**
Olson, E. C. S.; Chanasyk, D. S.; and Miller, J. J.
Transactions of the ASAE 49(4): 905-914. (2006)
NAL Call #: 290.9 Am32T; ISSN: 0001-2351
Descriptors: application rates/ depression storage/ feedlot runoff/ hardwood/ rainfall simulators/ runoff/ runoff coefficient/ runoff volume/ straw/ Canada, Alberta
Abstract: This two-year study examined the effects of two types of bedding materials (straw and wood chips) and two within-pen locations (bedding pack and pen floor) on various feedlot runoff parameters in southern Alberta, Canada, using a rainfall simulator. Bedding type affected antecedent factors and hydrological parameters differently by year. Bedding pack locations absorbed 23.5% to 32.9% more moisture, had about 8 cm greater manure depths, slopes between 2.1% and 5.1% steeper, and surfaces that were 2.6% to 5.7% rougher than pen floor locations. Pen floor locations had clod bulk densities that were 0.83 Mg m super(-3) greater than bedding pack locations in 1998. However, the effect of bedding packs on these properties depended on the amount of bedding added, which depended on feedlot conditions. Runoff began sooner from pen floor than from bedding pack locations. Once runoff started, the amount and type of bedding material, length of time since fresh bedding was added, and within-pen location affected the time for specific runoff volumes. For example, in 1998, 6 L of runoff were collected about 3 min faster from wood chips than from straw bedding and about 7 min faster from the pen floor than from the bedding pack. Runoff coefficients increased during the simulation events and occasionally exceeded rainfall application rate depending on whether or not water in depression storage was released. Treatment effects were dependent on year of study, and were inconsistent. Thus, further study is warranted regarding the effects of bedding type on feedlot runoff.

1032. **Effects of Casuarina equisetifolia composted litter and ramial-wood chips on tomato growth and soil properties in Niayes, Senegal.**
Soumare, M. D.; Mnkeni, P. N. S.; and Khouma, M.
Biological Agriculture and Horticulture 20(2): 111-123. (2002)
NAL Call #: S605.5.B5 ; ISSN: 0144-8765
Descriptors: bulk density/ carbon nitrogen ratio/ crop yield/ growth/ litter plant/ mineral uptake/ nitrogen/ nutrient uptake/ phosphorus/ plant nutrition/ potassium/ residual effects/ soil density/ soil organic matter/ soil properties/ tomatoes/ water holding capacity/ wood chips/ organic matter in soil
Abstract: A field experiment was conducted in 1999 to study the effects of ramial chipped wood (RCW) and litter compost (LC) of C. equisetifolia on tomato (Lycopersicon esculentum) growth and soil properties in Niayes, Senegal. The RCW and LC were applied to a sandy soil at 10, 20 and 40 t ha-1 and compared with a control and recommended fertilizer mixture. Soil and plant samples were taken at 45 days of tomato growth and at harvest time for analysis. Residual effects of the materials were evaluated by establishing a second tomato crop on the same plots. Application of RCW depressed tomato growth and yield during the first cropping and this was attributed to RCW inducing intense N immobilization in the soil due its wide C:N ratio. Improvements in growth and yield were observed during the second cropping and ascribed to improved nitrogen release following the extended incubation of the RCW in the soil. To derive short-term benefits from RCW application, it should be applied in combination with experimentally determined amounts of mineral fertilizers. Litter compost improved tomato growth and yield during both croppings owing to increased soil levels and tomato uptake of N, P and K following its incorporation in soil. This was attributed to the narrower C:N ratio of LC, which facilitated its decomposition in the soil. The residual effects of LC were, however, much less, suggesting that LC had limited residual nutrients value. Both RCW and LC increased the soil organic matter content and water holding capacity, and reduced the bulk density of the soil, suggesting that their regular application could result in the long-term improvement of its productivity.

1033. **Effects of crushed wood ash on soil chemistry in young Norway spruce stands.**
Arvidsson, H. and Lundkvist, H.
Forest Ecology and Management 176(1-3): 121-132. (Mar. 2003)
NAL Call #: SD1 .F73; ISSN: 0378-1127 [FECMDW]
Descriptors: Picea abies/ ash/ soil chemistry/ logging/ fuels/ forest soils/ soil fertility/ field experimentation/ soil depth/ cation exchange capacity/ exchangeable calcium/ exchangeable magnesium/ exchangeable potassium/ soil ph/ application rate/ Sweden/ slash

1034. **Effects of different growing media on greenhouse lettuce grown in soilless culture.**
Turhan, E. and Sevgican, A.
Acta Horticulturae 491: 405-408. (1999)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: bark/ growing media/ lettuces/ organic fertilizers/ perlite/ pine bark/ pines/ pumice/ sawdust/ seedlings/ soilless culture/ vegetables/ potting composts/ rooting media/ vegetable crops
Abstract: The effects of 8 different growing media on lettuce (cv. Bounty) production were investigated. The media used were perlite, pumice, fine sawdust, ground pine (Pinus brutia) bark and mixtures of these materials (1:1). The perlite and pumice were previously used for production of one cucumber crop. The sawdust and ground pine bark were not composted. Seedlings with 3-4 leaves were transplanted into 4-litre pots filled with these substrates on 20 December 1995 and watered with a complete nutrient solution. All the lettuces were harvested on 8 March 1996. Parameters measured were average crop weight, leaf numbers (total, consumable and non-consumable) and proportion of heading. The best results were obtained with pumice medium fertilized with organic manure.

1035. **Effects of different soil media on the growth of Dracaena dermensis var. Janet Craige cuttings.**
Wazir, M. G.; Noor ul Amin; Ishtiaq, M.; Aziz, A.; and Khan, I. A.
Sarhad Journal of Agriculture(Pakistan) 19(1): 31-34. (2003)
NAL Call #: RA565.S365 S322.P32S37; ISSN: 1016-4383.
Notes: 2 tables, 9 ref. Summary (En). Citation notes: PK (Pakistan).
Descriptors: soil media/ Dracaena dermensis/ sawdust
Abstract: Effects of different soil media on the growth of Dracaena dermensis var. Janet Craige cuttings were studied at the Ornamental Nursery, Horticulture Department, NWFP Agricultural University, Peshawar. Direct cuttings of were planted in 6 inch clay pots containing different soil mixture such as silt sawdust, leaf mould and garden Data showed that soil media of silt + garden soil + leaf mould + sawdust gave maximum number of leaves (62.5) thickness of stem (3.0 cm) number of roots (19.8) and root weight per plant (9.1 g) while minimum number of leaves (55.0), stem thickness (2.4 cm). number of roots (12.3) and root weight (5.0 g) were noted in silt + sawdust. Soil media of silt + sawdust gave maximum days to sprouting (40.5 day) while minimum days to sprouting were noted in Silt + Garden Soil (35.6 days). Maximum length of stem (27.3 cm) and length of roots per plant (41.8 cm) were measured in garden soil while minimum length of stern (19.6 cm) was measured in silt + sawdust and minimum root length (34.8 cm) in silt + garden Soil + leaf mould + sawdust.

1036. **The effects of different traditional sources of nutrients on the infestation of pepper fruits by the pepper fruitfly, Atherigona orientalis (Schiner), in Nigeria.**
Ogbalu, O. K.
Journal of Agronomy and Crop Science 182(1): 65-71. (1999); ISSN: 09312250 [ZAPFA].

Notes: doi: 10.1046/j.1439-037X.1999.00287.x.
Descriptors: Atherigona orientalis/ infestation/ Nigeria/ pepper fruits/ sources of nutrients/ tradition/ chemical fertilizer/ compost/ manure/ nigeria/ nutrient/ plant disease control/ plant residue/ plant variety/ wood ash/ crop pest/ nutrient/ pest control/ vegetable/ nigeria/ atherigona orientalis/ capsicum annuum/ capsicum frutescens
Abstract: Experiments were conducted in 1995 and 1996 to determine the effects of different sources of nutrients on the infestation of fruits of five pepper varieties by Atherigona orientalis (Schiner). Different sources of nutrients -chicken droppings, plant residues (compost manure), wood ash and NPK (chemical fertilizer) - were used in the planting of each of the five pepper varieties [Nsukka yellow, Atarugu, and Sweet pepper, all of Capsicum annum; Bird's eye chilli and Local medium red (Ogoni pepper) both of C. frutescens]. In 1995 plantings, pepper plots of Nsukka yellow and Atarugu varieties that received chicken droppings as source of nutrients suffered the highest percentage fruit damage of 90.7% and 80.8 %, respectively. Pepper plots of Nsukka yellow, Atarugu, Sweet pepper and Local medium red grown in 1996 and treated with chicken droppings suffered the highest percentage fruit damage of 93.7%, 56.6% and 52.2%, respectively. Plots of the Bird's eye chilli variety received minimal or no fruit damage in all. Pepper fruits in the control plots also did not undergo A. orientalis attack. Chicken droppings offered the lowest Relative Protection (RP) values to most pepper varieties in 1995 and 1996. NPK chemical fertilizer offered the highest percentage RP values in 1995 and wood ash offered the highest RP in 1996 to most pepper varieties. Also, wood ash in both 1995 and 1996 offered a relatively high percentage RP to most pepper varieties. Compost manure offered a moderate percentage RP in both years.

1037. **Effects of dosage and types of organic composts in the production of lettuce in two soils under protected environment.**
Boas, R. L. V.; Passos, J. C.; Fernandes, D. M.; Bull, L. T.; Cezar, V. R. S.; and Goto, R.
Horticultura Brasileira 22(1): 28-34. (2004)
NAL Call #: SB320.43 .B7H67; ISSN: 0102-0536.
Notes: Efeito de doses e tipos de compostos organicos na producao de alface em dois solos sob ambiente protegido.
Descriptors: absorption/ application rates/ bark/ bean straw/ beans/ boron/ calcium/ characteristics/ composts/ copper/ crop yield/ Inceptisols/ iron/ lettuces/ magnesium/ mineral uptake/ nitrogen/ nutrient uptake/ Oxisols/ plant nutrition/ potassium/ sawdust/ straw/ zinc/ soil types genetics
Abstract: The effects of 3 levels (60, 120, and 240 g/vase) of 3 different organic composts (Eucalyptus bark, wood sawdust, and bean straw), applied to 2 soil types (Oxisol (Dark Red Larisol; LE, sandy phase), and Inceptisol (AQ)) on production and nutrient uptake by lettuce grown in plastic vases each with 4 litres of soil in a plastic tunnel. The composts were mixed with fowl manure. The bean straw compost increased the fresh weight of the aerial part and the amount of N, K, Ca, Mg, B, Cu, Fe, S, and Zn in the plants. The best results were obtained in LE in relation to AQ.

1038. **Effects of fermented sawdust feeds and powdered fish oil in diet on the shelf -life of pork.**
Lee, J. I.; Chung, M. S.; Hwangbo, J.; Park, B. Y.; Park, T. S.; Kim, J. H.; Sung, P. N.; and Park, G. B.
Korean Journal of Animal Science 40(1): 69-78. (1998)
Descriptors: byproducts/ carcass quality/ diets/ fish oils/ meat quality/ pigmeat/ sawdust/ storage/ trees/ wood residues/ woody plants/ hogs/ pork/ South Korea/ swine
Abstract: The effect of feeding fermented sawdust and powdered sardine oil on the quality of pork was studied. Pigs were randomly assigned to one of 4 diets, control (normal feed), T1 (normal feed and fermented sawdust 30%), T2 (normal feed and 10% sardine powder oil), T3 (normal feed, 30% fermented sawdust, 10% sardine powder oil and 30% limiting amino acids) from 30 to 110 kg liveweight. Samples were stored at 0+or-1 degrees C. Thiobarbituric acid reaction substance (TBARS) values in all treatments increased with storage period (P<0.05). T1 had a lower TBARS value than the other treatments until the 8th day; there were no significant differences among treatments on the 15th day. There were no significant differences in volatile basic N (VBN) between treatments with storage periods. The peroxide value of all treatments decreased with duration of storage (P<0.05), but increased again after the 8th day, that of T1 being significantly lower than the others on the 15th day. TBARS values of all treatments increased with storage (P<0.05), but were not significantly different to each other. There were no significant differences among VBN of treatments with storage periods. Peroxide values of all treatments decreased with storage period (P<0.05), but increased again after the 8th day, while that of T1 was significantly lower than the others on the 15th day.

1039. **Effects of fertigation on blueberry plants.**
Treder, W.; Krzewinska, D.; and Borowik, M.
Zeszyty Naukowe Instytutu Sadownictwa i Kwiaciarstwa w Skierniewicach 15: 35-45. (2007)
NAL Call #: SB319.3.P7 Z47; ISSN: 1234-0855.
Notes: Original title: Wpyw sposobu nawozenia borowkina wzrost i plonowanie.
Descriptors: application methods/ blueberries/ broadcasting/ crop yield/ fertigation/ fruits/ furrows/ irrigation/ sawdust/ yield components/ fertirrigation/ watering
Abstract: The aim of the experiments conducted in 2004-2005 in the Experimental Orchard in Dabrowice was to compare two methods of nutrient application: fertigation using complete (NPK) fertilizer and traditional broadcast fertilization. The research was carried out on the blueberry cultivar 'Bluecrop', planted in 2000, spaced out at 3x1 m. The plants were cultivated on mineral soil or in furrows filled with a mixture of mineral soil and sawdust. The results showed that the blueberry plants grown in a mixture of mineral soil and sawdust grew better and gave twice as high a yield as the bushes grown in mineral soil. Moreover, their growth was positively influenced by liquid fertilization applied during plant vegetation. Fertigation was more effective than broadcast fertilization. A nitrogen dose of 16.7 kg/ha (N) applied by fertigation resulted in a yield

similar to that obtained with 50 kg/ha (N) in broadcast fertilization. Fertigation also increased the average fruit weight.
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1040. **Effects of hardwood sawdust in potting media containing biosolids compost on plant growth, fertilizer needs, and nitrogen leaching.**
Bugbee, G. J.
Communications in Soil Science and Plant Analysis 30(5-6): 689-698. (1999)
NAL Call #: S590.C63; ISSN: 0010-3624 [CSOSA2]
Descriptors: Coreopsis grandiflora/ Rudbeckia hirta/ growing media/ sawdust/ nutrient requirements/ nitrogen/ leaching/ nitrates/ carbon nitrogen ratio/ perlite/ slow release fertilizers/ NPK fertilizers/ ammonium nitrogen/ nitrate nitrogen/ stems/ leaves/ flowers/ dry matter partitioning/ fertilizer requirements/ application rate/ fertilizer requirement determination/ growth/ refuse compost
Abstract: Biosolids compost is used in media to grow potted plants. Nitrogen (N) in media leachate may contribute to nitrate (NO3-N) contamination of surface or ground water. Addition of sawdust to potting media containing biosolids compost will increase the carbon to nitrogen ratio and could prevent N leaching without adversely affecting plant growth. A control medium containing 0% sawdust (v/v), 30% perlite, 50% municipal biosolids compost, and 20% sand was modified to contain either 10, 20, or 30% (v/v) fresh hardwood sawdust. The sawdust replaced either 1/3, 2/3, or all of the perlite in the control medium. Slow release fertilizer, slow plus quick release fertilizer, or no fertilizer was added to each of the four media to determine how the sawdust affected fertilizer needs. Coreopsis (Coreopsis graridiflora L.) and Rudbeckia (Rudbeckia hirta L. 'Goldstrum') were grown in pots for five months. Leachate was tested for NO3-N and ammonium N (NH4-N). Increasing amounts of sawdust produced no differences in growth of Coreopsis and few differences in the growth of Rudbeckia. The addition of slow or slow plus quick release fertilizer had little effect on the growth of Coreopsis and a greater effect on the growth of Rudbeckia. Sawdust and fertilizer had no effect on the leaching of N. Nitrogen leached primarily as NH4-N during the first four weeks of the experiment.
This citation is from AGRICOLA.

1041. **Effects of humic substances derived from organic waste enhancement on the growth and mineral nutrition of maize.**
Eyheraguibel, B.; Silvestre, J.; and Morard, P.
Bioresource Technology 99(10): 4206-12. (July 2008)
NAL Call #: TD930.A32; ISSN: 0960-8524
Descriptors: agriculture: methods/ biodegradation, environmental/ biomass/ biotechnology: methods/ carbon: chemistry/ fertilizers/ humic substances/ hydrogen ion concentration/ hydroponics/ organic chemicals: chemistry/ plant leaves: metabolism/ plant roots: metabolism/ plant shoots: metabolism/ plants/ Zea mays: chemistry
Abstract: A physico-chemical process has been developed to transform and enhance lignocellulosic waste in liquid humic extracts: humic-like substances (HLS). The aim of this study was to determine the effects of HLS on plant physiology in order to consider their agricultural use as organic fertilizers. The effects of HLS were evaluated on maize seed germination, and their impact on growth, development and mineral nutrition was studied on maize plants cultivated under hydroponic conditions. The experimental results showed that HLS do not increase the percentage and rate of germination but enhance the root elongation of seeds thus treated. Positive effects were also observed on the whole plant growth as well as on root, shoot and leaf biomass. These effects can be related to the high water and mineral consumption of plants undergoing this treatment. The high water efficiency indicated that such plants produce more biomass than non-treated plants for the same consumption of the nutrient solution. Furthermore, the use of HLS induced a flowering precocity and modified root development suggesting a possible interaction of HLS with developmental processes. Considering the beneficial effect of HLS on different stages of plant growth, their use may present various scientific and economic advantages. The physico-chemical transformation of sawdust is an interesting way of enhancing organic waste materials.
This citation is from PubMed.

1042. **Effects of humic substances from composted or chemically decomposed poplar sawdust on mineral nutrition of ryegrass.**
Bidegain, R. A.; Kaemmerer, M.; Guiresse, M.; Hafidi, M.; Rey, F.; Morard, P.; and Revel, J. C.
Journal of Agricultural Science 134(3): 259-267. (May 2000); ISSN: 0021-8596 [JASIAB]
Descriptors: Lolium multiflorum/ crop yield/ composts/ Populus deltoides/ sawdust/ blood/ oxidation/ biodegradation/ humic acids/ metabolites/ nutrient uptake/ phosphorus/ copper/ manganese/ nitrogen / roots/ flour/ growth/ mineral nutrition
Abstract: Two organic fertilizers were prepared from the same initial mixture of popular sawdust, blood and flour either by composting in a reactor or by chemical oxidation. Both processes resulted in loss of c. 30% of the organic matter. Composting required 90 days in comparison to only a few hours with chemical oxidation. Extraction of the organic residues with 1 N KOH gave solutions containing 24-6 and 15.1 g/l of humic substances respectively. These humic solutions were applied to pot-grown Lolium multiflorum Lam. At 4 and 10 mg carbon per pot to assess the short-term uptake of macro and microelements by the plants. When the plants were short of phosphorus, the humic substances from the chemically decomposed sawdust supplied at 10 mg C per pot improved total P uptake and yield. Humic substances also increased copper and manganese uptake, and by enhancing root development, also improved nitrogen uptake and biomass yield.
This citation is from AGRICOLA.

1043. **Effects of integrated treatments against rice sheath blight severity, disease incidence and yield parameters.**
Surulirajan, M. and Janki Kandhari
Annals of Plant Protection Sciences 11(2): 284-288. (2003)
NAL Call #: SB950.A1A46; ISSN: 0971-3573
Descriptors: biological control/ biological control agents/ carbendazim/ chemical control/ crop yield/ cultural control/ farmyard manure/ fungal antagonists/ fungal diseases/ fungicides/ integrated control/ plant disease control/ plant diseases/ plant pathogenic fungi/ plant pathogens/ rice/ rice

straw/ sawdust/ seed weight/ soil amendments/ straw/ yield components/ biocontrol agents/ biological control organisms/ carbendazol/ FYM/ Hyphomycetes/ integrated plant protection/ MBC/ medamine/ paddy/ phytopathogens
Abstract: The control of sheath blight (caused by Rhizoctonia solani) in rice (cv. Pusa Basmati-1) by the application of Trichoderma viride, carbendazim and soil amendments, singly or in combination, was evaluated in a pot experiment. A highly virulent isolate of R. solani (RS 4500) was incorporated into the soil at 15 days before transplanting. Farmyard manure (FYM) and sawdust (1.0%) were applied to soil at 30 days before transplanting. Carbendazim 50 WP (0.1%) was sprayed at 65-, 85 or 105-day intervals. Three days after the application of carbendazim 50 WP, the spore suspension of T. viride (Tv 3235) was sprayed. Disease severity was evaluated at maximum tillering and panicle initiation stages, and just before harvesting. Among the treatments, the application of T. viride + carbendazim 50 WP + FYM + sawdust resulted in the lowest disease incidence at all stages, as well as in the highest grain and straw yields. The treatments had no significant effect on 1000-grain yield.

1044. **Effects of litter substrate and genotype on layers' use of litter, exterior appearance, and heterophil:lymphocyte ratios in furnished cages.**
Wall, H.; Tauson, R.; and Elwinger, K.
Poultry Science 87(12): 2458-65. (Dec. 2008); ISSN: 0032-5791
Descriptors: animals/ chickens: genetics/ female/ floors and floorcoverings/ genotype/ grooming/ housing, animal/ lymphocytes: physiology/ stress, physiological
Abstract: Effects of sand versus sawdust as a litter bath substrate in furnished cages for laying hens were studied. The study used 112 Hy-Line White (HYW) and 140 Hy-Line Brown (HYB) layers housed in 18 furnished cages with 14 hens in each cage, generating 4 or 5 replicates per combination of genotype and litter substrate. Traits studied were mortality, feather cover, hygiene of hens, pecking wounds, heterophil/lymphocyte ratios, and hens' use of litter baths. Hens' litter bath use was measured by direct observations and by use of the passive integrated transponder technique. The latter technique allowed for recording of an individual hen's visits to litter baths during the 420-d study. There were no indications of differences between sand and sawdust as litter substrates in mortality rates, exterior appearance, or heterophil/lymphocyte ratios. Litter baths with sand or sawdust were occupied to the same extent but dustbathing behaviors were more frequently seen in baths with sawdust. Hens of both lines visited the litter bath to the same extent but HYB performed more dustbathing. There was large variation in the number of days that individual hens visited litter baths; in fact, 30% of the hens never entered litter baths, whereas some hens visited baths almost every day. The HYB hens had inferior feather cover compared with HYW, indicating that feather pecking occurred more frequently in cages with brown hens. The HYW hens had lower body weight, longer claws, and more comb wounds than HYB. In conclusion, sawdust seems to be an acceptable alternative to sand as a litter substrate in furnished cages.

1045. **Effects of mulching on fruit yield, accumulated plant growth and fungal attack in cultivated lingonberry, cv. Sanna, Vaccinium vitis-idaea L.**
Gustavsson, B. A.
Gartenbauwissenschaft 64(2): 65-69. (1999); ISSN: 0016-478X
Descriptors: bark/ crop yield/ frost/ fruit crops/ gravel/ growth/ mulches/ mulching/ peat/ pine bark/ plant development/ plant residues/ plastic film/ sawdust/ small fruits/ soil ph/ symptoms/ mulching materials
Abstract: The effect of mulching (black plastic foil, peat moss, pine needle litter, sawdust, chopped pine bark, gravel or bare soil (control)) on the growth and yield of V. vitis-idaea cv. Sanna, grown on a sandy mineral soil, was investigated during 1995-97 in Sweden. Symptoms of an unidentified fungus as well as accumulated plant growth were determined in the last year of the trial. Soil pH was measured prior to and after the trial. Plastic foil and peat mulch promoted fruit yield, whereas pine needle litter mulch had a negative influence. In a year with deep and delayed winter frost, the organic mulch materials resulted in decreased yield, whereas plants mulched with plastic foil and gravel were unaffected. Accumulated plant growth was positively influenced by peat mulch. Pine needle litter had a significant positive effect when compared with sawdust which gave the poorest growth of all treatments. Gravel mulched- and control-plants exhibited the most severe fungal symptoms; the healthiest plants were those mulched with pine needle litter. Soil pH did not decrease during the cultivation period in chopped pine bark treatment, but decreased in all other treatments, especially in peat moss and pine needle litter treatments, from the initial 5.6 to 4.6 and 4.7, respectively.

1046. **Effects of nitrogen-fixing shrubs in Washington and Coastal California.**
Haubensak, K. A.; D'Antonio, C. M.; and Alexander, J.
Weed Technology 18(Suppl): 1475-1479. (2004); ISSN: 0890-037X
Descriptors: burning/ grasslands/ invasion/ nitrogen/ nitrogen fixation/ nutrient availability/ sawdust/ flaming
Abstract: Open grasslands in California and Washington are being invaded by two closely related European shrubs, French broom and Scotch broom, that are considered among the most invasive and damaging of wildland species in those habitats. In this study, we present evidence of their effects on soil nitrogen (N) and the implications for restoration. Using natural abundance 15N signatures of leaves, we show that N fixation by brooms varies across sites and may depend on a suite of site-specific factors. Nonetheless, in sites in both California and Washington, we observe up to a two-fold increase in soil N availability, as assayed in the laboratory. Across a range of sites, we determined that burning decreases total soil N by nearly 40%. We found burning to have the simultaneous effect of decreasing the broom seedbank by 68% after one burn. In a separate experiment, we removed broom and added sawdust to the soil to test whether a N-immobilization effect would help slower growing native perennial grasses in competition with European annual grasses. We found that although sawdust effectively decreased N availability after a

2-yr application period, we could not effectively target which group of species would benefit most.
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1047. **The effects of organic and mineral soil media on the quality of Pterygota alata Roxb-seedlings.**
Hendromono
Buletin Penelitian Hutan 617: 55-64. (1998); ISSN: 1410-0649.
Notes: Original title: Pengaruh media organik dan tanah mineral terhadap mutu bibit Pterygota alata Roxb.
Descriptors: coir/ crop quality/ forest nurseries/ growing media/ mineral soils/ organic matter/ Oxisols/ peat/ plant height/ plant morphology/ planting stock/ sand/ sawdust/ seedling growth/ seedlings/ soil types/ soilless culture/ coconut fibre/ nursery plants/ nursery stock/ planting materials/ potting composts/ rooting media
Abstract: An experiment was conducted to prove that organic material have advantages over mineral soil as growing media and to validate the quality index value as an indicator of Pterygota alata seedling quality. The seven types of media used (50% Oxisols+50% sand, pure peat, pure coir, pure sawdust, 50% peat+50% coir, 50% peat+50% sawdust, and 50% coir+50% sawdust) were arranged in a completely randomized design with four replicates consisting of 15 plants. The morphological quality and height growth of the seedlings at four and nine months after sowing were better in organic media than in mineral soil medium. The weight of the seedlings grown in the best organic medium was more than twice the weight of the seedlings in mineral soil. The best media for growth and morphological quality of seedlings were pure peat and 50% peat+50% coir by volume. The medium consisting of 50% Oxisols+50% sand by volume was the worst medium for growth and quality of the seedlings. Quality index value could be used as an indicator of P. alata seedling quality. The larger the quality index value, the higher is the quality of the seedlings.
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1048. **Effects of organic resource quality on soil profile N dynamics and maize yields on sandy soils in Zimbabwe.**
Mtambanengwe, F. and Mapfumo, P.
Plant and Soil 281(1/2): 173-191. (2006)
NAL Call #: 450 P696; ISSN: 0032-079X
Descriptors: ammonium nitrogen/ cattle manure/ composts/ crop yield/ immobilization/ leaching/ litter plant/ maize/ maize stover/ nitrate/ nitrate nitrogen/ nitrogen/ nitrogen fertilizers/ nutrient availability/ release/ rooting depth/ sandy soils/ sawdust/ small farms/ soil profiles/ soil types/ sunn hemp/ use efficiency/ ammonia nitrogen/ corn/ fluxes
Abstract: Optimizing the use efficiency of nitrogen (N) derived from different quality organic resources and mineral fertilizers on sandy soils with <100 g clay kg-1 is a major challenge for smallholder farmers in Southern Africa. The dominant sandy soils have a poor capacity to store and supply crop nutrients due to low organic matter contents and inherent infertility. A study was conducted in Zimbabwe to determine the differential N supply effects of different quality and quantities of organic nutrient sources on maize productivity. Crotalaria juncea L., Calliandra calothyrsus Meissn., cattle manure, maize (Zea mays L.) stover and Pinus patula Schiede & Schltdl. & Cham. sawdust which represented high to low quality materials respectively, were each incorporated into soil at 1.2 and 4 t C ha-1 at Makoholi Experiment Station (rainfall: 450-650 mm yr-1) and tested against a sole mineral N fertilizer and control treatments. In a separate experiment conducted in farmers' fields under different rainfall zones of Zimuto (450-650 mm yr-1), Chinyika (650-750 mm yr-1) and Chikwaka (>750 mm yr-1), commonly available organic materials, including manure and composted miombo leaf litter, applied in varying amounts by farmers were evaluated. Nitrogen release patterns were consistent with differences in resource quality. At 3 weeks after incorporation into soil at the onset of the rains, C. juncea and C. calothyrsus had released as high as 24% and 13% of added N respectively, compared with no more than 5-6% for the rest of the amended treatments. Most of the N released was lost through leaching as evidenced by progressive movement of NO_3--N bulges beyond maize rooting depth following major rainfall events. Maize yields were significantly related to the size of profile mineral N fluxes, with the best linear relationship (R2=0.86) obtained with N available in the top 30 cm of soil at maize flowering. High grain yields of ~3 t ha-1 were only achieved with C. juncea applied at 4 t C ha-1, which also had highest NO_3--N leaching losses. Conversely, the same application rate increased N immobilization by 30% and 42% under maize stover and sawdust, respectively, relative to the control. Results from farmers' fields showed that organic resources traditionally used on smallholder farms are invariably of low quality relative to C. juncea and C. calothyrsus. However, they exhibited shorter N immobilization effects than was shown for maize stover and sawdust at Makoholi, suggesting that pre-application treatments, such as composting, employed by farmers enhance seasonal N benefits from these materials. Maize yields increased linearly with total N added in these resources in combination with N fertilizer, justifying the high organic matter loading strategy (e.g. >20 t ha-1 for manure, fresh litter and composted litter) used by farmers who often achieve high crop yields on such coarse sandy soils in Zimbabwe.
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1049. **Effects of organized soil cultivation on yield and quality of tomato in greenhouse.**
Zhang ZhiBin and He ChaoXing
Acta Horticulturae 691(1): 305-311. (2005)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: ascorbic acid/ crop quality/ crop yield/ crude protein / cultivation/ fruits/ lycopene/ maize/ maize straw/ manures/ peat/ plant disorders/ plant residues/ protected cultivation/ reducing sugars/ sawdust/ soilless culture/ straw/ substrates/ tomatoes/ vermiculite/ wheat/ wheat straw/ yield components/ corn/ cultivation under glass or plastic/ vitamin C
Abstract: A greenhouse experiment was conducted to determine the effects of different organized soil mixtures on the yield and quality of tomato cv. Zhongza No.9. The treatments comprised: 25% manure + 75% wheat straw (T_1); 25% manure + 75% sawdust (T_2); 25% manure + 75% maize stalk (T_3); 25% manure + 75% mushroom residue (T_4); 25% manure + 50% maize stalk + 25% wheat straw (T_5); 25% manure + 50% maize stalk + 25% sawdust (T_6); 25% manure + 50% maize stalk + 25% peat (T_7); 25%

manure + 50% maize stalk + 25% mushroom residue (T_8); 25% manure + 50% maize stalk + 25% vermiculite (T_9); and 37.5% manure + 50% maize stalk + 12.5% wheat straw ash (T_1). The highest number of fruits per plant (26.3), yield per plant (3.81 kg) and contents of reducing sugar (4.55%), crude protein (0.95%), ascorbic acid (16.9 mg/100 g) and soluble solids (6.4%) were obtained with T_2. T_9 gave the highest average fruit weight (146 g) and lowest ratio of blossom end rot incidence (2.0%), while T_8 gave the highest lycopene content (48.5 mg/100 g). Comparative data on the changes of physical properties of different substrates from sowing to harvest are also tabulated.

1050. **Effects of phosphorus and nitrogen manipulations on tallgrass prairie restoration.**
Kincaid, P.; Smith, V. H.; Foster, B. L.; and Madden, V. L.
Proceedings Rocky Mountain Research Station, USDA Forest Service RMRS P 24: 364-369. (2002)
Descriptors: ammonium nitrate/ application rates/ establishment/ grasslands/ nature conservation/ nitrogen/ nitrogen fertilizers/ nutrient availability/ phosphorus/ phosphorus fertilizers/ prairie soils/ prairies/ sawdust/ soil fertility/ soil types/ superphosphate/ phosphate fertilizers/ United States of America
Abstract: A study was initiated in spring 1996 to determine the effects of experimental N and P manipulations on the establishment success of two native bunchgrass species (Andropogon gerardii and Sorghastrum nutans) within replanted tallgrass prairie plots located near Lawrence, Kansas, USA. The N availability treatments included 2 levels of N depletion, 31.25 and 62.50 g m-2 year-1, which were accomplished using surface soil additions of mixed hardwood and softwood sawdust from a local sawmill; a set of controls, which received neither sawdust nor N additions; and N enrichment levels, which received 6 different supply rates of surface-applied commercial 34-0-0 ammonium nitrate fertilizer (1.0, 2.0, 3.4, 5.4, 7.5 and 9.5 g m-2 year-1). To increase the degree of N-limitation in half of the experimental units, 3 plots from each of the 9 N availability treatments were randomly selected in spring 1997. Since 1997, these 3 plots have also received an additional 11.25 g m-2 year-1 of surface-applied commercial 0-0-18 superphosphate fertilizer. Results strongly suggest that soil P can mediate the effects of variations in soil N supply on the abundance of the 2 native prairie grasses.

1051. **Effects of soil amendment with sawdust and rice husks on the growth and incidence of seedling blight of Tamarindus indica Linn.**
Muhammad, S.; Abubakar, A.; Magaji, M. D.; and Amusa, T.
Journal of Sustainable Agriculture and the Environment 3(1): 39-44. (2001); ISSN: 1119-8152
Descriptors: cultural control/ fungal diseases/ leaves/ plant disease control/ plant diseases/ plant height/ plant pathogenic fungi/ plant pathogens/ rice husks/ sawdust/ seedling growth/ seedlings/ soil amendments/ tamarinds/ Coelomycetes/ Hyphomycetes/ phytopathogens/ rice hulls
Abstract: Soil in pots were pasteurized and infected with cultures of Macrophomina phaseolina and Rhizoctonia solani. The soil was impregnated with sawdust and rice husk, respectively. The amended soils in pots were allowed to stand for 5, 10, 15 and 20 days before sowing the seeds of T. indica. The incidence of seedling blight diseases was less in seedlings raised in soils with sawdust and rice husk amendments. The increase in the number of days between amendment application and planting also influenced the reduction in the incidence of seedling blight. The number of compound leaves and plant height were significant in seedlings produced from seeds sown at 20 days after the application of soil amendment. Sawdust was more effective in the reduction of the incidence of seedling blight of T. indica.

1052. **The effects of soil amendments with sawdust and rice husks on the incidence of seedling blight caused by Fusarium solani and Rhizoctonia solani and the growth of Parkia biglobosa.**
Muhammad, S.; Amusa, N. A.; Suberu, H. A.; Abubakar, A.; and Magaji, M. D.
Moor Journal of Agricultural Research 2(1): 40-46. (2001); ISSN: 1595-4153
Descriptors: fungal diseases/ growth/ leaves/ plant diseases/ plant height/ plant pathogenic fungi/ plant pathogens/ rice husks/ sawdust/ seedlings/ seeds/ soil amendments/ yield components/ Hyphomycetes/ phytopathogens/ rice hulls
Abstract: Soil in pots, was sterilized and infected with cultures of Fusarium solani and Rhizoctonia solani. The soil was impregnated with sawdust and rice husk respectively. The amended soil in pots was allowed to stand for 0, 5, 10, 15, and 20 days before planting seeds of P. biglobosa. The incidence of seedling blight diseases was less in seedlings raised in soils with sawdust and that of rice husk amendments respectively, allowing the soil in pots to stay for some days after the amendment, before planting also influenced the reduction in the incidence of the seedling blight. The number of compound leaves and plant height were significant in seedlings whose seeds were sown after 20 days of soil amendment. Sawdust amendment however, was found to be more effective in reducing the incidence of seedling blight of P. biglobosa.

1053. **Effects of strains and medium compositions on yield and cell toxic activities of fruit bodies in sawdust-based cultivation of Yamabushitake (Hericium erinaceum).**
Tsujii, H.; Suenari, M.; and Masuno, K.
Bulletin of the Shinshu University Alpine Field Center 1: 73-79. (2003)
Descriptors: antineoplastic properties/ cell cultures/ crop yield/ cultivation/ cytotoxicity/ HeLa cells/ maize cobs/ medicinal fungi/ neoplasms/ pharmacology/ strain differences/ substrates/ wheat bran/ Basidiomycetes/ cancers/ Hericiaceae/ Hericiales/ Hericium/ Hericium erinaceus
Abstract: A study was conducted to compare the cultivation period, yield and cell toxic activity of 6 strains of Yamabushitake (H. erinaceum [H. erinaceus]) in sawdust-based cultivation. Six strains, maintained in the Nagano Forestry Centre, were used: 4 from Japan, one from Taiwan and one from China. Cell toxicity was determined by adding hot water extracts of fruit bodies to growing HeLa cells. All the 6 strains had cytotoxic activity. Two strains, Y5

and Y6, had the ability to form mature fruit bodies in a short period of cultivation and higher yield than the other 4 strains. On the other hand, the extracts from Y1 and Y2 exhibited the highest cell toxicity potential. The effects of using different maize cob meal levels and supplements were also investigated. Addition of maize cob meal as substrate to sawdust media decreased fruit body yield, shortened the cultivation period and increased cytotoxic activity. Addition of wheat bran as a supplement to the sawdust media improved cytotoxic activity but decreased fruit body yield. The results indicate that mature fruit body with high cytotoxic activity can be produced if Japanese strains such as Y1 and Y2 are cultivated with maize cob meal as a substrate and wheat bran as a supplement to sawdust media.

1054. **Effects of straw, sawdust and sand bedding on dairy manure composting.**
Michel Jr., F. C.; Keener, H. M.; Rigot, J.; Wilkinson, T.; and Pecchia, J.
In: Asae Annual International Meeting 2004.
Ottawa, ON; pp. 4669-4682; 2004.
Descriptors: ammonia loss/ composting/ dairy/ manure/ nitrogen loss/ sawdust/ straw/ windrow/ ammonia/ manures/ nitrogen/ sawdust/ straw/ ammonia loss/ dairy/ nitrogen loss/ windrow/ composting/ ammonia / composting/ manure/ nitrogen/ saw dust/ straw
Abstract: Composting is an increasingly popular manure management tool for dairies. However, there is little information on the effects of common amendment and bedding types (straw, sawdust and sand) on windrow size, mass, volume, dry matter, and nitrogen losses during composting. In this study, straw, sawdust and sand bedded dairy manures were amended with either sawdust or straw and composted on multiple occasions. Results showed that starting windrow volumes for straw amended composts were 2.1 to 2.6 times greater than for sawdust windrows. Straw amended composts had lower initial bulk densities and temperatures, higher free air space values (75-93%), and near ambient interstitial oxygen concentrations during composting as compared to sawdust amended composts. Sand bedding resulted in greater compost densities, less weight loss and >50% more final compost on a per cow basis. All sawdust-amended composts self-heated to >55°C within 10 days. Sawdust composts without sand maintained these levels for more than 60 days meeting pathogen reduction guidelines. However, none of the straw-amended or sand bedded sawdust amended composts met the guidelines. All of the composts were stable after 100 days and exhibited manure volume and weight reductions relative to the initial manure. Initial compost C:N ratios ranged from 25:1 to 50:1 and the manure nitrogen lost during composting ranged from 2% to 38%. There was a negative correlation between initial compost C:N ratio and nitrogen loss (R 2=0.59). An initial C:N ratio of greater than 40 resulted in nitrogen losses less than 10% during dairy manure composting with all three bedding types.

1055. **The effects of substrates prepared by tea waste and disinfection methods on the yield and quality of Pleurotus sajor-caju .**
Dogan, H. and Peksen, A.
Ondokuz Mays Universitesi, Ziraat Fakultesi Dergisi 18(1): 39-48. (2003); ISSN: 1300-2988.
Notes: Original title: Cay atklarndan hazrlanan yetistirme ortamlar ve dezenfeksiyon yontemlerinin Pleurotus sajor-caju 'nun verim ve kalitesine etkisi.
Descriptors: agricultural byproducts/ chemical control/ climatic seasons/ crop yield/ disinfection/ edible fungi/ methyl bromide/ pasteurization/ sawdust/ straw/ substrates/ summer/ tea/ wheat/ wheat bran/ wheat straw/ winter/ wood residues/ bromomethane/ Lentinaceae/ pasteurizing / Poriales
Abstract: Studies were conducted during the summer and winter growing seasons to determine the possible use of East Black Sea tea factory wastes as growth substrates for the cultivation of Pleurotus sajor-caju. The most suitable disinfection method (autoclave, pasteurization, and methyl bromide) for the substrates was also determined. The substrates were tea wastes, wheat straw, sawdust, and wheat bran. The highest total mushroom yield (175.29 g/1 kg substrate) was obtained from tea waste:wheat bran:wheat straw (1:1:2) substrate disinfected by autoclave in the winter season. Tea waste:wheat bran (1:3) and tea waste:wheat straw (2:2) substrates disinfected by autoclave gave the highest mushroom yield (156.29 and 154.43 g/1 kg substrate, respectively) in the summer season.

1056. **Effects of the type and application season of animal manure on herbage productivity and utilization efficiency of animal manure in mixed grassland.**
Yook WanBang; Choi KiChun; and Ryu GeunChang
Journal of the Korean Society of Grassland Science 24(1): 71-80. (2004)
NAL Call #: SB202.K6H352; ISSN: 1013-9354
Descriptors: animal manures/ application date/ application methods/ autumn/ biomass production/ cattle manure/ cattle slurry/ nitrogen/ nitrogen content/ nutritive value/ pig manure/ sawdust/ soil fertility/ soil organic matter/ split dressings/ spring/ use efficiency/ fall/ nutritional value/ organic matter in soil/ quality for nutrition/ split applications
Abstract: A study was conducted to investigate the effects of the type and season of animal manure (AM) application on herbage productivity and nitrogen use efficiency in a mixed grassland. The treatments consist of: cattle feedlot manure (CFM), swine manure fermented with sawdust (SMFWS) and cattle slurry (CS) and application in autumn or spring as single dressing and 50:50 split dressing. The herbage productivity and nutritive value were hardly influenced by the type and season of AM application. The nitrogen use efficiency of CFM and CS was lower than that of SMFWS. Soil organic matter (OM) content was not significantly affected by the type and season of AM application. The highest OM content was observed in CFM and lowest with CS. The soil nitrogen content was not significantly affected by the type and season of AM application.

1057. **Effects of three types of free-stall surfaces on preferences and stall usage by dairy cows.**
Tucker, C. B.; Weary, D. M.; and Fraser, D.
Journal of Dairy Science 86(2): 521-9. (Feb. 2003)
NAL Call #: 44.8 J822 ; ISSN: 0022-0302
Descriptors: animals/ behavior, animal/ cattle: physiology/ female/ housing, animal
Abstract: One important criterion in choosing appropriate housing systems for dairy cattle is that the freestall provides a comfortable surface for the cow. This paper describes two experiments testing the effects of commonly used lying surfaces on stall preference and stall usage by Holstein cows. In both experiments, 12 cows were housed individually in separate pens. Each pen contained three free stalls with a different surface: deep-bedded sawdust, deep-bedded sand, and a geotextile mattress covered with 2 to 3 cm of sawdust. The animals were restricted to each surface in turn, in a random order for either 2 (Experiment 1) or 3 d (Experiment 2). Both before and after this restriction phase, the animals were allowed access to all three surfaces, and preference was determined, based on lying times. Of the 12 cows used in Experiment 1, 10 preferred sawdust before and nine after the restriction phase. During the restriction phase, average lying times and number of lying events during the restriction phase were significantly lower for the sand-bedded stalls (P < or = 0.05), and standing times were higher on mattresses (P < or = 0.05), compared with sawdust. Although these cows had some experience with all three surfaces during the experiment, they had been housed in sawdust-bedded stalls during their previous lactation. Cows used in Experiment 2 had spent their previous lactation in sand bedded stalls. In this experiment, about half the cows preferred sand and half sawdust, after the restriction phase. During the restriction phase of experiment, lying times and number of lying events were lower, and standing times were higher when the animals were restricted to the mattresses compared to either sand or sawdust (P < or = 0.05). These results indicate that (1) free stall surface can affect both stall preferences and stall usage, and (2) mattresses are less preferred.
This citation is from PubMed.

1058. **Effects of types and application levels of swine manure on herbage productivity, improvement of soil fertility and environmental pollution in mixed grassland.**
Yook, W. B.
Journal of the Korean Society of Grassland Science 23(3): 193-202. (2003)
NAL Call #: SB202.K6H352; ISSN: 1013-9354
Descriptors: application rates/ clay loam soils/ dry matter/ grass sward/ grasslands/ herbage/ leaching/ nitrate/ nitrogen/ nutritive value/ organic matter/ pig manure/ pig slurry/ pollution/ productivity/ sawdust/ silty soils/ soil fertility/ soil types/ urea fertilizers/ environmental pollution/ nutritional value/ quality for nutrition/ South Korea
Abstract: This study was conducted to investigate the effects of the type and application level of swine manure on herbage productivity, efficiency of nitrogen utilization and environmental pollution due to leaching of nitrogen compounds in mixed grasslands. The field experiment was carried out on established grassland sward growing on silt clay loam soil in Korea Republic. Main plots were applied with different types of swine manure: swine manure fermented with sawdust (SMFWS), swine manure fermented without sawdust (SMF), swine slurry (SS) and mineral fertilizer (urea). In the subplots swine manure were applied at 100, 200 and 400 kg N/ha. The highest values of herbage productivity, nutritive value and nitrogen yields were observed in plots with mineral fertilizer, followed by SS and the lowest values were in SMFWS. The dry matter (DM) yield of plots with mineral fertilizer was 100%, while the DM percents of SMFWS, SMFS and SS were 90.6. 80.9 and 76.8%, respectively. Organic matter (OM) contents of the soils were increased by the applications of swine manure. OM contents were high in plots with SMFS and lowest in plots mineral fertilizer. The amounts of nitrate leaching by types and application levels of swine manure were highest during the end of August and early September and ranged from 10 to 25 ppm.

1059. **Effects of vermicompost as substrate amendment on the growth of papaya (Carica papava l.).**
Acevedo, I. C. and Pire, R.
Interciencia 29(5): 274-279 and 231. (2004); ISSN: 03781844.
Notes: Original title: Efectos del lombricompost como enmienda de un sustrato para el crecimiento del lechosero (Carica papaya l.). Language of original document: Spanish.
Descriptors: biodiversity/ ecosystems/ fertilizers/ plants (botany)/ sand/ sawdust/ substrates/ volatile organic compounds/ cattle manure/ crop fertilizers/ vermicomposts/ crops/ bos taurus/ Carica/ Carica papaya
Abstract: Among crop fertilizer practices with low impact on ecosystems, the use of organic materials such as vermicompost has been proposed. The object of this research was to evaluate the effect of the addition of a vermicompost, obtained from cattle manure and coffee pulp, to substrates for the growth of papaya plants. Two experiments were conducted under nursery and field conditions for 60 and 120 days, respectively. In the first one vermicompost was applied alone, while in the second it was applied along with a nitrogen fertilizer. The vermicompost was added in proportions of 0, 5, 10, 15, 20 and 25% to a substrate made of rice hulls, coconut sawdust and thin sand (1:1:1). The nitrogen fertilizer was applied at decreasing ratios in order to keep a constant amount of this element. Both experiments were conducted under a randomized design with 6 treatments, 8 plants per plot and 3 replicates per experiment. The vegetative growth of the plants was evaluated through leaf area, plant height, stem thickness and total dry weight. The largest growth was found with the highest ratios of vermicompost without fertilizer addition, while when nitrogen was added, intermediate ratios were more efficient. The results show the benefits of vermicompost as a substrate amendment for vegetative growth of papaya plants under nursery and field conditions.

1060. **Effects of wood-ash addition on soil solution chemistry and soil N dynamics at a Picea abies (L.) Karst. site in southwest Sweden.**
Hogbom, Lars; Series: Report / SkogForsk, 1103-6648 ; Report (Stiftelsen skogsbrukets forskningsinstitut) 4. (2001).

Notes: Includes bibliographical references (p. 19-20)
NAL Call #: SD211 .R47 2001 no.4
Descriptors: wood ash / soil-solution chemistry/ soil-N dynamics/ Picea abies/ Sweden
This citation is from AGRICOLA.

1061. **Efficacy of organic soil amendments on the population of Meloidogyne incognita on okra in South Western Nigeria.**
Nwanguma, E. I. and Fawole, B. I.
Nigerian Journal of Horticultural Sciences 9: 89-95. (2004); ISSN: 1118-2733
Descriptors: application rates/ crop residues/ cultural control/ decomposition/ nematode control/ okras/ organic amendments/ organic wastes/ pest control/ plant parasitic nematodes/ plant pests/ population density/ poultry manure/ sawdust/ soil amendments/ eelworms/ poultry litter/ Secernentea/ Tylenchida
Abstract: The efficacy of organic soil amendments on the populations of Meloidogyne incognita on okra were investigated in two field trials. Organic wastes comprising fresh poultry mature, crowding, fruits peelings and sawdust were each ploughed 15 cm into the soil at the rates of 0,4, 8 and 16 th/ha, respectively, most significant suppressive effect on soil and root nematode populations. The populations observed in sawdust-amended soil was the lowest. An inverse relationship was observed between nematode populations and rates of each manure type and decomposition period. Similar trends of results were observed in the effects of manure type x manure type x decomposition period interactions on the tested parameters. However, 8 t/ha of poultry in manure (PM) with 6 weeks decomposition period (PM x 8 t/ha x 6 wk) interaction recorded the most outstanding effect other interactions.
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1062. **Efficiency of Trichoderma viride Pers: Fr. with wheat bran/sawdust on damping-off of tomato seedlings caused by Pythium indicum Bal.**
Neelamegam, R.
Advances in Plant Sciences. 2006; 19(2): 381 386 19(2): 381-386. (2006)
NAL Call #: QK1.A38; ISSN: 0970-3586
Descriptors: biological control/ biological control agents/ biomass production/ cultural control/ dry matter accumulation/ fungal antagonists/ fungal diseases/ integrated control/ plant disease control/ plant diseases/ plant pathogenic fungi/ plant pathogens/ sawdust/ seed germination/ seedling growth/ seedlings/ tomatoes/ vigour/ biocontrol agents/ biological control organisms/ Hyphomycetes/ integrated plant protection/ Peronosporomycetes / phytopathogens/ Pythiaceae/ Straminipila/ vigor
Abstract: The integration of T. viride and sawdust (1.0%) was more effective in the reduction of the incidence of damping off (15%) than T. viride (44%) or wheat bran (59%) in P. indicum [P. deliense]-inoculated unsterilized soil. However, wheat bran (0.1%) resulted in the greatest tomato (cv. Co-1) seed germination (100%), seedling growth (17.8 cm), and seedling vigour index (1780) in unsterilized soil treated with P. indicum and T. viride. Biomass (dry matter) production was greatest (21.3 mg per plant) in P. indicum-inoculated unsterilized soil amended with T. viride and sawdust.
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1063. **Elemental composition of bean (Phaseolus vulgaris) and soy bean (Glycine max L.) grown on wood ash amended soil.**
Mbaherekire, B. J.; Oryem Origa, H.; Kashambuzi, J.; Mutumba, G. M.; and Nyangababo, J. T.
Bulletin of Environmental Contamination and Toxicology 70(4): 817-823. (Apr. 2003)
NAL Call #: RA1270.P35A1; ISSN: 0007-4861 [BECTA6]
Descriptors: wood ash / soil amendments/ soybeans/ roots/ shoots/ seeds/ biomass/ heavy metals/ chemical constituents of plants/ Uganda/ plant height
This citation is from AGRICOLA.

1064. **Emergence and vigor of guava seedlings on different substrates.**
Smiderle, O. J. and Minami, K.
Revista Cientifica Rural 6(1): 38-45. (2001); ISSN: 1413-8263.
Notes: Original title: Emergencia e vigor de plantulas de goiaba em diferentes substratos.
Descriptors: guavas/ porosity/ pretreatment/ sand/ sawdust/ seed treatment/ seedling emergence/ seedlings/ seeds/ soil/ substrates/ vigour/ water holding capacity/ vigor
Abstract: A greenhouse experiment was conducted to evaluate the effects of different substrates on the percentage and speed of emergence and vigour of guava seedlings. Guava seeds were collected from ripe fruits in a commercial orchard in Guapore, Rio Grande do Sul, Brazil. The seed treatments were: (i) soaking in distilled water for 72 h; (ii) no soaking. After each treatment, seeds were sown in polypropylene trays with different substrates (soil, soil + sand and soil + eucalyptus sawdust) and placed in the greenhouse for seedling emergence. Among the substrates, soil + sawdust exhibited the highest porosity and capacity for water retention. The highest percentage of seedling emergence was obtained with soil + sawdust as substrate, while the highest speed of emergence was obtained with soil + sand as substrate. Pre-soaking the seeds anticipates the initiation of seedling emergence.
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1065. **Emissions of ammonia, nitrous oxide, methane, carbon dioxide and water vapor in the raising of weaned pigs on straw-based and sawdust-based deep litters.**
Nicks, Baudouin; Laitat, Martine; Vandenheede, Marc; Desiron, Alain; Verhaeghe, Claire; and Canart, Bernard
Animal Research 52(3): 299-308. (2003); ISSN: 1627-3583
Descriptors: emissions/ ammonia/ nitrous oxide/ methane/ carbon dioxide/ water vapor/ weaned pigs/ straw-based litter/ sawdust-based litter
Abstract: Five successive batches of 40 weaned pigs were raised on deep litter of sawdust or straw without changing the litter in between batches. The quantity of litter dry matter utilized in the two cases was 5 kg per pig. The concentrations of gases were measured 8 times, at about

one-month intervals, for 6 consecutive days and the ventilation flow was recorded continuously. Pig raising on sawdust-based litter differed from that with straw by an emission of 2.6 times less ammonia (0.46 vs. 1.21 g per pig per day), 2.1 times less methane (0.77 vs. 1.58 g per pig per day), 3.9 times more N2O (1.39 vs. 0.36 g per pig per day), 4% more CO2 (481 vs. 463 g per pig per day) and 21% more H2O (1126 vs. 933 g per pig per day). All differences were significant. About 58% of the nitrogen excreted by the pigs was recovered in the gas form and for the two litters, about 79% in the form of N2.

1066. **Enhancing biological control in orchards by increasing food web biodiversity.**
Brown, M. W. and Tworkoski, T.
Journal of Fruit and Ornamental Plant Research 14(Supplement 3): 19-27. (2006); ISSN: 1231-0948
Descriptors: apples/ chemical control/ composts/ crop yield/ cultural control/ detritivores/ diuron/ eugenol/ fruits/ herbicides/ insect pests/ integrated control/ mulches/ mulching/ natural enemies/ peaches/ plant pests/ population density/ poultry manure/ predatory arthropods/ sawdust/ soil arthropods/ terbacil/ weed control/ weeds/ DCMU / integrated plant protection/ mulching materials/ poultry litter/ United States of America/ weedicides/ weedkillers
Abstract: The effects of mulch, compost and herbicides on weed and insect communities in apple and peach orchards were studied in Kearneysville, West Virginia, USA, during 1999-2003. In 16-year-old apple orchards, poultry manure compost was applied in areas that had not been treated or treated with pre-emergent herbicides (diuron and terbacil). Pitfall traps were used to sample ground-dwelling arthropods in treated areas. The application of compost significantly increased the abundance of the detritivores and predators. The herbicides increased the abundance of herbivores dominated by migrating first-instar Eriosoma lanigerum. The predator-herbivore ratio was highest in plots with compost only (0.85), followed by compost and herbicide (0.32), compost without herbicide (0.32), and herbicide without compost (0.15). Orchards of apple cv. Ace Spur Delicious on M.7 rootstock and peach cv. Redhaven on Lovell rootstock were treated during 2002 with the following: 5% aqueous eugenol in May and June; composted sawdust mulch (8 cm deep) in June and 5% eugenol in May and June; or 0.56 kg paraquat/ha in May, June, July and August. Eugenol gave excellent weed control for one month but reapplication was necessary. Weed cover by the end of the first season was reduced to 54% with eugenol, 8% with composted sawdust mulch + eugenol; and 2% with paraquat. Weed control treatments did not affect fruit yield and weight. The results indicated that mulch + post-emergence eugenol was as effective in weed control as 4 paraquat applications.

1067. **Environmental and technical aspects of raising fattening pigs and weaned pigs on sawdust-based or straw-based deep litters.**
Nicks, B. and Lekeux, P.
Annales De Medecine Veterinaire 149(1 SPEC.): 31-36. (2005); ISSN: 00034118.
Notes: Original title: Aspects environnementaux et zootechniques de l'élevage de porcs charcutiers et de porcelets sevrés sur litičres accumulées de sciure ou de pail.
Language of Original Document: French.
Descriptors: Sus scrofa

1068. **Environmental results of keeping weaner pigs on a deep litter with sawdust.**
Nicks, B.; Laitat, M.; Desiron, A.; Vandenheede, M.; and Canart, B.
Journees de la Recherche Porcine en France 31: 105-109. (1999)
NAL Call #: SF391.I53 ; ISSN: 0767-9874.
Notes: Original title: Bilan environnemental de l'hebergement de porcelets sevres sur litiere accumulee de sciure.
Descriptors: ammonia/ deep litter housing/ dry matter/ evaporation/ growth/ litter/ liveweight/ manures/ particle size/ pig housing/ piglets/ sawdust/ temperature/ hogs/ piggeries/ sties/ swine/ swine housing
Abstract: Six batches of weaner pigs (N=440) were reared successively on a deep litter with sawdust without cleaning between the batches. The average liveweight of the pigs at the beginning and at the end of the post-weaning period was 8.4+or-2.4 and 26.0+or-4.6 kg. The average daily gain was 422+or-98 g. Each piglet needed 12 kg of sawdust and produced 15 kg of manure. The average temperature of the litter at 20 cm depth was 33.8 degrees C. At the end of the experimental period, the dry matter (DM) content of the litter was 49% and the N content 19 g/kg DM. The C/N ratio decreased progressively from 82 to 25. The water evaporation rate was 92% and the N gas-emission rate 75%. The amount of N in the compost was 139 g/piglet. The average NH_3 concentration in the experimental rooms was 8.7+or-5.2 ppm and the dust concentration 270+or-136 particles/ml. 90% of particles were in the size range of 0.3-0.5 micro m. To decrease the dust concentration water was regularly added to the litter at a rate of 0.94 l/kg sawdust.
This citation is from AGRICOLA.

1069. **Equipment performance for determining water needs of tomato plants grown in sawdust based substrates and rockwool.**
Dorais, M.; Caron, J.; Begin, G.; Gosselin, A.; Gaudreau, L.; and Menard, C.
Acta Horticulturae 691(1): 293-304. (2005)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: chlorophyll/ photosynthesis/ plant water relations/ protected cultivation/ rockwool/ sawdust/ soilless culture/ substrates/ tensiometers/ tomatoes/ water requirements/ carbon assimilation/ carbon dioxide fixation/ cultivation under glass or plastic/ mineral wool/ rock wool
Abstract: There might be a benefit in using sawdust for replacing rockwool in terms of reducing substrate costs while maintaining an adequate productivity and root growth. However, recent research showed that water availability and transfers in sawdust were limited, thereby increasing water stress during active plant growth. To lessen this risk, the objective of this study was to characterize the relationship of substrate matric potential with volumetric water content and dielectric (TDR) sensor in a range of soilless substrates moisture that could be observed in greenhouses. In addition, we investigated whether TDR, load cell, tensiometer and canopy temperature could

accurately sense plant water stress and monitor and control irrigation scheduling for tomato plants grown in sawdust-based substrates. Thus, equipments were installed in 3 substrates (1 - rockwool, 2 - pure sawdust, and 3 - 70% sawdust + 30% wood fibres) for the production of greenhouse tomato grown on raised-gutters with supplemental lighting. Under different solar radiation in winter and spring, and different water contents of the growing media, we measured gas exchanges, Chl a fluorescence and leaf water potential. We also measured plant growth and productivity during the whole growing seasons. For sawdust + wood fibre substrate, there were significant correlations between TDR, load cell, and tensiometer. Matric potentials were generally correlated to TDR and load cell of sawdust and rockwool substrates. The canopy temperature was a poor indicator of the matric potential but a good indicator of the substrate water content during spring. Regardless of the growing season, TDR and load cell measurements were correlated to CO_2 assimilation rate and F_v/F_m ratio of plant grown in sawdust based substrates and rockwool. However, relationships between water content measurements, matric potential, and physiological parameters varied with the growing media and season. No significant differences were observed for plant development, leaf area, plant dry weight, carbohydrate partitioning and yield of tomato plants grown under different growing media.
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1070. **Establishment of cattle waste manure composting technique for consideration of crop and soil, 3: Verification of factor that cattle waste compost with sawdust is avoided.**
Fukushima, M; Wakisaka, H.; and Kanbe, Y.
Bulletin of the Tochigi Prefectural Livestock Experiment Station (Japan) 22: 29-34 . (Feb. 2007); ISSN: 0288-9536.
Notes: Summary (Ja). Citation notes: JP (Japan).
Descriptors: cattle/ manure/ composting/ crops/ soils/ sawdust

1071. **Evaluation of allelopathic potential of wood chips for weed suppression in horticultural production systems.**
Rathinasabapathi, B.; Ferguson, J.; and Gal, M.
HortScience: A Publication of the American Society for Horticultural Science 40(3): 711-713. (June 2005)
NAL Call #: SB1.H6; ISSN: 0018-5345
Descriptors: wood chips/ mulches/ allelopathy/ weed control/ commercial horticulture/ horticulture/ leaves/ Lactuca sativa/ lettuce/ vegetable crops/ bioassays/ Desmodium tortuosum/ broadleaf weeds
Abstract: Shredded and chipped wood mulches are used for weed suppression in perennial fruit crops, in urban landscapes, and occasionally in vegetable crops. Wood chip mulches with weed-suppressing allelochemicals may be more effective for weed control, especially under sustainable and organic production systems, than mulches without such properties. The objective of this study was to test for the presence of water-soluble allelochemicals in wood chips derived from tree species, often found in wood resource recovery operations in the southeastern US. Presence of allelochemicals in water eluates of woodchips and leaves was evaluated in a lettuce bioassay. Eluates of wood chips from red maple (Acer rubrum L.), swamp chestnut oak (Quercus michauxii Nutt.), red cedar (Juniperus silicicola L.H. Bailey), neem (Azadirachta indica A. Juss.), and magnolia (Magnolia grandiflora L.) highly inhibited germinating lettuce seeds, as assessed by inhibition of hypocotyl and radicle growth. The effects of wood chip eluates from these five species were more than that found for eluates from wood chips of black walnut (Juglans nigra L.,) a species previously identified to have weed-suppressing allelochemicals. Tests on red cedar, red maple, and neem showed that water-soluble allelochemicals were present not only in the wood but also in the leaves. In greenhouse trials, red cedar wood chip mulch significantly inhibited the growth of florida beggarweed (Desmodium tortuosum DC.), compared to the gravel-mulched and no-mulch controls.
This citation is from AGRICOLA.

1072. **Evaluation of compost for use as a soil amendment in corn and soybean production.**
Smiciklas, K. D.; Walker, P. M.; and Kelley, T. R.
Compost Science and Utilization 16(3): 183-191. (2008)
NAL Call #: TD796.5.C58 ; ISSN: 1065657X [CSUTE]
Descriptors: applications/ biogeochemistry/ biological materials/ fertilizers/ grain (agricultural product)/ magnesium printing plates/ manures/ nitrogen fertilizers/ organic compounds/ project management/ soils/ urea/ wood products/ application rates/ compost application rates/ compost applications/ dairy cows/ dry matters/ food wastes/ grain yields/ high organic/ high rates/ in fields/ indicator bacteria/ inorganic fertilizers/ organic matters/ research projects/ soil amendments/ soil characteristics/ soybean productions/ wood chips / composting/ compost/ conference proceeding/ crop production/ fertilizer application/ maize / soil amendment/ soybean/ bacteria/ compost/ corn/ fertilizers/ organic matter/ soil conditioners/ soy beans/ bacteria (microorganisms)/ bos/ glycine max/ zea mays
Abstract: The purpose of this research project was to 1) evaluate rate of compost application and 2) to compare compost with uncomposted raw material and inorganic fertilizer N application upon maize and soybean growth and productivity, and upon soil characteristics. During the first three years of the study, the source of uncomposted material and compost was food waste and ground newsprint. During years 4 to 9 of the study, the source of uncomposted material and compost was dairy cow manure and wood chips. Application rates in field site 1 were 0, 11.2, 22.4, 33.6 and 44.8 Mg ha-1 compost, 44.8 Mg ha-1 uncomposted material and 140 kg ha-1 fertilizer N (as urea). Application rates in field site 2 were 0, 22.4, 44.8, 67.2 and 134.4 Mg ha-1 compost, 134.4 Mg ha-1 uncomposted manure and 180 kg ha-1 fertilizer N (dry matter basis). The high rates of compost application significantly raised organic matter levels, and available P and K compared to inorganic fertilizer N. Uncomposted manure and increasing compost application rates significantly increased grain yield, number of kernels per plant and plant weight. Composting significantly reduced pathogen indicator bacteria concentrations. The data of this study suggest that on these high organic matter soils 22.4 Mg ha-1 to 44.8 Mg ha-1 are optimal compost application rates.

1073. **Evaluation of different composts from horticultural crop residues and their uses in greenhouse soilless cropping.**
Urrestarazu, M.; Salas, M. C.; Padilla, M. I.; Moreno, J.; Elorrieta, M. A.; and Carrasco, G. A.
Acta Horticulturae 549: 147-152. (2001)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: composts / cress/ crop residues/ crop yield/ cucumbers/ growing media/ inoculation/ lettuces/ melons/ peat/ perlite/ sawdust/ seed germination/ seedling growth/ soilless culture/ tomatoes/ wood shavings/ Capparales/ gherkins/ Hyphomycetes/ potting composts/ rooting media
Abstract: A study was conducted to evaluate the possibility of using different composts from horticultural residues under forced ventilation conditions with different levels of inoculation of microorganisms (inoculations each at 15 days from the beginning; one inoculation at the start of composting; and without inoculation, control). All compost treatments which started with a similar volumetric ratio, 2 pepper:1 cucumber:1 runner bean:1 wooden material (sawdust and industrial shavings), were inoculated with Trichoderma koningii and Coriolus versicolor. Germination assays were performed in cress (Lepidium sativum) and lettuce seeds to determine the compost maturity degree and indirectly the presence of phytotoxicity. In the vegetative growth test conducted using melon seedlings, treatments consisted of a mix of each compost and perlite, in a volume ratio of 1 compost:2 perlite, one control treatment with perlite and another replacing the compost component by peat moss (1 peat moss: 2 perlite). The effect on yield was tested using Lycopersicon esculentum var. cerasiforme under similar conditions as the growth test. Results indicate that to use the composts for seedling production, it would be necessary to correct the pH and reduce salinity by leaching. For crops with longer growing periods, the tendency was reversed due to similar values at the plant rhizosphere as those in standard conditions obtained with a daily pot fertigation. It is concluded that these composts could be used not only for compost amendment but as
horticultural and environmentally friendly substrates. They are able to substitute other traditional substances such as peat, at least during one growing period.
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1074. **Evaluation of nitrogen availability of composted poultry and sawdust cattle manures labeled with 15N on paddy field rice.**
Uenosono, S.; Nagatomo, M.; Takahashi, S.; Kunieda, E.; and Yamamuro, S.
Japanese Journal of Soil Science and Plant Nutrition 75(3): 313-319. (2004); ISSN: 0029-0610
Descriptors: ammonium sulfate/ carbon nitrogen ratio/ cattle manure/ composts/ mineralization/ nitrogen/ nutrient availability/ nutrient balance/ organic fertilizers/ paddy soils/ poultry manure / rape/ rice/ sawdust/ soil organic matter/ soil types/ swede rape/ ammonium sulphate/ canola/ Capparales/ oilseed rape/ organic matter in soil/ paddy/ poultry litter
Abstract: This study was conducted to investigate the availability and balance of nitrogen from 15N-labelled composted poultry manure and sawdust-cattle manure by 15N tracer technique, and to compare these results to the 15N-labelled rape cake and chemical fertilizer, ammonium sulfate. In the field experiment, 15N recovery in rice plants from ammonium sulfate, rape cake, composted poultry and sawdust-cattle manure at maturity were 41.7, 28.7, 15.7 and 4.0% respectively. On the other hand, the 15N residual in the top soil (0-15 cm) from the same set were 35, 41, 47 and 91%, respectively. The mineral fertilizer equivalent of composted poultry manure, composted sawdust-cattle manure and rape cake were 40, 10 and 70%, respectively. The span of 15N availability from these manures was from active tillering stage to panicle formation stage. The trend of change of organic 15N recovery derived from 15N labelled matters in a laboratory incubation experiment was similar to that in the field experiment. It is suggested that the laboratory incubation experiment can characterize or predict the pattern of mineralization of organic matters in the actual field conditions.
This citation is from AGRICOLA.

1075. **Evaluation of non-chemical treatments in the control of Meloidogyne incognita on common bean.**
Ibrahim, A. A. M. and Ibrahim, I. K. A.
Pakistan Journal of Nematology 18(1/2): 51-57. (2000)
NAL Call #: QL391.N4P34; ISSN: 0255-7576
Descriptors: animal manures/ carbofuran/ cattle manure/ chemical control/ cultural control/ galls/ guavas/ leaves/ nematicides/ nematode control/ organic amendments/ pest control/ phytotoxicity/ plant parasitic nematodes/ plant pests/ poultry manure/ sawdust/ Botryocladia/ Botryocladia capillaceae/ eelworms/ Ficus microcarpa/ green bean/ poultry litter/ Rhodymeniaceae/ Rhodymeniales/ Secernentea/ snap bean/ Tylenchida/ Ulva/ Ulva fasciata/ Ulvaceae/ Ulvales
Abstract: A greenhouse study was conducted to evaluate the efficacy of 2 marine algae (Ulva fasciata and Botryocladia capillaceae), leaves of Eucalyptus sp., Ficus retusa and Psidium guajava (guava), manures of cattle, chicken and dove, and sawdust as soil amendments at 2% w/w, compared to carbofuran 10G in controlling the root-knot nematode M. incognita infesting common bean (Phaseolus vulgaris) cv. Giza 3. All treatments greatly suppressed the disease index (root galling) and nematode reproduction (egg mass production). The highest reduction in root galling (97.4%) and egg mass production (98.9%) was recorded for the treatment with U. fasciata. The relative efficacy of B. capillaceae, leaves of P. guajava, and the cattle and chicken manures was approximately equal to that of carbofuran in reducing the number of egg masses, while U. fasciata reduced egg mass production 18-fold compared with carbofuran. Fresh and dry weights of shoot and root systems of common beans were generally increased by carbofuran and all the tested organic amendments. Both Eucalyptus sp. and P. guajava leaves exhibited low phytotoxicity.
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1076. **Evaluation of simplified covering systems in the reduction of gaseous emissions from pig and cattle slurry storage.**
Guarino, M.; Navarotto, P.; Sonzogni, A.; Fabbri, C.; and Valli, L.
Rivista di Ingegneria Agraria (Italy) 35(3): 63-70. (Sept. 2004); ISSN: 0304-0593.
Notes: Original title: Valutazione di sistemi di copertura semplificati nella riduzione di emissioni gassose da

stoccaggi di liquami suini e bovini. Summary (En). Citation notes: IT (Italy).
Descriptors: manure slurry/ covering systems/ gaseous emissions/ swine manure/ cattle manure/ storage
Abstract: In Italy it has been estimated that atmospheric emissions from cattle and pig farms regard ammonia, methane and nitrous oxide production. A significant share of these emissions comes out from waste storage and treatment phases because of the decomposition of organic matter present in slurry. The proposed solutions for reducing emissions from storage lagoons have mainly concerned a reduction of the free surface of slurry by constructing very tall structures or by covering the storage lagoons. In this study, we investigated the effectiveness of a number of simplified floating covers at two different thickness (vegetable oil, maize stalks, light weight expanded clay aggregates, wood chips and wheat straw) in reducing ammonia, methane and odour emissions from pig and cattle slurry. Also their floating capacity was tested. Nine stain steel cylinders of 190 x 10E3 cube m with the possibility of a hermetic seal were used to allow monitoring the air in the headspace. For this analysis, the Brueel e Kjaer monitor (mod. 1302) and the olfactometer T07 were used. The results obtained showed good levels of ammonia emission reduction efficiency (66-100%) and odour abatement (52-90%) for all the tested covers at higher thickness. Some of these materials (clay aggregates, wood chips) also showed good capacity for long-term resistance to deterioration and sinking into slurry. Equally valid results were not obtained as far as methane emissions were concerned.

1077. **Evaluation of various potting media and fertilizer levels for commercial nursery production of Ficus benjamina L.**
Gad, M. M.
Assiut Journal of Agricultural Sciences 34(4): 123-151. (2003); ISSN: 1110-0486
Descriptors: application rates/ branches/ carotenoids/ chemical composition/ chlorophyll/ clay/ growing media/ leaf area/ leaves/ nitrogen content/ nitrogen fertilizers/ NPK fertilizers/ nurseries/ ornamental plants/ ornamental woody plants/ peat/ phosphorus/ phosphorus fertilizers/ plant composition/ plant height/ pot culture/ pot experimentation/ potassium/ potassium fertilizers/ root shoot ratio/ roots/ sand/ sawdust/ soilless culture/ stems/ straw/ traits/ vermiculite/ woody plants/ chemical constituents of plants/ ornamentals/ phosphate fertilizers/ potash fertilizers/ potting composts/ rooting media/ tetraterpenoids
Abstract: A pot experiment was conducted to study the effect of various potting mixtures and NPK fertilizer rates on the growth and quality of F. benjamina. The potting mixtures comprised: clay, clay + straw; clay + sawdust; peat moss; peat + clay; peat + vermiculite; peat + sand; vermiculite; vermiculite + straw; vermiculite + sawdust; sand + straw; and sand + sawdust. The NPK treatments comprised 0:0:0, 8:4:2 and 16:8:4 g NPK/pot. Peat moss alone produced the best vegetative and root characteristics compared to the other media. Peat moss increased plant height, stem diameter, number of branches and leaves, fresh weight of leaves, branches and roots, leaf size, total leaf area per plant and shoot:root ratio followed by peat + vermiculite and vermiculite + straw. The addition of either straw or sawdust to clay or sand showed a great reduction in plant growth. NPK at 16:8:4 g/pot gave the best increase in vegetative and root characteristics. High leaf contents of N, P, K, chlorophylls a and b, and carotenoids were closely correlated with the best growth and quality obtained with the most suitable media combined with high NPK rates.

1078. **Evaluation of weathered poultry manure, cow dung and sawdust in the management of Meloidogyne incognita race 2 in okra.**
Adekunle, O. K.
Environment and Ecology 25(2): 322-328. (2007)
NAL Call #: TD172.E5; ISSN: 0970-0420
Descriptors: application rates/ cattle manure/ growth/ nematode control/ okras/ pest control/ plant development/ plant parasitic nematodes / poultry manure/ sawdust/ Adenophorea/ Dorylaimida/ eelworms/ poultry litter/ Secernentea/ Tylenchida
Abstract: Greenhouse and field experiments were conducted in Nigeria to determine the efficacy of weathered poultry manure (14.35% N, 104.35 mg P/kg and 146.64 mg/kg), cow dung (10.75% N, 21.65 mg P/kg and 153.27 mg K/kg) and sawdust (2.84% N, 205.97 mg P/kg and 53.82 mg K/kg) applied singly at 1.5 and 3.0 t/ha on Meloidogyne incognita race 2 infesting okra. The application of weathered poultry manure, cow dung and sawdust to nematode-infested soil resulted in increased vegetative growth, reduced root galling increased yield of okra fruit but also an increase in soil populations of 4 genera of plant parasitic nematodes, namely Meloidogyne incognita, Longidorus spp., Xiphinema spp. and Pratylenchus spp.

1079. **Experiment on different formulae and covering soil of Pleurotus cornucopiae.**
Huang YuShan; Su GuiPing; and Chen MingBao
Edible Fungi of China 20(6): 12-13. (2001); ISSN: 1003-8310
Descriptors: casing/ cottonseed husks/ crop quality/ crop yield/ culture media/ edible fungi/ gypsum/ sawdust/ sugar/ wheat bran/ Lentinaceae/ Poriales
Abstract: P. cornucopiae was cultured on the following media: (1) 78% sawdust + 20% wheat bran (WB) + 1% brown sugar (BS) + 1% gesso [?gypsum], (2) 50% cottonseed hulls (CH) + 30% sawdust + 18% WB + 1% BS + 1% gesso, (3) 80% CH + 18% WB + 1% BS + 1% gesso, and (4) 20% CH + 60% sawdust + 17% WB + 1% BS + 1% gesso. The media were covered or not with soil. Yields were highest in (1), followed by (4), (3) and (2), but the differences in yield between the media were not significant. Covering with soil increased yield by about 80% compared with no covering, and improved quality (including colour, taste and size).

1080. **Exploring the mechanisms behind elevated microbial activity after wood ash application.**
Jokinen, H. K.; Kiikkilä, O.; and Fritze, H.
Soil Biology and Biochemistry 38(8): 2285-2291. (2006)
NAL Call #: S592.7.A1S6; ISSN: 00380717 [SBIOA].
Notes: doi: 10.1016/j.soilbio.2006.02.007.
Descriptors: dgge/ doc/ pH/ thymidine-incorporation/

bacteria/ carbon/ pH effects/ wood/ dgge/ doc/ relative bacterial growth rate (rbgr)/ thymidine-incorporation/ microbiology/ carbon/ dissolved organic carbon/ experimental study/ fertilizer application/ growth rate/ humus/ hydrophobicity/ incubation/ microbial activity/ relative abundance/ soil microorganism/ wood ash/ ash/ bacteria/ carbon/ microbiology/ pH/ wood/ bacteria (microorganisms)
Abstract: Wood ash fertilization increases the pH and concentration of dissolved organic carbon (DOC) in the soil solution and enhances the activity of soil microorganisms. However, it is unknown whether DOC or pH is primarily responsible for the increase in microbial activity. We designed an experiment to separate the effects of DOC and/or pH on soil microbial activity using suspensions of humus extracts and bacteria that had not previously been exposed to wood ash fertilization. After a 3-week incubation, DOC extracts were obtained from control (DOCC) and ash (DOCA) treatments with carbon concentrations of 9.1 and 32.5 mg C l-1, respectively. These extracts were supplied to bacterial suspensions at concentrations of 0 and 5 mg C l-1. We controlled for pH by matching adjustments, i.e. the original pH of the DOCC extract was 4.5 and its adjusted pH was 6.9, whereas the DOCA extract was pH 6.9 originally and pH 4.5 adjusted. The relative bacterial growth rate (RBGR), as measured by 3H-thymidine incorporation, increased in suspensions of 5 mg C l-1 DOC as compared to control suspensions of 0 mg C l-1. At pH 6.9, RBGR was higher for both DOC extracts than at pH 4.5. These results suggest that both DOC and pH influence microbial activity. As the growth rate at pH 6.9 with DOCA was higher than with DOCC, the quality of the DOC extract must also play a role since the carbon concentration was controlled for. The decrease in relative abundance of hydrophobic and hydrophilic acids in DOCA compared to DOCC indicates a quality shift. As measured by DGGE banding patterns, the bacterial community structure changed over the course of the 24-h experiment in the following three trials, all of which received 5 mg C l-1: DOCC at pH 6.9 and DOCA at pH 4.5 and 6.9. These results demonstrate that both the DOC origin (control vs. ash) and the pH influence a subset of the bacterial community. © 2006 Elsevier Ltd. All rights reserved.

1081. **Fate of nitrogen derived from 15N-labeled cattle manure compost applied to a paddy field in the cool climate region of Japan.**
Nishida, M.; Sumida, H.; and Kato, N.
Soil Science and Plant Nutrition 54(3): 459-466. (2008)
NAL Call #: 56.8 SO38; ISSN: 0038-0768
Descriptors: application rates/ cattle manure/ composts/ growth/ nitrogen/ paddy soils/ rice/ sawdust/ soil types/ uptake/ paddy
Abstract: To estimate the fate of nitrogen (N) derived from cattle manure compost with sawdust (CMC) in a paddy field in the cool climate region of Japan, well-composted 15N-labeled CMC was applied to a microplot field experiment. Throughout the experimental period of three crop seasons, N from CMC was taken up by rice plants without a marked decline. The percentages of N taken up derived from CMC to applied N as CMC (%CNRp) were 2-3% for each year. The N from CMC was taken up by rice plants over the entire growth period by 1-2, 2 and 2-3% as %CNRp at the panicle initiation, heading and maturity stages, respectively. A significant positive linear correlation was found between the cumulative compost N uptake and the number of days transformed to standard temperature (25 degrees C) over the entire experimental period, including the fallow season. The %CNRp was identical at CMC application rates ranging from 1 to 4 kg m-2. Using 15N-labeled CMC, the results showed that well-composted CMC was a stable N source for rice plants for at least 3 years, regardless of the CMC application rate (ranging from 1 to 4 kg m-2) in the cool climate region of Japan. The distribution of CMC N was 7% in the rice plants accumulated over 3 years, 66-69% in the soil and 24-27% was un-recovered at the end of the third crop season.

1082. **Fate of nitrogen derived from 15N-labeled plant residues and composts in rice-planted paddy soil.**
Ueno, H. and Yamamuro, S.
Soil Science and Plant Nutrition 47(4): 747-754. (2001)
NAL Call #: 56.8 SO38; ISSN: 0038-0768
Descriptors: cattle manure/ composts/ denitrification/ immobilization/ maize/ mineralization/ nitrogen/ nutrient uptake/ organic amendments/ paddy soils/ plant nutrition/ plant residues/ pot experimentation/ rice/ rice husks/ rice straw/ sawdust/ soil types/ straw/ corn/ paddy/ rice hulls
Abstract: Pot experiments that lasted for 3 years were conducted to investigate the dynamics of nitrogen derived from plant residues (rice root, hull, straw, maize root and rapeseed pod-wall), and composts (rice straw compost, cattle manure compost and cattle manure sawdust compost), which were labelled with 15N. The rates of nitrogen uptake by rice (=N efficiency), denitrification and immobilization derived from the organic materials incorporated before the first year of cultivation were investigated throughout 3 years of cultivation. At the end of the first year of cultivation, relatively high rates of N efficiency were obtained for rapeseed pod-wall (24.6%), rice straw (19.1%), and rice hull (18.6%), while maize root and cattle manure sawdust compost displayed a noticeably high denitrification rate. Maize root, cattle manure sawdust compost, rice hull, and rapeseed pod-wall exhibited remarkably high N mineralization rates ranging from 60 to 75% of the organic materials N applied. Cumulative rates of N efficiencies from the organic materials applied before the first year of cultivation fitted well to a first-order kinetic model and their asymptotes were compared among the organic materials. The asymptotic rates of N efficiency tended to depend on the rates at the end of the first year of cultivation.

1083. **Fattening pigs on a thin litter of wood grain or sawdust.**
Ramonet, Y. and Robin, P.
In: 34emes Journees de la Recherche Porcine, sous l'egide de l'Association Franccaise de Zootechnie.Paris, France.); pp. 143-148; 2002.
Notes: Original title: L'engraissement de porcs sur litiere de particules de bois ou de sciure en couche fine.
Descriptors: ammonia/ litter/ nitrogen/ sawdust/ ventilation/ wood dust/ hogs/ swine
Abstract: Balances of water and minerals, and performance of growing pigs were evaluated in a fattening

pig house with litter. The pig house was isolated and mechanically ventilated, the slope of the floor was low. Two batches of 48 pigs were fattened on two thin litters. The thickness and the composition of the litter were 24 cm of sawdust in room 1 and 15 cm of wood grain in room 2. To maintain the litter in an acceptable condition, it was necessary to add sawdust or wood grain in the two rooms. At the end of the growing period, the amount of litter produced in rooms 1 and 2 were 193 and 218 l per pig, respectively. During the breeding period, around 80% of the water excreted by pigs was evaporated. In the rooms 1 and 2, 63.2% and 62.8% of the total nitrogen of the manure was removed as gases, respectively. The estimation of the ammonia flow indicated that most of the lost nitrogen was emitted as ammonia, from which 70% in the last third part of the growing period.
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1084. **Fertilizing effects of swine compost fermented with sawdust on mixed pastures.**
Shin, J. S.; Cho YoungMu; Lee HyoHo; Yoon SeaHung; Park GeunJe; and Choi KiChun
Journal of the Korean Society of Grassland Science 24(3): 245-252. (2004)
NAL Call #: SB202.K6H352; ISSN: 1013-9354
Descriptors: botanical composition/ calcium/ composts/ crop mixtures/ crop yield/ crude protein/ dry matter/ fermentation/ fertilizers/ legumes/ magnesium/ phosphate/ pig manure/ potassium/ protein content/ sawdust/ soil chemical properties/ weeds/ chemical properties of soil/ South Korea
Abstract: An experiment was conducted in Suwon, Korea Republic, to investigate the effects of different fertilizer application rates of swine compost fermented with sawdust (SCS) and chemical fertilizer (CF) on the yield and soil chemical properties of mixed pastures sown in September 1993. The treatments include: T0-control; T1-CF (standard amount); T2-SCS (standard amount); T3-SCS(75% of standard amount); T4-SCS(50% of standard amount); T5-SCS(75%) + CF(25%); T6-SCS(50%) + CF(50%); and T7-SCS(25%) + CF(75%). The dry matter yields were similar among treatments except in control and T4. The percentage of legumes and weeds in each treatment was increased. The total digestible nutrients, NE and crude protein yields were nearly the same in the SCS fertilized plots compared to those of CF. Phosphate, potassium, magnesium contents and K:(Ca + Mg) except calcium content were generally higher in the SCS fertilized plots compared to those of CF.
This citation is from AGRICOLA.

1085. **Field evaluation of compost, sawdust and rice [Oryza sativa] straw biomass on soil physical and hydraulic properties.**
Eusufzai, M. K; Maeda, T.; and Fujii, K.
Journal of the Japanese Society of Soil Physics (Japan) 107: 3-16. (Nov. 2007); ISSN: 0387-6012.
Notes: Summaries (En, Ja). Citation Notes: JP (Japan).
Descriptors: compost/ sawdust/ rice/ Oryza sativa/ biomass/ hydraulic properties
Abstract: A field experiment was carried out to investigate the effects of compost, sawdust and rice straw biomass on soil three-phase composition, soil resistance to penetration, bulk density, near-saturated hydraulic conductivity, K (h), and soil water retention characteristics. The experimental design involved ten split blocks such that the non-amended one plot was considered as control and other nine plots were under each of compost, sawdust and straw treatments at application rates of 0.1, 0.2 and 0.3 cubic m/cubic m of apparent soil volume. Addition of compost, sawdust and straw showed potential for improvement of surface soil physical and hydraulic properties, then its effectiveness was partly dependent on amendment types and application rates. Three-phase composition of all amended soils showed solid-phase reductions and increase of total porosity. Generally, soil resistance and bulk density at all amendment plots were decreased, which was likely due to reduction in soil solid phases. A good correlation between soil resistance and bulk density was also observed. Except for sawdust applied at higher rate, the K(h) generally increased at any level of compost and straw incorporations, and this was attributed to the of reduction in solid phase of amended soils. Soil water content was relatively high at higher suction for compost amended soils, while improvement in soil water retention was limited at lower suction for sawdust, and gradually increased from low to high suction for straw amended soils, respectively.

1086. **A field growing system to reduce sulphur uptake of a crop grown in a moderately high sulphur soil: Preliminary report.**
Trolove, S. N. and Reid, J. B.
Agronomy New Zealand 32/33: 51-59. (2002); ISSN: 0110-6589
Descriptors: barley/ barley straw/ crop management/ crop production / crop yield/ cropping systems/ fertigation/ furrow irrigation/ furrows/ growth/ immobilization/ leaching/ nutrient content/ nutrient uptake/ onions/ roots/ sawdust/ silt loam soils/ soil types/ straw/ sulfur/ urea fertilizers/ elemental sulphur/ fertirrigation/ sulphur
Abstract: The nutrient composition of crops affects a range of characteristics, including yield, storage, protein composition, disease resistance, and flavour, e.g. low sulfur (S) onions are milder than high S onions. Vegetable growers have a limited range of options to manage the nutrient uptake of their crops. Uptake of specific nutrients can be increased by applying fertilizer, but there are no commonly practised techniques for reducing uptake of major nutrients. Here, we report the early testing of a new growing system to help control nutrient uptake. In this system, the plants are grown in 'V'-shaped furrows filled with sawdust and supplied with nutrients via drip tape. We compared five treatments for their ability to reduce S uptake in onions. The treatments were: sawdust-filled furrows (Sawdust), sawdust-and-soil-filled furrows (2:1 mix) (S&S), soil-filled furrows (SFF), barley straw (4 t DM ha-1)+urea (40 kg N ha-1) (BS), and soil (Control). All treatments were fertigated with the same amount of water and nutrients. Crop bulb yields were 61, 59, 71, 65 and 69 t FW ha-1 of bed (LSD0.05=7 t FW ha-1) and bulb S concentrations were 0.27, 0.31, 0.60, 0.48 and 0.51% (LSD0.05=0.06%) for the Sawdust, S&S, SFF, BS and Control treatments, respectively. Preliminary analysis suggests that the Sawdust treatment may have reduced S content by both immobilization and by excluding 38% of the roots from the soil.
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1087. **Flooring in front of the feed bunk affects feeding behavior and use of freestalls by dairy cows.**
Tucker, C. B.; Weary, D. M.; de Passille, A. M.; Campbell, B.; and Rushen, J.
Journal of Dairy Science 89(6): 2065-71. (June 2006)
NAL Call #: 44.8 J822 ; ISSN: 1525-3198
Descriptors: animal welfare/ animals/ behavior, animal/ cattle: physiology/ eating/ female/ floors and floorcoverings/ housing, animal
Abstract: In 2 experiments we assessed how preferences, time budgets, and feeding behavior of dairy cows change in response to flooring surfaces in front of the feed bunk. In Experiment 1, 12 nonlactating dairy cattle were individually housed with access to 2 standing platforms filled with either concrete or sawdust. In Experiment 2, 24 nonlactating dairy cattle were given access to either concrete or Animat rubber flooring in front of the feed bunk. In Experiment 1, cows preferred the sawdust to the concrete flooring. In both experiments, cows provided with a softer floor in front of the feed bunk spent more time standing near the feed bunk without eating (Experiment 1: 67 vs. 40 min/d on sawdust vs. concrete, respectively, SEM = 5.6 min/d; Experiment 2: 176 vs. 115 min/d on Animat vs. concrete, respectively, SEM = 20.5 min/d) compared with when they were kept on concrete. The increased time spent at the feed bunk was due to a combination of more frequent eating and standing bouts, indicating that cows were more willing to move on nonconcrete flooring. Total time spent eating was significantly greater on the softer floor in Experiment 2, but not in Experiment 1 (Exp. 1: 289 vs. 275 min/d on sawdust and concrete, respectively, SEM = 7.3 min/d; Exp. 2: 330 vs. 289 min/d on Animat and concrete, respectively, SEM = 15.4), although feed intake was increased on the sawdust treatment in Experiment 1. Cows spent significantly more time lying in the feed alley when the flooring was rubber (219 vs. 53 min/d on Animat and concrete, SEM = 53.6 min/d), perhaps because the lying area in Experiment 2 was inadequate. In conclusion, cows prefer to stand on softer flooring in front of the feed bunk, and are more willing to move on and spend more time standing in front of the feed bunk when provided with softer flooring. These results indicate that cows find softer flooring surfaces more comfortable to stand on than concrete, and highlight the importance of evaluating the comfort of the entire facility. This citation is from PubMed.

1088. **Fruit optimization with wastes used for outdoor cultivation of King Stropharia.**
Domondon, D. and Poppe, J.
In: Science and Cultivation of Edible Fungi. Proceedings of the 15th International Congress on the Science and Cultivation of Edible Fungi.Maastricht, Netherlands.); pp. 909-918; 2000.
Descriptors: agricultural wastes/ burning/ casing/ colonization/ contamination/ cultural methods/ development/ edible fungi/ fructification/ growing media/ inoculation/ maize/ plant residues/ production possibilities/ pruning/ sawdust/ shade/ shrubs/ size/ straw/ sunflowers/ temperate zones/ tropics/ utilization/ vegetables/ woody plants/ corn/ farm wastes/ flaming/ Hyphomycetes/ potential production/ potting composts/ production potential/ rooting media/ Strophariaceae/ tropical countries / tropical zones/ vegetable crops
Abstract: Since spring 1997, numerous experiments with the King Stropharia, S. rugoso-annulata, were started in a large garden with trees and shrubs near Gent University, Netherlands [Belgium]. The tested agricultural wastes were: chopped straw, grass chaff, sawdust, chopped winter pruning wood, chopped summer pruning wood, sunflower peels, corn cobs, and combinations. Tree shade, fast substrate colonization, the specific casing layer, surrounding herbs and shrubs, partial carton covers, and periodic rain acted as stimulators of fructification. Some attention was devoted to the influence of fruit peels on primordial formation within the casing layer. Between 6 and 8 weeks after inoculation, the first fruiting bodies appeared on the casing layer. The first harvest came on chopped pruning wood followed by straw, sawdust, grass chaff. Highest mean yield was obtained on the chopped winter pruning wood; numerous large carpophores with a maximum weight of 300 g per fruiting body were harvested. Outdoor cultivation of S. rugoso-annulata is better than indoor cultivation where contamination with Trichoderma sp. is prevalent. Since burning of pruning wood is forbidden in many Western countries and dissuaded in the tropics, this easy outdoor S. rugoso-annulata cultivation can be considered very promising for the cool tropical mountain regions and during summer in temperate zones. Reproduced with permission from the CAB Abstracts database.

1089. **Fungal communities in fallow soil before and after amending with pine sawdust.**
Kwasna, H.; Sierota, Z.; and Bateman, G. L.
Applied Soil Ecology: A Section of Agriculture Ecosystems and Environment 14(2): 177-182. (Apr. 2000); ISSN: 0929-1393
Descriptors: sawdust/ Pinus/ soil fungi/ community ecology/ fallow/ soil ph/ population density/ Trichoderma harzianum/ Penicillium/ Mucorales/ Gymnoascales/ biological control agents/ arable soils/ afforestation/ site preparation/ forest plantations/ Poland/ organic amendments/ pseudogymnascus roseus/ Internet resource This citation is from AGRICOLA.

1090. **Gaseous emissions from deep-litter pens with straw or sawdust for fattening pigs.**
Nicks, B.; Laitat, M.; Farnir, F.; Vandenheede, M.; Desiron, A.; Verhaeghe, C.; and Canart, B.
Animal Science: An International Journal of Fundamental and Applied Research 78(1): 99-107. (Feb. 2004); ISSN: 1357-7298
Descriptors: swine/ swine housing/ litter (bedding)/ straw/ sawdust/ gas emissions/ ammonia/ nitrous oxide/ methane production/ carbon dioxide/ water/ pig manure/ nitrogen content/ air pollution
Abstract: Three successive batches of fattening pigs were raised on a deep litter of straw in one room and of sawdust in another. The quantities of litter used per pig were 40 kg of straw and 81 kg of sawdust. Once a month, the emissions of ammonia, nitrous oxide, methane, carbon dioxide and water vapour were measured continuously for 6 days consecutively. Gaseous emissions from pig raising on sawdust-based litter and straw-based litter were respectively 12.16 and 13.61 g per pig per day for ammonia (NH3), 4.96 and 7.39 g per pig per day for methane (CH4), 2.09 and 0.03 g per pig per day for nitrous oxide (N2O), 3.15 and 2.74 kg per pig per day for water (H2O) and 1.32 and 1.30 kg per pig per day for carbon dioxide (CO2). Differences between the emissions of the two litters were

significant for N2O and H2O (P < 0.01). The nitrogen content of the manures collected at the end of the experiment was 1.47 kg per pig for the straw-based litter and 1.07 kg per pig for that based on sawdust. Nitrogen emissions were calculated under the assumption that no gases volatilized from the litter or from the animals other than NH3 and N2O. With the two litters, about 50% of nitrogen excreted by the pigs was emitted into the atmosphere in the form of N2.
This citation is from AGRICOLA.

1091. **Germination and seedling growth of African pear (Dacryodes edulis Don. G. Lam. H. J.) as affected by different planting media.**
Agbogidi, O. M.; Enujeke, E. C.; and Eshegbeyi, O. F.
American Journal of Plant Physiology 2(4): 282-286. (2007); ISSN: 1557-4539
Descriptors: crop residues/ growing media/ medicinal plants/ metabolism/ plant development/ sawdust/ seed germination/ seedling emergence/ seedling growth/ substrates/ drug plants/ medicinal herbs/ officinal plants/ potting composts/ rooting media
Abstract: A study was conducted in 2006 to determine the germination and seedling growth of African pear (Dacryodes edulis) as affected by different planting media: top garden soil, sharp sand, sawdust and a mixture of top soil and sawdust in a ratio of 50:50 in the Teaching and Research Farm of the Delta State University, Asaba Campus, Delta State, Nigeria. The experiment was laid out in a Randomized Complete Block Design (RCBD) with four replications. The results showed that seeds planted in sharp sand had the highest germination percentage (93.5%) and were significantly different (p<=0.05) from those (88.4, 60.7 and 48.0%) sown in the other media (TS/SD, SD and TS) respectively. The results also indicated that the performance of the seedlings in terms of height, number of leaves, leaf area and collar diameter planted in top garden soil was better and differed significantly (p<=0.05) compared to those in the other growth media. This study has established that the germination and seedling growth of Dacryodes edulis are significantly affected by planting media; while sharp sand favoured greater germination percentage, topsoil is recommended for the seedling growth when more nutrients would be required for normal metabolic activities.
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1092. **GHG emissions from manure in a naturally ventilated, freestall dairy barn, comparing sand and sawdust bedding.**
Van Vliet, L. J. P.; Patni, N. K.; and Matin, Md. A.
In: Asae Annual International Meeting 2004. Ottawa, ON; pp. 5963-5974; 2004.
Notes: Conference code: 66322.
Descriptors: bedding materials/ carbon dioxide/ dairy barn/ greenhouse gases/ manure/ methane/ nitrous oxide/ carbon dioxide/ greenhouse effect/ manures/ methane/ nitrogen oxides/ sand/ sawdust/ ventilation/ bedding materials/ dairy barn/ emission rates/ sawdust bedding/ gas emissions/ carbon dioxide/ greenhouse gases/ manure/ methane/ nitrogen oxides/ sand/ saw dust/ ventilation
Abstract: Concentrations and emissions rates of greenhouse gases CO2, CH4 and N2O from manure on concrete alley floor were determined in a naturally ventilated, freestall Holstein dairy cow barn with sand and sawdust bedding, in south coastal British Columbia, Canada. Gas samples for GHG analysis were collected in two separate experiments during the spring and summer using open chambers placed on the alley floor. Laboratory experiments were also conducted with chambers, one testing different proportions of manure mixed with bedding, and the other using manure from the alley floor, with the two bedding materials. GHGs were analyzed using a gas Chromatograph. Results from the barn and laboratory experiments showed significantly higher CO 2 emission rate from manure with sawdust (1,512 mg-1m -2hr-1) than from sand (1,272 mg-1 m -2hr-1). However, a significantly lower N2O emission rate was recorded from sawdust (0.05 mg-1m -2hr-1) than from sand (0.22 mg-1m -2hr-1). Emission rate for CH4 was similar from both types of bedding. Emission loads from manure on the barn floor followed the same pattern as the emission rates from each type of bedding. Both the emission rates and loads of GHGs in this study pertain mainly to bedding-littered manure on the alley floor, and essentially exclude GHGs released from the rumen and the lungs of the cows. Further studies are needed to include all sources of GHG emissions in dairy barns.

1093. **Growing foliage plants without soil.**
Siar, S. V. and Jalotjot, H. C. Jr.
In: Philippine Journal of Crop Science.Gen. Santos City, South Cotabato (Philippines).); Vol. 24.; pp. 76; 1999.
Notes: Annual Scientific Conference of the Federation of Crop Science Societies of the Philippines. Summary only.
Citation notes: PH (Philippines).
Descriptors: foliage plants/ soil-less media/ propagation
Abstract: For foliage plant growers, it is common to use soil-based planting media to propagate the plants. It can be a mixture of soil and coirdust, widely used by growers in Laguna [Philippines] or soil and ricehull, which is more common in Bulacan [Philippines] and others but with soil as the major component of the medium. However, the use of non-soil planting media is now becoming more popular. Ever heard of pure coirdust as rooting medium in some foliage plants? Or how about sand, sawdust, ricehull and many more. These are some of the many non-soil materials which can be used as alternate to soil-based media commonly used by ornamental growers. Our country is blessed with an abundance of these materials either as waste products or just one of nature's elements left unexploited or used in other means. Tapping these resources for ornamental purposes as planting media will not just reduce our dependence on soil but create added income for people living in area where they are abundant. Also quarantine regulations of countries importing live ornamental plants prohibit importations of plants with soil-based planting media. This makes non-soil media the right materials for plants geared for the export markets.

1094. **Growing media varying in particle size and shape for greenhouse tomato.**
Allaire, S.; Caron, J.; Menard, C.; and Dorais, M.
Acta Horticulturae 644: 307-311. (2004)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: bark/ crop yield/ diffusivity/ growing media/ hydraulic conductivity/ non wood forest products/ peat/

physical properties/ protected cultivation/ rockwool/ sawdust/ soilless culture/ substrates/ tomatoes/ water holding capacity/ wood shavings/ cultivation under glass or plastic/ mineral wool/ minor forest products/ non timber forest products/ potting composts/ rock wool/ rooting media
Abstract: Seven different substrates, i.e. rockwool slab, fresh spruce sawdust, spruce wood shaving, 100% composted spruce bark, 100% fine blond peat, 66% of fine blond peat + 33% composted bark and 33% fine blond peat + 66% of composted bark, were compared for the greenhouse production of tomato. Substrates made of peat and bark gave similar yield as rockwool, while sawdust and shaving gave lower average daily yield than rockwool during 2001 and similar yield as rockwool during 2000. Yield was not related to the physical properties (i.e. water retention characteristics, hydraulic conductivity, pore tortuosity and gas diffusivity) although they greatly vary between substrates. The results indicate that if irrigation is adjusted for the physical properties of the substrates, then different recycling organic materials with various particle sizes and shapes can be used for greenhouse tomato production.
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1095. **Growth and evolution of Salix purpurea L. willow plants cultivated on composts obtained from wood waste.**
Wroblewska, H.; Stolarski, M.; and Czajka, M.
Fragmenta Agronomica 29(3): 316-327. (2006); ISSN: 0860-4088.
Notes: Original title: Wzrost i rozwoj roslin wierzby Salix purpurea L. uprawianej na kompostach sporzadzonych z odpadow drzewnych.
Descriptors: application rates/ composting/ composts/ growth/ mineral soils/ nitrates/ nitrogen content/ plant height/ plywood/ shoot cuttings/ soil amendments/ soil ph/ soil salinity/ substrates/ trace elements/ urea formaldehyde/ waste utilization/ waste wood/ wood products/ microelements
Abstract: A comprehensive research on safe composting of industrial and post-use waste of composite wood products and on the utilization of obtained composts for plant growing has been carried out in the Wood Technology Institute for several years. The effect of composts obtained from plywood waste and post-use wood waste on the growth and development of S. purpurea seedlings was determined by cultivating willow in pots filled with mineral soil mixed with the composts in various proportions (1:1, 1:3 or 1:9). Three 20-cm long cuttings from Salix purpurea "Perinea" shoots were set in each pot. Before the test started, microelement content, pH and salinity of the soil and the substrate were determined. The experiment started at the end of April and was continued till September. Plant condition was evaluated visually and a photographic documentation was made. Plant height was measured and recorded once every 3 weeks. The substrate used for willow cultivation differed mostly in N content. Toxic doses of this element were observed in pure compost from indoor plywood waste, where plywood was glued with urea-formaldehyde resin. To a lesser extent, these N toxic doses were present in composts from post-use wood waste. The strongest evolution and increase in height were observed in of plants set into substrata consisting of soil and compost obtained from industrial exterior plywood waste glued with phenol-formaldehyde resin. These substrate were characterized by a medium content of N in the form of nitrates. After 18 weeks, S. purpurea in every variants of the substrate containing this compost (also in the case of 100% compost) were higher than the plants in the control. Compost from interior plywood waste at a dose of 10% had a positive influence on plant growth. Smaller doses of composts from post-use wood waste also resulted in better growth of the plants compared to those plants in pure mineral soil. Results suggest that S. purpurea can be cultivated on soils amended with mature composts obtained from industrial and post-use wood waste, provided that safe doses of composts, determined base on their chemical compositions are used.
This citation is from AGRICOLA.

1096. **Growth, nutrient composition and straw yield of sorghum as affected by land configuration and wood-chips mulch on a sandy loam soil in northeast Nigeria.**
Chiroma, A. M.; Alhassan, A. B.; and Yakubu, H.
International Journal of Agriculture and Biology 8(6): 770-773. (2006); ISSN: 1560-8530
Descriptors: chemical composition/ climatic factors/ crop yield/ edaphic factors/ grasslands/ growth/ mulches/ mulching/ nutrient content/ nutrients/ plant composition/ ridging/ sandy loam soils/ soil types/ sown grasslands/ stems/ wood chips/ chemical constituents of plants/ mulching materials/ sown pastures
Abstract: Six land configuration and wood chips mulch treatments were evaluated from 1999-2002 on a sandy loam soil, northeast Nigeria for their effects on growth, leaf nutrient composition and straw yield of sorghum. Treatments evaluated include: flat bed (FB), open ridge (OR), tied ridge (TR), FB + mulch (FBM), OR + mulch (ORM) and TR + mulch (TRM). Early plant growth as measured by leaf number plant-1 and stem diameter were not significantly influenced by treatments in any given year but with advancement in growth, the mulched (FBM, ORM and TRM) treatments showed better growth than their bare (FB, OR and TR) counterparts. Sorghum leaf N, P, K, Ca and Mg contents were all higher in the mulched than in the bare treatments irrespective of tillage method. Averaged across the four experimental years (1999-2002) mean increases in straw yield relative to the FB treatment were 9.6% for OR, 16% for TR, 56% for FBM, 39% for ORM and 41% for TRM. The OR and TR treatments slightly increased straw yield in years with normal rainfall (1999, 2001 and 2002) but decreased straw yield in 2000, the year with poor rainfall distribution. It is concluded that under the edapho-climatic conditions of Maiduguri in northeast Nigeria, substantial improvement in the growth and straw yield of sorghum can be obtained when adequate amounts of wood chips are applied to the surface of either a flat bed or ridge tilled soil with little/no risk of crop failure.
This citation is from AGRICOLA.

1097. **Growth promotion of spinach by fluorescent Pseudomonas strains under application of organic materials.**
Urashima, Y.; Suga, Y.; and Hori, K.
Soil Science and Plant Nutrition 51(6): 841-847. (2005)
NAL Call #: 56.8 SO38 ; ISSN: 0038-0768
Descriptors: betaine/ bioluminescence/ composts/ grasslands/ growth/ hippuric acid/ horse dung/ oat straw/ oats/ organic matter/ pampas/ rice/ rice husks/ rice straw/

roots/ sawdust/ soil amendments/ spinach/ straw/ trehalose/ glycinebetaine/ paddy/ rice hulls
Abstract: We investigated whether the colonization of spinach roots by fluorescent Pseudomonas strains was promoted by the application of organic materials. Firstly, the bioluminescence (lux) gene was introduced into fluorescent Pseudomonas strains, and the colonization of on spinach roots by fluorescent Pseudomonas strains was observed using a CCD (charge-coupled device) camera. As a result, various organic materials were found to promote the colonization of spinach roots by fluorescent Pseudomonas strains. H3-4 strain colonized the roots when oat straw and betaine monohydrate, rice husks, Japanese pampas grass and horse feces compost (with rice straw) were applied. D23-2 strain colonized the roots when hippuric acid sodium salt, Japanese pampas grass, oat straw, horse feces compost (with rice straw) and trehalose dehydrate were applied. H23-1 strain colonized the roots when cattle feces compost (with rice straw), horse feces compost (with sawdust), Japanese pampas grass, betaine monohydrate, oat straw, horse feces compost (with rice straw) and hippuric acid sodium salt were applied. The organic materials (cattle feces compost (with rice straw), horse feces compost (with sawdust), Japanese pampas grass, betaine monohydrate or horse feces compost (with rice straw)) and fluorescent Pseudomonas (HS23 strain) were applied to soil, and spinach was cultivated. The growth of spinach was promoted when fluorescent Pseudomonas strains and organic materials except for Japanese pampas grass were applied. Since the growth of spinach was not promoted when only the organic materials were applied, this growth-promoting effect was considered to be due to the fluorescent Pseudomonas strains that colonized the roots more readily when the organic materials were applied. In conclusion, the growth-promoting effect of fluorescent Pseudomonas strains was demonstrated in soil culture by the application of fluorescent Pseudomonas strains and organic materials, which promoted root colonization by fluorescent Pseudomonas strains.

1098. **Growth, yielding and fruit firmness of two highbush blueberry cultivars cultivated on three different organic substrates.**
Ochmian, I.; Grajkowski, J.; Ostrowska, K.; and Mikiciuk, G.
Zeszyty Naukowe Instytutu Sadownictwa i Kwiaciarstwa w Skierniewicach 15: 47-54. (2007)
NAL Call #: SB319.3.P7 Z47; ISSN: 1234-0855.
Notes: Original title: Wzrost, plonowanie oraz jedrnosc owocow dwoch odmian borowki wysokiej (Vaccinium corymbosum L.) uprawianej w trzech typach podozy organicznych.
Descriptors: crop yield/ firmness/ growing media/ husks/ peat/ sawdust/ seedling growth/ substrates/ hulls/ potting composts/ rooting media
Abstract: The experiment was carried out in 2003-2005 at the Experimental Fruit-Growing Station of the Szczecin University of Agriculture in order to study possibilities of highbush blueberry cultivation on a compact soil of alkaline reaction. Three different organic substrates were used: peat, cocoa husks, and sawdust. The experiment was performed on 'Sierra' and 'Patriot' cultivars. Measurements were also carried out of the length and quantity of annual shoots, and of yield size and its characteristics. As a result, it was found that of the three substrates tested peat and sawdust had the best influence on the growth of both cultivars. The blueberry plants started yielding on all three substrates already in the second year after being planted. Yields from the bushes growing on peat and sawdust were similar, whereas on cocoa husks they were reduced by over 50%. 'Patriot' bushes produced yields considerably higher than 'Sierra' bushes. It was also found that the substrates had an influence on fruit firmness. Fruits produced on peat were less firm than those produced on sawdust or cocoa husks.

1099. **Heavy metal speciation in compost derived from the different animal manures.**
Ko, H. J.; Choi, H. L.; and Kim, K. Y.
Journal of Animal Science and Technology 46(2): 273-282. (2004); ISSN: 1598-9429
Descriptors: animal manures/ arsenic/ bulking agents/ cadmium/ cattle manure/ chemical speciation/ chromium/ composting/ composts/ copper/ heavy metals/ lead/ nickel/ pig manure/ poultry manure/ rice husks/ sawdust/ zinc/ poultry litter/ rice hulls
Abstract: Composting animal manure is one of feasible treatments that reserves some portion of nutrients of manure. Although the application of compost to arable land has many advantages, the repeated cultivation of the agriculture land will accumulate the level of heavy metals in the soil which is potentially harmful to people and animals. Therefore it is important to know the characteristics concentration and species of heavy metals in a variety of chemical forms than just total content of the metal. Because the metals in different forms have different mobilities and bioavailabilites. The aim of this study was to examine the total content and the chemical forms of the heavy metals; Cr, Ni, Cu, Zn, As, Cd and Pb in the animal manure composted with sawdust or rice hull as a bulking agent. A total of 75 compost samples were collected throughout the country and classified into the three groups in accordance with the characteristics of raw materials: swine manure, poultry manure, and mixed (swine+poultry+cattle) manure. The compost samples were analysed for total metal content and fractionated by sequential chemical extractions to estimate the quantities of metals: exchangeable, adsorbed, organically bound, carbonate and residual. The results showed that the heavy metal concentrations in all compost samples were lower than the maximum acceptable limits by the Korea Compost Quality Standards. The concentrations of heavy metals in the swine manure compost were higher than those of both the poultry and the mixed manure compost except for Cr. Zn and Cu concentrations of three different compost ranged from 157 to 839 mg Zn/kg DM (dry matter) and from 47 to 458 mg Cu/kg DM, depending on the composition of animal manures. The predominant forms for extracted metals were Cr, Ni, Zn, As and Pb, residual; Cu, organic; and Cd, carbonate. The results suggested that the legal standards for composts should be reexamined to revise the criteria on the total metal content as well as metal speciation.

1100. **Hock lesions and free-stall design.**
Weary, D. M. and Taszkun, I.
Journal of Dairy Science 83(4): 697-702. (Apr. 2000)
NAL Call #: 44.8 J822; ISSN: 0022-0302
Descriptors: animals/ cattle/ cattle diseases/ dust/ female/ hindlimb/ housing, animal/ lactation/ rubber/ silicon dioxide/ skin diseases: etiology: veterinary/ soil/ wood
Abstract: We compared the prevalence and severity of skin lesions on the hocks of lactating dairy cows in southern British Columbia, comparing 20 farms using three common bedding surfaces: sawdust, sand, and geotextile mattresses. Skin lesions were scored at five positions on the hock. For each position we noted if the lesion showed inflammatory attributes, and then assigned a severity score. Of the 1752 lactating cows scored, 1267 cows (73%) had at least one hock lesion. Of those cows with lesions, 87% had lesions on both legs, 76% had lesions on more than one location on the hock, and 78% had a lesion of at least moderate severity (i.e., evidence of skin breakage or an area of hair loss >10 cm2). Lesions were most prevalent on farms that used geotextile mattresses (91% of cows) and least common on farms that used sand (24% of cows). Moreover, lesions on cows from farms using mattresses were more numerous and more severe than those on cows from sand-bedded farms. The prevalence and severity of lesions on farms using sawdust was intermediate. Lesions also varied in relation to location on the hock. For farms using geotextile mattresses, lesions were more common and more severe on the lateral surfaces of both the tuber calcis and the tarsal joint. On farms using sawdust, lesions were common on the dorsal surface of the tuber calcis and the lateral surfaces of both the tuber calcis and the tarsal joint. Lesions were rare on all five positions for cows from sand-bedded farms. Among the 10 farms sampled using sawdust, we found a significant negative relationship between the length of the stall and severity of lesions. For cows with lesions, the number and severity of lesions increased with age.
This citation is from PubMed.

1101. **Housing of calves in pens on a deep litter of softwood sawdust.**
Szyndler, J. and Kaczor, A.
Annals of Animal Science Supplement 1: 137-140. (2002); ISSN: 1642-3402
Descriptors: animal behaviour/ animal housing/ behaviour/ body weight/ calves/ litter/ pens/ sawdust/ animal behavior/ behavior
Abstract: The effects of deep litter of softwood sawdust on housing conditions of calves in pens were investigated. Calves were housed under 4 bedding systems: deep litter of sawdust, deep litter of sawdust supplemented with Stalosan F, deep litter of 50% sawdust and 50% straw (by volume), and shallow straw litter. Behavioural studies revealed no negative effects of litter of softwood sawdust on the behaviour of calves. Cleanliness of animals kept on litter of sawdust was similar or slightly better compared to straw litter housing. The type of floor had no effect on weight gains of the calves. Based on the studies and measurements made, it is concluded that softwood sawdust is useful as a bedding material for calves.
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1102. **Immobilization of soil nitrogen as a possible method for the restoration of sandy grassland.**
Torok, K.; Szili Kovacs, T.; Halassy, M.; Toth, T.; Hayek, Z.; Paschke, M. W.; and Wardell, L. J.
Applied Vegetation Science 3(1): 7-14. (2000)
Descriptors: abandoned land/ altitude/ cellulose/ chemical composition/ decomposition/ grasslands/ immobilization/ nitrogen/ old fields/ organic matter/ polysaccharides/ productivity/ revegetation/ sandy soils/ sawdust/ soil/ soil amendments/ soil fertility/ soil organic matter/ soil water/ starch/ sucrose/ complex carbohydrates/ organic matter in soil/ saccharose/ soil moisture
Abstract: Experiments were designed to test the applicability of nitrogen immobilization as a means of accelerating the recovery of an endemic open sandy grassland (Festucetum vaginatae danubiale) on old fields in the Great Hungarian Plain. Effects of various carbon sources (sucrose, starch, cellulose and sawdust) and their combinations in different quantities were studied in laboratory microcosms. Carbon addition decreased nitrogen availability in all cases, the rate and timing of change being dependent on the type of carbon source applied. The combination of 2 g each of sucrose and polysaccharides (starch, cellulose, sawdust) per kg soil was found to be the most effective, as sucrose decreased available nitrogen content of soil intensively and the polysaccharides maintained the immobilized nitrogen for a longer period. In a follow-up experiment, sucrose and sawdust were selected for field application to test their effectiveness in immobilizing N and accelerating restoration. The field experiment was established to test the importance of abiotic site differences in the immobilization of soil nitrogen. Selected sites were located along an altitude, moisture and productivity gradient. Soil organic matter, microbial biomass-C and decomposition rate varied between sites depending on altitude. At two sites with lower soil moisture and organic matter levels carbon addition increased microbial activity and nitrogen immobilization significantly.
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1103. **Impact of crop residues on soil organic matter content and the production of late jute seed.**
Alim, M. A.; Alam, M. M.; Khandker, S.; Ahmed, S. A.; Haque, A.; and Akhter, N.
OnLine Journal of Biological Sciences (Pakistan) 1(12): 1124-1126. (Dec. 2001); ISSN: 1608-4127.
Notes: 5 tables, 24 ref. Summary (En). Citation Notes: PK (Pakistan).
Descriptors: crop residues/ soil organic matter/ jute seeds/ sawdust/ straw
Abstract: An investigation was undertaken to evaluate the impact of different crop residues on late jute seed yield and organic matter content of soil. The plant height, number of branch/plant, number of pod/plant, number of seeds/pod and seed yield/plant were significantly increased with different crop
residues. The performance in seed yield were dry jute leaves (89.30%) greater than lentil straw (87.77%) wheat straw (43.28%) greater than compost (35.35%) greater than rice straw (32.740%) greater than saw-dust (16.91 %) over the control. The resources increased the soil organic matter content in soil by 24.59, 22.92, 26.22, 19.67, 29.51 and 30.33% respectively over the control indicating the

enrichment of soil health. In correlation studies it was observed that the jute seed yield parameters, the seed yield was highly correlated with plant height, number of branches/plant and number of pods/plant.

1104. **Impact of high-volume wood-fired boiler ash amendment on soil properties and nutrients.**
Chirenje, T. and Ma, L. Q.
Communications in Soil Science and Plant Analysis 33(1-2): 1-17. (2002)
NAL Call #: S590.C63; ISSN: 0010-3624 [CSOSA2]
Descriptors: wood ash / sandy soils/ spodic horizons/ soil ph/ electrical conductivity/ soil water content/ bulk density/ soil fertility/ trace elements/ nutrient availability/ saturated hydraulic conductivity/ water holding capacity / application rate/ Florida/ macronutrients/ subsurface application/ surface treatment/ boilers
Abstract: Forest application of boiler ash is fast becoming a popular alternative to landfilling. Boiler ash is a good source of calcium (Ca), magnesium (Mg), potassium (K), phosphorus (P), manganese (Mn), and zinc (Zn), but it may potentially increase soil pH and electrical conductivity. A monitoring study was conducted to determine the changes in soil properties and the availability and leachability of nutrients following the application of large quantities of boiler ash in a sandy soil (with a spodic horizon). Two application rates (900 and 1800 Mg ha(-1)) and two application methods (surface and subsurface) were used in a three-hectare area, which was divided into 15 subplots. Soil samples from different depths were collected over a period of 21 months. Soil pH increased from 5.6 to above 9 and the electrical conductivity increased by up to 2 orders in all plots compared to the controls. The high alkalinity from the ash in the 1800 Mg ha(-1) rate depleted the spodic layer, and this was more pronounced in the subsurface treatments. Plant-available water was doubled to 12% in the 1800 Mg ha(-1) treatment and soil bulk density was reduced from 1500 kg m(-3) to 1200-1360 kg m(-3). Total and plant available macronutrients (Ca, Mg, K, and P) and micronutrients [iron (Fe), Mn, copper (Cu), and Zn)] increased substantially after ash application. Based on our study, it is highly recommended that ash application rates be lowered to agronomic rates, e.g., approximately 10 Mg ha(-1), based on liming equivalence, to maximize the beneficial effects of boiler ash on soil.
This citation is from AGRICOLA.

1105. **Impact of sawdust and wood shavings in bedding on pig tuberculous lesions in lymph nodes, and IS1245 RFLP analysis of Mycobacterium avium subsp. hominissuis of serotypes 6 and 8 isolated from pigs and environment.**
Matlova, L.; Dvorska, L.; Palecek, K.; Maurenc, L.; Bartos, M.; and Pavlik, I.
Veterinary Microbiology 102(3-4): 227-236. (Sept. 2004); ISSN: 0378-1135
Descriptors: litter (bedding)/ sawdust/ wood shavings/ tuberculosis/ Mycobacterium avium/ animal pathogenic bacteria/ lymph nodes/ isolation/ restriction fragment length polymorphism/ serotypes/ swine/ lesions (animal)/ genotype/ Mycobacterium fortuitum/ bacterial contamination/ disease transmission/ livestock production/ Czech Republic/ Mycobacterium avium hominissuis
Abstract: Among 25,027 slaughter pigs raised in two farms, tuberculous lesions were detected in the lymph nodes of 898 (3.6%) of them. Tuberculous lesions were most commonly found in the mesenteric (601; 2.4%) and head (451; 1.8%) lymph nodes. Mycobacteria were isolated from 49 of 120 randomly selected mesenteric, head and bronchial lymph nodes with diagnosed tuberculosis originating from both farms. Forty six Mycobacterium avium subsp. hominissuis, one M. chelonae and two M. fortuitum isolates were found in the lymph nodes of pigs. No statistically significant difference was detected between farms A and B for isolation rates of mycobacteria from the lymph nodes of pigs and their species composition. To investigate the source of the pigs' infections, culture examinations of 117 samples from the external environment were performed. Mycobacteria were isolated from 25 samples from the external environment (21.4%). Mycobacterial isolates were also detected in eleven (91.7%) and two (16.7%) of 12 used sawdust and 12 of non-used (fresh) sawdust samples, respectively. None of 12 wood shavings was culture-positive. Twelve of 13 sawdust isolates were classified as M. a. hominissuis of serotypes 6 and 8 and genotype IS901- and IS1245+; the remaining isolate was classified as species M. fortuitum. Other conditionally pathogenic mycobacteria were only isolated from 12 of the remaining 81 samples from the external environment (excluding bedding). A total of eight isolates (two pig and six sawdust samples originating from farms A and B) were examined by IS1245 restriction fragment length polymorphism (IS1245 RFLP) analysis. These isolates produced five distinct IS1245 RFLP types with more than 20 bands. Based on identical IS1245 RFLP types of one pig isolate and two isolates of used sawdust from farm A, we have concluded that contaminated sawdust was the source of mycobacterial infection for pigs in our study.
This citation is from AGRICOLA.

1106. **The impact of the addition of Eucalyptus grandis wood chips on nitrogen availability in plantation soils.**
Bird, T. L. and Scholes, M. C.
Southern African Forestry Journal 196: 9-14. (2003); ISSN: 0038-2167
Descriptors: clear felling/ forest plantations/ immobilization/ logging/ mineralization/ multipurpose trees/ nitrogen fertilizers/ nutrient availability/ soil fertility/ soil types/ trees/ wood chips/ wood residues/ woody plants/ clearcutting/ timber extraction/ timber harvesting
Abstract: The impact of plantation residues, as a result of clear felling, on nutrient availability in plantation systems, as well as the difficulties during subsequent planting and harvesting, should be considered in the development of plantation management strategies. The aim of this experiment was to determine if the addition of stump wood chips would result in the immobilization of nitrogen. Soil from two plantations, one of the Kranskop soil form (0.57% nitrogen) and one of the Hutton soil form (0.23% nitrogen), were analysed in a laboratory experiment for changes in nitrogen availability. Soils were amended with wood chips and varying amounts of nitrogen fertilizer. Inorganic nitrogen was measured after 14, 60 and 90 days of aerobic incubation. Net mineralization rates, regardless of treatment or soil, ranged between -24.98 and +2.53 micro g nitrogen/g soil/day, over the 3-month incubation period. Immobilization of nitrogen was found to occur in those treatments that received the highest nitrogen additions.

Addition of wood chips on their own did not alter the nitrogen availability patterns. However, it was observed that wood chips, together with high levels of additional nitrogen, resulted in an extended period of release of nitrogen in these plantation soils.
This citation is from AGRICOLA.

1107. **Impacts of ground vegetation management strategies in a kiwifruit orchard on the composition and functioning of the soil biota.**
Wardle, D. A.; Yeates, G. W.; Bonner, K. I.; Nicholson, K. S.; and Watson, R. N.
Soil Biology and Biochemistry 33(7/8): 893-905. (2001)
NAL Call #: S592.7.A1S6; ISSN: 0038-0717
Descriptors: agricultural land/ biota/ decomposition/ ground vegetation/ herbicides/ kiwifruits/ microbial activities/ mulches/ orchards/ pastures/ sawdust/ soil amendments/ soil biology/ soil fauna/ soil flora/ soil management/ vegetation management/ Eucnemidae/ farmland/ grazing lands/ mulching materials/ nematodes/ weedicides/ weedkillers
Abstract: Replicated field plots were established in a New Zealand kiwifruit (Actinidia deliciosa) orchard of each of five ground vegetation management treatments, i.e., maintenance of pasture, planting of a dwarf fescue (Festuca rubra) mulch, sawdust application, cultivation and repeated use of herbicides, and the responses of components of the soil biota to these treatments monitored over a 5-year period. Those treatments involving enhancement of basal resources inputs (pasture, fescue, sawdust) consistently supported higher levels of microbial biomass and activity than did the others. These effects were not consistently propagated through higher trophic levels of the decomposer food web. The response of decomposer food web components to treatments was considered to be due to the complex interplay of top-down and bottom-up forces in soil food webs. Ordination analysis revealed that the sawdust and cultivated plots supported different species assemblages to the pasture and fescue plots. Further treatments supporting greater basal resource inputs tended to result in a higher diversity of nematodes; on average the Shannon-Weiner diversity index for the 0-5 cm depth layer was 2.80 and 2.64 for the fescue and pasture treatments, and only 2.32 and 2.45 for the cultivation and herbicide treatments. Populations of Collembola were also generally enhanced in plots with greater basal resource inputs. Litterbag decomposition rates was utilized as a measure of the performance of ecosystem functioning carried out by the soil biota, and it was shown that surface litter decomposition rates were generally greatest in those treatments supporting greater levels of basal resource inputs and microbial biomass (i.e., greatest for the mulched and fescue plots, least for the herbicides and cultivated plots), but were generally independent of higher trophic levels..
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1108. **In-situ conservation of residual soil moisture through tillage and mulch for maize (Zea mays) in tropical Bay Islands.**
Pramanik, S. C.
Indian Journal of Agricultural Sciences 69(4): 254-257. (1999)
NAL Call #: 22 AG83I; ISSN: 0019-5022
Descriptors: coir/ cultivation/ maize/ minimum tillage/ mulches/ rice/ rice husks/ rice straw/ sawdust/ straw/ water use/ coconut fibre/ corn/ minimum tillage systems/ mulching materials/ paddy/ rice hulls
Abstract: In a field experiment during the dry seasons (December-April) of 1994/95 and 1995/96 at Port Blair, Andaman and Nicobar Islands, India, maize cv. Co 1 was grown with conventional or minimum tillage and mulching with rice straw, sawdust, coir dust or rice husks. The tillage treatments had no significant effect on growth, yield or water use. Mulching significantly increased yield and water use, with rice husks giving the poorest results. The yield increase was due to better crop growth parameters, improvement in moisture stress indices, efficient root development, conservation of more residual soil moisture in the crop root zone and higher water use efficiency.
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1109. **Increased occurrence of acute mastitis caused by Klebsiella spp. in a dairy with sawdust bedding.**
Peinhopf, W. and Deutz, A.
Praktische Tierarzt 86(6): 420-425. (2005); ISSN: 0032-681X.
Notes: Original title: Gehauftes Auftreten von Akutmastitiden durch Klebsiella spp. in einer Milchviehherde mit Sagemehl Einstreu.
Descriptors: ampicillin/ bovine mastitis/ case reports/ clinical aspects/ cows/ dairy cows/ drug resistance / enrofloxacin/ gentamicin/ litter/ oxytetracycline/ sawdust/ sulfonamides/ trimethoprim/ cefaperazone/ clinical picture/ sulphonamides/ terramycin
Abstract: The increased occurrence of acute mastitis in a Holstein-Friesian dairy caused by Klebsiella spp. is described in a case report. Besides acute clinical mastitis (72%), subacute (28%) cases of Klebsiella mastitis were also observed. The bacteriological examination of the sawdust bedding on this farm showed Klebsiella spp. in 3 out of 7 samples, while no Klebsiella spp. could be detected in several straw bedding samples from other dairies. Furthermore Listeria monocytogenes was detected only in sawdust bedding (3 out of 7 samples). Both, the bacteriological findings and the anamnesis, led to the assumption that a galactogen infection, caused by sawdust bedding, was responsible for this outbreak. Some Klebsiella strains detected were resistant to Ampicillin (100%), Terramycin (26%) and Gentamicin (5%), while all of them were sensitive to Cefaperazon, Enrofloxacin and Sulfonamide/Trimethoprim.
This citation is from AGRICOLA.

1110. **Industrial wood ash as a soil amendment for crop production.**
Meyers, N. L. and Kopecky, M. J. 81(4): 123-130. (1998); ISSN: 07341415 [TAJOD]
Descriptors: biomass/ coal ash/ cultivation/ environmental protection/ fertilizers/ greenhouse effect/ land fill/ soil conditioners/ wood/ alfalfa/ crop production/ indicator crops/ soil amendment/ wood ash/ waste utilization
Abstract: Wood ash - produced as a by-product of energy generation by wood-products industries - has potential for use as a liming and nutrient source for crop production. We conducted greenhouse and field studies to evaluate the effects of landspreading industrial wood ash on the yield and elemental composition of forage crops and on soil

nutrient levels. Greenhouse studies evaluated ash rates up to the equivalent of 40 tons/acre (90 Mg ha-1) using alfalfa (Medicago sativa L) and barley (Hordeum vulgare) as indicator crops. A limed and fertilized control (dosages based on soil tests) was included for comparison. In field trials, wood ash was applied to alfalfa at rates up to 20 tons/acre (45 Mg ha-1) at two locations in Price County, WI. Biomass yields generally increased with ash application up to 20 tons/acre and decreased at applications exceeding this level. Wood-ash application usually produced yields greater than those obtained with the limed and fertilized control treatment No undesirable elements accumulated in forage tissue at ash application rates up to 20 tons/acre. These results suggest that land application of wood ash is an environmentally safe alternative to landfilling and may replace conventional limestone and fertilizer for forage crop production. Application: Greenhouse and field tests evaluating the effects of landspreading wood ash as a crop fertilizer.

1111. **Influence of Cognettia sphagnetorum (Enchytraeidae) on birch growth and microbial activity, composition and biomass in soil with or without wood ash.**
Liiri, M.; Setala, H.; Haimi, J.; Pennanen, T.; and Fritze, H.
Biology and Fertility of Soils 34(3): 185-195. (Sept. 2001)
NAL Call #: QH84.8.B46; ISSN: 0178-2762
Descriptors: Betula pendula/ Enchytraeidae/ microbial activity/ soil microorganisms/ microorganisms/ biomass/ species diversity/ ash/ soil amendments/ seedlings/ degradation/ drought/ water stress/ soil fauna/ population density/ population dynamics/ nitrogen content/ leaves/ roots/ shoots/ disturbed soils/ Finland/ ratios/ growth
Abstract: In this laboratory study using microcosms with seedlings of silver birch (Betula pendula), we explored whether Cognettia sphagnetorum (Enchytraeidae) can retain its important role of accelerating decomposition processes in soils and stimulating primary production under disturbance. We established systems with or without wood ash amendment (first-order disturbance) in the soil, either in the presence or absence of C. sphagnetorum. To test whether the systems treated with wood ash are more sensitive to an additional disturbance than the ash-free systems, the microcosms were later on disturbed by drought. To determine the influence of two disturbances on the enchytraeids and populations of other fauna, and the possible changes in the system functioning, measurements were made of the growth of birch seedlings, foliar N concentration, composition and biomass of soil microbial communities and leaching of N and dissolved organic carbon from the microcosms. Both wood ash application and drought exerted a clear negative influence on the populations of C. sphagnetorum. However, populations of this species were very resilient and recovered rapidly after drought in the ash-free soils. In the ash-free soils C. sphagnetorum tended to improve birch growth, increased the N content of the birch leaves, and decreased the root to shoot ratio. However, in the ash-treated soils enchytraeids had negative effects on these parameters. C. sphagnetorum impacted on neither N and C leaching nor soil microbes, whereas wood ash decreased microbial biomasses and changed their community structure (as determined by phospholipid fatty acids method and denaturing gel electrophoresis) and substrate utilisation potential (Biolog method). It was concluded that C. sphagnetorum can retain its influential role under varying environmental conditions, but that the stimulating or retarding effects of this species on system functioning can be context dependent.
This citation is from AGRICOLA.

1112. **Influence of different nutrient sources on nodulation, growth and yield of chickpea.**
Dhanveer Singh; Ram, H; Singh, A K; Maurya, B R; and Jagdish Prasad
Indian Journal of Fertilisers 4(2): 59-60, 69. (2008); ISSN: 0973-1822
Descriptors: bulk density/ chickpeas/ chlorophyll/ composts/ crop yield/ iron/ leaves/ manganese/ nodules/ plant height/ pods/ protein/ sawdust/ sludges/ soil ph/ yield components/ Mn
Abstract: In a pot experiment conducted during November to February 2006 in Varanasi, Uttar Pradesh, India with chickpea as test crop, the application of 10 tonnes pressmud/ha-1 with days after planting (DAP) at 100 kg ha-1 significantly increased plant height, nodule and pod numbers/pot, leaf-chlorophyll, grain-protein and grain yield over control and found to be superior than other treatments comprising of pressmud/sawdust/compost/sludge at 5 or 10 tonnes ha-1 with DAP at 100 kg ha-1, whereas sawdust treatments decreased pH and bulk density of post-harvest soil. Despite increase in nodule-Fe and Mn by sludge application, it did not reflect on yield parameters of chickpea.

1113. **The influence of intercropping and saw dust mulching on carrot yield and entomofauna.**
Luik, A.; Heidemaa, M.; Viidalepp, V.; and Estonian Agricultural University, Tartu Estonia
Transactions of the Estonian Agricultural University (Estonia). Agronomy 208: 115-120. (2000); ISSN: 1406-4049.
Notes: Original title: Segaviljeluse ja saepurumultchi moju porgandi saagile ning entomofaunale. 1 table; 4 ill., 6 ref. Summary (En). Citation notes: EE (Estonia).
Descriptors: intercropping/ sawdust/ mulching/ carrots/ yield/ entomofauna
Abstract: Intercropping of carrots with garden beans (in rows with a 40 cm distance) and mulching with fresh saw dust significantly disoriented pests and decreased the damage of carrots by Trioza viridula and Psila rosae. Garden beans and saw dust separately did not have significant influence on these pests. Under synergism of garden beans and saw dust the part of undamaged carrots in crop was significantly increased. 19 species of carabids were found in carrot beds. Amara fulva, A. bifrons, Harpalus rufipes, H. affinis and Calathus erratus were most numerous.

1114. **The influence of mineral fertilization with mixtures of waste activated sludges with bark and sawdusts on the yield and chemical composition of ryegrass (Lolium multiflorum Lam.).**
Kalembasa, S. and Symanowicz, B.
Folia Universitatis Agriculturae Stetinensis, Agricultura 77: 129-134. (1999).

Notes: Original title: Wpyw nawozenia mineralnego, mieszanin osadow posciekowych z kora i trocinami na plonowanie i skad chemiczny Lolium multiflorum Lam.
Descriptors: bark/ chemical composition/ fertilizers/ NPK fertilizers/ sawdust/ sewage sludge/ wastes
Abstract: Pot experiments were conducted to compare the effects of farmyard manure, sewage sludge, and sludge mixed with sawdust or coniferous tree bark, on L. multiflorum. Treatments were applied with or without mineral NPK fertilizers. Dry matter yields and plant NPK contents are tabulated.
This citation is from AGRICOLA.

1115. **Influence of moisture conditions on the production and growth of black currant.**
Strautina, S. and Kampuss, K.
In: Proceedings of the International Conference Fruit Production and Fruit Breeding.Tartu, Estonia.); pp. 173-176; 2000.
Descriptors: black currants/ crop yield/ drought/ fertigation/ irrigation/ mulching/ sawdust/ Cunoniales/ fertirrigation/ watering
Abstract: Black currants are among the most economically important small fruit crops in Latvia. To obtain high berry yields, it is necessary to secure optimal growth conditions for this crop. One of the demands is sufficient moisture supply. In a trial established in spring 1997 with cultivars Titania and Zagadka, three growing methods were tested: (1) without additional moisture regulation (control variant); (2) sawdust mulch; (3) drip irrigation combined with fertigation. In a prolonged drought, fertigation proved to be the best moisture supply method, providing the plants with optimal amounts of water and nutrients. It was found in the trial that during a long dry period, sawdust mulch has a negative influence on black currant growth and yield.
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1116. **Influence of mulch on erva-mate productivity.**
Lourenco, R. S.; Medrado, M. J. S.; Nietsche, K. ; and Sabatke Filho, F. E.
Boletim de Pesquisa Florestal 43(113-122)(2001); ISSN: 1517-6371.
Notes: Original title: Influencia da cobertura morta na produtividade da erva-mate.
Descriptors: fertilizers/ intercropping/ mate/ mulches/ productivity/ sawdust/ wood chips/ wood residues/ mulching materials
Abstract: A field experiment was conducted in Sao Mateus do Sul, Brazil to determine the efficiency of using two types of mulch, intercrop (grass) and fertilizer application in achieving erva-mate [Ilex paraguariensis] productivity. The treatments used in the experiments were: (T1) no mulch, no fertilizer; (T2) fertilizer application without mulch; (T3) application of chips without fertilizers; (T4) application of chips+fertilizer; (T5) application of sawdust without fertilizer, (T6) application of sawdust+fertilizer; (T7) intercrop grass without fertilizer; and (T8) intercrop grass+fertilizer. Results showed that the addition of chips as mulch improved the productivity of erva-mate up to four years.
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1117. **Influence of mulch on soil temperature, nutrient concentration, yield components and tuber yield of sweet potato (Ipomoea batatas).**
Ossom, E. M.; Pace, P. F.; Rhykerd, R. L.; and Rhykerd, C. L.
Indian Journal of Agricultural Sciences 73(1): 57-59. (2003)
NAL Call #: 22 AG83I; ISSN: 0019-5022
Descriptors: coffee/ coffee pulp/ copper/ crop yield/ dry matter/ grass clippings/ husks/ iron/ leaves/ magnesium/ manganese/ mineral content/ mulches/ nutrient content/ plant nutrition/ potassium/ sawdust/ soil temperature/ sweet potatoes/ tubers/ weed utilization/ weeds/ yield components/ zinc/ hulls/ Mn/ mulching materials
Abstract: A field experiment was conducted in Kabiufa, Papua New Guinea from September 1999 to February 2000 to study the effects of 4 organic materials on soil temperature, and nutrient concentration and tuber yield of sweet potato (I. batatas cv. Wan Mun). The organic materials used as mulch were coffee (Coffea arabica) husk, coffee pulp, sawdust and thatch grass (Imperata cylindrica). Grass mulch resulted in the lowest soil temperatures. Significant temperature differences (P=0.05) were observed at 5-cm, 10-cm and 15-cm depths. Coffee husk mulch resulted in the highest K (2.04%), Mg (0.11%), Fe (180.26 ppm), Mn (33.02 ppm), Cu (9.88 ppm) and Zn (16.52 ppm) concentrations in the tubers. Sawdust mulch resulted in a higher but not statistically significant dry matter yield of tuber at 16 weeks after planting, whereas the grass mulch gave the lowest dry matter yield.
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1118. **The influence of mulching on nutrition and yield of 'Northblue' blueberry.**
Karp, K.; Noormets, M.; Paal, T.; and Starast, M.
Acta Horticulturae 715: 301-305. (Aug. 2006)
NAL Call #: 80 Ac82
Descriptors: peat mulch/ phKCl/ plastic mulch/ sawdust mulch/ vaccinium corymbosum x vaccinium angustifolium/ vaccinium/ vaccinium angustifolium/ vaccinium corymbosum
Abstract: Research to optimize blueberry cultivation in Estonia started in the Department of Horticulture at Estonian Agricultural University. The first experiments were established with different cultivation technologies in 1997. The purpose of the present experiment is to ascertain the influence of different mulches on the nutrition and yield of fruit bearing plants. The data were collected the 5th and 6th year after planting. The cultivation treatments were a control without mulch, sawdust mulch, peat mulch, plastic mulch, and soil amended with peat and covered with peat or plastic mulch. The initial pH of the experimental area was pHKCl 5.9; this changed over the years significantly to a pH more suitable for blueberry in treatments where peat was used as mulch or as an amendment. In treatments where peat was used, the soil acidity in the upper soil layers was pH 4.3 to 5. The soil pH was 5.4 only in treatments where soil was amended with peat and plastic mulch was used. In deeper layers (10 to 15 cm) the pH was 5.8 to 6.1. Mulching treatment significantly influenced nutrient content of leaves. Chlorophyll meter readings were significantly lower in the leaves of control plants compared to the plants growing on different mulches (381 and 498, 542 SPAD

units respectively). The average yield (2001, 2002) was 20 to 402 g/plant. Treatment and year had a significant effect on yield. The lowest yield was obtained in control plants (without mulch) and the highest was in plants where soil was amended with peat and a plastic mulch was used.

1119. **Influence of organic amendments on nematode fauna and microflora of chickpea rhizosphere.**
Gopal Pandey; Pandey, R. K.; and Hemlata Pant
Indian Journal of Pulses Research 18(2): 263-264. (2005); ISSN: 0970-6380
Descriptors: chickpeas/ composts/ fauna/ flax/ growth/ Indian mustard/ linseed/ microbial flora/ neem seed cake/ non wood forest products/ oilseed cakes/ organic amendments/ plant development/ plant parasitic nematodes/ plant pests/ rhizosphere/ rhizosphere fungi/ root nodules/ sawdust/ soil organic matter/ Capparales/ eelworms/ microflora/ minor forest products/ neem/ neem seed oilmeal/ non timber forest products/ oil cakes/ organic matter in soil/ Secernentea/ Tylenchida
Abstract: A study was conducted in Uttar Pradesh, India, to assess the effects of organic amendments on nematode fauna and microflora of chickpea rhizosphere. Treatments comprised: mustard cake, mahua cake, neem cake, linseed cake, composts, sawdust and a control. Results showed that organic amendments significantly increased growth parameters of chickpea. Higher growth of plants was recorded in neem cake-amended soil. The organic amendments significantly reduced the root-knot (Meloidogyne incognita) infection, with neem cake recording the maximum reduction. The Rhizobium and Azotobacter populations increased significantly with neem cake treatment. The number of root nodules was also higher in neem cake-amended soil in both experiments. Organic matter and oil cakes increased population of total fungi in the rhizosphere. Maximum increase in fungal number was noted in neem cake-amended soil. The soil nematode population around the roots of treated plants were decreased.
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1120. **Influence of organic amendments on the exchangeable aluminium of an Oxisol.**
Castillo, A. E.; Carbonell, R. M.; and Vazquez, S.
Ciencia del Suelo 17(1): 58-59. (1999); ISSN: 0326-3169.
Notes: Original title: Influencia de enmiendas organicas sobre el aluminio de cambio de un oxisol.
Descriptors: acidity/ aluminium/ Ferralsols/ manures/ organic amendments/ Oxisols/ pines/ sawdust/ soil/ soil solution/ soil toxicity/ stems/ tobacco/ toxicity/ aluminum/ toxic soils
Abstract: A greenhouse experiment was conducted to assess the effects of organic amendments on the aluminium toxicity of an Oxisol. Two rates (4.6 and 13.9 g kg-1) of farmyard manure, pine tree sawdust and tobacco stems were applied to pots containing the plough-layer of the studied soil. An unamended treatment was also incorporated as control. pH, acidity and exchangeable aluminium were determined in composite samples after 60, 90 and 120 days. Results showed that organic amendments decreased aluminium in the soil solution from 2.95 cmol kg-1 in the control to 0.572 cmol Al kg-1 in the treatment with the highest rate of tobacco stems.
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1121. **The influence of organic fertilizers on the humus content and composition in deflated chestnut soils.**
Egorova, R. A. and Chimitdorzhieva, G. D.
Agrokhimiya 2: 27-30. (2000); ISSN: 0002-1881
Descriptors: application/ bark/ cattle dung/ chestnut soils/ composts/ fractionation/ humic acids/ manures/ sawdust/ soil/ humic substances
Abstract: The effects on humus of manure, compost, straw, dung + sawdust, and bark compost at application rates ranging from 0 to 40 t/ha were studied in an experiment in Buryatia, Russia, from 1990 to 1992. It was shown that dung + sawdust and bark compost increased the content of humic acid fraction 1, and also a tendency to increase humic acid fraction 2. Applications of straw compost led to an increase in humic acid fraction 2. Changes in humic substance groups were non--significant.
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1122. **Influence of precipitated calcium carbonate ($CaCO_3$) on shiitake (Lentinula edodes) yield and mushroom size.**
Royse, D. J. and Sanchez Vazquez, J. E.
Bioresource Technology 90(2): 225-228. (2003)
NAL Call #: TD930.A32 ; ISSN: 0960-8524
Descriptors: calcium carbonate/ crop yield/ edible fungi/ growing media/ millets/ rye/ sawdust/ size/ soilless culture/ substrates/ weight/ wheat bran/ northern red oak/ potting composts/ rooting media/ Tricholomataceae
Abstract: Synthetic substrate consisting of oak sawdust (50%), white millet (28%), winter rye (11%) and soft red wheat bran (11%) was non-supplemented or supplemented with 0.2%, 0.4% or 0.6% (dry weight basis) precipitated calcium carbonate ($CaCO_3$). Shiitake (Lentinula edodes) was grown in two crops to determine the effect of three $CaCO_3$ levels on mushroom yield and size. Yields and biological efficiencies (averages for two crops) from substrates non-supplemented with $CaCO_3$ were lower by 14.1%, 18.4% and 24.9% compared to treatments supplemented with 0.2%, 0.4% and 0.6% $CaCO_3$, respectively. Mushroom size (weight) was larger with non-supplemented substrate (16.8 g) compared to substrate supplemented with 0.6% $CaCO_3$ (15.1 g). However, mushroom production was more consistent from crop to crop when 0.6% $CaCO_3$ was added to substrate.
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1123. **Influence of sawdust ash on soil chemical properties and cowpea performance in Southwest Nigeria.**
Awodun, M. A.
International Journal of Soil Science 2(1): 78-81. (2007); ISSN: 1816-4978
Descriptors: acid soils/ ash/ calcium/ chemical composition/ cowpeas/ crop yield/ magnesium/ nitrogen/

nutrient content/ phosphorus/ plant composition/ potassium/ sawdust/ soil chemical properties/ soil organic matter/ soil ph/ soil types/ black eyed peas/ chemical constituents of plants/ chemical properties of soil/ organic matter in soil/ southern peas
Abstract: Field trials were carried out at two locations in fairly acidic soils in Southwest Nigeria to test effect of sawdust ash on soil chemical properties, leaf nutrient content and yield of cowpea (Vigna unguiculata Walps). Sawdust ash applied at 2, 4, 6, 8 and 10 t ha-1 significantly increased soil organic matter, pH, N, P, K, Ca and Mg contents relative to 0 t ha-1 sawdust ash. The 4, 6, 8 and 10 t ha-1 sawdust ash increased pod weight and grain yield. The mean increases in grain yield across locations were 17, 63 and 68%, respectively.
This citation is from AGRICOLA.

1124. **Influence of seedbed mulching and shading on the germination and early development of rosewood (Aniba rosaeodora) seedlings .**
Marques, A. da S. J.; Varela, V. P.; and Melo, Z. L. de O.
Acta Amazonica 29(2): 303-312. (1999); ISSN: 0044-5967.
Notes: Original title: Influencia da cobertura e do sombreamento do canteiro na germinacao e desenvolvimento inicial de plantulas de pau rosa (Aniba rosaeodora).
Descriptors: clay minerals/ diameter/ forest nurseries/ forests/ growth/ height/ leaf area/ leaves/ mulches/ mulching/ nature reserves/ rice/ rice straw/ roots/ sawdust/ seed germination/ seedling emergence/ seedlings/ shade/ shading/ shoots/ straw/ tropical rain forests/ vermiculite/ mulching materials/ paddy
Abstract: An experiment was carried out in the nursery at Adolph Ducke Forest Reserve, Manaus, Amazonas, Brazil, to compare three types of mulching materials (rice straw, sawdust and vermiculite) often used in forest nurseries and to test four shade levels on germination, emergence and development of rosewood (Aniba rosaeodora) seedlings. The shade levels (30, 50 and 70%) were obtained by using black polyolefine screens and 0% shading intensity was obtained under full open sky. The types of mulch and interaction between shading levels and mulching did not influence seed germination and emergence speed index. The shade levels did not influence seed germination, but significantly effected emergence speed index. The mulches did not influence seedling growth in height, diameter and shoot, root and total dry weight, but the leaf area of the seedlings obtained with vermiculite mulch was greater than that obtained with sawdust. Better results in height growth and shoot, root and total dry weight were observed in seedlings grown under 30 and 50% shade. The interactions between 30% shade and vermiculite mulching and 50% shade and rice straw provided the best height growth and total dry weight, respectively.
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1125. **Influence of sowing techniques and pesticide application on the emergence and the establishment of bean plants (Phaseolus vulgaris L.).**
Valenciano, J. B.; Casquero, P. A.; and Boto, J. A.
Agronomie 24(2): 113-118. (2004); ISSN: 0249-5627
Descriptors: application methods/ crop establishment/ cultivars/ pesticides/ sawdust/ seedling emergence/ sowing/ vermiculite/ cultivated varieties/ green bean/ seed sowing/ snap bean
Abstract: The emergence and the establishment of beans are affected by bean seed fly attacks, soil fungi and crust formation. Experiments were conducted during 1998 and 1999 in Leon, Spain to evaluate the effects of the following treatments: bean cultivars (Rinon de Leon and Canela) as main plots; the pesticide application system (untreated, treatment of seed before sowing and treatment of seed during sowing) as subplots; and sowing technique (sowing in raised beds, sowing in flat land without adding substratum, sowing in flat land + adding sawdust and sowing in flat land + adding vermiculite) as sub-subplots. Sowing in flat land + addition of substrate to the sowing line resulted in the acceleration of the common bean emergence and the improvement of its establishment. Application of pesticides to the sowing line accelerated bean emergence. Highly significant interaction between environment and sowing technique was obtained for all parameters studied.
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1126. **Influence of substrate formulation and autoclave treatment on Lentinula edodes production.**
Kilpatrick, M.; Murray, D. J.; and Ward, F.
In: Science and Cultivation of Edible Fungi. Proceedings of the 15th International Congress on the Science and Cultivation of Edible Fungi.Maastricht, Netherlands.); pp. 803-810; 2000.
Descriptors: bark/ casing/ crop yield/ development/ edible fungi/ fructification/ grain/ growing media/ growth/ limestone/ microbial contamination/ mushrooms/ pathogens/ production/ sawdust / size/ spawning/ straw/ vegetables/ wheat/ wheat straw/ northern red oak/ potting composts/ rooting media/ Tricholomataceae/ vegetable crops
Abstract: Lentinula substrates were prepared from various lignocellulosic materials: red oak sawdust, composted spruce bark, composted spent mushroom substrate and wheat straw, supplemented with varying proportions of wheat grain, wheat bran and limestone. Yields (fresh weight/per unit fresh weight substrate) were highest from oak and oak/spruce bark combinations. Increasing grain supplementation (10-37% DW) of wood-based substrates raised productivity by an average 85%. In contrast, straw-based substrates showed a negative response with grain supplementation. When supplemented substrates were subjected to heat treatments of 2 or 3 autoclave cycles (121 degrees C for 1 h at 15 psi), there were no significant differences in level of pathogen infection or total yield. The more intensive regime reduced the number of fruiting bodies harvested by ~35%; the average weight per fruiting body increased by a similar amount. In a comparison of surface, core and mixed spawning techniques, surface spawning was a viable technique that could reduce post-autoclave contamination.
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1127. **Influence of substrate wood chip particle size on shiitake (Lentinula edodes) yield.**
Royse, D. J. and Sanchez-Vazquez, J. E.
Bioresoure Technology 76(3): 229-33. (Feb. 2001)
NAL Call #: TD930.A32 ; ISSN: 0960-8524

Descriptors: crops, agricultural: growth & development/ fertilizers/ food industry: economics: methods/ particle size/ shiitake mushrooms: growth & development/ wood
Abstract: Wood chips from four commercial hardwood sawmills were screened with 10 US standard sieves (4-0.21 mm) to assess particle size distributions. 96-98% of wood chips were < 4 mm while 95-99% of particles were > 0.21 mm. The majority (mean = 64.5%) of wood chips passed through US standard sieve size 14 (< 1.4 mm). Shiitake (Lentinula edodes) was grown in three crops to determine the effect of four particle size classes (1 = 2.8-4 mm; 2 = 1.7-2.8 mm; 3 = 0.85-1.7 mm; 4 = < 0.85 mm) on mushroom yield. Yields from substrates prepared with wood chips from class 4 (< 0.85 mm) were lower by 27.7%, 12.4% and 2% (mean = 14.9%) for Crops I, II, and III, respectively, when compared to controls. Profiling of wood chips may help growers optimize their production media and reduce production costs. This citation is from PubMed.

1128. **Influence of the substrate components on the crop yield of shiitake (Lentinus edodes (Berk) Singer).**
Kalberer, P.
Gartenbauwissenschaft 63(1): 15-19. (1998); ISSN: 0016-478X
Descriptors: calcium/ crop yield/ cultural methods/ growing media/ maize/ nitrogen/ plant residues/ sawdust/ soyabeans/ urea/ vegetables/ wheat/ corn/ potting composts/ rooting media/ soybeans/ Tricholomataceae/ vegetable crops
Abstract: Substrates for growing L. edodes [Lentinula edodes] contain mainly hardwood sawdust (75-80%) supplemented with other components. The effect of substrate composition on the yield of L. edodes was investigated. Under optimum growing conditions, the basic formulation gave a good yield in a short harvesting period; the standard deviation of yield was small. Yields from substrates containing whole maize meal as a supplement were more uniform than those from substrates containing wheat bran. Substrates with 20% whole maize meal gave higher yields than substrates with only 10%. For highest yields, the substrate should contain 20% maize meal, an additional N source (1% urea or 4% extracted soyabean meal) and 2% calcium carbonate.
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1129. **Influence of urea and ammonium chloride on crop yield and fruit body size of shiitake (Lentinula edodes).**
Kalberer, P. P.
In: Science and Cultivation of Edible Fungi Proceedings of the 15th International Congress on the Science and Cultivation of Edible Fungi.Maastricht, Netherlands.); pp. 361-366; 2000.
Descriptors: corn flour/ cultural methods/ deformation/ edible fungi/ fertilizers/ fructification/ growing media/ growth/ maize/ nitrogen fertilizers/ plant residues/ quality/ sawdust/ size/ spawn/ urea/ vegetables/ corn/ cornflour/ maize flour/ potting composts/ rooting media/ Tricholomataceae/ vegetable crops
Abstract: The supplementation of a sawdust-corn flour substrate with urea or ammonium chloride increased the crop yield of L. edodes. From supplemented substrates heavier fruiting bodies were harvested. The duration of the incubation influenced the crop yield and the size of the fruiting bodies. The supplements slowed down the spawn run and prolonged the incubation. Urea added to the substrate caused the failure of some primordia to develop and the deformation of some fruiting bodies. Reproduced with permission from the CAB Abstracts database.

1130. **Influence of various potting media on growth and nutrient uptake efficiency of Scindapsus aureus.**
Iftikhar Ahmad and Qasim, M.
International Journal of Agriculture and Biology 5(4): 594-597. (2003); ISSN: 1560-8530
Descriptors: chemical composition/ farmyard manure/ growing media/ manures/ nutrient uptake/ organic amendments/ plant composition/ plant nutrition/ potting/ sand/ sawdust/ silt/ substrates/ use efficiency/ chemical constituents of plants/ FYM/ potting composts/ rooting media
Abstract: The effects of various potting media were studied to determine growth response and nutrient uptake efficiency of S. aureus [Epipremnum pinnatum]. Soil amendments were made by using farmyard manure, leaf mould and poultry manure as main sources and by making different combinations with sand, silt and sawdust. Potting media in different combinations were better than the sole factor of the soil itself because different combinations of potting media produced more growth and vigour of the plants and improved total available N and P. Moreover, correlation coefficients indicated positive relationship among various growth responses and soil and plant NPK contents except leaf P which exhibited a negative relationship.
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1131. **Influence of wood ash-based soil amendments on weed occurrence and diversity in a humid tropical environment.**
Smith, M. A. K.; Ojeniyi, S. O.; and Oladejo, B. T.
Journal of Sustainable Agriculture and the Environment 3(2): 270-275. (2001); ISSN: 1119-8152
Descriptors: broadleaves/ dry matter/ forests/ humid zones/ maize/ occurrence/ rain forests/ soil amendments/ species diversity/ trees/ wood ash/ woody plants/ corn/ Mitracarpus villosus
Abstract: The weed species occurrence, diversity and dry matter accumulation at 6 weeks after applying ash-based soil amendments to early season maize (Zea mays var. DMR-ESR-Y) in the rainforest ecozone of southwestern Nigeria were evaluated. The weed flora was dominated by Poaceae (30.7%) and annual broadleaves (53.8%). Soil amendment resulted in a complex admixture of weed species particularly Euphorbia heterophylla (EHETE), Setaria spp. (SETAR), Mitracarpus villosus (MITVI) and Digitaria horizontalis (DIGHO). Weed densities were highest (107.2 plants/m2) and lowest (67.6 plants/m2) in 8 tonnes/ha wood ash (WA) and 12 WA, respectively. F3+4WA (150 kg/ha NPK 23-13-13+4 tonnes/ha wood ash) carried the most diverse weed flora (D=3.84) while the least variable weed flora occurred in F2+2WA (250 kg/ha NPK+2 tonnes/ha wood ash). In contrast, weeds were equally most widespread in F3+4WA and 8WA (8 tonnes/ha) and least in the untreated control (CON). Weeds occurring in 8WA, F2+2WA and F4+6WA (100 kg/ha NPK+6t/ha wood ash)

accumulated comparable dry weights and these were significantly more than in CON and F1 (300 kg/ha NPK), 12WA (12 tonnes/ha wood ash) and F3+4WA. The implications of these on soil fertility improvement strategies and associated weed management problems, are discussed.
This citation is from AGRICOLA.

1132. **Influence of wood chip particle size used in substrate on biological efficiency and post-soak log weights of shiitake.**
Royse, D J and Sanchez Vazquez, J E.
In: Science and Cultivation of Edible Fungi. Proceedings of the 15th International Congress on the Science and Cultivation of Edible Fungi.Maastricht, Netherlands.); pp. 367-373; 2000.
Descriptors: crop yield/ cultural methods/ edible fungi/ growing media/ logs/ sawdust/ size/ utilization/ vegetables/ wood chips/ potting composts/ rooting media/ Tricholomataceae/ vegetable crops
Abstract: Wood chips from 7 commercial sawdust sources were profiled by sieving materials through 10 US standard sieve sizes (4-0.21 mm). The majority (mean=70.7%) of wood chips passed through US standard sieve size 16 (<1.18 mm). Sawdust of particle size 0.5-0.85 mm accounted for the single largest particle size class (mean=32.2%). The next single largest class had a particle size distribution of 0.85-1.18 mm (mean=17.8%). Shiitake [Lentinula edodes] was grown in 3 crops to determine the effect of 4 particle size classes (1 = 2.8-4 mm; 2 = 1.7-2.8 mm; 3 = 0.85-1.7 mm; and 4 = <0.85 mm) on yield. In addition, logs from 2 crops were weighed after each soak (3) to determine the effect of particle size on water up-take. Yield from substrate prepared with wood chip particle size class 4 (extra fine; <0.85 mm) was significantly less than yields from the other particle size classes and the controls. Yield from particle size class 3 (0.85-1.7 mm) was highest among the 4 classes. Water uptake was greater in synthetic logs made with extra fine wood chips (<0.85 mm). Profiling of wood chips at the source may help growers optimize their production media and reduce production costs. Reproduced with permission from the CAB Abstracts database.

1133. **Initiation and growth of shoots of Gongronema latifolia benth stem cuttings in different rooting media.**
Agbo, C. U. and Omaliko, C. M.
African Journal of Biotechnology 5(5): 425-428. (2006)
NAL Call #: TP248.13 .A37; ISSN: 16845315 .
Notes: Export Date: 4 March 2009
Source: Scopus
Language of Original Document: English.
Descriptors: Gongronema latifolia/ propagation/ rooting media/ stem cuttings/ Nigeria/ nonhuman/ plant/ plant growth/ plant leaf/ plant root/ plant stem/ sawdust/ season/ soil/ spice/ stem cutting/ vegetable/ vegetation/ Gongronema
Abstract: Vegetative propagation of Gongronema latifolia Benth commonly used as a forest leafy vegetable and spice, was studied in three rooting media (sawdust, ricehull and soil) under two seasons in Nsukka. The study showed that G. latifolia could be effectively propagated by stem cuttings. There was significant reduction in number of days to shoot initiation and growth in sawdust medium in the wet season. Sawdust and soil gave a better performance of the cuttings in opening of apical buds, initiation of shoots, percentage of rooted cuttings, number of vines, vine length and number of opposite leaves on vines in both seasons. Even though, both media performed similarly in most of the attributes, sawdust medium will be preferred to soil because it is readily available and affordable. Effective and high percentage rooting of G. latifolia stem cuttings, which will provide excellent conservation of a selected clone derived from virgin forest and hybridization, could be achieved in sawdust medium during the dry season. © 2006 Academic Journals.

1134. **Integrated crop management strategies for plantain production and control of black leaf streak (black Sigatoka) disease in the Democratic Republic of Congo.**
Ngongo, P. M. K.
Infomusa 11(1): 3-6. (2002); ISSN: 1023-0076
Descriptors: cover crops/ cowpeas/ crop residues/ crop yield/ cultural control/ flowering date/ fungal diseases / harvesting date/ integrated control/ mulches / mulching/ nitrogen fertilizers/ phosphorus fertilizers/ plant disease control/ plant diseases/ plant height/ plant pathogenic fungi/ plant pathogens/ potassium fertilizers/ rice husks/ sawdust/ wood residues/ black eyed peas/ harvest date/ integrated plant protection/ mulching materials/ Mycosphaerellaceae/ phosphate fertilizers/ phytopathogens/ potash fertilizers/ rice hulls/ southern peas
Abstract: A field experiment was conducted in western Congo in 1998 to compare the field performance and yield of plantain (Musa AAB cv. Yumba) under different practices of soil fertility and disease management, viz. application of crop residues as mulches (wood sawdust or rice husk), cover crop (Vigna unguiculata) and fertilizers (300 kg N, 60 kg P_2O, 550 kg K_2O). The development and severity of black Sigatoka disease (caused by Mycosphaerella fijiensis) were studied. Growth (plant height, plant girth, number of emerged leaves, days to flowering, days to harvest and height of the tallest sucker) and yield parameters (number of hands per bunch, number of fruits per bunch, bunch weight and yield) were evaluated. Soil analysis showed that rice husk was the best in improving soil fertility level. The severity of black Sigatoka on plantain was much lower in the mulched plantain than in the non-mulched plantain. Rice husk was the best in slowing disease development. Crop residues also improved plant girth and lowered the number of leaves. Plants mulched with rice husk flowered earlier and had a longer fruit-filling period than those other treatments. Plantain mulched with rice husk was harvested 16 days earlier than plantain mulched with sawdust. It also showed better suckering and tallest suckers. Mulching improved the number of hands and fruits per bunch than the non-mulched plantains. Plantains mulched with rice husk outyielded the controlled plants, plants treated with cover crop and plants applied with NPK fertilizer by 46, 37 and 26%, respectively. Reproduced with permission from the CAB Abstracts database.

1135. **Integrated management of rice sheath blight under field condition.**
Surulirajan, M. and Janki Kandhari
Indian Phytopathology 58(4): 431-436. (2005)
NAL Call #: 464.8 IN2 ; ISSN: 0367-973X

Descriptors: biological control/ biological control agents/ carbendazim/ chemical control/ crop yield/ cultural control/ farmyard manure/ fungal diseases/ fungicides/ integrated control/ plant disease control/ plant diseases/ plant pathogenic fungi/ plant pathogens/ rice/ rice straw/ sawdust/ seed weight/ straw/ biocontrol agents/ biological control organisms/ carbendazol/ FYM/ Hyphomycetes/ integrated plant protection/ MBC/ medamine/ New Delhi/ paddy/ phytopathogens
Abstract: A study was conducted in Delhi, India, to assess the disease severity, percent disease incidence (PDI) and yield parameters (grain yield, straw yield and 1000-grain weight) against sheath blight (Rhizoctonia solani) of rice through different combinations of treatments in the field in 1999-2000 and 2000-01. Treatments comprised: Trichoderma viride 3235 (Tv3235) spore suspension spray; 0.1% carbendazim; 1% farmyard manure (FYM); 1% sawdust; Tv3235 + carbendazim; Tv3235 + FYM; Tv3235 + sawdust; carbendazim + FYM; carbendazim + sawdust; FYM + sawdust; Tv3235 + carbendazim + FYM; Tv3235 + carbendazim + sawdust; Tv3235 + FYM + sawdust; carbendazim + FYM + sawdust; Tv3235 + carbendazim + FYM + sawdust; and an untreated control. Among all the treatments, Tv3235 + carbendazim + FYM + sawdust showed the maximum reduction in sheath blight severity, PDI and the highest grain yield over the control.

1136. **Integration of fungal antagonist and organic amendments for the control of rice sheath blight.**
Khan, A. A. and Sinha, A. P.
Indian Phytopathology 59(3): 363-365. (2006)
NAL Call #: 464.8 IN2 ; ISSN: 0367-973X
Descriptors: biological control/ biological control agents/ crop yield/ cultural control/ farmyard manure/ fungal antagonists/ green manures/ integrated control/ neem seed cake/ non wood forest products/ organic amendments/ plant disease control/ plant pathogenic fungi/ plant pathogens/ rice/ sawdust/ straw/ wheat/ wheat straw/ biocontrol agents/ biological control organisms/ FYM/ Hyphomycetes/ integrated plant protection/ minor forest products/ neem seed oilmeal/ non timber forest products/ paddy/ phytopathogens
Abstract: A study was conducted to evaluate the effect of the integration of organic amendments (FYM, wheat straw, dhaincha [Sesbania aculeata], sawdust and neem cake) and fungal antagonist (Trichoderma harzianum (TH)) on rice sheath blight caused by Rhizoctonia solani. All treatments significantly reduced disease severity/incidence and increased grain yield and 1000-grain weight compared with the untreated control. FYM+TH, followed by neem cake+TH and dhaincha+TH, were the most effective treatments.

1137. **Investigation of chemical change on swine fecal composting added sawdust.**
Maeda, K. and Okuhata, S.
Bulletin of the Wakayama Research Center of Agriculture, Forestry and Fisheries (Japan) 2: 149-154. (2001); ISSN: 1345-5028.
Notes: 3 tables; 12 fig.; 10 ref. Summary (Ja).). Citation notes: JP (Japan).
Descriptors: chemical change/ swine manure/ composting/ sawdust

1138. **Investigations on quantity and physical-chemical quality of wood ash in improving the feeding values of poor quality roughage feeds for ruminants.**
Kimambo, A. E.; Aboud, A. A.; Laswai, G. H.; Mtakwa, P.; Nkenwa, D.; Anthony, N.; and Mtamakaya, J. D.
In: Proceedings of the Joint 17th Scientific Conference of the Tanzania Society for Animal Production and the 20th Scientific Conference of the Tanzania Veterinary Association.AICC Arusha, Tanzania.); pp. 170-182; 2002.
Descriptors: alkalinity/ ashing/ charcoal/ chemical composition/ combustion/ digestibility/ dry matter/ feed additives/ hardwoods/ nutritive value/ pH/ physicochemical properties/ roughage/ ruminant feeding/ softwoods/ wood/ wood ash/ wood residues/ hydrogen ion concentration/ neutral detergent fibre/ nutritional value/ potential of hydrogen/ quality for nutrition
This citation is from AGRICOLA.

1139. **Irrigation, sawdust mulch, and Enhance® biocide affects soft rot incidence, and flower and tuber production of calla.**
Wright, P. J. and Burge, G. K.
New Zealand Journal of Crop and Horticultural Science 28(3): 225-231. (2000)
NAL Call #: SB99.N45N45; ISSN: 01140671
Descriptors: agronomic methods/ calla/ Erwinia carotovora/ irrigation/ mulch/ soft rot/ Zantedeschia spp / flowering/ irrigation/ morbidity/ plant growth/ plant yield/ soft rot/ Zantedeschia
Abstract: The incidence and severity of soft rot, flower grades, and tuber yields of calla (Zantedeschia spp.) plants were affected by the quantity of water received during the growing season, sawdust mulch, and Enhance® biocide applications to tubers before planting. Incidence of plants with soft rot symptoms increased at a relatively constant rate during the season reaching an average for all treatments of 61% at the end of flowering. Irrigated plus mulched callas had 15% less soft rot than the irrigation without mulch or the mulch without irrigation treatments. Yield of tubers was 90% greater from irrigated plants. Dipping tubers in Enhance® before planting slightly reduced the severity of rotting in harvested tubers from non-irrigated plants. The total number of flowers was not affected by irrigation but was slightly reduced by sawdust mulch. However, the number of long stemmed flowers was increased 41% by irrigation, to over 1.5 per tuber.

1140. **Land management effects on biogeochemical functioning of salt-affected paddy soils.**
Quantin, C.; Grunberger, O.; Suvannang, N.; and Bourdon, E.
Pedosphere 18(2): 183-194. (2008)
NAL Call #: S590 .P43; ISSN: 1002-0160
Descriptors: cattle manure/ crop yield/ electrical conductivity/ flooding/ iron/ land management/ manganese/ organic amendments/ oxides/ paddy soils/ pig manure/ poultry manure/ redox potential/ redox reactions/ reduction/ rice/ saline soils/ sawdust/ soil chemistry/ soil management/ soil ph/ soil salinity/ soil solution/ soil types/ water management/ flooded

conditions/ Mn/ oxidation reduction potential/ oxidation reduction reactions/ paddy/ poultry litter/ water resource management
Abstract: Most lowlands in Northeast Thailand (Isaan region) are cultivated with rice and large areas are affected by salinity, which drastically limits rice production. A field experiment was conducted during the 2003 rainy season (July-November) to explore the interactions between salinity and land management in two fields representative of two farming practices: an intensively managed plot with organic inputs (buffalo, poultry and pig manure mixed with sawdust) and efficient water management, and one without organic matter addition. Field measurements, including pH, Eh, electrical conductivity (EC), and soil solution chemistry, were performed at three depths, with a particular focus on Fe dynamics, inside and outside saline patches. High reducing conditions appeared after flooding particularly in plots receiving organic matter and reduction processes leading to oxide reduction and to the release of Fe and, to a lesser extend, Mn to the soil solution. Oxide reduction led to the consumption of H+ and the more the Fe reduction was, the higher the pH was, up to 6.5. Formation of hydroxy-green rust were likely to be at the origin of the pH stabilization. In the absence of organic amendments, high salinity prevented the establishment of the reduction processes and pH value remained around 4. Even under high reduction conditions, the Fe concentrations in the soil solution were below commonly observed toxic values and the amended plot had better rice production yield. Reproduced with permission from the CAB Abstracts database.

1141. **Leaching of As and Cr in wood-ash-amended soil columns.**
Chirenje, T.; Rivero, C.; and Ma, L. Q.
Soil and Sediment Contamination 11(3): 359-375. (2002)
NAL Call #: TD878 .J68
Descriptors: arsenic/ chromium/ leaching/ wood ash/ soil amendments/ spodic horizons/ humic acids/ fulvic acids/ soil pollution/ risk
This citation is from AGRICOLA.

1142. **Leaching of nitrogen derived from cattle manure sawdust compost and coated fertilizer applied to vegetables grown in upland Andosol.**
Ohashi, T. and Matano, O.
Japanese Journal of Soil Science and Plant Nutrition 74(5): 631-635. (2003); ISSN: 0029-0610
Descriptors: Andosols / cattle manure/ composts/ denitrification/ leaching/ lysimeters/ nitrate/ nitrogen/ nitrogen fertilizers/ sawdust/ soil types/ tracer techniques/ upland soils/ vegetables/ volatilization/ hill soils/ vegetable crops
Abstract: A lysimeter study in combination with 15N-tracer method was carried out for 3 years and 9 months to investigate the fate of nitrogen derived from cattle manure sawdust compost and coated fertilizer which were applied to vegetables grown in upland Andosol. Of total amount of input nitrogen derived from cattle manure sawdust compost, 1.15% was leached as nitrate, 12.8% was taken up by plants, 68.1% remained in soil, and 18.0% was unaccounted - for which was estimated to be the result of denitrification and volatilization. Of total amount of input nitrogen derived from coated fertilizer, 2.55% was leached as nitrate, 65.3% was taken up by plants, 16.2% remained in soil, and 15.9% was unaccounted - for which was estimated to be the result of denitrification and volatilization. This citation is from AGRICOLA.

1143. **Lingonberry establishment on soils amended with fish waste and wood chips.**
Talbot, V. L.; Holloway, P. S.; and Matheke, G. E. M.
Acta Horticulturae 574: 305-308. (2002)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: fish scrap/ growth/ mineral soils/ nitrogen/ organic fertilizers/ phosphorus/ potassium/ rhizomes/ silt loam soils/ soil amendments/ soil ph/ soil types/ wood chips/ fish waste/ United States of America
Abstract: Year old lingonberries (Vaccinium vitis-idaea subsp. vitis-idaea) were planted in Rabideau silt loam soils (Trapper Creek, Alaska) amended with five combinations of cannery fish waste (90% salmon, 10% halibut) as an organic fertilizer and wood chips recovered from rotting windrows of tree slash as a soil amendment. Control consisted of mineral soils. Treatments included fish waste only, 2:1 (v:v) fish waste:wood chips, 1:1 (v:v) fish waste:wood chips, 1:2 (v:v) fish waste:wood chips and wood chips only. Total volume of an amendment applied singly or a combination of amendments was 150 l.m-2. Each amendment was tilled into the plots, and planting occurred six weeks later. Plants were grown for one full season following the planting season to study establishment and vegetative growth on this organic mix. All treatments with fish waste showed the greatest overall plant growth. The treatment with fish waste only produced the greatest number and dry weight of stems and leaves (average 45 stems, 680 leaves, 8 g per plant) of all treatments. Rhizome production varied widely among plants (0-13 rhizomes per plant) and did not differ among treatments. Vegetative growth was inhibited by addition of wood chips alone. Soil tests during the first growing season showed 2118-2749 micro g.g-1 total available N, 255-281 micro g.g-1 P and 787-880 micro g.g-1 K for fish-amended soils, 106 micro g.g-1 N, 25 micro g.g-1 P and 235 micro g.g-1 K for the control and 20 micro g.g-1 N, 27 micro g.g-1 P and 428 micro g.g-1 K for the wood chip plots without fish. Lingonberries that normally require low nutrient levels grew best at the highest nutrient levels and showed no adverse effects from the fish waste. Wood chips did not provide any benefit for the establishment of lingonberries on mineral soils during the first year.
This citation is from AGRICOLA.

1144. **Litter characteristics and performance of broilers reared under different stocking densities and litter types.**
Oliveira, M. C.; Bento, E. A.; Carvalho, F. I.; and Rodrigues, S. M. M.
Ars Veterinaria 21(3): 303-310. (2005); ISSN: 0102-6380.
Notes: Original title: Caracteristicas da cama e desempenho de frangos de corte criados em diferentes densidades populacionais e tipos de cama.
Descriptors: ammonia/ body weight/ broilers/ feed intake/ litter/ liveweight gain/ meat production/ moisture/ pH/ poultry/ sawdust/ stocking density/ stocking rate/ wood shavings/ chickens/ density of stocking/ domesticated birds/ hydrogen ion concentration/ liveweight gains/ potential of hydrogen

Abstract: This experiment was carried out to evaluate the litter characteristics and performance of broilers reared under different stocking densities and litter types. 450 chicks were distributed in an entirely randomized design and 2x2 factorial arrangement (2 stocking densities - 10 and 14 birds/m2 and 2 litter types - wood shavings and sawdust), with 4 treatments and 5 replications. At the end of the experiment, the body weight, liveweight gain, feed consumption, feed:gain ratio, meat/area production and viability were determined. Litter samples were collected for moisture, pH and volatilized ammonia analysis. The feed consumption decreased (P<0.01), the feed:gain ratio improved (P<0.02) and the total meat production increased (P<0.01) with increasing stocking density. In relation to the poultry litter, the final pH was not influenced by the stocking density and/or litter type. However, the moisture content and volatilized ammonia of the sawdust were higher (P<0.03) than that of the wood shavings (40.37% and 78.88 ppm and 32.68% and 37.91 ppm to sawdust and wood shavings, respectively). It was concluded that the highest evaluated density and use of wood shavings could be adopted under both stocking densities as well as the sawdust under the density of 10 birds/m2.
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1145. **Living conditions and body weight gains of fattening pigs kept on different litters.**
Kaczor, A. and Szyndler, J.
Roczniki Naukowe Zootechniki 26(4): 365-376. (1999); ISSN: 0137-1657
Descriptors: animal behaviour/ animal health/ animal housing/ animal welfare/ behaviour/ deep litter housing/ finishing/ floors/ hygiene/ liveweight gain/ living conditions/ pens/ pig housing/ sawdust/ stocking density/ stocking rate/ straw/ supplements/ animal behavior/ animal rights/ behavior/ density of stocking/ fattening/ flooring/ hogs/ liveweight gains/ piggeries/ sties/ swine/ swine housing
Abstract: The aim of the study was to determine the effect of various types of deep litter from coniferous tree sawdust on living conditions of pigs in standard pens approximately 10 msuperscript 2 in area including behaviour, hygiene, daily weight gains, and concentration of harmful gas admixtures in the fattening house. The studies were conducted on litter from coniferous tree sawdust without supplements, with Stalosan F, and with straw (50% of sawdust to 50% of straw in terms of volume). It was concluded that resting conditions of pigs were better on deep litter from sawdust than on shallow litter from straw. The best hygiene of animals was ensured by deep sawdust litter with Stalosan F or with straw. The concentration of harmful gas admixtures (NH_3 and CO_2) did not exceed the permitted level. The type of litter had no effect on daily weight gains of pigs, and stocking density was found to have greater influence. Management of pigs on deep sawdust litter in standard pens approximately 10 msuperscript 2 in area and with a stocking density of 6-7 animals (i.e. 1.4-1.2 msuperscript 2/pig) ensured proper living conditions. It is concluded that deep litter from coniferous tree sawdust is usefulness for managing pigs in standard pens up to 10 msuperscript 2 in area.
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1146. **Maintenance and hysteresis of soil-root interface water potential of cherry-plum in response to soil dehydration and rehydration.**
Xu HuiLian; Caron, J.; Bernier, P. Y.; Umemura, H.; Gauthier, L.; and Gosselin, A.
Journal of the Japanese Society for Horticultural Science 68(2): 228-235. (1999); ISSN: 0013-7626
Descriptors: bark/ composts/ dehydration/ growing media/ hydraulic conductivity/ hysteresis/ matric potential/ ornamental plants/ ornamental woody plants/ peat/ plant water relations/ responses/ sawdust/ soil water/ transpiration/ water potential/ water stress/ woody plants/ xylem / xylem water potential/ ornamentals/ potting composts/ Prunus cistena/ rooting media/ soil moisture
Abstract: For Prunuscistena plants grown in 3 artificial soil mixes and subjected to soil dehydration and rehydration, the soil-root interface water potential ($Psi_{s.r}$ was estimated using an equation of Ohm's analog, and the maintenance and hysteresis of $Psi_{s.r}$ as well as xylem water potential (Psi_X) and transpiration rate (E_A), were examined. The soil mixes were composted bark, peat and sand (Mix 1), peat, bark, sand and compost (Mix 2), and peat, sawdust and sand (Mix 3). When water was withheld and the soil matric potential (Psi_m) was lowered, plants grown in Mix 2 maintained higher $Psi_{s.r}$ as well as higher Psi_X. However, when the soil mix was rehydrated, $Psi_{s.r}$ was always lower during the re-wetting than during the drying cycles. The relationship between Psi_m and $Psi_{s.r}$ showed a strong hysteresis-like behavior. Hysteresis was greatest in Mix 2 and least in Mix 3. Hysteresis of Psi_X or E_A showed a similar trend to that of $Psi_{s.r}$. The differences among soil mixes in hysteresis of $Psi_{s.r}$ might be related to the unsaturated hydraulic conductivity of substrates.
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1147. **The management of bedding litter and mastitis.**
Escobal, I.; Martinez, L.; and Esnal, A.
Albeitar 65: 20-21. (2003).
Notes: Original title: El manejo de las camas y las mamitis.
Descriptors: bark/ cattle housing/ cows/ dairy cows/ litter/ mastitis/ sawdust/ straw/ cattle sheds
Abstract: An account is given of the type of litter used, its cleanliness and the frequency of changing it on the count of bacteria causing mastitis in dairy cows. Other factors considered were housing density, cow feeding, cleanliness of pens, humidity and the storage of litter. Data are tabulated for the bacterial count of straw, Peruvian bark shavings, wood shavings and sawdust bedding materials (0 and 24 h after use). It was concluded that although bedding consisting of straw and Peruvian bark shavings had a higher bacterial count than that from wood shavings and sawdust, efficient management of litter is more important than the type of litter used.
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1148. **Manioc peel and charcoal: A potential organic amendment for sustainable soil fertility in the tropics.**
Topoliantz, S.; Ponge, J. F.; and Ballof, S.
Biology and Fertility of Soils 41(1): 15-21. (2005)
NAL Call #: QH84.8.B46; ISSN: 0178-2762

Descriptors: calcium/ carbon nitrogen ratio/ cassava/ cassava peel/ charcoal/ crop production/ crop yield/ exchangeable aluminium/ growth/ magnesium/ mulches/ nutrient availability/ nutrient content/ organic amendments/ organic farming/ Oxisols/ phosphorus/ sawdust/ shifting cultivation/ soil acidity/ soil fertility/ soil types/ sustainability/ tropical soils/ tropics/ bush fallowing/ eco agriculture/ ecological agriculture/ exchangeable aluminum/ manioc/ mulching materials/ organic culture/ slash and burn/ swidden agriculture/ tapioca plant/ tropical countries/ tropical zones
Abstract: In tropical areas, where crop production is limited by low soil quality, the development of techniques improving soil fertility without damage to the environment is a priority. In French Guiana, we used subsistence farmer plots on poor acidic soils to test the effect of different organic amendments, bitter manioc peel (M), sawdust (Sw) and charcoal (Ch), on soil nutrient content, earthworm abundance and yard-long bean (Vigna unguiculata sesquipedalis) production. The peregrine Pontoscolex corethrurus was the only earthworm species found. Pod production and plant growth were lowest in unamended soil. The application of a mixture of manioc peel and charcoal (M+Ch) improved legume production compared with other organic mixtures. It combined the favourable effects of manioc peel and charcoal. Manioc peel improved soil fertility through its low C:N ratio and its high P content, while charcoal decreased soil acidity and exchangeable Al and increased Ca and Mg availability, thus alleviating the possible toxic effects of Al on plant growth. The M+Ch treatment was favourable to P. corethrurus, the juvenile population of which reached a size comparable to that of the nearby uncultivated soil. The application of a mixture of manioc peel and charcoal, by improving crop production and soil fertility and enhancing earthworm activity, could be a potentially efficient organic manure for legume production in tropical areas where manioc is cultivated under slash-and-burn shifting agriculture.

1149. **Manipulating bedding materials and PLT™ to reduce NH_3 emissions from broiler manure.**
Tasistro, A. S.; Cabrera, M. L.; Ritz, C. W.; and Kissel, D. E.
Bioresource Technology 99(6): 1952-1960. (2008)
NAL Call #: TD930.A32 ; ISSN: 0960-8524
Descriptors: ammonia/ ammonium/ carbon dioxide/ carbon nitrogen ratio/ emission/ groundnut husks/ litter/ paper/ poultry manure/ sawdust/ straw/ waste utilization/ wheat/ wheat straw/ wood shavings/ groundnut shells/ peanut husks/ peanut shells/ poultry litter
Abstract: We studied the effect of five bedding materials (wood shavings, sawdust, peanut hulls, wheat straw and shredded paper) and PLT™ (a commercial formulation of Na bisulfate) in factorial combinations, on NH_3 emissions from broiler manure. Treatments were incubated for 11 days at 25 degrees C and 98% relative humidity. Ammonia was trapped in 0.1 N H_2SO_4 and measured colorimetrically as NH_4+, and CO_2 was monitored with an infrared analyzer. Ammonia and CO_2 emissions were suppressed by PLT™ throughout the study. Wheat straw, wood shavings, and sawdust, with C(total)/N(total) > 50 or C(biodegradable)/N > 20, had low NH_3 emissions. Total NH_3 emissions from peanut hulls and shredded paper were the highest, probably due to peanut hulls' low C/N ratio and shredded paper's alkaline pH. No significant interactions on NH_3 emissions were detected between PLT™ and bedding materials.

1150. **Manipulating the N release from N-rich crop residues by using organic wastes on soils with different textures.**
Chaves, B.; Neve, S. de; Piulats, L. M.; Boeckx, P.; Cleemput, O. van; and Hofman, G.
Soil Use and Management 23(2): 212-219. (2007)
NAL Call #: S590.S68; ISSN: 0266-0032
Descriptors: carbon nitrogen ratio/ cauliflowers/ crop residues/ leeks/ microbial activities/ mineralization/ nitrogen/ organic wastes/ overwintering/ sandy loam soils/ sawdust/ silt loam soils/ sludges/ soil texture/ soil types/ vinasse/ Capparales/ heading broccoli/ microbial biomass
Abstract: The potential to manipulate the N release from vegetable crop residues (cauliflower, leek) by using organic wastes was tested under field conditions on three soil textures during 2 years (silt loam, sandy loam and loamy sand). During the first year, incorporation of green waste compost and sawdust did not significantly increase microbial biomass N and did not lead to a significant N immobilization of crop residue-N. During the second year, straw did increase microbial biomass N and showed a good N immobilization potential in all textures. The largest increase in microbial biomass N and the greatest N immobilization occurred in the loamy sand soil. The texture effect was probably because of better incorporation of the crop residues and immobilizer wastes in the loamy sand soil compared with the other textures. During spring, there was no consistent remineralization of immobilized N after the addition of malting sludge or vinasses in either year. This could be a result of the limited amount of N immobilized and available for remineralization in the first year or an unsuitable composition of the remineralizer wastes.

1151. **Manipulating the quantity, quality, and manner of C addition to reduce soil inorganic N and increase C4:C3 grass biomass.**
Bleier, J. S. and Jackson, R. D.
Restoration Ecology 15(4): 688-695. (2007)
NAL Call #: QH541.15.R45R515; ISSN: 1061-2971
Descriptors: biomass production/ carbon/ immobilization/ mineralization/ sawdust/ soil amendments/ soil types/ sugar/ inorganic nitrogen/ restoration ecology/ United States of America
Abstract: Applying C to soils has been proposed as a plant community restoration tactic because it has been shown to immobilize inorganic N, which should confer a competitive advantage to slower growing plants that are often key components of the desired plant community. Disparate experimental and survey results have led to questions about the appropriate quality and quantity of C to apply. We conducted a single-season glasshouse experiment in three soil types to determine how the quality (sugar, sawdust, sugar+sawdust), quantity (1 and 5 kg sugar or sawdust/m2), and mode of application (surface applied or

mixed into soil) of C affected soil inorganic N pools, net mineralization rates, and aboveground biomass of coexisting C3 and C4 plant species. Carbon applied as sawdust mixed into the soil resulted in the highest level of immobilization in the short term (6 weeks), but all combinations and rates of sugar and sawdust application resulted in immobilization over this period. In the long term (24 weeks), most amendments immobilized N and suppressed aboveground biomass of the C3 grass, Bromus inermis, but the high rate of sugar resulted in the strongest immobilization and C3 suppression. However, this treatment also maintained the highest soil inorganic N pool at season's end, which calls into question its effectiveness if longer-term benefits are desired. Neither net mineralization rates nor soil inorganic N pools were correlated to the ratio of C4 to C3 plant biomass at season's end indicating that the mechanisms for favorable plant response to C addition are not understood. Reproduced with permission from the CAB Abstracts database.

1152. **Mass and nutrient losses during the composting of dairy manure amended with sawdust or straw.**
Michel, F. C. Jr; Pecchia, J. A.; Rigot, J.; and Keener, H. M.
Compost Science and Utilization 12(4): 323-334. (2004)
NAL Call #: TD796.5.C58 ; ISSN: 1065-657X
Descriptors: bulk density/ carbon/ carbon nitrogen ratio/ cattle manure/ composting/ losses/ mass/ nitrogen/ nutrients/ phosphorus/ potassium/ sawdust/ soil amendments/ soil density/ straw/ windrows/ swath
Abstract: Composting has become an increasingly popular manure management method for dairy farmers. However, the design of composting systems for farmers has been hindered by the limited amount of information on the quantities and volumes of compost produced relative to farm size and manure generated, and the impact of amendments on water, dry matter, volume and nitrogen losses during the composting process. Amendment type can affect the free air space, decomposition rate, temperature, C:N ratio and oxygen levels during composting. Amendments also initially increase the amount of material that must be handled. A better understanding of amendment effects should help farmers optimize, and potentially reduce costs associated with composting. In this study, freestall dairy manure (83% moisture) was amended with either hardwood sawdust or straw and composted for 110-155 days in turned windrows in four replicated trials that began on different dates. Initial C:N ratios of the windrows ranged from 25:1 to 50:1 due to variations in the source and N-content of the manure. Results showed that starting windrow volume for straw amended composts was 2.1 to 2.6 times greater than for sawdust amendment. Straw amended composts had low initial bulk densities with high free air space values of 75-93%. This led to lower temperatures and near ambient interstitial oxygen concentrations during composting. While all sawdust-amended composts self-heated to temperatures >55 degrees C within 10 days, maintained these levels for more than 60 days and met EPA and USDA pathogen reduction guidelines, only two of the four straw amended windrows reached 55 degrees C and none met the guidelines. In addition, sawdust amendment resulted in much lower windrow oxygen concentrations (<5%) during the first 60 days. Both types of compost were stable after 100 days as indicated by CO_2 evolution rates <0.5 mg CO_2-C/g VS/d. Both types of amendments also led to extensive manure volume and weight reductions even after the weight of the added amendments were considered. However, moisture management proved critical in attaining reductions in manure weight during composting. Straw amendment resulted in greater volume decreases than sawdust amendment due to greater changes in bulk density and free air space. Through composting, farmers can reduce the volume and weights of material to be hauled by 50 to 80% based on equivalent nitrogen values of the stabilized compost as compared to unamended, uncomposted dairy manure. The initial total manure nitrogen lost during composting ranged from 7% to 38%. P and K losses were from 14 to 39% and from 1 to 38%, respectively. There was a significant negative correlation between C:N ratio and nitrogen loss (R2=0.78) and carbon loss (R2=0.86) during composting. An initial C:N ratio of greater than 40 is recommended to minimize nitrogen loss during dairy manure composting with sawdust or straw amendments. This citation is from AGRICOLA.

1153. **Mass multiplication of antagonists and standardization of effective dose for management of web blight of urd and mung bean.**
Dubey, S. C. and Patel, B.
Indian Phytopathology 55(3): 338-341. (2002)
NAL Call #: 464.8 IN2 ; ISSN: 0367-973X
Descriptors: application rates/ biological control/ biological control agents/ bran/ cattle dung/ crop yield/ fungal antagonists/ fungal diseases/ green gram/ groundnut husks/ growth/ mass rearing/ mortality/ mung beans/ plant disease control/ plant diseases/ plant height/ plant pathogenic fungi/ plant pathogens/ poultry manure/ rice/ rice straw/ root nodules/ roots/ sawdust/ seed germination/ sporulation/ straw/ substrates/ sugarcane bagasse/ wheat/ wheat bran/ wheat straw/ biocontrol agents/ biological control organisms/ death rate/ groundnut shells/ Hyphomycetes/ mung bean/ paddy/ peanut husks/ peanut shells/ phytopathogens/ poultry litter
Abstract: Ten substrates, based on combinations of wheat bran, pulse bran, sugarcane bagasse, rice straw, wheat straw, cow dung, poultry manure, groundnut shell, and sawdust, were used for the mass multiplication of the fungal antagonists Trichoderma viride and Gliocladium virens. The substrates were mixed with tap water (3/4; v/v) and were sterilized before being inoculated with one-week-old culture of T. viride or G. virens. The growth of G. virens was most pronounced after 4 days of incubation in substrates with groundnut shell and wheat straw + pulse bran. After 6 days of incubation, sporulation was most intensive with pulse bran + sawdust. Growth was slow in manure-based substrates. Growth was not observed in substrates containing sugarcane bagasse + tap water. T. viride sporulation was most pronounced after 4 days of incubation in substrates containing wheat straw + pulse bran and rice straw + pulse bran. After 6 days of incubation, pulse bran + sawdust and groundnut shell resulted in superior sporulation. The effect of both antagonists (multiplied in substrates containing pulse bran + sawdust and inoculated at 0.5, 1.0, 2.0, 3.0, 4.0. 5.0, 6.0. 7.0, or 8.0 g/kg soil 24 h

before sowing) on Rhizoctonia solani (inoculated at 5 g/kg soil 48 h before sowing) and on mung bean cv. Sunaina and urd bean (Vigna mungo) cv. T-9 (sown at 10 seeds/pot) was also investigated. Both antagonists increased seed germination, plant height, root length, root nodule number, and yield, and reduced plant mortality and disease caused by R. solani. The highest rate, however, adversely affected seed germination. The inoculation of both antagonists at 6 g/kg soil appeared to be most appropriate.
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1154. **Mathematical model for estimating the water evaporation in a deep-litter and conventional slatted floor housing systems for pigs.**
Oliveira, P. A. V. de
Engenharia Agricola 23(3): 398-406. (2003); ISSN: 0100-6916.
Notes: Original title: Modelo matematico para estimar a evaporacao d'agua contida nos dejetos, em sistemas de criacao de suinos sobre cama de maravalha e piso ripado, nas fases de crescimento e terminacao.
Descriptors: composting/ composts/ deep litter housing/ evaporation/ faeces/ mathematical models/ pig housing/ pig manure/ sawdust/ slatted floors/ urine/ waste management/ feces/ piggeries/ sties/ swine housing
Abstract: The reduction of manure production becomes a crucial problem, especially in regions with intensive pig production because of the risks of water pollution by nitrates and air pollution by ammonia. A study was conducted to precisely quantify the contribution of the litter to the water evaporation in a deep-litter housing system, compared to a conventional housing system with slatted floor. The experiment was realized in 2 cells of 12 pigs each, from 25 to 100 kg of live weight. In the first cell, the pigs were housed on a deep sawdust litter and in the second in a full slatted floor. A methodology for quantification the amount of water evaporated from the cell or stored in the slurry was developed and validated through a mass balance in the cell with slatted floor. In the deep-litter system, most of the water from faeces and urine was evaporated, and water evaporation was negligible in the slatted floor. The amount of slurry was largely reduced and stabilized in the form of a compost in the deep litter system.
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1155. **Matriconditioning improves the quality and protein level of medium vigor hot pepper seed.**
Ilyas, S.; Sutariati, G. A. K.; Suwarno, F. C.; and Sudarsono
Seed Technology 24(1): 65-75. (2002); ISSN: 1096-0724
Descriptors: chemical composition/ gibberellic acid/ plant composition/ plant growth regulators/ protein content/ sawdust/ seed germination/ seed quality/ seed treatment/ seeds/ vigour/ chemical constituents of plants/ plant growth substances/ plant hormones/ vigor
Abstract: The objective of this study was to invigorate medium vigour hot pepper [Capsicum annuum] seed using matriconditioning. In one experiment, medium (80% germination, 2-year-old) vigour seeds of hot pepper were subjected to various invigoration treatments. In the subsequent experiment, medium and high (95% germination, one-year-old) vigour hot pepper seeds were subjected to matriconditioning treatment at 15 degrees C for 6 days using sawdust (210 micro particle size) moistened with 100 micro M gibberellic acid (GA_3). In the later experiment, the ratio of seed to sawdust to GA_3 solution in the matriconditioning treatment was 1:2:5. Seed quality of matriconditioned medium vigour seed was enhanced over the untreated seed as indicated by a higher percent of germination, improved vigour index, and speed of germination. The total protein isolated from matriconditioned seed was 16% higher than that from untreated. Meanwhile, total protein isolated from high vigour seed was 10% higher than that from medium vigour seed. Qualitative changes in the profiles of total protein isolated from matriconditioned seeds occurred within the 76, 45, 38, 30 and 20 kDa polypeptides. Matriconditioning with sawdust and GA_3 offers an alternative for improving seed quality of hot pepper seeds.
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1156. **Method of sawdust-based cultivation of shiitake (Cortinellus shiitake) and a cultivation water tank used for the method.**
Inoue, Sadayuki; Ayusawa, Sumio; and Eda, Katsumasa
Official Gazette of the United States Patent and Trademark Office Patents 1257(2)(2002); ISSN: 0098-1133
Descriptors: sawdust/ shiitake/ Cortinellus shiitake/ cultivation/ water tanks
Abstract: A method of sawdust-based cultivation of Shiitake (Cortinellus Shiitake) and a cultivation water tank used for the method in which a top portion of a cultivation bag which includes a cultivation bed (sawdust-based substrate) is cut to expose a top surface of the cultivation bed and water is poured into a gap between the bag and bed; and a cultivation water tank comprises a framework, water tanks arranged in the framework, sawdust-based substrates arranged in the water tank, a latticed frame, water sprinklers, an air blower and illuminators, a pump connected to the water pipe and the exhaust pipe through a pipe, exhaust pipes provided at a drain pipe so that water may not overflow onto the top surface of the sawdust-based substrates which is characterized in that water is circulated to refrain mushrooms from fruiting and growing from the side and bottom faces of the sawdust-based substrates, but to grow only from the top surface of sawdust-based substrates.

1157. **Microbial stabilization of pig slurry solids amended with natural zeolite and/or sawdust.**
Vargova, M.; Sasakova, N.; Venglovsky, J.; Ondrasovicova, O.; Vucemilo, M.; and Tofant, A.
Stocarstvo 54(4): 253-260. (2000); ISSN: 0351-0832
Descriptors: animal wastes/ pig slurry/ public health/ waste treatment/ hogs/ livestock wastes/ swine
Abstract: The effects of natural zeolite clinoptilolite on microbial stabilization of the solid fraction of pig slurry supplemented with zeolite and/or sawdust were investigated during a 6-week storage period with turning after 1 and 3 weeks. The solid fraction was obtained by mechanical separation on vibrating sieves in the first stage of aerobic pig slurry treatment. Temperatures recorded in the substrates S1-S4 (S1=control; S2=SF+2% zeolite; S3=SF+2% sawdust; S4=SF+2% zeolite+2% sawdust) showed a significant positive effect of zeolite during the first 3 weeks of storage. Plate counts of psychrophilic, mesophilic and coliform bacteria were also affected by

zeolite and corresponded to temperature. At the end of the experiment, fecal coliform counts were by one order lower in supplemented substrates (S2-S3) compared with the control (S1).
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1158. **Movement and environmental load of nitrogen derived from compost in greenhouse culture.**
Fujita, N. and Furukawa, Y.
Bulletin of the Nara Prefectural Agricultural Experiment Station 36(21-27)(2005); ISSN: 1345-6393
Descriptors: application rates/ cattle manure/ composts/ crop yield/ nitrate nitrogen/ nitrogen/ nitrogen oxides/ nutrient availability/ nutrient balance/ sawdust/ spinach/ Capparales
Abstract: Cattle compost mixed with sawdust (0, 30 or 120 mg/ha) was used continuously for 5 years for year-round greenhouse-cultured komatsuna [Brassica campestris] and spinach. When mature compost was applied at 120 mg/ha, more than 30 mg N/ha derived from the compost was retained in the soil. The same treatment reduced the rate of N_2O derived from the compost, consequently reducing the NO_3-N retained in the soil. The compost at 120 mg/ha reduced the yields of komatsuna and spinach, and adversely affected the soil nutrient balance.
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1159. **Mulch induced eco-physiological growth and yield of maize.**
Awal, M. A. and Khan, M. A. H.
Pakistan Journal of Biological Sciences (Pakistan) 3(1): 61-64. (Jan. 2000)
NAL Call #: QH301 .P355; ISSN: 1028-8880.
Notes: 1 ill., 3 tables, 18 ref. Summary (En). Citation notes: PK (Pakistan).
Descriptors: mulch/ eco-physiological growth/ yield/ maize
Abstract: Mulching effects of sawdust, ash, rice straw and water hyacinth on growth, dry matter partitioning, earliness, yield attributes and yield of maize were studied. All mulches except sawdust significantly influenced the SLA, CGR, NAR and DM partitioning, but with no apparent effect on RGR. Water hyacinth and rice straw mulches hastened the tasseling, Bilking and maturity time by 6, 8 and 8 days respectively and produced double the amount of biological and economic yield as compared to the control and sawdust, the ash mulch behaved intermediately. Significantly higher harvest index. was also observed under water hyacinth and rice straw mulches.

1160. **Mulching effects on soil physical properties and peanut production.**
Khan, A. R.
Italian Journal of Agronomy 6(2): 113-118. (2002); ISSN: 1125-4718
Descriptors: aeration / bulk density/ crop production/ crop yield/ diffusion/ evaporation/ groundnuts/ lateritic soils/ mulches/ mulching/ oxygen/ plant water relations/ polyethylene/ porosity/ rice/ rice husks/ rice straw/ sandy loam soils/ sawdust/ soil physical properties/ soil temperature/ soil types/ soil water/ straw/ Ultisols/ water use efficiency/ mulching materials/ paddy/ peanuts/ physical properties of soil/ polythene/ rice hulls/ soil moisture
Abstract: A field experiment was conducted on lateritic sandy loam soil (Ultisols) in the coastal belt of Bay of Bengal (Eastern India) to investigate the variable soil surface conditions which can create favourable soil physical conditions and improve the productivity and water use efficiency of groundnuts. The treatments spread on the soil surface were: rice husk (6 t/ha); rice husk incorporated (6 t/ha); paddy straw (6 t/ha); sawdust (6 t/ha); water mulch; clear polyethylene; black polyethylene; and bare (control). Physical properties of soils such as bulk density, aeration porosity, soil temperature and oxygen diffusion rate were studied under these vegetative and plastic mulches. Data showed that relatively higher values of bulk density occurred in bare as compared to mulched plots. Plastic mulches maintained minimum values of bulk density during the two years of experimentation. The radiation interception due to shading and evaporative cooling were responsible for lower soil temperature under vegetative mulches, whereas incident short wave radiation was transmitted through clear polyethylene sheets and absorbed directly by the soil causing higher soil temperature. Minimum depletion of moisture was observed in plastic mulches. Increased pod yield of groundnut and higher water use efficiency were recorded under plastic mulches. Mulched plots were in better position to store and retain moisture for a longer period.
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1161. **Mulching-induced alteration of microclimatic parameters on the morpho-physiological attributes in onion (Allium cepa L.).**
Rahman, M. S. and Khan, M. A. H.
Plant Production Science 4(3): 241-248. (2001); ISSN: 1343-943X
Descriptors: ash/ burnt soils/ dry matter accumulation/ flowering date/ leaf area index/ mulches/ mulching/ onions/ plant height/ rice husks/ roots/ sawdust/ soil temperature/ soil water/ LAI/ mulching materials/ rice hulls/ soil moisture
Abstract: The effects of mulches (rice husk, sawdust, ash and burnt soil) on soil temperature and moisture conservation of soil, and their relationship with morpho-physiological attributes of onion (cv. Faridpuri Bhati) were studied in Bangladesh during 1995 and 1996. All mulches except ash were effective in conserving soil moisture. The sawdust mulch retained the soil moisture most effectively, followed by rice husk and burnt soil. For almost all stages of growth and at any time of the day, ash mulch retained the soil temperature most effectively. Sawdust was least effective in this aspect. Dry matter accumulation, leaf area index (LAI), plant height and root length were significantly influenced by these mulches. Mulching increased the number of scapes, but the effect of the number of scapes on their fresh and dry weights were insignificant. Ash mulch induced early flowering while the other mulches significantly delayed it. Thus, the use of ash as mulch was better compared to the other three mulches. This might be due to

the increased soil temperature under ash mulch. Further work is required to elucidate the fertilizing effect of the mulches.
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1162. **Mulching with shredded wood or Miscanthus chips maintains soil moisture and promotes soil fertility as well as vegetative and reproductive growth of young apple trees.**
Beeck, C. in der; Pude, R.; and Blanke, M.
Erwerbsobstbau 48(2): 47-61. (2006); ISSN: 0014-0309.
Notes: Original title: Holzhacksel und Miscanthusmulch erhalten die Bodenfeuchte und fordern die biologische Bodenaktivitat sowie vegetatives und generatives Wachstum junger Apfelbaume.
Descriptors: apples/ carbon nitrogen ratio/ growth/ light relations/ microbial activities/ mineral uptake/ mineralization/ mulches/ mulching/ nitrogen/ nutrient uptake/ plant nutrition/ potassium/ soil fertility/ soil water/ wood chips/ mulching materials/ soil moisture
Abstract: Tree rows of a 2-year-old apple (cv. Topaz) orchard in Klein-Altendorf, Bonn, Germany, were mulched with either (a) high (6 cm; 17 t dm/ha), (b) low (3 cm, 7 t dm/ha) shredded stems of Miscanthus in July 2004, or (c) shredded broadleaved tree trunks (5 cm; 29 t dm/ha) in January 2005 to conserve resources and achieve closed systems. An uncovered soil served as the control. The soil covered with any of the three mulches mineralized 7-14 kg less N/ha throughout the growing season resulting in a more balanced N mineralization. The reduction in N supply prevented late vegetative growth and contributed to good fruit colouration. The largest soil respiration was recorded with wooden chips as mulch with a peak of 1.6 CO_2 m-2 h-1 in June-July, followed by Miscanthus mulch and the uncovered control, which indicates enhanced microbial activity in the summer as a result of medium C/N ratio, warming and better aeration of the wood chips. The organic mulches preserved soil moisture with values of less than 53 centibars and with less fluctuation than in the control. The organic mulches reflected ~10% of incident PAR 1 m above ground, i.e. more light than uncovered soil, all without affecting fruit colouration. The two thicker (5 and 6 cm) organic mulches suppressed weed population by 63-67% relative to the control. The two thicker (5-6 cm) organic mulches improved potassium uptake by the apple leaves with 1.5% K relative to 1.3% K in the control on a leaf dry matter basis, but reduced their calcium and magnesium content. Wood chips as mulch improved the vegetative growth of the apple trees during the growing season, measured as trunk diameter, of 4 mm, followed by 3.6 mm of the high Miscanthus and 2.8 mm in both the low Miscanthus mulch and the control. 8. The organic mulches enlarged apple fruit diameter from 78 mm in the control to 80 mm with a concomitant increase in fruit weight from 180 g in the control to 185-188 g.
This citation is from AGRICOLA.

1163. **Mushroom cultivation using smoke-heated softwood sawdust.**
Yoshizawa, N.; Itoh, T.; Ohnishi, M.; Ishiguri, F.; Ando, M.; Yokota, S.; Sunagawa, M.; and Idei, T.
Bulletin of the Utsunomiya University Forests 34: 69-79. (1998)
NAL Call #: 99.9 UT72 ; ISSN: 0286-8733
Descriptors: chemical composition/ cultural methods/ edible fungi/ growing media/ heat treatment/ plant extracts/ sawdust/ softwoods/ vegetables/ Basidiomycetes/ Coriolaceae/ Grifola/ Grifola frondosa/ heat processing/ Hypsizygus mamoreus/ Larix leptolepis/ Lentinaceae/ Poriales/ potting composts/ rooting media/ smoke treatment/ Tricholomataceae/ vegetable crops
Abstract: The use of smoke-heated sugi (Cryptomeria japonica) and karamatsu (Larix leptolepis) sawdust for sawdust-based cultivation of shiitake (Lentinus edodes [Lentinula edodes]) and hiratake ((Pleurotus ostreatus) edible fungi was investigated in order to offset the shortage of hardwood sawdust as a cultural substrate. Brief details are also included of more limited tests on the cultivation of 3 other edible fungi (enokitake, Flammulina velutipes; maitake, Grifola frondosa; bunashimeji, Hypsizygus mamoreus). In chemical analyses of sawdust prepared from smoke-heated logs of sugi and karamatsu, the hot-water, 1% sodium hydroxide, and ethanol-benzene extracts were reduced in comparison with non-treated sawdust. This could lead to the promotion of active mycelial growth. In tests with shiitake cultivation using both sugi and karamatsu smoke-heated sawdust, yields of fruiting bodies decreased with increases in mixing ratios of softwood sawdust with beech sawdust (from 100% beech through 3:1, 1:1, 1:3 beech/softwood to 100% softwood). The best mixtures were 3:1 and 1:1 beech/softwood) and smoke treated sugi sawdust gave better shiitake fruiting body yields than non-smoke treated sugi and smoke treated karamatsu. In the sawdust-based cultivation of hiratake using smoke-heated sugi or karamatsu sawdust in the same ratios with beech as above, yields of fruiting bodies were similar in the various media mixes and with smoke-heated or non-heated softwood sawdust. The results suggest that smoke-heated sawdust of both sugi and karamatsu would be useful for the cultivation of shiitake and hiratake mushrooms, and would in addition reduce the cost of mushroom cultivation.
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1164. **Mycobiota of soil amended with sawdust with refer to influence of various carbon sources on polygalacturonases produced by Aspergillus terreus.**
Barakat, A.; El Shanawany, A. A.; and El Maghraby, Y. H.
African Journal of Mycology and Biotechnology 11(3): 39-49. (2003); ISSN: 1110-5879
Descriptors: enzyme activity/ enzymes/ polygalacturonase/ sawdust/ soil amendments/ Hyphomycetes/ pectin depolymerase/ pectinase/ Trichocomaceae
Abstract: Ninety-three species and 2 species varieties belonging to 25 genera were isolated from soil amended with sawdust and non amended soil (control). The total counts of fungi and number of genera and species were higher in amended soil with sawdust than the non amended soil. Aspergillus, Emericella and Penicillium were the most prevalent genera recovered from both soil types in all experimental periods. The 90 fungal isolates which were recovered during this work were screened for their capabilities to produce pectinase enzyme and the effect of different carbon sources on the activities of the endo- and exo-polygalacturonases (PG) produced by A. terreus were also studied.
This citation is from AGRICOLA.

1165. **New results concerning the importance of substrate composition in Pleurotus sp. cultivation.**
Ficior, D.; Indrea, D.; Apahidean, A. S.; Apahidean, M.; Maniutiu, D.; Ganea, R.; Bobaila, M.; and Paven, I.
Buletinul Universitatii de Stiinte Agricole si Medicina Veterinara Cluj Napoca Seria Horticultura 61: 45-48. (2004); ISSN: 1454-2382
Descriptors: crop yield/ maize cobs/ sawdust/ straw/ substrates/ wheat/ wheat straw/ Lentinaceae/ Poriales
Abstract: Experiments were carried out during 2000-02 in an old greenhouse to investigate the effect of substrate composition on Pleurotus sp. cultivation. The treatments comprised maize cobs, wheat straw, beech sawdust, 50% wheat straw+50% maize cobs, 50% beech sawdust+50% maize cobs, 50% wheat straw+50% beech sawdust, 25% wheat straw+75% maize cobs, 75% wheat straw+25% maize cobs, and 33% maize cobs+33% wheat straw+33% beech sawdust. The materials were shredded into pieces of 1-3 cm (in the first 2 years) or 3-7 cm (in the last year) and then, moistened. The highest average yield (12.66 kg/120 l) was recorded with 25% wheat straw+75% maize cobs and the lowest (2.93 kg/120 l) with beech sawdust. Wheat straw in combination with maize cobs or beech sawdust improved the quality of the substrate. The dimensions of the materials could affect the yield.
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1166. **New role of sulfuric acid in production of multicomponent fertilizers from renewable sources.**
Górecka, H.; Górecki, H.; Chojnacka, K.; Baranska, M.; Michalak, I.; and Zielinska, A.
American Journal of Agricultural and Biological Science 2(4): 241-247. (2007); ISSN: 15574989
Descriptors: animal bones/ NPK fertilizers/ poultry feather/ renewable sources/ slaughter wastes/ sulfuric acid/ wood ash/ animalia
Abstract: The paper discusses the possibility of using renewable sources: slaughter wastes and wood ashes in the production of NPK fertilizers. The content of macronutrients, micronutrients and toxic elements in these materials was reported. In the present work, poultry feathers were used as fertilizer source of nitrogen, animal bones as the source of phosphorus and wood ash as the source of potassium and micronutrients. Bioavailability of fertilization components was increased by mineralization with sulfuric acid, which transformed keratinous nitrogen of poultry feathers into ammonia nitrogen, hydroxyapatite phosphorus to bioavailable orthophosphate. Also, mineralization of organic content of the materials was achieved. The method of production and the composition of NPKS fertilizer, the content of which was adjusted to the requirements of oil seed rape was provided. The fertilization properties were checked in germination tests. © 2007 Science Publications.

1167. **Nitrogen content of shiitake mushroom (Lentinus edodes (Berk.) Sing.) cultivated on sawdust medium and dependence on that in the medium.**
Fujihara, S.; Kasuga, A.; Sugahara, T.; Hashimoto, K.; Kiyomizu, Y.; Nakazawa, T.; and Aoyagi, Y.
Journal of the Japanese Society for Food Science and Technology 47(3): 191-196. (2000)
Descriptors: amino acids/ bran/ carbohydrates/ chemical composition/ composition/ edible fungi/ growing media/ maize/ nitrogen/ nucleic acids/ quality/ rice/ rice bran/ sawdust/ soyabeans/ vegetables/ corn/ paddy/ potting composts/ rooting media/ saccharides/ soybeans/ Tricholomataceae/ vegetable crops
Abstract: L. edodes [Lentinula edodes] was cultivated on sawdust media to which had been added okara (insoluble residue of homogenized soyabean produced as a waste product of tofu manufacture), rice bran or maize bran (5, 10, 15, 25 or 35%). Total N in media and fruiting bodies was determined. Fruiting bodies were analysed for total amino acids, amide-N, free amino acids, nucleic acids and chitin. N contents of fruiting bodies were closely related to those of the growing media. No significant relationship between lentinic acid concentration in fruiting bodies and N content of the medium was observed. The concentration of lentinic acid in fruiting bodies cultivated on media supplemented with rice bran and maize bran was about twice that of fruiting bodies obtained from okara-amended media. High levels of N in sawdust media could decrease carbohydrates in fruiting bodies, thus reducing quality (fruiting bodies too soft to eat).
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1168. **Nitrogen transformations during pig manure composting.**
Huang, G. F.; Wu, Q. T.; Li, F. B.; and Wong, J. W.
Journal of Environmental Sciences (China) 13(4): 401-5. (Oct. 2001)
NAL Call #: TD187.5.C6J68; ISSN: 1001-0742 .
11723923
Descriptors: animals/ biotransformation/ conservation of natural resources/ germination/ hydrogen-ion concentration/ manure/ nitrogen: chemistry: metabolism/ plant leaves/ refuse/ disposal: methods/ seeds/ swine/ wood
Abstract: Composting is now suggested as one of the environmentally and friendly alternative method for disposal of solid organic wastes, as it leads to minimization, stabilization, and utilization of organic waste. Transformations of nitrogen were investigated in co-composting of pig manure with different amendments, such as sawdust and leaves. Samples were analyzed for pH, total-N, soluble NH4-N, soluble NO3-N and soluble organic-N. The total-N increased after 63 days of composting, as well as the soluble NO3-N and soluble organic-N. Soluble NH4-N increased significantly and showed peak values at day 7, thereafter decreased sharply and gradually to lower levels. Seed germination index (GI) showed that co-composting of pig manure with sawdust reached maturity after 49 days of composting, while co-composting of pig manure with sawdust and leaves required shorter time for 35 days. Soluble NH4-N was significantly negatively ($P < 0.05$), while soluble NO3-N and soluble organic-N were significantly positively ($P < 0.05$), correlated with seed germination index (GI). Addition of leaves in co-composting of pig manure with sawdust had no significant impacts on nitrogen transformations, but it was beneficial for maturity of pig manure compost.
This citation is from PubMed.

1169. **Nitrogenous gas emissions during the rearing of pigs on sawdust litter.**
Kermarrec, C. and Robin, P.
In: 34emes Journees de la Recherche Porcine, sous l'egide de l'Association Franccaise de Zootechnie.Paris, France.); pp. 155-160; 2002.
Notes: Original title: Emissions de gaz azotes en elevage de porcs sur litiere de sciure.
Descriptors: ammonia/ floor pens/ litter/ nitrogen/ nitrogen balance/ nitrous oxide/ sawdust/ slatted floors/ ventilation/ hogs/ swine
Abstract: The early composting of pig slurry in rearing systems based on litter leads to nitrogenous gas emissions. The types of molecules and the amounts emitted depend on both livestock and litter management. Our objectives were firstly to characterise the difference between the fully-slatted floor system (used as a reference system) and the deep litter sawdust system, secondly to explore the variability in emissions depending on the area in the pen (either excretion or sleeping area) and the management system (litter either turned or not turned). The experiments were conducted under controlled conditions, and the gas emission measurements were compared with the mass balance (food, pig, and litter or slurry). The comparison of the slatted floor and litter systems was performed under the same conditions: climate, building, animals and food. The comparison showed that there was a large discrepancy in nitrogen balance that could be attributed to atmospheric nitrogen (N_2) in the deep litter system. The study of the variability in emissions showed that nitrogen losses were negligible when the litter contained high levels of available carbon and when it was porous. This is of interest in the conservation nitrogen. Conversely, the highest nitrogen losses occurred with low carbon availability. In the latter case, ammonia (NH_3) was emitted from the surface where defaecation occurred and nitrous oxide (N_2 O) was emitted from deep within the litter. Deep litter emissions of N_2O were highest when litter was turned.

1170. **A note on the effect of bedding materials on the performance of lactating piglets.**
Gonzalez, C.; Ortega, J.; Vecchionacce, H.; and Diaz, I.
Cuban Journal of Agricultural Science 33(4): 383-386. (1999); ISSN: 0864-0408
Descriptors: coffee/ crop residues/ diarrhoea/ farrowing pens/ lactation/ lesions/ litter/ liveweight gain/ mortality/ piglets/ pines/ rice husks/ sawdust/ wood shavings/ death rate/ diarrhea/ hogs/ liveweight gains/ rice hulls/ scouring/ swine
Abstract: The effects of different bedding materials on the survival, liveweight gain and diarrhoea incidence in lactating piglets were evaluated. An experiment was carried out using a completely randomized design with 42 observations distributed in 7 treatments consisting of a control (without bedding) or the use as bedding of pine or common sawdust, pine or common shavings, coffee parchment or rice hulls. The bedding was placed in the farrowing stalls from birth until 15 days of age. There were statistically significant (P<0.01) differences between treatments for articular lessions at the limbs and the volume of bedding used. Articular lesions increased with the abrasiveness of the material used, being higher with common shavings, rice hulls or no bedding. The highest bedding expenses were for pine sawdust, pine shavings, coffee parchment and rice hulls, and the lowest for common sawdust and common shavings. There was no treatment effect on daily gain, diarrhoea frequency or mortality. It is suggested that there is better performance in the pig litters with bedding than without it.

1171. **Nutrient absorption characteristics of greenhouse tomato cultivated with organic substrates.**
Chen ShuangChen; He ChaoXing; Zou ZhiRong; and Zhang ZhiBin
Plant Nutrition and Fertilizer Science 11(3): 369-374. (2005); ISSN: 1008-505X
Descriptors: crop residues/ farmyard manure/ growing media/ maize stover/ mushroom compost/ nitrogen/ nutrient requirements/ nutrient uptake/ peat/ phosphorus/ plant nutrition/ potassium/ poultry manure/ protected cultivation/ sawdust/ straw/ substrates/ tomatoes/ wheat/ wheat straw/ cultivation under glass or plastic/ dietary standards/ food requirements/ FYM/ nutritional requirements/ potting composts/ poultry litter/ rooting media
Abstract: In a greenhouse experiment, tomato hybrid Zhongza plants were grown on various mixtures of artificial organic substrates prepared with fermented broken-up maize stalk, wheat straw, peat moss, straw ash, sawdust, spent mushroom compost, dung and poultry manure. Different formulae of the substrates resulted in differences in N, P and K uptake per plant, nutrient use efficiency and nutrient allocation to various portions of the plants. The ratio of $N:P_2O_5:K_2O$ for the whole growing season was 1:0.194-0.375:0.903-1.412. Calculated according to the yield data, N, P_2O_5 and K_2O required for the production of 100 kg tomato was 136.7-201.4, 39.9-60.0 and 156.7-235.7 g, respectively. The best organic substrate formula was dried dung:maize stalk:sawdust/spent mushroom compost (1:2:1).

1172. **Nutrient availability in soil amended with pecan wood chips.**
Tahboub, M. B.; Lindemann, W. C.; and Murray, L.
HortScience: A Publication of the American Society for Horticultural Science 42(2): 339-343. (Apr. 2007)
NAL Call #: SB1.H6; ISSN: 0018-5345
Descriptors: Carya illinoinensis/ pecans/ nut crops/ wood chips/ soil amendments/ nutrient availability/ immobilization in soil/ soil fertility/ nitrogen/ phosphorus/ potassium/ silty soils/ clay soils/ application rate/ ammonium sulfate/ carbon nitrogen ratio/ crop residue management/ crop residues/ New Mexico
Abstract: Pecan [Carya illinoinensis (Wangenh.) K. Koch] pruning wood is usually burned, a practice that creates serious environmental concerns. Chipping and soil incorporation of prunings may be an alternative disposal method if nutrient immobilization is not a problem. Our objective was to determine if incorporation of pecan wood chips into soil would affect the availability of nitrogen (N), phosphorus (P), and potassium (K). Pecan wood chips were incorporated into a silty clay soil at rates of 0, 4484, 8968, 13,452, and 17,936 kgp"ha-1 in May or June 2002, 2003, and 2004. Some plots received N (ammonium sulfate) at a rate of 0, 15.2, 30.5, 45.7, and 61.0 kgp"ha-1

to adjust the C:N ratio of trimmings to 30:1. Wood chip incorporation did not significantly decrease inorganic N regardless of application rate or number of applications. When ammonium sulfate was added to balance the C:N ratio, soil inorganic N increased with the rate of wood chip application, also indicating that N immobilization did not occur. Soil-available P and K were not significantly affected after one, two, or three wood chip applications. Soil-available K increased when ammonium sulfate was added to balance the C:N ratio. Soil incorporation of pecan wood chips does not appear to immobilize N, P, or K, thus providing growers with an environmentally viable means of wood disposal.
This citation is from AGRICOLA.

1173. **Nutrient dynamics in tropical acid soils amended with wood ash.**
Nkana, J. C. V.; Demeyer, A.; and Verloo, M. G.
Agrochimica 44(5/6): 197-210. (2000)
NAL Call #: 385 AG84; ISSN: 0002-1857
Descriptors: acid soils/ chemical composition/ leachates/ lime/ liming/ magnesium/ nitrate/ nutrient availability/ nutrients/ organic carbon/ potassium/ soil amendments/ soil composition/ soil types/ sulfate/ tropical soils/ udults/ ultisols/ wood ash
Abstract: The effects of wood ash and lime on the dynamics of soil nutrients were studied in the laboratory using columns of mixed samples of topsoils from three tropical acid soils (Kandiudult) in the forest zone of central Cameroon. Amendments were applied to attain 80% base saturation and at amounts corresponding to 1 and 2 times the content of exchangeable aluminium. The soil columns were leached for a period of 90 days with an amount of deionized water equivalent to the annual rainfall. Available nutrients in the soil were measured with $NH_4OAcEDTA$ pH 4.65 extract. In general, wood ash affected leachate composition more than lime. Application of wood ash led to increases in concentrations of dissolved organic carbon, NO_3, SO_4, Ca, Mg and K in the leachates and losses increased with wood ash application rates. Available Ca in the soil subsequent to leaching increased with both wood ash and lime, while available Mg and K increased with wood ash but was not affected with lime. Increases in the leached and available Ca, Mg and K were significant with wood ash application compared to liming. In these particular experimental conditions, an annual maintenance dressing with wood ash of 4.6 t/ha in Mbalmayo soil, 5.7 t/ha in Mengang soil and 4.3 t/ha in Nkolbisson soil would provide enough Ca to compensate losses. However, when taking into account simultaneous additions of Mg and K with wood ash, only their leaching losses can be recovered. Therefore, adequate supplementation with Mg and K fertilizers is still needed to obtain maximum crop yield for the next growth cycle.
This citation is from AGRICOLA.

1174. **On-site composting of greenhouse crop residuals.**
Cheuk, W.; Fraser, B. S.; and Lau, A.
Biocycle 43(10): 32-34. (2002)
NAL Call #: 57.8 C734 ; ISSN: 0276-5055
Descriptors: composting/ composts/ crop residues/ greenhouses/ pruning trash/ sawdust/ waste disposal/ waste management/ waste treatment/ waste utilization/ wood residues/ glasshouses
Abstract: This paper describes the on-site composting of crop residuals (fruit culls and plant prunings, whole plants removed at the end of the growing season, and spent sawdust growing medium) from vegetable greenhouses in British Columbia, Canada.
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1175. **Organic amendments enhance biological suppression of plant-parasitic nematodes in sugarcane soils.**
Stirling, G. R.; Wilson, E. J.; Stirling, A. M.; Pankhurst, C. E.; Moody, P. W.; and Bell, M. J.
In: 2003 Conference of the Australian Society of Sugar Cane Technologists.Townsville, Queensland, Australia.); pp. 11; 2003.
Descriptors: cultural control/ decomposition/ grass clippings/ hay/ lucerne/ nematode control/ nitrate/ nitrogen/ pest control/ plant parasitic nematodes/ plant pests/ population density/ sawdust/ soil/ soil amendments/ soil fertility/ soil management/ sugarcane/ sugarcane trash/ alfalfa/ eelworms
Abstract: Previous research has shown that population densities of plant-parasitic nematodes are reduced when a legume crop is grown in rotation with sugarcane. However, this effect is only temporary, as nematodes usually return to high densities within 12 months of planting sugarcane. This rapid resurgence suggests that natural enemies that normally keep plant-parasitic nematodes under control in natural environments may be depleted by the soil-management practices used to grow sugarcane. This paper describes an experiment in which organic materials were added to sugarcane soils in an attempt to enhance biological activity and increase the suppressiveness of soils to plant-parasitic nematodes. The amendments used were sawdust, sugarcane trash, grass hay and legume hay with or without nitrogen, and feedlot manure, poultry manure, chitin and mill mud without additional nitrogen. The chemical and biological changes occurring during the decomposition process were monitored for 12 months, while the capacity of amended soils to suppress lesion and root-knot nematodes was assessed periodically using bioassays. Seven months after amendments were incorporated, soils amended with sawdust, sugarcane trash or grass hay were more suppressive to root-knot nematode than soils amended with nitrogenous materials. Sugarcane grown in soil amended 6 months previously with sawdust, sugarcane trash, grass hay or lucerne hay had 78, 61, 96, and 92%, respectively, fewer lesion nematodes in roots than sugarcane growing in non-amended soil. Low concentrations of nitrate nitrogen in the soil, a fungal dominant soil biology and high numbers of omnivorous nematodes were most closely associated with suppression. These results indicate that the biology of sugarcane soils can be altered by changing the quality and quantity of organic inputs. Amendments with high C/N ratios are most effective in enhancing biological control activity against plant-parasitic nematodes.
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1176. **Organic amendments for management of Heterodera cajani in pulses.**
Devi, S. L.
Indian Journal of Nematology 32(2): 143-146. (2002)
NAL Call #: QL391.N4I5; ISSN: 0303-6960
Descriptors: animal manures/ application rates/ cattle manure/ cowpeas/ cultural control/ Indian mustard/ linseed oilmeal/ neem seed cake/ nematode control/ nodulation/ non wood forest products/ oilseed cakes/ organic amendments/ pest control/ pig manure/ pigeon peas/ plant parasitic nematodes/ plant pests/ poultry manure/ rice husks/ sawdust/ wheat bran/ black eyed peas/ Capparales/ eelworms/ Heterodera cajani/ linseed cake/ minor forest products/ neem/ neem seed oilmeal/ non timber forest products/ oil cakes/ poultry litter / rice hulls/ Secernentea/ southern peas/ Tylenchida
Abstract: In pot and field experiments conducted in Uttar Pradesh, India, sawdust, rice husk, wheat bran, cow dung, rabbit dung, goat dung, pig dung, and poultry manure, when applied at 400 kg/ha to the soil on which arhar (Cajanus cajan) and moong bean (Vigna sinensis [V. unguiculata]) were grown, increased plant growth and rhizobium nodulation, and reduced H. cajani population. Oil cake (neem, mustard, and linseed) at 100 and 400 kg/ha were also effective.

1177. **Organic fertilizers based on humic substances for Pelargonium and begonia crops.**
Morard, M. and Morard, P.
PHM Revue Horticole 477: 40-42. (2006); ISSN: 0031-5087.
Notes: Original title: Fertilisants organiques a base de substances humiques en cultures de Pelargonium et begonia.
Descriptors: fertilizers/ ornamental plants/ sawdust/ soilless culture/ waste utilization/ ornamentals
Abstract: A biostimulant was developed by transformation of sawdust and tested for soilless culture of Pelargonium and begonia in France. For Pelargonium , treatment with 70 mg of biostimulant per litre of nutritive solution resulted in a significant increase in the number of flowers and leaves. Similar effects were obtained for begonia.

1178. **Organic matter quality and management effects on enrichment of soil organic matter fractions in contrasting soils in Zimbabwe.**
Mapfumo, P.; Mtambanengwe, F.; and Vanlauwe, B.
Plant and Soil 296(1/2): 137-150. (2007)
NAL Call #: 450 P696; ISSN: 0032-079X
Descriptors: application rates/ cattle manure/ clay loam soils/ crop yield/ fertilizers/ maize/ maize stover/ nutrients/ sandy soils/ sawdust/ small farms/ soil organic matter/ soil texture/ soil types/ sunn hemp/ use efficiency/ corn/ organic matter in soil
Abstract: Maintenance of soil organic matter (SOM) at levels that sustain optimal supply of soil nutrients and enhance efficiency of externally added fertilizers is a major challenge for smallholder farming systems of southern Africa. A study was conducted to quantify the interactive effects of organic resource quality and management on SOM formation and subsequent maize yields under contrasting soil types. Crotalaria juncea L., Calliandra calothyrsus Meissn., cattle manure, maize (Zea mays L.) stover and Pinus patula Schiede and Schltdl. and Cham. sawdust were applied at 1.2 and 4 t C ha-1 at Domboshawa and Makoholi Experimental Stations, simulating some of the soil amendments commonly available on smallholder farms. Soils at Domboshawa are sandy-clay loams with 220 g clay kg-1 while the sandy soils at Makoholi had <100 g clay kg-1. At 12-14 weeks after incorporation, organic resource quality effects on particulate organic matter (POM) C enrichment were most significant ($p<0.01$) in the macro-POM (250-2,000 micro m diameter) fraction of both soil types constituting 15-30% of total soil C on coarse sand soil and 5-10% on sandy clay loam soils. The highest increases were under C. calothyrsus, manure and sawdust treatments. There was evidence of sub-soil enrichment under these two treatments on sandy soils at different sites. While no significant treatment effects were observed on the size of organo-mineral fraction, there was a significant ($p<0.05$) separation of treatments in terms of potential mineralizable N from the same fraction. On coarse sands, organo-mineral fraction under medium to high-quality materials such as manure and C. juncea released ~50 mg N kg-1, compared to 8-18 mg N kg-1 from sawdust and maize stover, suggesting that such materials enhanced the N-supply capacity of this fraction without necessarily increasing its size. The same trends were observed under sandy clay loams although, in contrast to coarse sands, the high-quality materials released no more than 25 mg N kg-1, suggesting that the added C was protected against short-term mineralization. These contrasting properties were also reflected in maize yield patterns. On sandy clay loams, a significant linear relationship between maize yield and the amount of mineralizable N in the macro-POM fraction ($R2=0.50$; $p<0.01$) was evident, while the best predictor for maize yield on coarse sands was the amount of mineralizable N from the organo-mineral fraction ($R2=0.86$). We concluded that maize productivity on contrasting soil types hinges on different soil organic fractions and therefore require different management strategies. Sustainability of cropping on sandy soils is likely to depend on a regular supply of high-quality C materials, which enhance the nutrient supply capacity of the small organo-mineral fraction. Under the relatively C protective sandy clay loams, it is apparently the size of the macro-POM fraction which largely determines crop yields in the short-term.

1179. **Organic mulches, wood products, and composts as soil amendments and conditioners.**
Stratton, M. L. and Rechcigl, J. E.
Handbook of Soil Conditioners: Substances that Enhance the Physical Properties of Soil: 43-95. (1998)
NAL Call #: S661.7.H35 1998
Descriptors: amendments/ bark/ composting/ composts/ management/ mulches/ non wood forest products/ sawdust/ soil chemistry/ soil conditioners/ soil physical properties/ wood products/ minor forest products/ mulching materials/ non timber forest products/ physical properties of soil
Abstract: The beneficial effects of wood products, mulches and composts as soil amendments and conditioners are reviewed. Wood products are generally used as mulches, but sawdust and bark have also been used as soil

amendments. The effects of mulches on soil physical properties (structure, erosion, moisture, temperature), soil chemistry (soil fertility, plant nutrition), soil organisms, pests, and weeds are considered. The composting process is outlined and the effects of compost on soil physical properties (structure, bulk density, erosion, moisture), soil chemistry, soil organisms and pests, and weeds are reviewed. Management issues relating to mulching and composting are discussed.

1180. **Organic okro (Abelmoschus esculentus): Its growth, yield and organoleptic properties.**
Taiwo, L. B.; Adediran, J. A.; Ashaye, O. A.; Odofin, O. F.; and Oyadoyin, A. J.
Nutrition and Food Science 32(4/5): 180-183. (2002); ISSN: 0034-6659
Descriptors: application rates/ colour/ crop quality/ crop yield/ fertilizers/ flavour/ growth/ microbial activities/ okras/ organic fertilizers/ organoleptic traits/ pods/ poultry manure/ sawdust/ taste/ texture/ color/ flavor/ organoleptic properties/ poultry litter
Abstract: Okro [okra] (Abelmoschus esculentus) was grown in the field [location and date not given] and greenhouse and applied with organic-based (OBF), organic (sawdust and poultry manure) and chemical fertilizers. Okro soups produced from the okro fruits harvested from the various fertilizers treatments were subjected to sensory evaluation tests. Application of 10 t/ha organic fertilizers on the greenhouse okro plants led to significant increases in microbial activities in the root zone and it also gave the highest pod yield. In the sensory evaluation test, panellists preferred organically-grown okro soup to the chemically-grown variant when they assessed the colour, taste, texture, flavour and drawness. Organically grown okro enjoyed more acceptability than the chemically grown. In the field trial, no significant effects of all the treatments were found on some growth parameters assessed. However, application of 5 t OBF/ha led to significant increases in the number of okro pods.

1181. **Organic waste materials for soil fertility improvement in the border region of the Eastern Cape, South Africa.**
Adediran, J. A.; Baets, N. de; Mnkeni, P. N. S.; Kiekens, L.; Muyima, N. Y. O.; and Thys, A.
Biological Agriculture and Horticulture 20(4): 283-300. (2003)
NAL Call #: S605.5.B5 ; ISSN: 0144-8765
Descriptors: calcium/ cellulose/ copper/ iron/ lignin/ magnesium/ mineralization/ nitrogen/ organic wastes/ phosphorus/ pig manure/ pineapples/ polyphenols/ potassium/ poultry manure/ sawdust/ sewage sludge/ soil fertility/ tobacco/ zinc/ microbial biomass/ poultry litter
Abstract: Sixteen organic wastes (tobacco, sawdust, pig dung, poultry manure, pineapple waste, sewage sludge, hoof and horn meal, coffee waste, bone meal, paunch contents, blood meal, and carcass meal) with potential for enhancing soil productivity were identified in the Border region of the Eastern Cape, South Africa and were analysed for elemental composition. Pineapple waste (Pw), tobacco waste (Tw), poultry manure (Pm), pig dung (Pd) and commercial compost (Cp) were further analysed for their lignin, polyphenol and cellulose contents. The nutrient release patterns and carbon mineralization of these organic wastes were investigated in laboratory incubation studies in which the organic wastes were mixed with 100 g of soil at rates that supplied 100 kg N ha-1 and incubated for 12 weeks. Incubation of the four organic wastes and Cp resulted in the release of N, P, K, Ca, Mg, Zn, Fe and Cu indicating the potential of the materials to supply these nutrients to crop plants. The mineralization of N was highest during the first four weeks of incubation and the rate of release followed the order Cp>Pd identical-to Pm>Pw identical-to Tw. The N mineralization rate was positively correlated with total N and lignin content and negatively related to the C:N ratio, cellulose, polyphenol and polyphenol:total N. All organic materials had a positive influence on soil microbial biomass but Tw had the least effect, possibly due to the toxic effects of nicotine. With the exception of Pm, organic wastes that had P contents above the critical value of 0.2% released considerable amounts of P especially towards the end of the incubation. Compared with the other micronutrients studied, Zn was released by the organic materials in larger quantities and in proportion to the Zn content of the materials. Based on N mineralization, nature and cost of the materials, Pm, Pd, Pw and Tw were found to be suitable for the improvement of soil productivity. Poultry manure and Pd could be applied directly to soils as sources of N for annual crops while Tw and Pw could be mixed with inorganic fertilizers or used as raw materials in composting.

1182. **Performance characteristics of West African dwarf goat fed Rhizopus treated sawdust.**
Belewu, M. A. and Popoola, M. A.
Scientific Research and Essays 2(11): 496-498. (2007); ISSN: 1992-2248
Descriptors: crude protein/ diets/ feed intake/ goat feeding/ lignin/ liveweight gain/ sawdust/ West African Dwarf goat breed/ crude fiber/ liveweight gains/ Mucoraceae
Abstract: Feed intake and liveweight gain of West African dwarf (WAD) goats consuming Rhizopus treated sawdust were determined. 27 WAD goats in a 3x3 Latin square design with a 196-day period consumed normal diet with 20% untreated sawdust (Treatment 1, control), while Treatments 2 and 3 contained fungus treated sawdust at 20 and 25%, respectively. Crude protein, crude fibre and ether extract consumed increased (P<0.05) by the addition of the fungus treated sawdust for Treatment 3. In contrast, the lignin intake was significantly lower (P<0.05) in Treatments 2 and 3. The weight gain of the experimental animals was highest in Treatment 3. In conclusion, fungus treated sawdust-based diet for growing WAD goats may improve performance as a result of increasing feed intake and liveweight gain.

1183. **pH correction in Salix sp. sawdust-perlite mixture used as horticultural growing media in soil less cultivations.**
Gariglio, N. F.; Alsina, D. A.; Nescier, I.; and Castellaro, F. J.
Investigacion Agraria Produccion y Proteccion Vegetales 16(2): 205-211. (2001); ISSN: 0213-5000.
Notes: Original title: Correccion del pH en sustratos a base de serrin de Salicaceas.
Descriptors: ph/ Salix/ sawdust/ perlite/ soil-less medium
Abstract: Salix sp. sawdust is used as growing media in soil less cultivations at Santa Fe (Argentina). However, its pH, as well as that of its mixture with perlite, is higher than the suggested for soil less crops. The aim of this work was to evaluate pH correction and its persistence in Salix sp. sawdust-perlite mixture substrates. Sulphur 1% w/w, ferrous sulphate 1% w/w and sphagnum peat (pH 5.67) 10% v/v replacing equal amounts of perlite were evaluated as pH correctors. Salix sp. sawdust-perlite, 1:1 (v/v) mixture was used as control. pH and electrical conductivity in the drainage solution were measured to evaluate pH correction and pH persistence. Samples from each treatment were placed in a glass column and daily irrigated with nutrient solution. In another trial, perlite was replaced by different levels of peat and the pH response was evaluated. It was observed that the pH correction obtained through the addition of mineral substances was not adequately persistent due to the rapid washing of the minerals. However, incorporation of 10% sphagnum peat replacing perlite allowed an optimum and stable pH to be reached for most of the soil less cultivations.

1184. **Physical and chemical changes during composting of wood chip-bedded and straw-bedded beef cattle feedlot manure.**
Larney, F. J.; Olson, A. F.; Miller, J. J.; DeMaere, P. R.; Zvomuya, F.; and McAllister, T. A.
Journal of Environmental Quality 37(2): 725-35. (Mar. 2008-Apr. 2008)
NAL Call #: QH540.J6; ISSN: 0047-2425
Descriptors: Alberta/ animals/ carbon: analysis/ cattle/ hordeum/ housing, animal/ manure: analysis/ nitrogen: analysis/ phosphorus: analysis/ soil: analysis/ temperature/ wood
Abstract: In the 1990s, restrictions on incineration encouraged the forest industry in western Canada to develop new uses for their wood residuals by product. One such use was as a replacement for cereal straw bedding in southern Alberta's beef cattle (Bos taurus) feedlot industry. However, use of carbon (C)-rich bedding, such as wood chips, had implications for subsequent composting of the feedlot manure, a practice that was being increasingly adopted. In a 3-yr study, we compared composting of wood chip-bedded manure (WBM) and barley (Hordeum vulgare L.) straw-bedded manure (SBM). There were no significant differences in temperature regimes of SBM and WBM, indicating similar rates of successful composting. Of 17 physical and chemical parameters, five showed significant ($P < 0.10$) differences due to bedding at the outset of composting (Day 0), and 11 showed significant differences at final sampling (Day 124). During composting (10 sampling times), seven parameters showed significant bedding effects, 16 showed significant time effects, and four showed a Bedding x Time interaction. Significantly lower ($P < 0.10$) losses of nitrogen (N) occurred with WBM (19%) compared with SBM (34%), which has positive implications for air quality and use as a soil amendment. Other advantages of WBM compost included significantly higher total C (333 vs. 210 kg Mg(-1) for SBM) and inorganic N (1.3 vs. 1.0 kg Mg(-1) for SBM) and significantly lower total phosphorus (4.5 vs. 5.3 kg Mg(-1) for SBM). Our results showed that wood chip bedding should not be a problem for subsequent composting of the manure after pen cleaning. In combination with other benefits, our findings should encourage the adoption of wood chips over straw as a bedding choice for southern Alberta feedlots. This citation is from PubMed.

1185. **Physical and chemical characteristics of substrates for the production of Ilex paraguariensis St. Hil. seedlings.**
Wendling, I.; Guastala, D.; and Dedecek, R.
Revista Arvore 31(2): 209-220. (2007); ISSN: 0100-6762.
Notes: Original title: Caracteristicas fisicas e quimicas de substratos para producao de mudas de Ilex paraguariensis St. Hil.
Descriptors: cattle manure/ chemical properties/ composts/ cost benefit analysis/ growing media/ humus/ physical properties/ pine bark/ propagation/ propagation materials/ sawdust/ seedling growth/ seedlings/ stems/ substrates/ plant propagation/ potting composts/ rooting media
Abstract: This work aimed to evaluate the physical and chemical properties of different materials and their compositions, as well as their efficiency in the production of Ilex paraguariensis seedlings in plastic tubes. The work was conducted at the Baldo S.A. Company nursery in Sao Mateus do Sul, Parana, Brazil. Six materials were used to formulate 14 treatments: cattle manure, semi-decomposed sawdust, Ilex paraguariensis chopped stems, underground earth, commercial substrate based on pinus bark and earthworm humus. The results indicated that the treatments containing sawdust, Ilex paraguariensis stems and mainly cattle manure, besides being more economical, produced good quality seedlings. The treatments consisting of 40% cattle manure and 60% sawdust stood out because of the good cost-benefit ratio and the easiness of preparation. Substrate chemical characteristics did not affect the physical characteristics, as well the influence of physical characteristics on Ilex paraguariensis seedling production depends on the analysed variable.

1186. **Physical, chemical properties and microbial population of soil as affected by application of chemical fertilizer and swine manure fermented with sawdust on Cheju brown volcanic ash pasture soil.**
Kim MoonChul; Hyun HaeNam; and Lee SungCheol
Journal of the Korean Society of Grassland Science 20(2): 139-146. (2000)
NAL Call #: SB202.K6H352; ISSN: 1013-9354
Descriptors: application rates/ ash/ availability/ calcium/ fertilizers/ magnesium/ manures/ nitrogen/ nitrogen fertilizers/ phosphorus/ potassium/ sawdust/ sodium/ soil bacteria/ soil fungi/ soil organic matter/ soil ph/ hogs/ organic matter in soil/ South Korea/ swine
Abstract: A trial was carried out to investigate the effect of fermented saw-dust pig manure (FSP) and N fertilizer application on physical, chemical properties and microbial

population of soil on Cheju brown volcanic ash pasture during the period from September, 1997 to January, 1999. Average soil N contents during 3 different periods, August and October, 1998, and January, 1999 were 0.39, 0.41 and 0.39% for fertilizer N level 0, 150 and 300 kg/ha, respectively. Soil N contents determined in January, 1999, was significantly increased by an increase of fertilizer N. Nitrogen contents in the soil applied with 0, 3, 6 and 12 t/ha of FSP were 0.43, 0.40, 0.38 and 0.38%, respectively, showing decreasing tendency of soil with increasing levels of FSP application. Soil N contents determined in August, 1998 and January, 1999, were significantly decreased by increasing levels of FSP application. Organic matter contents of the soil applied with N 0, 150 and 300 kg/ha was 8.04, 8.37, and 9.08%. Soil organic matters determined on the 1st and 2nd period trended to increase with increasing level of fertilizer N. FSP application significantly decreased organic matter contents of pasture soil, (9.14, 8.79, 8.28 and 7.78% OM in soil applied with FSP 0, 3, 6 and 12 t/ha of FSP), respectively. Soil OM determined in October, 1998, also showed a significant decrease with increasing level of FSP. Soil pH, available phosphorus, exchangeable K, Ca, Mg and Na in pasture soil studied were not influenced by fertilizer N or FSP application during all three periods. N application tended to increase soil bacteria count, (27.0x104 cfu/g, 29.4x104 cfu/g and 53.6 104 cfu/g in the soil applied with 0, 150 and 300 kg N/ha, respectively). The number of colonies of soil bacteria and fungi determined in June and October, 1998 was not increased remarkably by FSP application, but the number of colonies of bacteria determined in March, 1998 showed a significant increase with increasing level of FSP application. In conclusion, N contents and OM of soil increased with increasing level of N application, but decreased with increasing level of FSP application. This citation is from AGRICOLA.

1187. **Physico-chemical properties of organic and inorganic materials used as container media.**
Choi JongMyung; Chung HaeJoon; and Choi JongSeung
Korean Journal of Horticultural Science and Technology 18(4): 529-535. (2000); ISSN: 1226-8763
Descriptors: aeration / bark compost/ calcium/ cation exchange capacity/ container grown plants/ electrical conductivity/ greenhouse crops/ growing media/ magnesium/ ornamental plants/ particle size distribution/ peat/ perlite/ physicochemical properties/ pine bark/ porosity/ potassium/ rice husks/ rockwool/ sawdust/ sodium/ soil chemical properties/ soil physical properties/ vermiculite/ bark humus/ chemical properties of soil/ compost/ mineral wool/ ornamentals/ physical properties of soil/ potting composts/ rice hulls/ rock wool/ rooting media
Abstract: The physicochemical properties were investigated of organic (composted rice hulls, sawdust, pine bark and Russian [Sphagnum] peat) and inorganic materials (vermiculite, perlite and rockwool) commonly used as substrates for greenhouse container crops. Of the organic media composted dry bark had the highest proportion of particles greater than 1.0 mm (72%) followed by composted wet bark (69%). Only 33-34% of rice hull and sawdust compost particles were greater than 1.0 mm. With the exception of ground rockwool and imported vermiculite, all types of inorganic media showed high proportions (63-90%) of particles greater than 1.0 mm. Russian peat and rockwool showed the highest total porosity and container capacity of the organic and inorganic substrates, respectively. Air space was low (4%) in Russian peat and composted sawdust indicating that aeration could be a problem for container-grown crops in these substrates. Electrical conductivity was significantly higher in composted sawdust than in other substrates. Cation exchange capacity was generally higher in organic (50-80 meq/100 g) than in inorganic substrates (6-27 meq/100 g) with the exception of domestic vermiculite (64 meq/100 g). Potassium (as K_2O) and sodium (Na_2O) contents were significantly lower and calcium (CaO) and magnesium (Mg) contents significantly higher in Russian peat than in other organic substrates.

1188. **Physiological quality of Ocotea porosa (Ness et Martius ex Ness) seeds after different storage and sowing conditions.**
Tonin, G. A. and Perez, S. C. J. G. de A.
Revista Brasileira de Sementes 28(2): 26-33. (2006)
NAL Call #: SB113.2.R48; ISSN: 0101-3122.
Notes: Original title: Qualidade fisiologicade sementes de Ocotea porosa (Nees et Martius ex Nees) apos diferentes condicoes de armazenamento e semeadura.
Descriptors: chemical composition/ containers/ moisture content/ plant composition/ plant water relations/ sawdust/ seed germination/ seeds/ shading/ storage/ substrates/ water content/ chemical constituents of plants/ Ocotea porosa
Abstract: The seed moisture level at harvest and the following procedures are very important factors for germination, and will result in the success or failure of plant establishment. The aim of this study was to add information about the viability and vigour of O. porosa (imbuia) seeds, such as the right time to harvest, the best storage procedure and how to produce plants inside a greenhouse. In this study, the seed moisture level was 40 and 30% and differences in chemical composition were detected. They were stored in plastic bags and glass recipients under ambient conditions in a cool room. The seeds from different conditions were sown in plastic bags containing different substrates (agricultural compound, cerrado soil plus sawdust) maintained under full sunlight and 65% artificial shading. A combined analysis was carried out to know the relationships between the parameters and to check the type of dependence between them. A linear relationship between the parameters was detected, and thus a cluster analysis was performed. The highest rate and percentage of seedling emergence were registered with seeds presenting 40% moisture level, stored under ambient conditions, inside plastic bags, sown in agricultural substratum plus cerrado soil and sawdust, and maintained under artificial shading. Seed storage in glass recipients decreased seed viability and vigour.

1189. **Pine sawdust pretreated with fungi strains as a substrate for the cultivation of tomatoes.**
Andrade S. N. and Valenzuela F. E.
Agro Sur 30(2): 28-34. (2002)
NAL Call #: S15.A395; ISSN: 0304-8802.
Notes: Original title: Aserrin de pino pretratado con cepas fungicas como sustrato para la produccion de plantulas de tomate (Lycopersicon esculentum Mill).

Descriptors: crop production/ height/ leaves/ length/ red soils/ roots/ sawdust/ seedling emergence/ seedlings/ seeds/ soil amendments/ soil types/ survival/ tomatoes/ Basidiomycetes/ Cortinariaceae/ Cortinariales/ Gymnopilus/ Gymnopilus spectabilis/ Pleuroflammula croceosanguinea/ red earths
Abstract: The cultivation of tomato plantlets (Lycopersicon esculentum) on sawdust of Pinus radiata pretreated with strains of Agaricales UACHMGs-99 (Gymnopilus spectabilis) and UACHMPc-280 (Pleuroflammula croseosanguinea) was studied. Pretreated sawdust was mixed with clayish red soil (1:1 vol/vol). As controls sawdust alone, clayish red soil and a mixture of both were used. Triplicated substrates were deposited in containers and in each container 50 tomato seeds were sown and cultivated during one month in a chamber (16/8 h light/darkness, 4.000 lux, 10-24 degrees C+or-1 degrees C). For sixty plantlets per treatment, the emergence and survival percentage, height, root length, number of leaves and dried weight were determined. Statistical analysis was performed on the data, using ANOVA and a Tukey Test. The tomato plantlets cultivated on the substrate with pretreated sawdust had a higher survival (98.5 to 100%), plant height (12.2 to 16.5 cm) and root length (13.9 cm) were measured. The study demonstrated the presence of significant differences between tomato plantlets cultivated on substrates that included pretreated sawdust versus the controls. Therefore, the pretreated sawdust of P. radiata could be used for the cultivation of tomato plantlets.
This citation is from AGRICOLA.

1190. **Polycyclic aromatic hydrocarbons in ash: Determination of total and leachable concentrations.**
Enell, A.; Fuhrman, F.; Lundin, L.; Warfvinge, P.; and Thelin, G.
Environmental Pollution 152(2): 285-92. (Mar. 2008)
NAL Call #: QH545.A1E52; ISSN: 0269-7491
Descriptors: adsorption/ environmental monitoring: instrumentation: methods/ fertilizers/ incineration/ particulate matter/ polycyclic hydrocarbons, aromatic: analysis/ refuse disposal/ soil pollutants: analysis/ wood
Abstract: Before wood ash can be used as a soil fertilizer, concentrations of environmentally hazardous compounds must be investigated. In this study, total and leachable concentrations of 16 polycyclic aromatic hydrocarbons (PAHs) were determined in four ash samples and one green liquor sludge. The ash sample with the highest carbon content also contained high levels of PAHs; three of the ash samples had total concentrations exceeding the limit permitted by the Swedish Forest Agency for recycling to forest soils. The leachable concentrations were higher for the non-stabilized samples; this was probably due to colloid-facilitated transport of the contaminants in these samples. However, the leachable concentrations were overall relatively low in all the samples studied. The amounts of PAHs introduced to forest soils by additions of stabilized, recyclable ash products will be determined primarily by the rate of weathering of the ash particles and the total concentration of contaminants.
This citation is from PubMed.

1191. **Possibility of using organic substrates as substitutes for common hydroponic media and finding suitable nutrient solution for soilless culture in greenhouse grown tomato.**
Delshad, M.; Kashi, A. K.; and Babalar, M.
Iranian Journal of Agricultural Sciences 37(1): 176-186. (2006); ISSN: 1017-5652
Descriptors: ascorbic acid/ chemical composition/ crop quality/ crop yield/ dry matter/ firmness/ growing media/ hydroponics/ leaves/ perlite/ protected cultivation/ sawdust/ soilless culture/ stems/ substrates/ titratable acidity/ tomatoes/ cultivation under glass or plastic/ potting composts/ rooting media/ vitamin C
Abstract: The efficacy of coarse and fine perlite (3:1; M1) and sawdust (M2) as hydroponic media for soilless culture of greenhouse tomato was evaluated along with 2 nutrient solutions, S1 (a commercial standard solution for soilless-cultured, greenhouse-grown tomato) and S2 (modified Coic solution). Plants grown in perlite exhibited better growth than those grown in sawdust. Yield (number and weight of fruits per plant), fruit firmness and stem diameter were higher in tomatoes grown in perlite medium, whereas early yield, fruit vitamin C content, titratable acidity, dry weight percentage, numbers of leaves and trusses per plant as well as plant stem length were similar in both M1 and M2. Stem diameter in plants supplemented with S2 solution was higher than in those supplemented with S1, whereas fruit titratable acidity in the latter was higher. No other significant differences were observed between the nutrient solutions.

1192. **Potential for sawdust and leaves of Chromolaena odorata as soil amendments for plant growth in an oil polluted soil.**
Akonye, L. A. and Onwudiwe, I. O.
Niger Delta Biologia 4(2): 47-55. (2004); ISSN: 1118-8731
Descriptors: biomass/ cassava/ chlorophyll/ cowpeas/ fuel oils/ groundnuts/ growth/ leaves/ maize/ okras/ polluted soils/ rooting/ roots/ sawdust/ soil amendments/ soil pollution/ soil types/ toxicity/ waste management/ waste utilization/ black eyed peas/ corn/ manioc/ peanuts/ southern peas/ tapioca plant
Abstract: The potential for sawdust and leaves of Chromolaena odorata to act as amendment agents in oil-polluted soils was explored in Nigeria. The agents were independently applied to soils polluted with crude oil at two levels (2% and 6%) in a greenhouse pot test with Abelmoschus esculentus, Zea mays, Manihot esculenta, Arachis hypogaea, Vigna unguiculata and Axonopus compressus. The addition of the agents generally improved plant biomass yield, root proliferation, and chlorophyll a more at 2% than at 6% over the polluted treatments but not with the controls. The overall performance of the various plants showed that the legumes Arachis hypogaea and V. unguiculata responded more favourably than Abelmoschus esculentus, Z. mays, M. esculenta, and Axonopus compressus in that order. These results are indicative of the ability of sawdust and chromolaena leaves to either reduce the toxicity of the oil pollutant or induce favourable soil properties or both, thus supporting a wide range of plant growth.
This citation is from AGRICOLA.

1193. **Potential for the cultivation of exotic mushroom species by exploitation of Mediterranean agricultural wastes.**
Philippoussis, A.; Diamantopoulou, P.; Zervakis, G.; and Ioannidou, S.
In: Science and Cultivation of Edible Fungi. Proceedings of the 15th International Congress on the Science and Cultivation of Edible Fungi.Maastricht, Netherlands.); pp. 523-530; 2000.
Descriptors: agricultural wastes/ cotton/ cotton gin trash/ crop yield/ cultural methods/ edible fungi/ growing media/ poplars/ production/ sawdust/ straw/ utilization/ vegetables/ wheat/ wheat straw/ Bolbitiaceae/ farm wastes/ gin trash/ Lentinaceae/ Mediterranean countries/ Pluteaceae/ Poriales/ potting composts/ rooting media/ Tricholomataceae/ vegetable crops
Abstract: Four agricultural wastes abundant in eastern Mediterranean countries (wheat straw, cotton gin-trash, peanut shells and poplar sawdust), were comparatively evaluated as substrates for the cultivation of selected strains of Pleurotus ostreatus, P. eryngii, P. pulmonarius, Agrocybe aegerita, Lentinula edodes and Volvariella volvacea. Both quantitative and qualitative parameters were examined, i.e. substrate incubation efficacy, earliness, yield, biological efficiency, basidiomata number, weight and size. Wheat straw and cotton gin-trash were the most suitable substrates for Pleurotus spp. and A. aegerita (the former being more advantageous for high BE's and size, the latter for earliness and length of cultivation cycle), followed by poplar sawdust and peanut shells. Cotton gin-trash was unsuitable for L. edodes. V. volvacea growth was good on cotton gin-trash and wheat straw. The results, verified for P. ostreatus and P. pulmonarius strains in successive cultivation studies of 5 Pleurotus strains on cotton gin trash, are encouraging for the exploitation of cotton gin-trash as an alternative substrate for the cultivation of exotic fungal species.
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1194. **The potential for the field production of vegetables with the 'Earth Box' system.**
Csizinszky, A. A.
In: 14th International Congress on Plastics in Agriculture.Tel Aviv, Israel.); pp. 635-642; 1998.
Descriptors: bark/ fruit vegetables/ growing media/ leaching/ mulches/ peat/ pine bark/ plastic film/ polyethylene/ protected cultivation/ sawdust/ tomatoes/ trickle irrigation/ vegetables/ cultivation under glass or plastic/ mulching materials/ polythene/ potting composts/ rooting media/ vegetable crops
Abstract: Tomatoes and bell peppers were grown in the 'Earth Box' in 1996. The 'Earth Box' is a closed production system: the bottom compartment contains a water reservoir and the top compartment the soil and fertilizer. There is no leaching of fertilizer or water from the boxes to the environment. Tomatoes (cv. Agriset 761) were grown in Spring 1996 in a split-plot design. Main plots were three growth media: 100% soil (EauGallie fine sand) (100 soil); 100% prepared medium mix of 40% peat, 20% sawdust and 40% pine bark (100% medium); and 50% fine sand: 50% prepared medium mix (50% medium). Sub-plots were unshaded (U) and shaded (S) boxes. In the U sub-plots a 0.032-mm-thick white on black polyethylene film covered only the top of the box and in the S sub-plots the plastic film covered the top and the south side of the box. Peppers, (cv. Capistrano) were grown in Autumn 1996 with the same 3 growing media as were the tomatoes, but in shaded (S) boxes only. In the control plots, tomatoes and peppers were grown with the full-bed polyethylene mulch system with micro (trickle) irrigation. Tomato yields in the 100% medium treatment were similar to those in the microirrigated plots with 625 mm irrigation, compared with only 406 mm irrigation in the Earth Boxes. Pepper yields in the 50% medium and 100% medium treatments were also similar to yields in the microirrigated plots and received 155 mm irrigation in the boxes compared with 468 mm irrigation in the microirrigated control plots. Tomato and bell pepper yields in the boxes were lowest with the 100% soil (fine sand) treatment due to poor root growth in this medium.
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1195. **The potential for the sequential production of vegetables in the field with the 'Earth Box' system.**
Csizinszky, A. A.
Acta Horticulturae 513: 137-144. (2000)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: cabbages / crop yield/ cucumbers/ cultivars/ growing media/ irrigation/ mulches/ NPK fertilizers/ peat soils/ pine bark/ polyethylene film/ potting/ salts in soil/ sandy soils/ sawdust/ sequential cropping/ Capparales/ cultivated varieties/ Earth Box/ gherkins/ mulching materials/ potting composts/ rooting media/ United States of America/ watering
Abstract: Three vegetable crops, bell peppers, Capsicum annuum (cv. Capistrano); cabbage, Brassica oleracea var. capitata (cv. Tastie) and cucumber, Cucumis sativus (cv. Dasher II); were grown in Bradenton, Florida, USA, during the fall, winter and spring (September 1996-June 1997) in sequence in the Earth Box and compared with yields of the same three vegetable crops grown on the same land using the full-bed polyethylene mulch system with micro-irrigation. Soil in the micro-irrigated plots was the Eau Gallie fine sand. The Earth Box, made of recycled plastic, is a 244 cm long, 33 cm high and 40.6 cm wide closed production system. The bottom (9 cm deep) compartment contains the water reservoir and is separated from the 24-cm deep soil compartment above it by a perforated plate. There is no leaching of fertilizer or water, from the box to the environment. The boxes were filled with three growth media: 100% soil; 100% prepared medium mix of peat, sawdust and pine bark; and 50% fine sand: 50% prepared medium. Dry fertilizers were banded prior to planting in a narrow, 5 cm groove for the crops (N:P:K at kg/ha equivalent) as follows: bell pepper: 292:35:243; cabbage: 228:0:98; and cucumber: 119:0:82. The top and south side of the boxes were covered with a 0.032 mm thick white on black polyethylene film. Best yields in the boxes were recorded from the 50% medium treatment. Marketable yields of cucumbers, with 118 mm irrigation and bell peppers with 288 mm irrigation in the 50% medium treatment were similar to yields in the micro-irrigated plots with 320 mm and 344 mm irrigation, respectively for cucumbers and bell peppers. Cabbage yields were lower in the boxes than in the micro-irrigated plots. Very high

residual concentrations of total soluble salts were measured in the growth media in the boxes after each cropping. Little or no differences were found in leaf elemental concentrations among the treatments. Reproduced with permission from the CAB Abstracts database.

1196. **Potential replacements for rockwool as growing substrate for greenhouse tomato.**
Allaire, S. E.; Caron, J.; Menard, C.; and Dorais, M.
Canadian Journal of Soil Science 85(1): 67-74. (2005)
NAL Call #: 56.8 C162; ISSN: 0008-4271
Descriptors: aeration / air/ available water/ bark/ crop production/ crop yield/ diffusivity/ drainage/ gases/ growing media/ hydraulic conductivity/ mixtures/ peat/ performance/ physical properties/ porosity/ protected cultivation/ rockwool/ sawdust/ substitutes/ substrates/ tomatoes/ water/ wood shavings/ cultivation under glass or plastic/ mineral wool/ potting composts / rock wool/ rooting media
Abstract: The greenhouse industry needs renewable, cheap, and available substitutes for rockwool. The physical properties and performance of rockwool substitutes such as low grade peat, composted bark white spruce and fir, shavings, sawdust, and peat-bark mixtures were compared during two greenhouse experiments with tomato grown in plastic bags. Air and water filled porosities greatly differed between substrates, particularly for sawdust and shavings. Relative gas diffusivity (D_s/D_o) and the hydraulic conductivity were less different between substrates. The physical properties of the substrates changed over a production cycle but the changes were small compared to treatment differences. Yields in peat-bark substrates were similar to rockwool substrates during both the short and long experiments but were lower in sawdust and shavings during the long experiment. The yield differences expected between media were less than the differences between some substrate physical properties of the various media. Yields were positively related to easily available water (EAW) and negatively related to D_s/D_o and air-filled porosity (AFP). This indicated excessive drainage for the low-yielding substrates. In plastic bags, media properties related to aeration were not good indicators of production because the plants adapted to the lack of aeration by modifying their root distribution. White spruce and fir bark alone or mixed with low-grade peat showed high potential for greenhouse tomato production and represent an environmental sound alternative to rockwool.
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1197. **Potentiality of antagonists in reducing white rot disease of French bean in amended soil.**
Das, M. G. and Das, B. C.
Crop Research Hisar 29(3): 503-508. (2005)
NAL Call #: SB4.C66 ; ISSN: 0970-4884
Descriptors: biological control/ biological control agents/ crop yield/ farmyard manure/ fungal antagonists/ fungal diseases/ organic matter/ plant disease control/ plant diseases/ plant pathogenic fungi/ plant pathogens/ rice husks/ sawdust/ seed treatment/ seeds/ soil ph/ biocontrol agents/ biological control organisms/ FYM/ green bean/ Hyphomycetes/ Leotiales/ phytopathogens/ rice hulls/ Sclerotiniaceae/ snap bean
Abstract: The most suitable soil amendment and fungal antagonist for controlling white rot disease (Sclerotinia sclerotiorum) on French bean cv. Contender were investigated. Seeds were treated with spore suspensions of Trichoderma harzianum, Gliocladium virens and Aspergillus flavus. The soil amendments, farmyard manure (FYM at 2% w/w), rice husk and sawdust, were supplied to pots where the seeds were sown. The most effective treatment combination for controlling the disease was seed treatment with T. harzianum + FYM soil treatment. This treatment increased plant growth and yield. The application of antagonists + amendments resulted in low soil pH and high organic matter content.
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1198. **The practicability of swine manure compost deodorization, and effect of mixed sawdust to odor removal.**
Sakai, T.; Kawahara, H.; and Shikimachi, H.
Japanese Journal of Swine Science 44(3): 144-147. (2007); ISSN: 0913-882X
Descriptors: ammonia/ comparisons/ composts/ deodorizing/ methyl sulfide/ mixing/ odours/ pig manure/ removal/ sawdust/ methyl mercaptan/ methyl sulphide/ odors/ smells
Abstract: An improvement of swine manure in deodorizing swine faeces is reported by adding sawdust to the swine manure in Japan. A mixed swine manure with sawdust obtained a higher removal rate of ammonia, methyl mercaptan and dimethyl-sulfide than swine manure itself, showing 100%, 93% and 92% removal respectively, whereas swine manure obtained removal rates of 99%, 86% and 75%, respectively. For this comparison test, water content was kept at over 40%, which is considered essential to promote bacteria activities in deodorizing process in both cases.
This citation is from AGRICOLA.

1199. **Preferences of housed finishing beef cattle for different floor types.**
Lowe, D. E.; Steen, R. W. J.; and Beattie, V. E.
Animal Welfare 10(4): 395-404. (2001); ISSN: 0962-7286
Descriptors: animal behaviour/ animal housing/ beef cattle/ behaviour/ floor type/ litter/ mats/ sawdust/ slatted floors/ steers/ straw/ animal behavior/ behavior/ bullocks/ preferences
Abstract: Six pairs of steers were allowed to choose between two types of floors in a paired choice test. The four floors tested were a fully slatted floor, a fully slatted floor covered with rubber mats, a solid floor with sawdust bedding, and a solid floor with straw bedding. All combinations of floor types were tested and the choices were repeated eight times, using naive animals. The animals were allowed 17 days to habituate, and on days 18-21 their behaviour was recorded by video for 72 hours. Straw was the most preferred floor type, followed by sawdust, then mats, and finally slats. During a second test period, rubber mats were compared with rubber strips, and no significant preferences were found.
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1200. **Preliminary study of the effect of continuous and intermittent aeration on composting hog manure amended with sawdust.**
Hong, J. H.; Keener, H. M.; and Elwell, D. L.
Compost Science and Utilization 6(3): 74-88. (Summer 1998)
NAL Call #: TD796.5.C58 ; ISSN: 1065-657X
Descriptors: pig manure/ composting/ sawdust/ aeration/ ammonia/ carbon nitrogen ratio/ nitrogen/ ammonium nitrogen/ degradation/ odor emission/ losses/ dry matter
This citation is from AGRICOLA.

1201. **A preliminary study on control of cucumber root-knot nematode by organic amendments.**
Liu HuiZhi; Li HongLian; Yuan HongXia; Xing XiaoPing; Wang ZheYue; and Sun BingJian
Plant Protection 30(6): 58-60. (2004); ISSN: 0529-1542
Descriptors: chaff/ cucumbers/ groundnut oilmeal/ leaves/ nematicidal plants/ nematicides/ non wood forest products/ organic amendments/ pest control/ pines / plant parasitic nematodes/ plant pests/ rapeseed oilmeal/ sawdust/ soil amendments/ wheat/ eelworms/ gherkins/ groundnut cake/ minor forest products/ non timber forest products/ peanut oilmeal/ Secernentea/ Tylenchida
Abstract: In pot and plot experiments, soil was treated with 12 types of plant organic matter to study the effect on control of cucumber root-knot nematodes (Meloidogyne spp.). Pot experiments showed that properly fermented leaves of caster oil plant, wheat chaff, leaves of Chinaberry and peanut cake had a control efficiency of 70.44, 68.17, 56.09, and 54.92%, respectively. In a plot experiment, the efficacy of wheat chaff, Chinaberry leaves, leaves of caster oil plant and rapeseed cake mixed with soil at 1% (W/W) was 71.55, 69.99, 63.14, and 62.19%, respectively. Cucumber growth improved with the organic amendments, especially wheat chaff, and slightly less by Chinaberry leaf, pine sawdust and rapeseed cake.
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1202. **Procedure to measure the level of polycyclic aromatic hydrocarbons in wood ashes used as fertilizer in agroforestry soils and their transfer from ashes to water.**
Rey-Salgueiro, L.; Garcia-Falcon, M. S.; Soto-Gonzalez, B.; and Simal-Gandara, J.
Journal of Agricultural Food Chemistry 52(12): 3900-4. (June 2004); ISSN: 0021-8561
Descriptors: agriculture/ chromatography, high pressure liquid/ fertilizers: analysis/ forestry/ polycyclic hydrocarbons, aromatic: analysis/ soil/ water: chemistry/ wood
Abstract: Before wood ash can be safely used as a fertilizer in soils, possible negative effects such as input of organic contaminants or remobilization of contaminants already stored in the soil must be investigated. The objective of this study was to optimize and characterize extraction methods to isolate and quantitatively measure polycyclic aromatic hydrocarbons (PAHs) concentrations in wood ash that can be used as amendment of soils. It will be then possible to examine the effects of wood ash application on PAHs concentrations in the washing waters with the aim of evaluating their distribution by storage in the different compartments and what influences their stability and persistence. Simple, rapid and inexpensive methods have been set up for the determination of seven polycyclic aromatic hydrocarbons (PAHs) in wood ashes and ash aqueous extracts without interferences from other chemical contaminants using organic solvent extraction and/or SPE techniques and analyzed by an optimized RP-HPLC-FLD method. The feasibility of extraction for the determination of PAHs in wood ashes has been evaluated because PAHs are strongly sorbed to such a matrix, which explains why the PAHs content in ash was seldom studied. The method resulted to be of recoveries ranging from 81 to 97% for the different PAHs, with repeatabilities (RSDs%) better than 6%. Detection levels were from 0.2 to 2.2 microg/kg, while quantification limits were from 0.7 to 5.6 microg/kg, low enough to evaluate the presence of PAHs in wood ashes.
This citation is from PubMed.

1203. **Production and composition of manure from pigs fattened on sawdust, wood shaving or bark-based litter material.**
Texier, C.; Baron, P.; and Charnet, F.
Techni Porc 27(4): 29-37. (2004); ISSN: 0181-6764.
Notes: Original title: Production et composition des fumiers de porcs engraisses sur sciure, copeaux ou ecorce.
Descriptors: bark/ excretion/ finishing/ litter/ pig housing/ pig manure/ sawdust/ straw/ surveys/ wood shavings/ fattening/ piggeries/ sties/ swine housing
Abstract: This article provides reference data on the production, composition and excretion of manure from pigs fattened in sawdust or other wood waste products as litter in comparison to straw. Dry and fresh sawdust, dry wood shavings and fresh bark were tested. The results of a survey led by the IDF in association with the ITP and conducted on the Farming Group and Chamber of Agriculture technicians were analysed. The survey confirmed that this practice remained marginal and demonstrated the lack of knowledge among pig breeding technicians with regard to the use of sawdust as litter material, which could be due in particular to a very limited amount of references on the subject. There was a very diverse range of practices applied in the use of sawdust as litter, and the absence of a model for production was a major disincentive to the development of this technique. Its advantages in environmental terms could be expected to lead to an increased development in the use of sawdust litter. Building design could be streamlined to enable some of the more unpleasant tasks such as litter maintenance to be mechanized.
This citation is from AGRICOLA.

1204. **Production and economic aspects of conventional and alternative pig fattening.**
Margeta, V.; Tolusic, Z.; and Kralik, I.
Agriculture Scientific and Professional Review 11(1): 49-53. (2005); ISSN: 1330-7142
Descriptors: backfat/ carcass composition/ carcass grading/ carcass quality/ carcass yield/ costs/ crossbreds/ deep litter housing/ fat thickness/ feed conversion efficiency/ finishing/ litter/ liveweight gain/ meat production/ muscle tissue/ pig housing/ sawdust/ straw/ costings/ fattening/ hogs/ liveweight gains/ piggeries/ sties/ swine/ swine housing
Abstract: The aim of this research was to compare the productive, slaughtering and economic characteristics of conventional and deep litter housing systems of pig fattening. The research was carried out on 105 crossbreds (LW x GL) x GL, divided into three groups. Pigs of the first

group were kept on straw-bedded floor, while the second group was kept on sawdust. The third group was kept in a conventional solid floor system without straw. When compared to pigs kept on deep litter, pigs kept in the convention housing system had higher liveweights, better average daily liveweight gains and better feed conversion during fattening. Pigs kept on deep litter housing had thinner backfat, greater portions of muscular tissue in carcasses and more favourable classification of carcasses to commercial classes than the pigs kept on sawdust and conventional housing. The deep litter housing system also provided better financial results than the conventional housing systems.
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1205. **Promoting microbial immobilization of soil nitrogen during restoration of abandoned agricultural fields by organic additions.**
Szili Kovacs, T.; Torok, K.; Tilston, E. L.; and Hopkins, D. W.
Biology and Fertility of Soils 43(6): 823-828. (2007)
NAL Call #: QH84.8.B46; ISSN: 0178-2762
Descriptors: abandoned land/ grasslands/ immobilization/ microbial activities/ natural grasslands/ nitrogen/ nutrient availability/ organic amendments/ regeneration/ sandy soils/ sawdust/ soil types/ sucrose/ microbial biomass/ natural pastures/ saccharose
Abstract: Application of organic materials to soils to enhance N immobilization into microbial biomass, thereby reducing inorganic N concentrations, was studied as a management option to accelerate the reestablishment of the native vegetation on abandoned arable fields on sandy soils the Kiskunsag National Park, Hungary. Sucrose and sawdust were used at three different topographic sites over 4 years. N availability and extractable inorganic N concentrations were significantly reduced in all sites. Soil microbial biomass C and microbial biomass N increased significantly following C additions, but the microbial C to microbial N ratio remained unaffected. It is concluded that the combined application of the rapidly utilized C source (sucrose) promoted N immobilization, whereas the addition of the slowly utilized C source (sawdust) maintained the elevated microbial biomass C and microbial biomass N in the field.
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1206. **Properties of livestock feces compost, 1: Effect of bulking agents or the location of piles on chemical properties of dairy cattle and beef cattle feces compost.**
Koyama, F. and Takamuku, K.
Bulletin of the Fukuoka Agricultural Research Center (Japan)(19): 110-114. (2000); ISSN: ISSN 1341-4593.
Notes: 3 tables; 4 fig.; 16 ref. Summaries (En, Ja). Citation notes: JP (Japan).
Descriptors: manure compost/ livestock/ bulking agents/ dairy manure/ beef manure
Abstract: We analyzed the application of cattle feces compost for better soil management in Fukuoka prefecture with a view toward determining the chemical properties of compost attributable to different types of cattle and bulking agents. The results were as follows: (1) Phosphorus pentaoxide in beef cattle compost mixed with sawdust (A) was significantly higher than that of dairy cattle compost mixed with sawdust (B). On the other hand, calcium oxide in (A) tended to be lower than (B). These differences were probably due to the ingredients in the feed. The total carbon in (A) was higher than (B) because most of the bedding was made up of sawdust. As a result, the C/N ratio in (A) amounted to 24. (2) The moisture content and quality of the fertilizer properties in dairy cattle compost mixed with rice hulls (C), compared with (B). decreased due to drainage. (3) The range of difference in chemical properties between (A) and (B) was drastic because some of the droppings were piled outdoors during the maturing process. Not only was the moisture content of these droppings were higher, but the electric conductivity, potassium oxide and sodium oxide levels were also higher. (4) Potassium oxide in cattle compost mixed with sawdust tended to be higher than in the past. It seems that the reason for this increase coincides with the larger number of composting facilities in use that mix cattle feces and urine. (5) If 1 ton of the standard cattle compost maturing at indoor facilities were applied, then the potassium oxide content of fertilizer would be between 9 and 10kg. Thus, we recommend reducing the level of potassium oxide application of cattle compost.

1207. **Protection against potato scab.**
Divis, J. and Kristufek, V.
Sbornik Jihoceska Univerzita Zemedelska Fakulta, Ceske Budejovice Fytotechnicka Rada 15(2): 73-80. (1998); ISSN: 1210-6259.
Notes: Original title: Ochrana proti strupovitosti brambor.
Descriptors: climate/ contamination/ cultivars/ cultural control/ disease resistance/ green manures/ plant disease control/ plant diseases/ plant pathogenic bacteria/ plant pathogens/ plant pathology/ potatoes/ root crops/ sawdust / soil/ soil amendments/ straw/ tubers/ varietal susceptibility/ cultivated varieties / phytopathogens/ phytopathology/ resistance to disease
Abstract: Two experimental plots in a region commonly affected by the common potato scab (caused by Streptomyces scabies) were used to assess the effect of sawdust, straw and green manure incorporation in the soil on the degree of tuber infection. Two potato cultivars were used, cv. Karin (highly resistant) and cv. Desiree (susceptible). Results showed that none of the organic additives had a noticeable effect. The main factors influencing tuber infection were the level of soil contamination by the pathogen, the degree of varietal resistance to the disease, and climatic conditions.
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1208. **Quality of different bedding materials and their influence on the compostability of horse manure.**
Airaksinen, S.; Heinonen Tanski, H.; and Heiskanen, M. L.
Journal of Equine Veterinary Science 21(3): 125-130. (2001); ISSN: 0737-0806
Descriptors: ammonia/ bacterial count/ composting/ decomposition/ fabrics/ fertilizers/ horse dung/ linen/ litter/ paper/ peat/ sawdust/ straw/ water holding capacity/ wood chips

Abstract: The air quality of the stable and management and composting of manure can be improved by choosing bedding material with certain desirable properties. The optimal bedding material doesn't cause hygiene problems in the stable. It absorbs ammonia, is economic in use, and decomposes quickly with manure. The objective of this trial was to compare both quality of different bedding materials and their influence on the composting process of horse manure. Bedding materials used in the study were wood chips, straw, peat, hemp, linen, sawdust, shredded newspaper and the mixtures, peat/wood chips, peat/sawdust, and peat/straw. Peat and peat mixtures had the best quality of ammonia absorption, water holding, and manure fertilization value. The number of fungi and bacteria were lower in shredded newspaper and wooden materials than in straw, linen, hemp, and peat. The composting temperature became high enough for at least a partial destruction of parasites and seeds within the rubbish heaps in all boxes. Only peat manure was ready for further plant production after one month's composting period. Other bedding materials were decomposed only partially or not at all during the study.

1209. **Quantity and quality of humic acids extracted from sandy soils fertilized with vermicomposts.**
Kalembasa, D. and Wisniewska, B.
Annales Universitatis Mariae Curie-Sklodowska. Sectio E Agricultura (Poland) 59(4): 1911-1917. (2004)
NAL Call #: 512 L96AE; ISSN: 0365-1118.
Notes: Summary (En). Citation Notes: PL (Poland).
Descriptors: humic acids/ sawdust/ sandy soils/ fertilization/ vermicomposts
Abstract: A significant increase in the amount of produced organic waste made it necessary to work out different methods of their utilization, including the vermicomposting process. Vermicomposts were produced with the Eisenia fetida Sav. on the basis of waste activated sludge with the addition of mixed sawdust and waste from a meat processing factory. Vermicomposts were applied in a pot experiment on two soil materials: weakly loamy sand and heavy loamy sand. The Lolium multiflorum Lam. was the tested plants harvested eight times during two vegetation periods. After two years of experiment from total amount of carbon introduced into pots taken as 100 percent, in slightly sand there was left 56.0 percent and in loamy sand - 59.4 percent. The quantity of organic carbon compounds extracted from the soil materials with 0.1 mol NaOH/cubic dm in the 1st fraction was 70.2 percent and in the 2nd 29.8 percent of total carbon in which 81.4 and 55.2 percent were in humic acid, respectively. In the extracts from heavy loamy sand these values were 68.3 and 31.7 percent, including 84.2 percent and 57.2 percent in humic acids of total extracted carbon, respectively.

1210. **Rate effects of swine manure fermented with sawdust on efficiency of nitrogen utilization of silage corn and soil fertility.**
Yook WanBang; Choi DongHo; and Choi KiChun
Journal of the Korean Society of Grassland Science 20(2): 123-130. (2000)
NAL Call #: SB202.K6H352; ISSN: 1013-9354
Descriptors: application rates/ composts/ maize/ manures/ nitrogen/ nitrogen fertilizers/ sawdust/ silage/ soil fertility/ soil organic matter/ utilization/ corn/ organic matter in soil/ South Korea
Abstract: This study was carried out to examine the effects of animal manure on efficiency of the nitrogen utilization of silage corn (Zea mays) and soil fertility. The experiment was conducted on the field plot at Gongiam, Kwangju, Kyunggi-Do for 3 years, from 1996 to 1998, and arranged in split-plot design with three replications. The main plots were two kinds of composts, such as swine manure fermented with sawdust (SMFWS) and swine manure fermented without sawdust (SMF). Subplots were the nitrogen fertilizer rate (0, 100, 200, 300 and 400 kg N/ha/year). The nitrogen (N) yield increased as the nitrogen fertilizer rate increased up to a rate of 300 kg N/ha, but decreased at rate of 400 kg N/ha. Nitrogen yield in SMF treatments was higher than that of SMFWS treatments. But there were no significant differences between SMFWS and SMF treatments. Organic matter (OM) content of the soils in SMFWS was higher than that of SMF, and was not significantly different between SMFWS and SMF treatments. OM content increased with increasing the nitrogen fertilizer rate. Total nitrogen (TN) content of the soils increased as the nitrogen fertilizer rate increased. No difference of TN content was found between SMFWS and SMF treatments.
This citation is from AGRICOLA.

1211. **Rate effects of swine manure fermented with sawdust on productivity and nutritive value of silage corn.**
Yook WanBang; Choi DongHo; Choi KiChun; An SeongHyun; Yoon SeiHyung; and Lee JongKab
Journal of the Korean Society of Grassland Science 20(2): 115-122. (2000)
NAL Call #: SB202.K6H352; ISSN: 1013-9354
Descriptors: animal wastes/ application rates/ composts/ crop yield/ crude protein/ dry matter/ energy value / fodder crops/ in vitro digestibility/ maize/ nitrogen fertilizers/ pig manure/ sawdust / caloric value/ calorie value/ calorific value/ corn/ digestibility in vitro/ livestock wastes
Abstract: This study was carried out to determine fertilizer requirements for silage maize, using two kinds of composts, and to examine the potential possibility of utilization as an organic fertilizer. The experiment was conducted on the field plot at Gongiam, Kwangju, Kyunggi-Do for 3 years, from 1996 to 1998, and arranged in split-plot design with three replications. The main plots were two kinds of composts such as pig manure fermented with sawdust (SMFWS) and pig manure (fermented without sawdust (SMF)). Subplots were N application rates (0, 100, 200, 300 and 400 kg N/ha annually). The dry matter (DM) yield increased as N rate increased up to 300 kg N/ha, but decreased at 400 kg N. Dry matter yield in SMFWS treatment was higher than that of SMF treatment, but there was no significant difference between SMFWS and SMF treatments. Net energy for lactation (NE_1) and total digestible nutrients (TDN) in maize increased as the fertilization rate of SMFWS and SMF increased, and crude protein (CP) content increased by the fertilization of SMFWS and SMF. No difference of CP, NE_1 and TDN was found between SMFWS and SMF treatments.
This citation is from AGRICOLA.

1212. **Recovery assessment of lumber mill wastes: Composting product field test.**
Chang ChangTang; Lee ChingHwa; Chiou ChyowShan; and Jeng FuTien
Resources, Conservation and Recycling 25(2): 133-150. (1999)
NAL Call #: TP156.R38R47; ISSN: 0921-3449
Descriptors: analysis / assessment/ byproducts/ composting/ composts/ cost analysis/ disposal/ economics/ field tests/ flowers/ forest products industries/ manures/ marine environment/ ornamental herbaceous plants/ ornamental plants/ sawdust/ sawnwood/ sea birds/ seafoods/ solid wastes/ waste wood/ wastes/ costing/ Filicopsida/ forest industry/ Formosa/ lumber/ ornamentals/ timber mill waste
Abstract: Lumber mill waste with a more than monthly generation of 5000 tons is one of the main solid waste sources in the I-Lan area of Taiwan. The lumber sawdust together with seafood processing residue and distillery byproducts, was evaluated within a composting machine as a disposal alternative to the conventional landfill and incineration methods. The addition of seabird manure provides adequate P source for the eventual composting product to be used as an alternative organic fertilizer to conventional chemical fertilizer. Thermophilic bacteria were added to facilitate composting reaction at 70 degrees C. The composting product was further evaluated for effectiveness as organic fertilizer in greenhouse and field studies. The tested plants include Zinnia elegans, Celosia cristata and Asplenium nidus. The control experiments include soil alone as well as soil with the addition of chemical fertilizer or compost product. The experimental results demonstrate that flower growth of the C. cristata is enhanced in the presence of composting product. The cost analysis indicates that it is economically feasible to yield a useful composting product.

1213. **Relating compost measures of stability and maturity to plant growth.**
Cooperband, L. R.; Stone, A. G.; Fryda, M. R.; and Ravet, J. L.
Compost Science and Utilization 11(2): 113-124. (2003)
NAL Call #: TD796.5.C58 ; ISSN: 1065-657X
Descriptors: ammonium nitrogen/ biological activity in soil/ biomass/ cannery wastes/ carbon dioxide/ carbon nitrogen ratio/ cattle manure/ composting/ composts/ crop residues/ electrical conductivity/ growth/ maturity/ microorganisms/ mineralization/
nitrate nitrogen/ nitrogen/ nutrient uptake/ pH/ plant nutrition/ potato waste/ poultry manure/ respiration/ sawdust/ stability/ ammonia nitrogen/ dissolved organic carbon/ hydrogen ion concentration/ micro organisms/ potential of hydrogen/ poultry litter
Abstract: Assessment of compost maturity is important for successful use of composts in agricultural and horticultural production. We assessed the 'maturity' of four different sawdust-based composts. We composted sawdust with either cannery waste (CW), duck manure (DM), dairy (heifer) manure (HM) or potato culls (PC) for approximately one year. Windrows were turned weekly for the first 60 days of composting, covered for four winter months and then turned monthly for six more months. We measured compost microbial respiration (CO_2 loss), total C and N, C:N ratio, water soluble NO_3-N and NH_4-N, dissolved organic carbon, pH and electrical conductivity at selected dates over 370 days. Compost effects on ryegrass biomass and N uptake were evaluated in a greenhouse study. We related compost variables to ryegrass growth and N uptake using regression analysis. All composts maintained high respiration rates during the first 60 days of composting. Ammonium-N concentrations declined within the first 60 days of composting, while NO_3-N concentrations did not increase until 200+ days. After 250+ days, DM and PC composts produced significantly more ryegrass biomass than either CW or HM composts. Total C, microbial respiration and water-extractable NO_3-N were good predictors of compost stability/maturity, or compost resistance to change, while dissolved organic carbon, C:N ratio and EC were not. The compost NO_3-N/CO_2-C ratio was calculated as a parameter reflecting the increase in net N mineralization and the decrease in respiration rate. At ratio values >8 mg NO_3-N/mg CO_2-C/day, ryegrass growth and N uptake were at their maximum for three of the four composts, suggesting the ratio has potential as a useful index of compost maturity.

1214. **Relationships between microbial biomass nitrogen, nitrate leaching and nitrogen uptake by corn in a compost and chemical fertilizer-amended Regosol.**
Herai, Y.; Kouno, K.; Hashimoto, M.; and Nagaoka, T.
Soil Science and Plant Nutrition 52(2): 186-194. (2006)
NAL Call #: 56.8 SO38; ISSN: 0038-0768
Descriptors: ammonium sulfate/ application rates/ composts/ leaching/ maize/ nitrate/ nitrate nitrogen/ nitrogen/ organic amendments/ plant nutrition / Regosols/ rice/ rice straw/ sawdust/ soil amendments/
soil flora/ soil types/ straw/ temporal variation/ ammonium sulphate/ corn/ microbial biomass/ paddy/ rhegosols
Abstract: To determine the relationships between microbial biomass nitrogen (N), nitrate-nitrogen leaching (NO_3-N leaching) and N uptake by plants, a field experiment and a soil column experiment were conducted. In the field experiment, microbial biomass N, 0.5 mol L-1 K_2SO_4 extractable N (extractable N), NO_3-N leaching and N uptake by corn were monitored in sawdust compost (SDC: 20 Mg ha-1 containing 158 kg N ha-1 of total N [approximately 50% is easily decomposable organic N]), chemical fertilizer (CF) and no fertilizer (NF) treatments from May 2000 to September 2002. In the soil column experiment, microbial biomass N, extractable N and NO_3-N leaching were monitored in soil treated with SDC (20 Mg ha-1)+rice straw (RS) at five different application rates (0, 2.5, 5, 7.5 and 10 Mg ha-1 containing 0, 15, 29, 44 and 59 kg N ha-1) and in soil treated with CF in 2001. Nitrogen was applied as $(NH_4)_2SO_4$ at rates of 220 kg N ha-1 for SDC and SDC+RS treatments and at a rate of 300 kg N ha-1 for the CF treatment in both experiments. In the field experiment, microbial biomass N in the SDC treatment increased to 147 kg N ha-1 at 7 days after treatment (DAT) and was maintained at 60-70 kg N ha-1 after 30 days. Conversely, microbial biomass N in the CF treatment did not increase significantly. Extractable N in the surface soil increased immediately after treatment, but was found at lower levels in the SDC treatment compared to the CF treatment until 7 DAT. A small amount of NO_3-N leaching was observed

until 21 DAT and increased markedly from 27 to 42 DAT in the SDC and CF treatments. Cumulative NO_3-N leaching in the CF treatment was 146 kg N ha-1, which was equal to half of the applied N, but only 53 kg N ha-1 in the SDC treatment. In contrast, there was no significant difference between N uptake by corn in the SDC and CF treatments. In the soil column experiment, microbial biomass N in the SDC+RS treatment at 7 DAT increased with increased RS application. Conversely, extractable N at 7 DAT and cumulative NO_3-N leaching until 42 DAT decreased with increased RS application. In both experiments, microbial biomass N was negatively correlated with extractable N at 7 DAT and cumulative NO_3-N leaching until 42 DAT, and extractable N was positively correlated with cumulative NO_3-N leaching. We concluded that microbial biomass N formation in the surface soil decreased extractable N and, consequently, contributed to decreasing NO_3-N leaching without impacting negatively on N uptake by plants.

1215. **Replacement of straw by sawdust or wood shavings in fattening pig buildings: Effect on composting of litters.**
Texier, C.; Levasseur, P.; and Vaudelet, J. C.
Journees de la Recherche Porcine en France 32: 77-82. (2000)
NAL Call #: SF391.I53 ; ISSN: 0767-9874.
Notes: Original title: Remplacement de la paille par de la sciure ou des copeaux de bois, en porcherie d'engraissement: influence sur le compostage des litieres.
Descriptors: animal housing/ composting/ finishing/ manures/ pig housing/ pig manure/ fattening/ hogs/ piggeries/ sties/ swine/ swine housing
Abstract: The effects of different litter compounds (straw, sawdust and wood shavings) on the amount of manure produced per pig and the composting ability of the litter were studied in 2 trials. With 60 kg of straw each pig produced 200 kg of dung. Using only 40 kg of wood shavings the amount of manure was reduced by 15%. However, when 70-80 kg of sawdust was used, manure production increased by 5-10% when compared to straw. Average nitrogen output was 1.4 kg per pig on straw litter and <1 kg when straw was replaced by sawdust or wood shavings. The manure was turned over mechanically 3 times and composted for 3 months. Weight loss

during composting of litter produced with sawdust or wood shavings was -30% while that for straw litter was -45%.

1216. **The response of apple trees to fertigation and mulch.**
Rubauskis, E.; Skrivele, M.; Dimza, I.; and Berlands, V.
Sodininkyste ir Darzininkyste 21(3): 126-133. (2002); ISSN: 0208-4212
Descriptors: apples/ crop yield/ fertigation/ mulches/ mulching/ nitrogen fertilizers/ potassium fertilizers / sawdust/ soil amendments/ soil water/ trickle irrigation/ fertirrigation/ mulching materials/ potash fertilizers/ soil moisture
Abstract: An experiment was conducted during 1997-2001 at Dobele, Latvia to study the response of one-year-old dwarf apple (cultivars Melba and Korichnoe Novoe) trees to fertigation (drip irrigation) and sawdust mulch (supplied in tree strips). Nitrogen and potassium fertilizers were supplied to trees in equal rates in the fertigation treatment, while in the sawdust mulch treatment, 20% more nitrogen was supplied. Fertilizers were supplied to plants throughout the experiment. Soil samples at 0-30 and 30-60 cm soil layers were taken every week. Data on trunk diameter, yield, fruit size, fruit weight and soil moisture condition were recorded. Meteorological data for five years were collected. Both soil moisture treatments significantly increased the yield of apple trees. Soil mulching improved vegetative growth more than cropping. The influence of soil moisture treatment on yield efficiency (yield per trunk cross-sectional area) depended both on the cultivar and the size of yield. The yield per trunk cross-sectional area of Melba was 1.5-4.2 times larger than Korichnoe Novoe. The soil moisture treatments did not influence fruit quality during the three-year period of cropping.

1217. **Response of corn to bio and organic fertilizers in a newly reclaimed sandy soil.**
Radwan, S. M. A. and Saber, M.
Improved Crop Quality by Nutrient Management: 253-257. (1999)
Descriptors: chemical composition/ composts/ crop yield/ grain/ iron/ maize/ NPK fertilizers/ organic fertilizers/ sandy soils/ sawdust/ sulfur fertilizers/ trace element fertilizers/ corn/ micronutrient fertilizers/ sulphur fertilizers
Abstract: Field experiments were carried out in a newly reclaimed sandy soil in South Tahreer province, Egypt, during 1997 and 1998 to evaluate the effect of two rates of composted sawdust (20 or 40 msuperscript 3/feddan) with or without elemental sulphur (300 kg/feddan), Nofatrein (macro- and micronutrients) foliar fertilizer, Coatingen (Zn, Mn and Fe chelates) seed dressing and/or the multi-strain biofertilizer Microbein on the chemical composition and yield of maize cv. Single Cross 10. The 100-grain weight increased from 16.8 g with the usual rate of NPK fertilizer to 18.9 and 20.4 g with either 20 or 40 msuperscript 3/feddan composted sawdust, respectively. Combining the biofertilizer with either organic or chemical fertilizers led to a marked increase in grain and straw yields compared with their sole effect under different treatments. The greatest N, P, Zn, Fe and Cu contents of grain were achieved when Microbein was combined with elemental sulphur or Nofatrein. Generally, combinations of composted sawdust (40 msuperscript 3/feddan) and Microbein with elemental sulphur or Nofatrein led to highly significant differences over the usual rate of chemical NPK fertilizer for maize yield and chemical composition.

1218. **Response of cowpea, okra and tomato sawdust ash manure.**
Owolabi, O.; Ojeniyi, S. O.; Amodu, A. O.; and Hazzan, K.
Moor Journal of Agricultural Research 4(2): 178-182. (2003); ISSN: 1595-4153
Descriptors: application rates/ calcium/ cowpeas/ crop yield/ fruits/ leaves/ magnesium/ manures/ nutrient content/ okras/ phosphorus/ pods/ potassium/ sawdust/ tomatoes/ wood ash/ black eyed peas/ southern peas

Abstract: Field experiments were conducted in 1999-2001 at Akure and Obaile in southwest Nigeria to investigate the effect of sawdust ash manure treatments on cowpea (cv. IT82D-716), okra (cv. NAAe-47-4) and tomato (cv. Roma). Nutrient analysis of leaf and pod of okra given different sawdust ash manure treatments was performed. Sawdust ash applied at 3-12 t/ha increased pod yield of okra, with 9 t sawdust ash/ha being the optimum. Sawdust ash applied at 3, 6 and 9 t/ha increased okra leaf and pod P, K, Ca and Mg contents. Sawdust ash manure increased number and weight of tomato fruits significantly. Relative to the control, the 2, 4, 6 and 8 t ash/ha treatments increased number of tomato fruits by 109, 226, 265 and 226%, respectively, and the equivalent values for fruit weight were 29, 55, 64 and 57%. Sawdust at 4 t/ha is recommended for cowpea and tomato.
This citation is from AGRICOLA.

1219. **Response of gugo to different potting media.**
Gonzales, L. L.; Quimio, M. J. Jr; and Calinawan, R. M.
Canopy International 27(4): 3, 11. (2001); ISSN: 0115-0960
Descriptors: coir/ growing media/ growth/ potting/ propagation/ sawdust/ seed germination/ seed treatment/ seeds/ sexual reproduction/ shoot cuttings/ soaking/ soil/ stems/ survival/ coconut fibre/ Entada phaseoloides/ plant propagation/ potting composts/ rooting media
Abstract: The response of gugo (Entada phaseoloides) to different potting media (pure soil, coir dust and sawdust) was tested at the Jamboree site of the Los Banos Experimental Station, Laguna, Philippines. Propagation methods, both by seeds and by stem cuttings, were performed. Parameters such as survival, and plant growth and development were assessed. Results showed that gugo could be propagated best by sexual means. Scraping the seed hilum and soaking the seeds in tap water for 24 h recorded a seed germination percentage of approximately 98% before potting. The seed germination reached 83.3% with pure sawdust as potting medium. Propagation trials using stem cuttings from various portions of the stem (base, middle and top) planted in different potting media failed to produce shoots. Propagation of gugo by seeds through scraping of hilum is prescribed as the adaptable and appropriate technique for the species.
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1220. **Response of Musa species to macro-propagation II: The effects of genotype, initiation and weaning media on sucker growth and quality in the nursery.**
Baiyeri, K. P.
African Journal of Biotechnology 4(3): 229-234. (2005)
NAL Call #: TP248.13 .A37; ISSN: 1684-5615
Descriptors: bananas/ genotypes/ growing media/ growth/ leaves/ plant height/ plant residues/ poultry manure/ rice husks/ rooting/ sawdust/ suckers/ survival/ vegetative propagation/ vigour/ potting composts/ poultry litter/ rice hulls/ rooting media/ vigor
Abstract: Sucker plantlets of five Musa genotypes were derived from sword-sucker-corms using ricehull and sawdust as initiation media. Plantlets initiated were transferred to three weaning/rooting media formulated with ricehull (RH), sawdust (SD) and poultry manure (PM). Weaning media and genotypes had significant (P<0.05) effects on most of the sucker plantlet growth parameters studied. There was variable adaptation pattern of genotypes to weaning/rooting media. RH+PM (3:1 v/v) enhanced the best sucker quality in terms of number of photosynthetically active leaves, plant height, plant girth and plant vigour in four ('PITA 22', 'Agbagba', 'FHIA 17' and 'Nsukka local') out of the five genotypes evaluated. Except 'PITA 25' all other genotypes had the poorest performance in SD+PM (3:1 v/v). Medium SD+RH+PM (1.5:1.5:1 v/v/v) supported good quality sucker in 'Agbagba', 'FIHA 17', 'Nsukka Local' and 'PITA 25'. Percent survival in each weaning medium was influenced by genotype and the rooting status of plantlets at the time of excision. However, from the study RH+PM was adjudged the best medium for raising plantlets to vigorous suckers for field planting.
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1221. **Response of onion (Allium cepa, L.) plants and associated weeds to biofertilization under some plant mulches.**
Radwan, S. M. A. and Hussein, H. F.
Annals of Agricultural Science Cairo 46(2): 543-564. (2001); ISSN: 0570-1783
Descriptors: application rates/ butralin/ cultural control/ herbicides/ hoeing/ mulches/ nitrogen content / NPK fertilizers/ onions/ phosphorus/ physical control/ rhizosphere/ rice/ rice straw/ sawdust / straw/ weed control/ weeds/ biofertilizers/ mulching materials/ paddy/ weedicides/ weedkillers
Abstract: Two field experiments were conducted in Egypt during the winter season of 1999 and 2000 to study the effect of multi strains biofertilizer (phosphate dissolving bacteria, Azospirillum spp. and Pseudomonas spp.) with different levels of NPK fertilizer (50 and 75% of recommended rate) under different weed control treatments, including 4 plant mulches (sawdust, rice straw, clover weed or cogon grass [Imperata cylindrica]), hand hoeing and butralin herbicide with one hoeing on onion (Allium cepa) plants and associated weeds. The number of Azospirillum spp. in biofertilized rhizosphere recorded higher densities with 50% NPK application, while the number of phosphate dissolving bacteria and Pseudomonas spp. showed higher populations with 75% NPK application under different weed control treatments. Generally, hand hoeing treatment recorded higher number of tested microorganisms in onion rhizosphere as compared to unweeded check, butralin herbicide and applied different plant mulches except clover weed mulch treatments. Numbers of broadleaved weeds were significantly decreased by increasing the rate of NPK fertilizer, in the presence and absence of biofertilizer application, while the grassy weed was increased. Broadleaved weeds were more susceptible to mulching treatments than grassy weeds. Application of hand-hoeing (trice), sawdust mulch, rice straw mulch, clover weed mulch, cogon grass mulch and butralin herbicide + one hoeing significantly decreased the total dry weight of weeds at 75 days from transplanting and produced higher bulb yields over unweeded by 143.2, 127.2, 118.1, 151.6, 123.1 and 133.3%, respectively. The highest values of N and P content in onion bulbs were obtained as a result of

combined action biofertilizer and 75% NPK under different weed control treatments. However, sawdust mulch treatment recorded the greatest value of N content in the presence of biofertilizer + 50% NPK, while Zn and Fe contents reached their highest values under 100% NPK application.

1222. **Response of some tomato cultivars to sawdust compost and nitrogen sources under a calcareous soil condition. I. Plant growth, yield and nutrient uptake.**
El Gizy, S. M. and Rifaat, M. G. M.
Annals of Agricultural Science, Moshtohor 39(2): 1089-1111. (2001); ISSN: 1110-0419
Descriptors: application rates/ calcareous soils/ crop yield/ cultivars/ dry matter/ leaves/ nitrogen fertilizers/ nutrient availability/ nutrient content/ nutrient uptake/ phosphorus/ plant nutrition/ potassium/ sawdust/ soil acidity/ soil types/ tomatoes/ trace elements/ yield components/ cultivated varieties/ microelements
Abstract: Two pot experiments were carried out during the early summer seasons of 1999 and 2000 on a calcareous soil in Giza, Egypt to investigate the effects of sawdust compost and different N sources on 2 tomato cultivars, Line 73 and Floradade. Each pot received 7 kg soil. Two rates of sawdust compost were used: i.e. 2.5 and 5.0% as pot media, in addition to the control treatment. The N fertilizer was added at 4 sources, i.e. nitric acid solution (0.1 N), nitric-calcium nitrate (1:1) mixture, calcium nitrate solution and urea solution on N content basis. All these sources were added at one rate (40 kg/feddan), 35 mg N in each rate every 15 days (280 mg N/pot containing 7 kg soil with a total of 8 rates) compared with no mineral N application. The tomato cultivars differed significantly; Line 73 produced higher number of leaves, dry matter content as well as fruit yield than Floradade, which contained higher concentrations of macronutrients and micronutrients. Adding sawdust compost significantly increased number of leaves, fruit yield and nutrient uptake. The highest increments were achieved under the higher compost rate of 5%. N application was very important to tomato plants in such soil regardless of the form added. The completely and partially acidic N form induced a positive effect on the availability of nutrients such as P, K and micronutrients, which was reflected on the uptake by all organs. Floradade was more sensitive to soil acidification than Line 73. Adding sawdust compost to the calcareous soil in the presence of acidic N form could be recommended for best results in terms of fruit yield and favourable nutrient uptake.

1223. **Response of sugar beet and corn crops to sawdust compost and farmyard manure with combination of N sources: In relation to the effective properties of a calcareous soil.**
Negm, M. A.; Mohammedein, A. A. M.; Zaki, R. N.; and Elmeneasy, A. I. A.
Egyptian Journal of Soil Science 45(3): 279-296. (2005)
NAL Call #: 56.8 J825 ; ISSN: 0302-6701
Descriptors: calcareous soils/ clay loam soils/ composts/ controlled release/ crop yield/ equations/ farmyard manure/ grain/ harvest index/ improvement/ manures/ nitrogen/ organic fertilizers/ properties/ residual effects/ responses / roots/ sawdust/ seasons/ soil properties/ soil types chemical/ sugarbeet/ treatment/ urea/ yields/ FYM/ slow release
Abstract: In a field trial at Noubaria, where the soil is normal calcareous one having a sandy clay loam texture, locally composted saw-dust (SDC) at rates 4 and 8 ton was compared with 12 ton farmyard manure (FYM) both were in combination with diluted HNO_3, urea or slow-release N compound named Enciabien at 20 kg N/fed. rate. During two successive seasons, sugar beet and corn were cropped to study the direct and residual effects of the organic manures on the role of soil through 10 months and crop yields. The obtained results indicated that yield of sugar beet roots increased significantly by manuring over the control without differences between the 3 manure treatments, while the 8 level of SDC was the only significantly effective on increasing com grain yield over the control and FYM. Nitrogen sources did not effect on sugar beet roots but either of urea or Enciabien was significantly the highest. However, Enciabien was the lowest in case of corn. The ratio of root/shoot in sugar beet was significantly affected with the higher rate of SDC over FYM and control while N sources were as the same as control. Weight of 100 grains increased significantly with the higher rate of SDC and FYM over the lowest SDC rate and control. Urea and Enciabien, were superior to others for 100 grain weight, whereas, com harvest index was not affected with neither organic nor mineral applications. There were real relationships between some soil properties (as independent variables) and sugar beet crop, root/shoot ratio corn grain yield weight of 100 grains (as dependent variable). The regression equations were calculated for those significant relationships and discussed due to behaviour of the effective soil properties after 1, 5.5 and 10 months of organic additions. In conclusion, saw-dust compost could be a satisfactory manure for production of sugar beet followed by corn where the compost was combined with urea and a slow release-N (Enciabien). Due to application, improvement of certain soil properties enhancing crop responses under calcareous condition.

1224. **Responses of soil nematode populations, community structure, diversity and temporal variability to agricultural intensification over a seven-year period.**
Yeates, G. W.; Wardle, D. A.; and Watson, R. N.
Soil Biology and Biochemistry 31(12): 1721-1733. (1999)
NAL Call #: S592.7.A1S6; ISSN: 0038-0717
Descriptors: application/ biomass/ carbon/ communities/ composition/ cultivation/ diversity/ ecosystems/ equilibrium/ free living nematodes/ herbicides/ indicators/ interactions/ maize/ microbial flora/ monitoring/ mulching/ nematology/ predators/ productivity/ sawdust/ soil/ structure/ temporal variation/ treatment/ weeds/ corn/ microflora/ surveillance systems/ weedicides/ weedkillers
Abstract: Nematode communities and other ecosystem variables were investigated over 7 years under an annual (maize) and a perennial (Asparagus officinale) crop in New Zealand using three weed management practices (cultivation, herbicide application, mulching) which can be related to agricultural intensification. Crop productivity and soil conditions did not change significantly during the trial. All management practices influenced the nematode fauna but the greatest long-term effects were from sawdust mulching. In the mulched plots there was an initial flush of

both total and bacterial-feeding nematodes but both subsequently declined, which was coincident with enhanced populations of top predatory nematodes. The apparent negative interaction between bacterial-feeding and predatory nematodes was also demonstrated through the former being significantly (P<0.001) negatively correlated with soil carbon, bacterial mass and weed biomass and the latter being positively correlated with the same variables. Herbicide use did not exert any consistent detrimental effects on nematode communities and the nematode fauna in the herbicide treated plots tended to have greater diversity (as indicated by the Shannon-Weiner index) than that in many of the other plots. The effects of cultivation varied, but under the perennial crop the greatest number of total and bacterial-feeding nematodes were commonly at 5-10 cm depth in cultivated plots. While most treatments had relatively little general effect on the composition of the nematode fauna over the study period, several important specific effects were only apparent after at least 3 years. Thus to effectively evaluate the relative effects of different agricultural practices in the long-term it is necessary to sample until the ecosystem has achieved some degree of equilibrium rather than monitoring only initial cropping cycles.

1225. **Responses to fertility and disturbance in a low-diversity grassland.**
Gendron, F. and Wilson, S. D.
Plant Ecology 191(2): 199-207. (2007)
NAL Call #: QK900 .P63; ISSN: 1385-0237
Descriptors: biomass/ botanical composition/ dispersal/ grasslands/ introduced species/ light/ nature conservation/ nitrogen/ nutrient availability/ persistence/ sawdust/ soil fertility/ species diversity/ vegetation types
Abstract: We examined variation in species composition in a low-diversity, anthropogenic grassland in response to 11 years of nitrogen (N) manipulation and disturbance. The species-poor grassland (2-3 species/0.5 m2) represents a wide spread vegetation type (>10 million ha in North America) dominated by the introduced perennial grasses Bromus inermis and Agropyron cristatum. Four levels of N and three of soil disturbance were applied in all combinations to plots (5x15 m, N=120) in a completely randomized design each year. Seeds or transplants of 47 species were added to ensure that dispersal was not a barrier to changes in species composition. After 11 years of treatment, all but the most disturbed plots continued to be dominated by B. inermis. The cover of the second-most abundant species, A. cristatum, decreased with disturbance but did not vary significantly with N. Despite the lack of changes in the identity of the dominant species, our environmental manipulations strongly influenced ecosystem characteristics. Added N increased soil available N, and decreased the cover of bare ground and light availability. Soil disturbance decreased aboveground biomass, and increased the cover of bare ground and light availability. Sawdust application, designed to decrease N availability, significantly reduced community biomass, and increased light availability and the cover of bare ground, but did not alter nutrient availability or species composition. The results highlight the difficulty of restoring diversity in species-poor, anthropogenic communities dominated by introduced species, and thus the importance of conserving remnants of diverse natural grasslands.

1226. **Restoration of a coastal California grassland after invasion by nitrogen-fixing shrubs, French broom and Scotch broom.**
Haubensak, K. A. and D'Antonio, C. M.
Ecological Restoration 24(2): 93-99. (2006); ISSN: 1522-4740
Descriptors: biomass/ carbon/ coastal areas/ enrichment/ grasslands/ growth/ introduced species/ invasion/ leaves/ nitrogen/ nitrogen fixing trees/ nutrient availability/ plant competition/ sawdust/ soil amendments/ trees/ Genista monspessulana/ United States of America
Abstract: We studied the effect of two years of sawdust addition on the growth of native perennial grasses in a site where we manually removed two introduced nitrogen-fixing shrubs, French broom (Genista monspessulana) and Scotch broom (Cytisus scoparius) in central coastal California. We tested the hypothesis that sawdust addition to soil would reduce plant-available nitrogen levels, and thereby decrease the competitive effect of fast-growing exotic annual grasses on slower-growing native perennial grasses. Sawdust did not alter the competitive interaction between annuals and native perennials: native perennial grass seedlings were greatly suppressed by the presence of annuals and this was not changed by sawdust addition. In the absence of competition with annuals, we observed both direct stimulation and suppression by sawdust on native species. Annual grass biomass did not respond to sawdust addition. Nitrogen:carbon ratios of leaf tissue were similar across all species, suggesting that both annuals and perennials responded similarly to depletion of soil resources. Our results confirm that although it is possible to use sawdust to reduce nitrogen availability in broom-invaded soils, it is difficult to target the species that will benefit.

1227. **Retention properties of wood residues and their potential for soil amelioration.**
Dunisch, Oliver; Lima, Valmiqui Costa; Seehann, Gunther; Donath, Johannes; Montoia, Valdinez Ribeiro; and Schwarz, Thomas
Wood Science and Technology 41(2): 169-189. (Feb. 2007); ISSN: 0043-7719
Descriptors: wood residues/ soil amendments
Abstract: The particle size distribution, the nutrient content and the sorption behaviour of six solid wood and ash/charcoal residues collected in three wood-processing companies in Germany and Brazil were investigated in order to elucidate the potential of these residues for the development of new products for soil amelioration. The absorption of N, P, and K by the residues and the leaching of nutrients from impregnated samples were studied in the laboratory at substrate temperatures of 20 and 300° C. The release of elements by the impregnated samples and the sorption behaviour of ash/charcoal incorporated in the soil were also studied in the field on a temperate site (Hamburg,

53° 32'N 09° 59'E), on a subtropical site (Ivai, 25° 15'S 50° 45'W), and on a tropical site (Aripuana, 10° 09'S 59° 26'W). Under laboratory conditions the solid wood residues absorbed 2.0-9.1% of the N, 0.1-0.4% of the P, and 1.0-8.5% of the K available in the impregnation solution. At a temperature of 20° C, selected sieve fractions of the ash/charcoal residues absorbed up to twice as much as N and up to 100 times more K than the treated wood residues. The absorption of N, P, and K to the ash/charcoal residues increased significantly at a substrate temperature of 300° C compared to a substrate temperature of 20° C. In absolute numbers, the leaching of N, P, and K from the impregnated ash/charcoal residues was in the range of the release by the impregnated solid wood residues, whilst the relative rate of nutrient leaching was strongly reduced. The field experiments confirmed the results obtained in the laboratory and indicated that ash/charcoal residues are suitable raw materials for the development of new products for soil amelioration, in particular for application under humid climate conditions.
This citation is from AGRICOLA.

1228. **Rice growth and nutrient accumulation as affected by different composts.**
Shu YungYu and Chung RenShih
Communications in Soil Science and Plant Analysis 37(7/8): 1139-1156. (2006)
NAL Call #: S590.C63; ISSN: 0010-3624
Descriptors: animal manures/ cattle dung/ composts/ crop residues/ growth/ heading/ leaf sheaths/ leaves/ nitrogen/ phosphorus/ pig manure/ plant nutrition / potassium/ rice/ rice husks/ roots/ sawdust/ seeds/ stems/ tillering/ tillers/ Formosa/ paddy/ rice hulls
Abstract: This study evaluated the effects of four different kinds of compost: pea-rice hull compost (PRC), cattle dung-tea compost (CTC), hog dung-rice hull compost (HDR), and hog dung-sawdust compost (HDS). These types of compost differ in nitrogen composition and in the dry matter yield and nutrient accumulation [nitrogen (N), phosphorus (P), potassium (K)], of rice plants. The rice (Oryza sativa L.) plants were planted in an Oxisol soil. Plants were cultivated in pots, which contained 3 kg of soil, mixed with the four different composts (PRC, 404 g; CTC, 395 g; HDR, and HDS, 450 g) and chemical fertilizer (CHEM) ($N:P_2O_5:K_2O$=120:96:72) The residual effect was studied after the crop was harvested. All treatments were replicated four times, with a randomized complete block design. The nutrient concentrations in the root, leaf sheath, leaf blade, stalk, and grain were analysed at different growth stages. After the first crop, the dry matter yield and the amount of N, P, and K absorbed from the CTC or HDS treatments were higher than those of the other treatments, at the most active tillering stage. The growth and nutrient accumulation of rice plants given the PRC treatment were higher than those given the CHEM treatment at the heading stage or the HDR treatment at the maturity stage. In the second crop, the dry matter yield from the PRC, CTC, and HDR treatments was higher than from the other treatments. The nutrient accumulation of the rice plants was positively correlated with the dry matter yield. The residual effect of the HDS compost was the least among all four composts.
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1229. **Risk of phytotoxicity of sawdust substrates for greenhouse vegetables.**
Dorais, M.; Menard, C.; and Begin, G.
Acta Horticulturae 761: 589-594. (2007)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: biomass/ chlorophyll/ cucumbers/ greenhouse crops/ growing media/ indicators/ leaf area/ peat/ perlite/ phytotoxicity/ pines/ risk/ sawdust/ seedlings/ substrates/ tomatoes/ waste wood/ gherkins/ potting composts/ rooting media
Abstract: The use of forestry wastes based substrates for greenhouse production constitutes a sustainable alternative to largely used inorganic or peat substrates. Our recent studies have shown benefits of using Picea glauca sawdust/composted bark based substrates compared to rockwool in terms of reducing production costs with equivalent or higher yield and root growth. However, in addition to their specific physical properties, forestry waste products can contain phytotoxic compounds such as manganese, heavy metals, terpenes and phenols. These compounds can have serious consequences owing to the direct root contact with the concentrated form. Phytotoxic molecules can be detected and quantified by complex analytic methods, while bioassays are rapid, economic and include known and unknown toxic compounds. Therefore, this study was intended to evaluate the phytotoxicity risk of fresh sawdusts and sawdust species mixture substrates on greenhouse vegetable crops (tomato, cucumber and sweet pepper) by biotests. Ten tree species have been selected according to the usual byproducts of the Canadian forest industry (Abies balsamea, Picea sp., Pinus sp., Thuja sp., Chamaecyparis nootkatensis). Plant biomass, leaf area and Chl a fluorescence parameters were measured after 3-5 weeks of growth depending on the crop. The experimental design was a complete bloc with ten replicates (3 pots of 10 cm diameter per e.u.) including positive (peat/perlite substrate) and negative controls (peat/perlite substrate+dichlobenil). Our results have shown that Thuja sp. based substrates were phytotoxic for tomato, cucumber and pepper seedlings, while other tree species did not reduce plant biomass and leaf area. The F_v/F_m ratio was not a good indicator of the plant phytotoxicity.
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1230. **Role of certain composted plant or animal residues in the control of Rotylenchulus reniformis on cowpea.**
Ismail, A. E. and Badawi, M. A.
Pakistan Journal of Nematology 16(2): 127-136. (1998)
NAL Call #: QL391.N4P34; ISSN: 0255-7576
Descriptors: bananas/ cattle manure/ chemical control/ composts/ cowpeas/ grain legumes/ maize/ nematicidal plants/ nematicides/ nematology/ organic amendments/ plant nematology/ plant parasitic nematodes/ plant residues/ residues/ rice/ rice straw/ sawdust/ soil amendments/ straw/ black eyed peas/ corn/ eelworms/ paddy/ pulses/ Secernentea/ southern peas/ Tylenchida
Abstract: Soil amendment with 5 organic composts of plant or animal residues (sawdust (SD), rice straw (RS), banana tree (BT), maize stalks (MS) and cattle dung (CD) @ 0.25, 0.5 and 1.0% w/w) showed significant (P<=0.05 and/or 0.01) reduction in numbers of R. reniformis larvae in soil, females and egg masses on roots as well as the nematode

build-up, as compared to control. All doses of BT compost were the most effective in reducing numbers of the nematode stages, females, egg masses and the nematode build-up followed by 1.0% of both MS and SD composts. All doses of organic composts significantly increased growth of cowpea cv. Balady. Generally, there were positive significant correlations between doses of composts and reduction in the nematode stages, and increases in cowpea growth parameters. Most of the applied composts showed positive correlation between N, P and K uptake and the compost doses.

1231. **The role of organic manures on P and S use efficiency by potato in acidic soil of Fagu (Shimla).**
Sud, K C and Sharma, R C.
In: Potato, Global Research and Development Proceedings of the Global Conference on Potato.New Delhi, India.); Vol. 2.; pp. 877-882; 2002.
Descriptors: acid soils/ application rates/ dry matter/ farmyard manure/ leaves/ mineral uptake/ nutrient availability/ nutrient uptake/ organic amendments/ phosphorus/ phosphorus fertilizers/ pine needles/ potatoes/ poultry manure/ rice husks/ sawdust/ soil ph/ soil types/ stems/ sulfur/ sulfur fertilizers/ translocation/ tubers/ use efficiency/ elemental sulphur/ FYM/ phosphate fertilizers/ poultry litter/ rice hulls/ sulphur/ sulphur fertilizers
Abstract: Five organic manures/materials (farmyard manure, pine needles, poultry manure, rice husk and sawdust) were evaluated at three levels of P and S (no P and no S, 100 ppm P+50 ppm S, and 200 ppm P+100 ppm S) using labelled formulations with potato as a test crop in a study conducted in Himachal Pradesh, India. A significant increase in dry matter yield and nutrients uptake by leaves, stem and tubers was obtained with 100 ppm P+50 ppm S. Organic manures did not differ much among themselves with regard to tuber dry matter yield. Radioassay data on the P and S availability from labelled carriers and their utilization by the potato indicated that translocation of P and S was highest in leaf and stem, respectively. Among the organic manures, paddy husk and sawdust were found to be inferior with regard to P availability to potato. Likewise, pine needles and sawdust were less effective in increasing S availability from labelled carrier. Laboratory studies showed that increase in P availability to potato in presence of organic manures was due to their ability in lowering soil pH and chemical potentials. Correlation matrix between biological and radioassay data showed a significant relationship between % P utilization and P uptake by leaves and stem whereas S uptake by leaves and tubers had a high degree of correlation with the % S dff and % S utilization values.

1232. **The role of organic substances in the increase of productivity of dunes and poor former agricultural lands.**
Gorzelak, A.
Sylwan 142(8): 27-33. (1998)
NAL Call #: 99.8 SY52; ISSN: 0039-7660.
Notes: Original title:Rola substancji organicznych w podnoszeniu produkcyjnosci wydm oraz sabych gruntow porolnych.
Descriptors: agricultural land/ dune soils/ dunes/ forest litter/ land improvement/ organic amendments/ organic fertilizers/ peat/ pine bark/ productivity/ sand dune stabilization/ sandy soils/ sawdust/ soil amendments/ soil biology/ soil chemistry/ soil texture/ duff/ farmland
Abstract: The textural and chemical properties are described of sand dune (soils) in Poland, and an account given of organic materials used as dune fertilizers (including peat, forest litter, pine bark and sawdust) and as fertilizers on former agricultural land (pine bark and sawdust). The effects of these fertilizers are described, as well as methods for dune stabilization and the introduction of various (soil) organisms (such as ants).

1233. **The role of sawdust in cattle mycobacteriosis.**
Majoris, Tibor; Cseh, Kalman; and Guzsvany, Mihaly
Magyar Allatorvosok Lapja 120(9): 535-538. (1998); ISSN: 0025-004X.
Notes: .
Descriptors: wood waste/ sawdust/ cattle/ mycobacteriosis
Abstract: The authors analyse the origin of a tuberculin-positive result on a large scale cattle farm. They have performed an epidemiological investigation to identify possible sources of infection. Mycobacterium gordonae was isolated by The Hungarian Animal Health institute from sawdust used as bedding of cows. Other possible origin has not been discovered. This is the first time to prove the role of atypic mycobacterias in the cattle mycobacteriosis by demonstrating M. gordonae. The economical consequences of paraallergic reactions caused by husbandry and feeding anomalies are: decrease of performance, isolation, diagnostic slaughter and the employees' extra examinations - all significant expenses. These costs are more substantial than the general epidemic control measures. Additionally, the tuberculosis free status can be endangered.

1234. **Rubber wood saw dust: An ideal substrate for summer mushroom cultivation.**
Kochuthresiamma Joseph; Kothandaraman, R.; and Mathew, J.
Planter 74(871): 527-529. (1998); ISSN: 0126-575X
Descriptors: crop yield/ cultural methods/ edible fungi/ growing media/ plant residues/ rubber plants/ sawdust/ tropical crops/ vegetables/ potting composts/ rooting media/ vegetable crops
Abstract: The cultivation of summer mushroom (Calocybe indica) on rubberwood sawdust in India is described. The mycelium covered the surface of the beds in 20 days during the spawn run; small buttons formed 15 days after casing, the fruiting bodies being fully developed within 7 days. A FW of 533 g mushrooms/kg sawdust was produced. The mushrooms are symmetrical, umbrella-shaped, fleshy and milky white with a thick bulbous base.

1235. **Sand-compost-hydrogel mix for low cost production of tomato seedlings.**
El Hady, O. A.; Adam, S. M.; and El Kader, A. A. A.
Egyptian Journal of Soil Science 42(4): 767-782. (2002)
NAL Call #: 56.8 J825 ; ISSN: 0302-6701

Descriptors: composting/ composts/ crop production/ fertigation/ growing media/ leaves/ low input agriculture/ nitrogen/ nutrient content/ organic matter/ organic wastes/ phosphorus/ plant residues/ potassium/ refuse/ sand/ sandy soils/ sawdust/ seed germination/ seedling growth/ seedlings/ seeds/ soil types/ stems/ tomatoes/ use efficiency/ water use efficiency/ fertirrigation/ hydrogel / municipal wastes/ potting composts/ rooting media/ trash
Abstract: Different media were prepared to be used for commercial production of some local hybrids of tomato seedling (Lycopersicon esculentum) namely: Dokki 1, Ain Shams 2 and Wady. Examined media were: (I) sandy soil; (II or III) medium I mixed with 2% or 4% (W/W) of fine compost (produced by aerobic composting of some local organic wastes, i.e town refuse, sawdust, plant residues and organic manure at the ratio of 1:1:1:1); (IV or V) medium I mixed with 0.1% or 0.2% (w/w) of an absorbent material (mixture of an anionic polyacrylamide k polyacrylate 30% anionicity and a cationic polyacrylamide allylamine hydrochloride 20% cationicity hydrogels at the ratio of 2:3); and (VI, VII and VIII) medium I mixed with mixture of examined compost and hydrogel at the ratio of 1% compost+0.1% hydrogel, 2% compost+0.1% hydrogel and 2% compost+0.2% hydrogel (w/w), respectively. Fertigation was carried out twice a week using 1 g/1 fertilizer solution 19:19:19. Some growth parameters (viz., germination percentages; seedlings height; stem diameter; leaves number and area; fresh and dry weight of seedlings); N, P and K content and both water and fertilizers use efficiency by produced seedling as well as some physico-bio-chemical properties of the media at the end of the growing period, were taken as bases for preference. Under the conditions of conducted experiment and taking the economical aspects into consideration, the hybrid Wady and the growing medium No. VII seem to be suitable. Production of 1000 seedlings needs 250, 5 and 0.25 kg of sand, compost and hydrogel, respectively, that cost ~7 L.E.
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1236. **Sawdust and bark to treat nitrogen and faecal bacteria in winter stand-off pads on a dairy farm.**
Luo, J.; Donnison, A.; Ross, C.; Bolan, N.; Ledgard, S.; Clark, D.; and Qiu, W.
New Zealand Journal of Agricultural Research 51(3): 331-340. (2008)
NAL Call #: 23 N4892; ISSN: 0028-8233
Descriptors: sawdust/ bark/ nitrogen/ fecal bacteria/ winter/ stand-off pads/ dairy farms
Abstract: New Zealand farmers are increasingly using improved management systems including moving animals out of paddocks to protect wet soils from damage during winter. The cows can be held up to 20 h a day on specially constructed unroofed outdoor stand-off pads. A field study was undertaken to investigate excreta nitrogen (N) transformations, N and faecal bacterial transport to drainage, and denitrification N losses when Pinus radiata bark or sawdust were used as filling materials in stand-off pads. About 3 months after use only 4.0% of the N that was deposited on the bark or sawdust pad by cows had been transported to the drainage. Similarly, after the 3 months of use only 9.8% of the Escherichia coli bacteria that were deposited on the bark pad had been transported to the drainage and with even less, 0.3%, leached From the sawdust pad. The sawdust pad tended to retain more Campylobacter than the bark pad. About 6 months after use, gaseous N losses due to denitrification from the sawdust or bark pad accounted for about 4.5 and 1.7% of the deposited excreta N, respectively. Denitrification activity was limited by the available nitrate in the pad materials, and decreased after cows were moved out of the pads.

1237. **Sawdust and moss as components of the substrate for rooting green cuttings of plum and Prunus divaricata.**
Samoshchenkov, E. G. and Tikhomirov, V. A.
Sadovodstvo i Vinogradarstvo 1: 9-11. (2000); ISSN: 0235-2591
Descriptors: fruit crops/ fruits/ greenwood cuttings/ growing media/ peat/ perlite/ plums/ sand/ sawdust/ temperate fruits/ potting composts/ rooting media
Abstract: Green cuttings of plum (cv. Eurasia 21), 10-3-68 (a promising clonal rootstock), and 13-113 and 9-114 (winter-hardy forms of Prunus divaricata) were rooted under mist in various substrates. These were standard peat and perlite and peat and sand (controls), and also moss and sawdust either alone or mixed with soil, sand, well decomposed fen peat (pH 6.0) and perlite. The results from several years of trials are tabulated, and show that practically all substrates that included moss gave better rooting than the controls. Consistently good results were obtained with moss, moss and sawdust, moss and sand, moss and perlite. Sawdust alone and sawdust and perlite also gave very good results with all the cuttings. Rooting was best in clone 13-113 and rootstock 10-3-68. Rooting was poorest in those substrates containing peat. Accordingly it is recommended that moss should be added to any rooting substrate, and also that peat should be excluded from surface substrates in direct contact with the cuttings.
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1238. **Sawdust as a regulator of intake of a protein-energy supplement by dairy heifers during the dry season.**
Malafaia, P.; Lizieire, R. S.; Ronchi, A. R.; Valente, T. N. P.; Pereira, D. de L.; and Padilha, T. de F.
Livestock Research for Rural Development 16(3): article 15. (2004); ISSN: 0121-3784.
Notes: Original title: Serragem de madeira como controlador da ingestao diaria de um suplemento proteico energetico por novilhas durante a epoca seca.
Descriptors: cows/ dairy cows/ dry season/ feed intake/ heifers/ liveweight gain/ protein supplements/ sawdust/ sodium chloride/ liveweight gains
Abstract: Daily weight gain, costs and nutritional aspects were evaluated in 28 dairy heifers fed two protein-energy supplements for 114 days during the dry season. The heifers were divided into two groups. To one group a protein-energy supplement containing 35% of sodium chloride as a regulator for voluntary supplement intake was given. To the other group, 35% of powdered sawdust was mixed into the protein-energy supplement in order to verify if this organic residue could be used as a regulator for the daily supplement intake. The animals were weighed every 30 days and the protein-energy supplement intake was measured each day. There was no difference in daily

weight gain when sodium chloride (0.189 kg day-1) or sawdust (0.212 kg day-1) was used as regulator for the supplement intake. The daily intake of the supplement containing sodium chloride was 0.166 kg day-1, whereas the intake of the supplement containing sawdust was 0.196 kg day-1. The results of the experiment confirm the hypothesis that sawdust can be incorporated into protein-energy supplements to substitute sodium chloride for the regulation of daily supplement intake. The use of sawdust could be an alternative to avoid environmental problems caused by this ligno-cellulosic material.
This citation is from AGRICOLA.

1239. **Sawdust-based cultivation of mushrooms by using residual lumber smoke-heated.**
Oku, T.; Ishiguri, F.; Tamegai, J.; Otomo, M.; Yokota, S.; Yoshizawa, N.; and Henmi, T.
Bulletin of the Utsunomiya University Forests 38: 101-106. (2002)
NAL Call #: 99.9 UT72; ISSN: 0286-8733
Descriptors: edible fungi/ mushrooms/ pines/ sawdust/ Douglas fir/ Lentinaceae/ Poriales/ Tricholomataceae
Abstract: Utilization of Douglas fir (Pseudotsuga menziesii) and Russian red pine (Pinus spp.) sawdust for sawdust-based cultivation of Pleurotus ostreatus and Lentinula edodes was investigated. In P. ostreatus cultivation by using Douglas fir sawdust, the first yield of fruiting bodies was improved by using smoke-heated sawdust, suggesting that the use of this sawdust was possible for sawdust-based cultivation of this mushroom and beech (Fagus crenata) sawdust, whereas in Russian red pine sawdust, the first yield of fruiting bodies was almost the same as those by using smoke-heated sawdust. On the other hand, in L. edodes cultivation, only few fruiting bodies were obtained in the medium which was made with smoke-heated sawdust during 4-month cultivation, suggesting that sawdust of both species were not suitable for the cultivation of L. edodes.
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1240. **Sawdust-based cultivation of some mushrooms using unutilized wood resources.**
Oku, T.
Bulletin of the Utsunomiya University Forests 40: 1-67. (2004)
NAL Call #: 99.9 UT72; ISSN: 0286-8733
Descriptors: bagasse/ crop yield/ cultivation/ edible fungi/ heat treatment/ industrial wastes/ lignocellulosic wastes/ maize meal/ moisture content/ pines/ pumice/ sawdust/ smoking/ substrates/ thinnings/ wood residues/ Basidiomycetes/ Coriolaceae/ Douglas fir/ Grifola/ Grifola frondosa/ heat processing/ Lentinaceae/ Lyophyllum ulmarium/ Pholiota nameko/ Poriales/ Strophariaceae/ Tricholomataceae
Abstract: Results are presented of several studies on the possibility of sawdust-based cultivation of some edible mushrooms using softwood thinnings with and without smoke-heating, or residuals and wastes from the wood industry, with an aim of using the softwoods in place of hardwoods. Mycelial growth and fruiting body production by maitake (Grifola frondosa) were determined on sawdust of untreated and smoked Japanese cedar (Cryptomeria japonica) in comparison with beech (Fagus crenata). The effects of addition of corncob meal to the sawdust substrate on yield of fruiting bodies of shiitake (Lentinula edodes) was determined using smoke-heated Japanese cedar and Japanese larch (Larix kaempferi). Similar studies on the effect of pumice addition to the sawdust were done using the same sawdust for shiitake and maitake. The effects of wood meal size and moisture content of the substrate on shiitake mycelial growth were determined using Japanese cedar and oak (Quercus serrata). Possible use of wood residues for production of hiratake (Pleurotus ostreatus) and shiitake was determined using Douglas fir and Russian red pine with or without smoke-heating treatment. The final study investigated the use of crushed residuals of tatami board manufactured from grass straw and bagasse particleboard, in comparison with beech and Japanese cedar, for growth of shiitake, enokitake (Flammulina velutipes), nameko [Pholiota nameko], bunashimeji (Lyophyllum ulmarium), hiratake and maitake.
This citation is from AGRICOLA.

1241. **Screening of various substrates for sporulation and mass multiplication of bio-control agent Trichoderma harzianum through solid state fermentation.**
Lakshmi Tewari and Chandra Bhanu
Indian Phytopathology 56(4): 476-478. (2003)
NAL Call #: 464.8 IN2 ; ISSN: 0367-973X
Descriptors: biological control agents/ cellulosic wastes/ chickpeas/ farmyard manure/ flours/ fungal spores/ growth/ maize cobs/ mushroom compost/ organic wastes/ rice/ rice bran/ rice straw/ sawdust/ straw/ substrates/ sugarcane bagasse/ wheat/ wheat bran/ wheat straw/ biocontrol agents/ biological control organisms/ FYM/ Hyphomycetes/ paddy
Abstract: Three different categories of substrates, i.e. agroindustrial cellulosic wastes (wheat straw, rice straw, shelled maize cob, sawdust, paper waste and sugarcane bagasse), organic manures (farmyard manure, spent compost of button mushroom and spent straw of oyster mushroom) and cereal brans (wheat and rice bran), were evaluated for growth responses of T. harzianum through solid state fermentation technique. The cellulosic agro-wastes were supplemented with 2 and 4% chickpea flour (on dry weight basis) as organic N supplement. The wheat and rice straw supported the maximum radial growth. All the organic manures supported good mycelial growth of the biological control agent while on cereal brans very slow growth was observed. Rice straw and wheat straw produced the maximum conidial counts (4.95x108 and 4.86x108/g powder, respectively), which were significantly higher to the counts on other cellulosic substrates in 20-day-old cultures. The lowest conidial counts (1.16x108/g) after 20 days were recorded on paper waste. Among organic manures and cereal brans, the maximum and significantly higher CFU counts (40.80x108/g) were recorded on rice bran at 15 days. The lowest CFU counts were recorded on FYM and spent button mushroom compost. Supplementation of all the cellulosic substrates with chickpea flour significantly enhanced the conidial yield. Significantly higher conidial counts were recorded at 4% than at 2% supplementation level. At 4% supplementation level, the maximum CFU counts (11.96x108g) were

observed with rice straw that were at par with sugarcane bagasse (11.79x108/g) and wheat straw (11.52x108/g).
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1242. **Seed drills for dry beans in Leon Province.**
Boto Fidalgo, J. A. and Valenciano Montenegro, J. B.
Agricultura, Revista Agropecuaria 67(792): 578-580. (1998); ISSN: 0002-1334.
Notes: Original title: Las sembradoras para judia grano en la Provincia de Leon.
Descriptors: coir/ emergence/ equipment/ pesticides/ sawdust/ seed drills/ seed germination/ seedlings/ sowing/ vermiculite/ coconut fibre/ green bean/ seed sowing/ snap bean
Abstract: Recommendations were formulated to improve current seed sowing techniques in order to increase percentage seed germination and seedling emergence in dry beans [Phaseolus vulgaris] grown in the Province of Leon, Spain. The recommendations include sowing seeds at 15-cm intervals near the soil surface (3-cm depth) along ridges, applying pesticides at sowing, and filling the sowing hole with a substrate (coir, vermiculite or sawdust) in order to prevent formation of a soil crust which impedes seedling emergence. Alterations were made to a conventional seed drill to accommodate the above recommendations and field trials were carried out in 6 plots in 1997. Problems associated with pests, diseases and the effect of soil crust development on seedling emergence were reduced or eliminated. At the start of flowering (end of July), plants from the experimental plots had stronger root systems than plants from conventionally sown plots. Sawdust was generally the best substrate as coir did not flow well in the machine and vermiculite flowed too easily, although seeds had a greater tendency to dry out in sawdust. Soil crust formation was only eliminated if the substrate filled the hole to the level of the soil surface.
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1243. **Seed germination and seedling survival of Tillandsia geminiflora Brongn in different substrates.**
Stringheta, A. C. O.; Silva, D. J. H. da; Cardoso, A. A.; Fontes, L. E. F.; and Barbosa, J. G.
Acta Cientiarum Agronomy 27(1): 165-170. (2005); ISSN: 1679-9275.
Notes: Original title: Germinacao de sementes e sobrevivencia das plantulas de Tillandsia geminiflora Brongn, em diferentes substratos.
Descriptors: growing media/ nylon/ rice husks/ sawdust/ seed germination/ seedlings/ seeds/ substrates/ survival/ Dicksonia sellowiana/ Filicopsida/ potting composts/ rice hulls/ rooting media/ Tillandsia geminiflora
Abstract: In order to evaluate the germination percentage of Tillandsia geminiflora, seeds were sown in different materials: carbonized rice husks (CRH), dicksonia fern (Dicksonia sellowiana), sawdust and black nylon screen (with 80% shading). They were fixed by the plume or the seed itself. The highest germination percentage (76%) was obtained by the plume-fixed seeds on black nylon screen. To evaluate their survival rate, the plantlets were distributed in the following substrates: (1) CRH; (2) dicksonia fern; (3) sawdust; (4) Salvinia auriculata; (5) CRH (50%)+S. auriculata (50%); (6) CRH (50%)+sawdust (50%); (7) CRH (50%)+dicksonia fern (50%); (8) S. auriculata (50%)+sawdust (50%); (9) S. auriculata (50%)+dicksonia fern (50%); and (10) sawdust (50%)+dicksonia fern (50%). Treatments 3 and 6 showed the highest plantlet survival rates of 78.5 and 62.5%, respectively.
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1244. **Seed viability and seedlings vigour of jack fruit (Artocarpus heterophyllus Lam.) as influenced by different storage media.**
Baghel, B. S.; Rajesh Tiwari; and Pandey, L. P.
South Indian Horticulture 51(1/6): 204-206. (2003); ISSN: 0038-3473
Descriptors: ash/ charcoal/ duration/ jackfruits/ plant height/ sand/ sawdust/ seed germination/ seed testing/ seedlings/ seeds/ storage/ viability/ vigour/ vigor
Abstract: A study was conducted, to determine the suitable storage media for prolonging jackfruit seed viability in Jabalpur (Madhya Pradesh, India) in 1998. Treatments comprised: seed storage without media for 5, 10, 15 and 20 days, seed storage in ash for 5 days, seed storage in charcoal for 5, 10, 15 and 20 days, seed storage in sand for 5, 10, 15 and 20 days, seed storage in sawdust for 5, 10, 15 and 20 days. Seeds were sown just after extraction, and the earliest germination (11.66 days) was observed when seeds were stored in sawdust for 20 days. Very late seed germination (25.33 days) was observed in seeds stored without media for 20 days. Germination percentage (95.83%) and vigour were highest when the seeds were sown just after extraction (T1). Among the seeds stored for 20 days in different media, the highest germination percentage (93.75%) and vigour were recorded in charcoal dust. Plant height was highest in those seeds sown just after extraction.
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1245. **The significance of Cognettia sphagnetorum (Enchytraeidae) on nitrogen availability and plant growth in wood ash-treated humus soil.**
Liiri, M.; Ilmarinen, K.; and Setala, H.
Plant and Soil 246(1): 31-39. (Sept. 2002)
NAL Call #: 450 P696; ISSN: 0032-079X [PLSOA2]
Descriptors: Pinus sylvestris/ Oligochaeta/ nitrogen/ nutrient availability/ wood ash/ seedling growth/ soil ph/ biomass/ ammonium nitrogen/ nitrate nitrogen/ roots/ length/ conifer needles/ nitrogen content/ soil organic matter/ application rate/ root shoot ratio/ humus/ growth/ Internet resource
This citation is from AGRICOLA.

1246. **Similarity of bacterial communities in sawdust- and straw-amended cow manure composts.**
Green, S. J.; Michel, F. C. Jr.; Hadar, Y.; and Minz, D.
FEMS Microbiology Letters 233(1): 115-123. (Apr. 2004)
NAL Call #: QR1.F44; ISSN: 0378-1097
Descriptors: composted manure/ cattle manure/ bacteria/ community ecology
Abstract: We analyzed bacterial communities in two cow manure composts derived from the same feed manure and composted in the same location, but composted with different carbon amendments, and in peat-based potting

mixes amended with these composts. Bacterial communities were characterized by PCR-denaturing gradient gel electrophoresis (DGGE) analysis of extracted DNAs, and population fingerprints generated for each sample were compared. Sequence analyses of dominant DGGE bands revealed that members of the phylum Bacteroidetes were the most dominant bacteria detected in this study (19 of 31 clones). These analyses demonstrate that bacterial community profiles of individual composts were highly similar, as were profiles of compost-amended potting mixes. However, potting mix profiles differed substantially from the original compost profiles and from that of the peat base. These data indicate that highly similar bacterial populations were active in the two composts, and suggest that the effects of the initial carbon amendment on the mature compost bacterial communities were minor, while factors such as the feed manure and composting location may have been more influential.
This citation is from AGRICOLA.

1247. **Simple cultivation of sweet pepper in wood chips with recycled nutrient solution. Low-tech hydroponics for sweet pepper.**
Heuberger, H.; Grotz, U.; and Schnitzler, W. H.
Gemuse Munchen 40(11): 22-25. (2004); ISSN: 0016-6286.
Notes: Original title: Einfacher Anbau von Paprika in Holzfaser mit rezirkulierender Nahrlosung. Low-tech Hydroponik fur Paprika.
Descriptors: cost analysis/ crop quality/ crop yield/ drainage water/ fertigation/ fertilizers/ fixed costs/ greenhouses/ hydroponics/ protected cultivation/ recycling/ rockwool/ soilless culture/ substrates/ variable costs/ wood chips/ costing/ cultivation under glass or plastic/ fertirrigation/ glasshouses/ mineral wool/ rock wool
Abstract: Sweet pepper cultivars Spartakus and Fiesta were sown mid-December and planted on wood chips (Toresa special)early January, with harvesting from early May (green peppers) until end July. In 2001, 2 mixtures of fertigation fertilizer and standard fertilizer were used, while in 2002 and 2003 3 basic fertilizer treatments with additional N (NH_4:NO_3 of 1:3.7, 1:1.3, and 1:10, respectively) were used. Data are presented on crop yield, pH of irrigation water, water quality of recycled irrigation water, composition of drainage water, fixed and variable costs, and crop quality. The simple closed system is compared to a high-tech sytem with rockwool and a computer-based fertilizer program. Costs for the simple system were calculated at 1840 EURO/year compared to 5320 EURO/year for the high-tech system, assuming for both systems general cultivation costs per 1000 m2 of 16 600 EURO/year.
This citation is from AGRICOLA.

1248. **Simplified floor constructions in cubicles for cattle.**
Ekelund, K.; Herlin, A.; Michanek, P.; and Ventorp, M.
Specialmeddelande Institutionen for Jordbrukets Biosystem och Teknologi, Sveriges Lantbruksuniversitet 229: 46 pp. (1998).
Notes: Original title: Forenklade golv konstruktioner i liggbas for notkreatur i losdrift.
Descriptors: animal behaviour/ animal welfare/ behaviour/ cattle housing/ concrete/ costs/ cow housing/ floors/ litter/ mats/ nutrients/ sawdust/ animal behavior/ animal rights/ behavior/ cattle sheds/ costings/ cowsheds/ flooring
Abstract: This report is based on a review of experiences abroad and on a study in Sweden concerning the function of different lying area surfaces on: lying behaviour, hygiene of lying area, and contamination of soil. In the USA, cubicles placed directly on the soil have been used for a number of years with sand for litter/bedding. The advantages of sand are claimed to be comfort and health, the disadvantages, high use of bedding (25 kg/day per cubicle), animals dig in the sand, and difficulties with manure management. Soil samples were taken from 10 of these dairy farms in the USA (cubicles directly on the soil with no liquid barrier) at depths of 0-300 and 300-600 mm. Results are presented but are very variable. Cleanliness of the cubicles and laying down and lying behaviour were compared for 2 surfaces: a sand/sawdust mixture on compacted tarmac, and a thin layer of sawdust on a soft rubber mat (Comfort matReg.) on stone meal base. Cleanliness of cubicles was monitored twice a day, for 8 cubicles of each surface, over a 14 day period. The sand/sawdust mixture was superior and significantly cleaner, but bedding consumption was 6-7 times higher than for the rubber mat/sawdust. High bedding requirements lead to high costs, but a clean lying area is important for udder health, milk quality, and consumer opinions on dairy barns. The laying down and lying behaviour of 8 cows was monitored continuously over 3 days on each lying surface. Cows had a slightly shorter preparation time to lie down (probably due to comfort) on the sand/sawdust mix than on the rubber mat. The yearly cost (interest and depreciation) for a concrete floor as a cubicle base is of secondary importance to other building costs, and bedding or mat costs. Simplified floor constructions in cubicles would appear to be of greatest value in low cost buildings such as uninsulated lying barns. Reproduced with permission from the CAB Abstracts database.

1249. **Soil fertility management with wood ash.**
Nkana, J. C. V.
Crop Management and Postharvest Handling of Horticultural Crops. Volume III: Crop Fertilization, Nutrition and Growth: 201-228. (2003)
Descriptors: agriculture/ alkalinity/ application to land/ base saturation/ cation exchange capacity/ chemical composition/ chemical properties/ crop yield/ environmental impact/ forests/ growth/ leaching/ microbial activities/ mineral content/ nutrient availability/ nutrient content/ physical properties/ plant composition/ plant nutrition/ soil acidity/ soil chemical properties/ soil physical properties/ soil solution/ solubility/ stabilization/ wood ash/ chemical constituents of plants/ chemical properties of soil/ environmental effects/ land application/ physical properties of soil
Abstract: This paper summarizes the results of studies related to wood ash application to soils. The physical and chemical properties of wood ash and its effects on soil properties, plant nutrition and growth and nutrient availability in plants are discussed. The factors affecting the

efficiency of wood ash as a soil additive are presented. The environmental impact and management of wood ash are highlighted.
This citation is from AGRICOLA.

1250. **Soil management systems and morphology and yield of apple trees cvs. Lobo and Sampion.**
Tomaszewska, Z.
Biuletyn Naukowy. Akademia Rolniczo Techniczna w Olsztynie (Poland)(no.3): 159-164 . ((1999)); ISSN: 1505-4705.
Notes: Original title: Zroznicowane systemy pielegnacji gleby a wzrost i plonowanie jabloni odmian Lobo i Sampion. 2 tables; 8 ref. Summaries (En, Pl). Citation notes: PL (Poland).
Descriptors: soil management systems/ mulching/ sawdust/ manure/ morphology/ yield/ apple trees
Abstract: The results of mulching with sawdust and manure of applying sod and black fallow in an apple orchard of cvs. Lobo and Sampion planted in the belt-two-row system are presented. Black fallow resulted in a good growth of trees. Mulching retarded the growth of the stem diameter and current season shoots in the first two years of the study. The highest yields were obtained from the trees grown in black fallow. However, in the third year a high yield of cvs. Lobo was obtained from the plots mulched with manure and of Sampion from the plots mulched with sawdust. Productivity coefficient had a similar shape.

1251. **Soil P fractions as affected by on-farm composts in a controlled incubation study.**
Gagnon, B. and Simard, R. R.
Canadian Journal of Soil Science 83(2): 223-226. (2003)
NAL Call #: 56.8 C162; ISSN: 0008-4271
Descriptors: cattle manure/ composting/ composts/ crop residues/ horse manure/ leaves/ nutrient availability/ phosphorus/ Podzols/ poultry manure/sandy loam soils/ sawdust/ sheep manure/ soil amendments/ soil types/ straw/ waste wood/ wood chips/ poultry litter
Abstract: Information on the different forms and availability of P following compost addition to soil may help to better manage manure in respect to plant growth and the environment. An experiment was conducted to investigate through a sequential extraction procedure the availability of P of fresh dairy manure and several on-farm compost-soil mixtures (fresh solid dairy manure with straw, dairy manure with straw, dairy manure with hardwood shavings, beef manure with straw, horse manure with wood chips, poultry litter, sheep manure with straw, and vegetable residues, chicken manure, sawdust and leaves) after a 13-week incubation in glass jars at 35 degrees C. Materials were mixed at a rate of 200 mg N kg-1 with an Arago sandy loam (Humo-Ferric Podzol), supplying from 64 to 301 mg P kg-1. Fresh dairy manure gave the highest net increase of resin-P and labile P fractions in terms of percentage of total P added, whereas poultry litter compost was the most efficient in increasing $NaHCO_3$-inorganic P. Among the compost materials, poultry litter, vegetable residue and sheep manure increased labile P fraction the most. The contribution of the young dairy manure compost to this fraction was largely negative, and lower than those of fresh manure or partially and well-decomposed manure composts. A large part of added P was found in the moderately labile P fraction. The organic P fractions in the soil were less affected by manure or compost addition. This study indicated that the material P availability was reduced by composting, and was more affected by the origin of residue than by manure management.

1252. **Soil salinity and sodicity after application of fresh and composted manure with straw or wood-chips.**
Miller, J. J.; Beasley, B. W.; Larney, F. J.; and Olson, B. M.
Canadian Journal of Soil Science 85(3): 427-438. (Aug. 2005)
NAL Call #: 56.8 C162 ; ISSN: 0008-4271.
Notes: Summary in French.
Descriptors: soil salinity/ soil sodicity/ saline sodic soils/ clay loam soils/ sodium/ adsorption/ soil chemical properties/ electrical conductivity/ composted manure/ cattle manure/ straw/ wood chips/ application rate/ mineral fertilizers/ fertilizer application/ soil amendments/ soil salts/ barley/ Hordeum vulgare/ Alberta
This citation is from AGRICOLA.

1253. **Soil temperature fluctuations under sward, sawdust cover, herbicide-cleared ground, and under mechanical cultivation. III. Summer and autumn of 2000.**
Ysiak, G. and Houbowicz, T.
Prace z Zakresu Nauk Rolniczych 91: 155-162. (2001); ISSN: 0079-4708.
Notes: Original title: Wpyw systemu utrzymania gleby w sadzie na zmiane temperatury w glebie. III. Lato i jesien 2000.
Descriptors: apples/ autumn/ cultivation/ soil temperature/ summer/ fall
Abstract: From 30th May till 5th November 2000, air temperature at the level of 2 m as well as soil temperature at the depth of 30 cm under sward, sawdust cover, herbicide-cleared ground and under mechanical cultivation were recorded in an 8-year-old apple orchard. It was found that in the orchard the soil management systems had some influence on the dynamics of soil temperature fluctuations at the depth of 30 cm. The smallest daily fluctuations were recorded under the sawdust cover, and the largest under mechanical cultivation. Data collected on two warmest periods during summer and one cool period in early autumn are described and discussed in detail.

1254. **Sorption and transport of metals in preferential flow paths and soil matrix after the addition of wood ash.**
Bundt, M.; Zimmermann, S.; Blaser, P.; and Hagedorn, F.
European Journal of Soil Science 52(3): 423-431. (Sept. 2001)
NAL Call #: S590.E97; ISSN: 1351-0754 [ESOSES]
Descriptors: wood ash / leaching/ sorption isotherms/ exchangeable cations/ soil chemistry/ soil physical properties/ transport processes
This citation is from AGRICOLA.

1255. **Sources of mulching on the changes of physical and chemical properties in Alfisol soil in West Bengal, India.**
Nabakumar Mahata; Tarafdar, P. K.; Biswas, T; and De, S. K.
Environment and Ecology 26(3): 1129-1131. (2008)
NAL Call #: TD172.E5; ISSN: 0970-0420
Descriptors: Alfisols / bulk density/ crop residues/ erosion/ erosion control/ farmyard manure/ leaves/ mulches/ mulching/ nitrogen/ nutrient availability/ phosphorus/ porosity/ potassium/ sawdust/ soil chemical properties/ soil density/ soil fertility/ soil organic matter/ soil physical properties/ soil types/ straw/ water holding capacity/ chemical properties of soil/ FYM/ mulching materials/ organic matter in soil/ physical properties of soil
Abstract: A study was undertaken to determine the effect of different mulching materials (straw, farmyard manure (FYM), sawdust, grasses and leaves) on the physical and chemical properties of bare Alfisol under rainfed situation in Baradiha, West Bengal, India. Results revealed that physical properties like soil bulk density decreased by 12.2%, and porosity and water holding capacity increased by a maximum of 20.7 and 23.6%, respectively, under FYM mulching over fallow plots. The chemical properties like organic matter, total N, available K and P also increased by a maximum of 187.55, 411, 337 and 74%, respectively, under FYM over fallow plots. Soil loss varied from 4.9 to 16.9 t/ha and lowest under straw mulch.

1256. **Southern redcedar and southern magnolia wood chip mulches for weed suppression in containerized woody ornamentals.**
Ferguson, J.; Rathinasabapathi, B.; and Warren, C.
HortTechnology 18(2): 266-270. (2008)
NAL Call #: SB317.5.H68; ISSN: 10630198 [HORTF]
Descriptors: Amaranthus retroflexus/ Digitaria sanguinalis/ Juniperus silicicola/ large crabgrass/ Magnolia grandiflora/ nursery crops/ organic production/ redroot pigweed/ weed control/ Amaranthus/ Amaranthus retroflexus/ Cornus/ Cornus florida/ Digitaria sanguinalis/ Juniperus/ Juniperus virginiana silicicola/ Lagerstroemia/ Lagerstroemia indica/ Magnolia grandiflora/ Magnoliaceae
Abstract: Wood chip mulches from southern redcedar (Juniperus silicicola) and southern magnolia (Magnolia grandiflora) were evaluated for their effectiveness in weed control in nursery containers. In greenhouse tests, southern redcedar and southern magnolia wood chip mulches significantly inhibited the germination of redroot pigweed (Amaranthus retroflexus) and large crabgrass (Digitaria sanguinalis). In a field trial, nursery containers with 'Carolina Beauty' crape myrtle plants (Lagerstroemia indica) were sown with large crabgrass and redroot pigweed seeds, mulched with southern redcedar or southern magnolia wood chips, and compared with plants without mulch and plants treated with a mixture of isoxaben and trifluralin (Snapshot). Wood chips from both southern redcedar and southern magnolia were as effective as a mixture of isoxaben and trifluralin in suppressing weed growth in nursery containers. The wood chip mulches had no inhibitory effect on the growth of crape myrtle plants. In a similar, longer-term field trial using containerized dogwood (Cornus florida) plants sown with large crabgrass and redroot pigweed, the southern redcedar wood chip mulch was most effective in weed suppression when used in combination with a low dose of the chemical herbicide.

1257. **Spatial variability of tomato rooting system and implications on irrigation management in soilless cropping with substrates.**
Marouelli, W. A.; Carrijo, O. A.; and Zolnier, S.
Horticultura Brasileira 23(1): 57-60. (2005)
NAL Call #: SB320.43 .B7H67; ISSN: 0102-0536.
Notes: Original title: Variabilidade espacial do sistema radicular do tomateiro e implicacoes no manejo da irrigacao em cultivo sem solo com substratos.
Descriptors: coir/ electrical conductivity/ irrigation/ nutrient solutions/ rice husks/ root systems/ roots / sawdust/ soilless culture/ spatial variation / substrates/ tomatoes/ water deficit/ coconut fibre/ rice hulls/ watering
Abstract: The distribution of tomato rooting system and horizontal variability of matric potential (Psi_m) and electrical conductivity of the solution were evaluated on green coconut fibre, carbonized rice husk, carbonized coarse sawdust and commercial substrates packed in plastic bags. Each plant was irrigated by a single dripper, set up 7 cm apart. Higher root concentrations and lower Psi_m, under temporary water deficit conditions, occurred close to the plant for coconut fibres and rice husk, and close to the dripper for coarse sawdust and commercial substrates. The lower root concentration between a dripper and the following plant, irrigated by another emitter, occurred probably due to the high electrical conductivity of the nutrient solution in that zone (up to 8.3 dS m-1). Correlations between root concentration vs. Y_m and root concentration vs. electrical conductivity were significant for all substrates. Evaluation of Psi_m variability on substrates for plants exposed to water deficit allowed a qualitative estimation of the root system distribution of tomato crop, easier than the direct method. For irrigation scheduling purpose, moisture sensors should be placed between the plant and its respective dripper.

1258. **Status of oak mushroom cultivation and production in Korea focused on Hwasung and Yongin cities in Gyeonggi Province.**
Lee SangHyun; Kang HagMo; Choi SooIm; Lee ChangHeon; Kim Hyun; Cho YoungJin; Lim HoSub; and Kohroki, K.
Journal of the Faculty of Agriculture, Kyushu University 52(1): 239-247. (2007); ISSN: 0023-6152
Descriptors: cultivation/ edible fungi/ sawdust/ spawn/ South Korea/ Tricholomataceae
Abstract: The overall production of oak mushrooms has steadily increased in Korea, but the mushroom market is plagued with a wave of falling prices and intensified competition as imports of Chinese oak mushrooms increase. Imported Chinese oak mushrooms are mostly grown on sawdust blocks, which are costly in Korea because of higher labor costs and log prices. Mushroom farmers, therefore, strive to seek ways to compete with Chinese oak mushrooms, and the use of broad-leaved tree species is under consideration to promote sawdust-based mushroom cultivation. Korean oak mushrooms are

expected to be more competitive when they are grown on sawdust rather than log while imports of Chinese mushrooms are still limited due to difficulties sustaining freshness. However, there are some obstacles such as the acquisition of superior strains of mushroom to promote sawdust cultivation of oak mushroom. Thus, The study investigated the status of production and sales of oak mushroom and the intent of mushroom farmers toward mushroom culture in wooden trays by conducting a questionnaire survey involving mushroom farmers in the two cities in Gyeonggi Province. Results of the study revealed that there were differences in production volume and revenue per oak log between mushroom farmers in the two areas. Many farmers showed distrustful reactions towards strains distributed because of frequent loss and damages caused by purchased strains. It is, therefore, necessary to encourage farmers to increase productivity by standardizing culture techniques and supplying good strains of mushrooms. More farmers in Hwasung City are interested in mushroom cultivation in wooden trays, but farmers in Yongin City were less enthusiastic about mushroom cultivation in wooden trays after witnessing failures of other farmers. The findings of the study signifies the need for introducing effects of mushroom culture in wooden trays among mushroom farmers, and developing superior strains of mushrooms to promote mushroom growth using wooden trays.

1259. **Stimulation of predacious nematodes through soil amendments in small scale agriculture.**
Azmi, M. I.
Advances in Agricultural Research in India 10: 79-82. (2000); ISSN: 0971-6394
Descriptors: castor oilmeal/ cattle dung/ cowpeas/ farmyard manure/ groundnut oilmeal/ groundnuts/ leucaena leaf meal/ neem seed cake/ plant parasitic nematodes/ plant pests/ poultry manure/ predator prey relationships/ predators/ sawdust/ soil amendments/ Adenophorea/ black eyed peas/ Dorylaimida/ eelworms/ FYM/ groundnut cake/ neem/ neem seed oilmeal/ peanut oilmeal/ peanuts/ poultry litter/ Secernentea/ southern peas/ Tylenchida
Abstract: A pot experiment was conducted on cowpea to determine the effects of various soil amendments namely: neem seed cake, castor oilmeal, groundnut oilmeal and sawdust at 400 kg/ha (0.2 g/kg soil); neem leaf and leucaena leaf meal at 4000 kg/ha (2 g/kg soil); farmyard manure, cow dung and poultry manure at 6000 kg/ha (3 g/kg soil), on predacious (Iotonchus sp.) and plant parasitic nematodes (Meloidogyne sp.). Reduction of plant parasitic nematode population was maximum with application of neem seed cake whereas predator prey ratio increased with poultry manure, cow dung, farmyard manure, castor cake, groundnut oilmeal, neem seed cake, sawdust, and neem leaf. The shoot dry weight of cowpea was maximum with neem seed cake treatment. Initial nematode infestation in the soil was very low (500 plant parasitic nematodes/100 g soil) which was conducive for the conservation of predators.

1260. **Structure of fungal communities in barren post agricultural soil 1 and 2 years after pine sawdust application.**
Kwasna, H. and Sierota, Z.
Phytopathologia Polonica 17: 13-21. (1999); ISSN: 1230-0462
Descriptors: chemical composition/ phosphorus/ plant pathogenic fungi/ plant pathogens/ plant pathology/ soil/ soil amendments/ soil fungi/ Hyphomycetes/ mitosporic fungi/ Mortierella vinacea/ Mortierellaceae/ Penicillium herquei/ phytopathogens/ phytopathology/ Scotch pine/ Scots pine/ Trichoderma pubescens/ Zygomycetes
Abstract: Changes in chemical compounds and in structure of fungi communities in post agricultural soil lying barren for 6 years, 1 and 2 years after Pinus sylvestris sawdust application in Poland, were determined. It was found that the high increase in Trichoderma population, caused by application of
fresh Pinus sawdust, is not a long lasting phenomenon. The decrease of carbon, nitrogen and phosphorus content which was due to the sawdust decomposition caused the decrease in frequency and increase in diversity of the fungal community two years after sawdust application. The most common species were T. harzianum, T. pubescens, Penicillium herquei and T. harzianum, P. chrysogenum, Mortierella vinacea, respectively 1 and 2 years after the treatment. The frequency of T. harzianum decreased, however, more than 3 times in the second year after sawdust application.

1261. **Studies on cultivation of oyster mushroom (Pleurotus spp.) on different forest wastes.**
Hamza, H. R.; Khan, S. M.; and Khan, S. M.
In: Integrated Plant Disease Management Proceedings of 3rd National Conference of Plant Pathology, NARC.Islamabad.); pp. 144-147; 2002.
Descriptors: cattle dung/ cotton waste/ cottonseed husks/ crop yield/ edible fungi/ horse dung/ non wood forest products/ sawdust/ wheat bran/ Lentinaceae/ minor forest products/ non timber forest products/ Poriales
Abstract: The sawdust of Shisham (Dalbergia sissoo) supplied alone or in combination with 10% cotton seed hulls, 5% horse dung, 5% wheat bran or 5% cow dung were evaluated for the productivity of P. ostreatus. Sisham sawdust combined with 10% cotton seed hulls proved the best for spawn running with a mean 13.35 days, followed by Sisham sawdust combined with 5% horse dung, 5% wheat bran, 5% cow dung and Shisham sawdust alone. Maximum yield was obtained by Shisham + 10% cotton seed hulls while minimum yield was obtained by Shisham sawdust alone. Six different substrates, viz. cotton waste, sawdusts of Popular, Kikar, Pine, Shisham and Diar, were also evaluated for the productivity of P. ostreatus. Cotton waste proved the best for spawn running with a mean of 8.15 days followed by popular, pine, kikar and Shisham, while Diar showed no spawn running. Yield was highest on cotton waste followed by Popular, Shisham, Kikar and Pine, while Diar gave no yield.

1262. **Studies on the composts produced from layer feces mixed with sawdusts and their effect on the growth of Brassica campestris L.**
Tanaka, Hirofumi; Toku, Yasumitsu; Isoi, Toshiyuki; Fukaya, Takako; and Horiuchi, Noriko
Scientific Reports of the Faculty of Agriculture Meijo University 37(67-72)(2001); ISSN: 0910-3376
Descriptors: composting/ layer feces/ sawdust/ Brassica campestris L
Abstract: Sawdusts were mixed with layer feces by the weight ratios of 1:0.11, 1:0.25, 1:0.5, 1:0.75 and 1:1, then moistened with water. The mixtures in plastic pots were composted in the greenhouse for 12 weeks with agitating every week. Carbon/nitrogen ratios were determined in every two weeks. After 12 weeks of composting, the germination and growth tests were performed with Komatsuna (Brassica campestris L. var. perviridis). 1) C/N ratios of the composts were not decreased by the 12 weeks of composting showing the hardly decomposable nature of the sawdust. 2) Germination and growth tests directly sown on the composts showed the severe inhibition by the compost of 1:0.75 ratio. Inhibition by the excess ammonium ion was suggested by the analysis of the composts. 3) The composts were applied to Akadama soil (reddish soil located under volcanic ash soil, treated by 800degreeC) by the ratio of 1 t/10 t soil and the germination and growth were tested. Almost no detrimental effect was found in any composts on the germination. A vigorous growth was observed in the soil with the compost of 1:1 ratio.

1263. **Studies on the feasibility of composted agricultural cast-offs as growing media.**
Liu QingChao; Wang KuiLing; Liu QingHua; Zhang QiXiang; Pan HuiTang; Liang ShuLe; and Yue Momo
Acta Horticulturae 767: 65-72. (2008)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: buffering capacity/ calcium/ cation exchange capacity/ cellulose/ coir/ composts/ greenhouses/ growing media/ iron/ magnesium/ maize/ manganese/ organic acids/ peat/ pH/ poinsettias/ protected cultivation/ sawdust/ soyabean husks/ Balsaminales/ coconut fibre/ corn/ cultivation under glass or plastic/ glasshouses / hydrogen ion concentration/ Impatiens hawkeri/ Mn/ potential of hydrogen/ potting composts/ rooting media/ soybean husks
Abstract: Peat is widely used as a growing medium in greenhouse production, but heavy exploitation of peat will seriously destroy the ecological environment. It is necessary to find new material to substitute for peat. In this paper, the feasibility of composted peanut hull, soybean stalk, sawdust, coconut coir, maize core and lees from wine as growing media is reported for studies commencing in 2002. The physical characteristics of those materials were primarily suitable for growing media. Due to the accumulated organic acid, the pH of the lees was very low (pH 3.85). The soluble salts in peat were higher than all the other materials. The cation exchange capacity (CEC) of peat was 95.81 cmol.kg-1, but the CEC of the sawdust was 26.92 cmol.kg-1. The total organic matter and cellulose content in the materials were higher than those in peat, while the contents of Ca, Mg, Fe and Mn were lower. All materials, especially the lees, have excellent buffering capacity. The germination indices (GI) of three herbaceous flower species when soaked with the extracts of coconut coir, peanut hull and sawdust were similar to that of peat or even higher. Cyclamen persicum, Euphorbia pulcherrima and Impatiens hawkeri grew better in those materials in pot than that in peat. This shows that most agricultural cast-offs investigated in this trial were excellent substitutes for peat.

1264. **Studies on the production of sclerotia by Pleurotus tuber-regium (Fr.) singer.**
Chen MeeiHsing and Peng JinTorng
Journal of Agricultural Research of China 48(2): 143-148. (1999); ISSN: 0376-477X
Descriptors: agricultural wastes/ cotton/ cultural methods/ edible fungi/ growing media/ husks/ rice/ rice straw/ sawdust/ sclerotia/ straw/ temperature/ vegetables/ water content/ farm wastes/ hulls/ Lentinaceae/ paddy/ Poriales/ potting composts / rooting media/ vegetable crops
Abstract: Three agricultural wastes were evaluated for their suitability as growing media for the production of sclerotia by P. tuber-regium. Cotton seed hulls and rice straw were more suitable than sawdust on the basis of biological efficiency. The best temperature and water content of the cotton seed hulls substrate for the production of sclerotia were 20 degrees C and 65% w/w. Supplementation of this medium with rice bran reduced markedly both production of sclerotia and biological efficiency.

1265. **Studies on the seed germination of Magnolia cubensis (mantequero) from the site Topes de Collantes, Cuba .**
Trocones, A. G.; Toledo, J. R.; Aladro, J. S.; and Pujols, O.
In: II Simposio Sobre Avances en la Produccion de Semillas Forestales en America Latina.Memorias, Santo Domingo, Republica Dominicana.); pp. 187-189; 2000.
Notes: Original title: Estudios para la germinacion de semillas de Magnolia cubensis (mantequero) en la localidad de Topes de Collantes, Cuba.
Descriptors: drying/ forest trees/ sawdust/ seed germination/ seed moisture/ seed treatment/ seeds/ shade/ substrates/ trees/ woody plants/ Magnolia cubensis
Abstract: M. cubensis fruits were collected during November from 30-year-old trees. Three drying methods of fruits were compared, including drying outdoors (with and without shade) and indoors (laboratory). The effects of different submersion periods (6, 12 and 24 h) of seeds in water and 3 substrates (100% soil, 75% soil + 25% sand, and 50% soil + 40% sand + 10% sawdust) on seed germination were also investigated. The greatest reduction in moisture content (75%) was obtained after outdoor drying in the shade. Highest seed germination rates were obtained after submersion for 24 h and sowing in a substrate of soil + sand + sawdust.

1266. **Studies on the types and rates of application of cattle slurry and swine manure fermented with sawdust on productivity of silage corn and leaching of nutrients.**
Na HoonChan; Jung MinWoong; Choi YeunSik; Choi KiChoon; and Yook WanBang
Journal of the Korean Society of Grassland Science 26(4): 177-186. (2006)
NAL Call #: SB202.K6H352; ISSN: 1013-9354

Descriptors: ammonium nitrogen/ animal manures/ application rates/ biomass production/ cattle slurry/ chemical composition/ crop yield/ crude protein/ dry matter/ dry matter accumulation/ leaching/ losses from soil/ lysimetry/ maize/ maize silage/ nitrate nitrogen/ nitrogen/ NPK fertilizers/ nutrients/ phosphate/ phosphorus/ pig manure/ productivity/ sawdust/ silage/ urea/ ammonia nitrogen/ corn/ losses from soil systems
Abstract: This lysimeter study was conducted to determine the effects of the types and rates of application of animal manure on the productivity of maize silage and soil pollution. The main plots considered in the study were types of cattle slurry (CS), swine manure fermented with sawdust (SMFS) and chemical fertilizer (CF). The subplots include the application rates of animal manure as urea (100, 200 and 400 kg N/ha). Dry matter and nitrogen yields of maize silage were enhanced with increased application rates of CS, SMFS and CF. Dry matter yield showed a decrease in order of CF > CS > SMFS (P<0.05). Crude protein contents of the whole maize silage increased as with increased application rates of CS, SMFS and CF. NO_3-N content in leaching water by application of animal manure reveals that there is a decrease in the order of SMFS > CF > CS (P<0.05). However, NH_4-N content was hardly influenced by the application of animal manure and NH_4-N content increased as application rates increased. PO_4-P content in leaching water by application of animal manure revealed that there is a decrease in the order of SMFS > CF > CS. PO_4 increased with application rates whereas PO_4 in leaching water maintained low levels.
This citation is from AGRICOLA.

1267. **Study of the propagation of Ginkgo in containers and [different] culture medium.**
Zhang Yong; Zeng Ming; Yang TianXiu; and Yang ShuYun|
South China Fruits 31(5): 58-59. (2002); ISSN: 1001-4195
Descriptors: animal manures/ container grown plants/ forest nurseries/ growth/ ornamental plants/ roots/ sand/ sawdust/ substrates/ superphosphate/ ornamentals
Abstract: An experiment was carried out with plastic bag with a diameter of 12 cm, a length of 25 cm and filled with different substrates. Substrates included different ratios of soil from vegetable plots, river sand, sawdust, dried leaves, calcium superphosphate and animal manure. The best growth was obtained with 60% vegetable plot soil + 15% river sand + 5% calcium superphosphate + 20% animal manure. With this mixture the greatest height, root collar diameter and number of roots were obtained.
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1268. **Study on container medium of Eucalyptus urophylla with bagasse and sawdust.**
Cheng QingRong
Journal of South China Agricultural University 23(2): 11-14. (2002); ISSN: 1001-411X
Descriptors: bagasse/ container grown plants/ fertilizers/ growth / Luvisols/ ornamental plants/ sawdust/ seedlings/ soil types/ ornamentals/ sols lessives
Abstract: The growth of Eucalyptus urophylla grown in a container medium with composted bagasse and sawdust mixed with coal ash and yellow soil was investigated under three levels of fertilizers. The results showed that the following media were significantly better than or equal to peat: (1) sawdust: coal ash: yellow soil (in a ratio of 5:2:3), fertilized with level 2, or fertilized with level 1 and composted for 3 months, or composted for 6 months and not fertilized; (2) sawdust: coal ash (6:4), bagasse: coal ash: yellow soil (5:2:3), bagasse: coal ash (6:4) - these 3 media composted for 6 months and fertilized with level 2, or composted for 3 months and fertilized with level 1; (3) bagasse composted for 6 months and fertilized with level 2.
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1269. **Study on nitrogen mineralization characteristics of organic materials.**
Lin YuWen; Liu TsangShen; and Wang ChungHo
Journal of Agricultural Research of China 52(3): 178-190. (2003); ISSN: 0376-477X
Descriptors: bagasse/ carbon nitrogen ratio/ cattle manure/ composts/ mineralization/ pig manure/ poultry manure/ rice/ rice straw/ sawdust/ straw/ paddy/ poultry litter
Abstract: The nitrogen mineralization of nine commercial/farm-produced organic materials were investigated by incubation-leaching method. The accumulative mineralized N (AMN) released during 2, 4, 6 and 8 weeks incubation period was significantly negatively correlated with the naperian logarithm of C:N value of the organic materials. Nine materials were divided into two groups according to their mineralization characteristic curves of 8-week incubation. The continuous release of mineral N of Group 1 (hog manure I, hog manure II, chicken manure, sawdust compost and bagasse compost) started at the 1st week and reached the first AMN peak at the 1st or the 2nd week, and then was getting slow in the subsequent 1-5 weeks. After the slowing down period, hog manure I and chicken manure still released mineral N after incubation in the 2nd and 6th week, respectively. On the contrary, hog manure II, sawdust compost and bagasse compost presented N immobilization after 1 to 4 weeks. All in Group 2 (cattle manure, rice straw, sesbania and pure bagasse) presented N immobilization in the 8-week incubation, except for the 1st and 2nd day where N mineralization was observed in some material. Mineralization characteristic curve after the 8th week indicated AMN of hog manure I increased within 36 weeks, and the second AMN peak of chicken manure occurred at the 24th week. The N immobilization in cattle manure and rice straw was continuous, but the N mineralization of cattle started until after 28 weeks. N immobilization of rice straw lasted even after incubation test.
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1270. **The study on production and use of a compost: Use value of wood chips for bedding and compost.**
Ohta, T.
Bulletin of the Zootechnical Experiment Station - Prefecture of Yamaguchi (Japan) 19: 83-86. (Mar. 2004); ISSN: 0287-1262.
Notes: E; Summary (Ja). Citation notes: JP (Japan).
Descriptors: compost/ use value/ wood chips/ bedding/ livestock

1271. **Substrate effects on greenhouse cucumber growth and fruit quality in Australia.**
Parks, S.; Newman, S.; and Golding, J.
Acta Horticulturae 648: 129-133. (2004)
NAL Call #: 80 Ac82; ISSN: 0567-7572
Descriptors: coconuts / coir/ colour/ crop quality/ crop yield/ cucumbers/ dry matter/ firmness/ fruits/ growing media/ growth/ hydroponics/ perlite/ rockwool/ sawdust/ soilless culture/ storage losses/ storage quality/ substrates/ texture/ coconut fibre/ color/ gherkins/ mineral wool/ potting composts/ quality for storage/ rock wool/ rooting media
Abstract: The yield and fruit quality of mini cucumbers (Cucumis sativus cv. Tandora), grown using different substrates in a run-to-waste system, was examined during a 17-week greenhouse experiment. The substrates included coir (Cocos nucifera), sawdust (Pinus radiata), rockwool, perlite and cucumber mix (a commercial soil conditioner). The management of the crop, including the nutrient and irrigation regime, was the same for each medium. At each harvest, cucumber fruit number and fresh weight were recorded for each experimental plant. Additionally, quality and storability was assessed using fruits harvested at 7 (early season), 11 (mid-season) and 16 weeks (late season) after planting. Fruits were stored for 2 weeks at 10 degrees C. After an additional day at 20 degrees C, the cucumbers were assessed for weight loss, colour change and textural quality (crush strength and firmness). There was no significant effect of substrate on plant dry weight, cucumber number, cucumber weight or average weight per cucumber, or on the fruit quality measurements. However, there were differences in colour, deformation, crush strength and dry matter between harvests. There was no significant linear trend of yield over time for any media treatment. These results demonstrate that a range of growth media can be successfully used for hydroponic cucumber production.

1272. **Substrates and temperatures on germination of Phoenix roebelenii O'Brien.**
Iossi, E.; Sader, R.; Pivetta, K. F. L.; and Barbosa, J. C.
Revista Brasileira de Sementes 25(2): 63-69. (2003)
NAL Call #: SB113.2.R48; ISSN: 0101-3122.
Notes: Original title: Efeitos de substratos e temperaturas na germinacao de sementes de tamareira ana (Phoenix roebelenii O'Brien).
Descriptors: ornamental palms/ ornamental plants/ sand/ sawdust/ seed germination/ seedling growth/ seedlings/ seeds/ substrates/ temperature/ vermiculite/ ornamentals
Abstract: The effects of substrate and temperature on seed germination and seedling growth in P. roebelenii were studied. Seeds with a moisture content of 21.83% were used in the germination tests. In the first experiment, four substrates (vermiculite, sawdust, sand and Sphagnum) and five temperatures (20, 25, 30, 35 and 40 degrees) were evaluated for their effects on seed germination and speed of germination index (SGI). In experiment 2, the effects of the aforementioned substrates on seed germination and seedling growth (dry weight and length of roots and aerial parts) were studied under uncontrolled conditions with temperatures between 27 and 28.5 degrees C. The germination test under controlled conditions was conducted in a box under a light/dark period of 8/16 h. Regardless of the substrate, higher germination percentage was obtained at 25 and 30 degrees C. The highest SGI was obtained at 30 degrees C using either Sphagnum or sand as substrate. Sphagnum was superior in terms of most of the seedling parameters. SGI tests of dwarf palm seeds and seedlings suggested that vermiculite was not appropriate as substrate for P. roebelenii.

1273. **Suitability of untreated wood ash for recycling.**
Stahl, E. and Doetsch, P.
Umweltwissenschaften und Schadstoff Forschung: 1-9. (2008); ISSN: 09343504 .
Notes: doi: 10.1007/s12302-008-0001-9; Original title: Qualitat und Verwertungsmoglichkeiten von Holzaschen aus naturbelassenen Holzern.
Descriptors: agriculture/ fertilizer/ forest/ garden/ nutrient loops/ potash fertilizer/ wood/ wood ashes/ wood pellet heating appliance/ wood- fired heating appliance
Abstract: Background, aim and scope The increasing use of wood for generating heat and electricity requires that more and more fuels be obtained directly or indirectly from the forest. Sound, sustainable recycling management calls for the return of any generated wood ash back to the forest to make use of the nutrients it contains. Similarly, recycling this ash in other locations such as agricultural land or private gardens can serve equally well as fertilizer. At the same time, it is critical that no accumulated pollutants be introduced into the nutrient loop. Wood ash that is heavily laden with such pollutants must not be considered for recycling. As part of this research project, commissioned by the Ministry for the Environment and Conservation, Agriculture and Consumer Protection of the State of North Rhine-Westphalia in Germany (MUNLV), ash samples of 209 wood-fired appliances generating between 10 and 4000 kW of heat performance were taken from throughout the federal state of North Rhine-Westphalia. Untreated wood, either forested or scrap, was used as the sole fuel for these appliances. Materials and methods All course ash and fly ash samples were analyzed to determine their composition of main nutrients, heavy metals, and the elements Fe, Cl, Si, Al and Na. The purpose of this analysis was to evaluate the suitability of this wood ash for reintroduction to forest soils or as fertilizer in other types of soil. Results The majority of the wood ash samples in this study contained sufficiently high amounts of nutrients to match the requirement for stand-alone fertilizers (PK-fertilizer, potash fertilizer). However, the heavy metal content was highly variable, with a mean content high enough to prohibit them from being classified per se as PK- or potash fertilizer for agricultural land. Due to the high quantities of cadmium, application of this ash to garden soils would likewise be ill-advised. Discussion On forest soils German law permits application of a mixture of potash fertilizer containing, at most, 30% wood ash (course ash). Because of the high amounts of cadmium and copper, wood ash from our samples can only comprise a maximum of 28% when added to typically used potash fertilizers. Higher percentage of wood ash would exceed the cut-off value established by the German Fertilizer Ordinance

(Du?ngemittelverordnung - Du?MV). Conclusions The application of wood ash on agricultural land and in private gardens is, rightfully so, highly regulated by law. However, the rules governing application of wood ash in the forest are much more lax. Determination of heavy metal content in wood ash cannot be used to determine compliance with Du?MV standards because of the high content and fluctuating nature of heavy metals found. Recommendations and perspectives Presently an alternative approach for classifying the ecologic risk of wood ash recycling is being developed. _ 2008 Springer-Verlag.

1274. **Susceptibility to diseases and productivity of strawberries in different cultural systems.**
Laugale, V. and Morocko, I.
In: Proceedings of the International Conference Fruit Production and Fruit Breeding.Tartu, Estonia.); pp. 212-216; 2000.
Descriptors: crop yield/ mulching/ plant diseases/ plant pathogenic fungi/ plant pathogens/ plastic film/ sawdust/ strawberries/ wood shavings/ Coelomycetes/ Dermateaceae/ Hyphomycetes/ Leotiales/ Marssonina potentillae/ mitosporic fungi/ Mycosphaerellaceae/ phytopathogens/ polypropylene/ Ramularia tulasnei
Abstract: Experiments aimed at estimating the effectiveness of cultural systems and different mulching materials on strawberries were carried out at the Pure State Horticultural Research Station in 1996. In trials 5 different mulches (straw, black plastic, black polypropylene "Lutrasil 60", shavings and sawdust) plus bare ground as a control, 4 planting systems and strawberry cultivars Zefyr and Senga Sengana were used. Results obtained differed between cultural systems, mulches, growing years and cultivars. The following diseases were detected in the trials: white leaf spot (Ramularia tulasnei), leaf scorch (Marssonina potentillae), grey mold (Botrytis cinerea), Verticillium wilt (Verticillium spp.). Incidence and severity of diseases depended on the cultural system, mulching material applied and cultivar. Mulching materials, especially synthetic ones, limited the incidence of root and vascular tissue diseases. Total and 1st class berry yields were highest in cultural systems with 2.0-m wide polypropylene and black plastic mulches. Senga Sengana responded more to synthetic mulches than Zefyr.

1275. **Sustainable mushroom production in Africa: A case study in Ghana.**
Atikpo, M.; Onokpise, O.; Abazinge, M.; Louime, C.; Dzomeku, M.; Boateng, L.; and Awumbilla, B.
African Journal of Biotechnology 7(3): 249-253. (2008)
NAL Call #: TP248.13 .A37; ISSN: 1684-5315
Descriptors: case studies/ composting/ composts/ edible fungi/ fish scrap/ growth/ hybrids/ mushrooms/ mycelium/ rice bran/ sawdust/ temperature/ fish waste/ Lentinaceae/ Poriales
Abstract: This study investigated a sustainable alternative to grow crops using organic wastes as biofertilizers. Fresh fish waste (FFW) and cooked fish waste (CFW) mixed with sawdust from Tryplochyton scleroxylon wood species (Wawa) were made into compost heaps. Control compost from rice bran (CRB) was also prepared. Higher temperatures were recorded from compost heaps prepared from both FFW (38-52 degrees C) and CFW (37-52 degrees C) than from CRB (33-45 degrees C); with reduction in composting time and generation of large numbers of microorganisms in the fish-based compost heaps. Mycelial colonization of compost bags and subsequent growth of oyster mushrooms (Pleurotus species) were faster in fish-based substrates (FFW and CFW) as compared to CRB. P. eous and P. oestreatus exhibited uniform spread of mycelia in the compost bags than P. eous hybrid. However, P. eous hybrid produced the fastest rate of mycelial growth, completely colonizing the substrate within 26 days. Growth of each species of mushroom investigated was independent of the substrate in which it was grown. Irrespective of the substrate used to grow the mushroom, the pattern of utilization and growth remained the same. Oyster mushrooms grown on fish-based substrates produced bigger and firmer fruiting bodies. This alternative could be very attractive to small farmers throughout the world, who are known to operate under adverse conditions and limited resources.

1276. **Technical and environmental aspects of raising fattening pigs and weaned pigs on deep litter.**
Nicks, B.
Annales de Medecine Veterinaire 148(1): 31-38. (2004); ISSN: 0003-4118.
Notes: Original title: Caracteristiques techniques et aspects environnementaux de l'elevage de porcs charcutiers et de porcelets sevres sur litieres accumulees.
Descriptors: ammonia/ animal housing/ carbon dioxide/ deep litter housing/ finishing/ gas production/ greenhouse gases/ litter/ nitrogen/ rearing techniques/ sawdust/ straw/ fattening/ hogs/ swine
Abstract: The technique of raising pigs on deep litter consists of leaving the animals on a 30 to 50 cm depth straw or sawdust which can be used for several batches. This article gives the synthesis of the experimental results of rearing 3 to 4 successive batches of fattening pigs or 5 to 6 batches of weaned pigs on straw-based or sawdust-based deep litters. For fattening pigs, this rearing technique required an average of 80 kg sawdust or 45 kg of straw per pig and produced, on average, 123 kg per pig of sawdust-based compost or 159 kg per pig of straw-based manure with a nitrogen content of 1.29 and 1.87 kg, respectively. For weaned pigs, the rearing technique required on average 15 kg of sawdust or 6 kg of straw per pig and produced, on average, 17 kg of sawdust-based compost per pig or an equivalent quantity of straw-based manure with a nitrogen content of 177 and 210 g, respectively. The cumulative greenhouse gas emissions (CO_2, CH_4, N_2O), calculated in CO_2 equivalents were higher with sawdust-based litter than with straw-based litter by 42% during fattening periods and 53% during postweaning periods. On the contrary, NH_3 emissions were higher from the straw-based litter than from the sawdust-based litter but only during postweaning periods (+160%), but not during fattening periods. None of the two litters present a decisive advantage over the other based on the environmental point of view.

1277. **Thermo-technical properties of floor structures for lying cubicles.**
Lendelova, J. and Pogran, S.
Research in Agricultural Engineering UZPI (Czech Republic) 49(4): 146-150. (2003); ISSN: 1212-9151.
Notes: 2 graphs, 3 tables; 8 ref. . Summaries (En, Sk).
Citation notes: CZ (Czech-Republic).
Descriptors: thermo-technical properties/ floor structures/ lying cubicles/ dairy cows/ sawdust
Abstract: Thermal properties of concrete or ceramic floors with different types of beddings (rubber mattresses, straw, sawdust, sand, etc.) of different thickness were tested in two housing systems for dairy cows. Thermal absorptive capacity (TAC) values were calculated for each combination tested and surface temperatures (ST) of several types of beddings were evaluated in function of the time spent by the cows lying on them. TAC values depended on the type of floor and bedding as well as the bedding thickness. They increased with decreasing bedding thickness. Uncovered floors showed much higher TAC values than the covered ones and concrete floor higher than the ceramic one. Very low TAC values were obtained for foam-rubber mattresses, straw and sawdust beddings. ST values increased with the time spent by the animals lying down, the course of the increase as well as the values depended on the bedding. They were high when rubber-foam or rubber mattresses were used and low with uncovered concrete floor.

1278. **Tomato crop production under different substrates and greenhouse models.**
Carrijo, O. A.; Vidal, M. C.; Reis, N. V. B. dos ; Souza, R. B. de; and Makishima, N.
Horticultura Brasileira 22(1): 5-9. (2004)
NAL Call #: SB320.43 .B7H67; ISSN: 0102-0536.
Notes: Original title: Produtividade do tomateiro em diferentes substratos e modelos de casas de vegetacao.
Descriptors: coir/ crop yield/ fruits/ growing media/ insect pests/ plant pests/ protected cultivation/ rice husks/ rockwool/ sawdust/ soilless culture/ substrates/ tomatoes/ waste utilization/ weight/ Brasilia/ coconut fibre/ cultivation under glass or plastic/ mineral wool/ potting composts/ rice hulls/ rock wool/ rooting media/ Tuta/ Tuta absoluta
Abstract: An experiment was conducted in Brasilia [Distrito Federal], Brazil, to evaluate the performance of tomato crop production during 2000 and 2001, under 3 greenhouse models and different types of substrates. The greenhouse models were arch roof, even span, and an arch roof with upper convective aperture. The substrates were rice husk, carbonized rice husk, coconut fibre [coir], sawdust, coarse sawdust, rockwool and a substrate for seedling production used at Embrapa Hortalicas. No significant statistical difference was verified for tomatoes cultivated in coconut fibre (10.4 kg/m2), sawdust (9.9 kg/m2), carbonized rice husk (9.3 kg/m2) and coarse sawdust (9.0 kg/m2). On the other hand, the smallest production was obtained for tomatoes cultivated in rockwool (6,4 kg/m2). There was a yield reduction between cultivation years due to the South American tomato moth (Tuta absoluta) in all greenhouses. Coconut fibre and carbonized rice husk produced the heaviest fruits, 128 and 123 g, respectively.

1279. **Tomato fruit quality and yield as affected by NaCl in nutrient solutions.**
Combrink, N. J. J.
Journal of the Southern African Society for Horticultural Sciences 8(2): 57-59. (1998); ISSN: 1017-0316
Descriptors: containers/ cracking/ crop quality/ crop yield/ fertigation/ fruit vegetables/ fruits/ nutrient solutions/ salinity/ sawdust/ size/ soilless culture/ storage/ tomatoes/ vegetables/ wood shavings/ yield losses/ fertirrigation/ vegetable crops
Abstract: Different levels of NaCl were added to a nutrient solution to study effects on cv. Daniela tomatoes. Standard production methods were applied. A mixture of pine shavings and sawdust was used as the substrate in 15-litre plastic containers. Fertigation frequency was controlled with a solar integrator. NaCl was added to a standard nutrient solution (EC = 2.2 mS/cm, pH=5.3) at levels of 18.75, 37.50, 56.25 and 75.00 mmol/litre, increasing the EC to 3.9, 5.6, 7.3 and 8.9 mS/cm, respectively. A spring crop was grown. The terminal growing points were removed from the main stems 8 weeks after transplanting, allowing about 7 trusses to develop. The fruit yield from plants grown in the standard nutrient solution was 4.24 kg/plant. The yield declined by about 30% when NaCl was added at 18.75 mmol/litre. For every additional 18.75 mmol/litre of NaCl added, a smaller, but further reduction in yield occurred. A decrease in fruit size was directly responsible for the yield reduction, since the number of fruits produced per plant was unaffected. Fruit cracking decreased at the higher salinity levels and the weight loss during a 2-week storage period (at 18 degrees C) also declined. Although significant taste differences could not be detected, total soluble solids (TSS) reached a maximum level of 8.8 degrees Brix at 5.6 mS/cm. The limited improvements in fruit quality were outweighed by significant fruit size and yield reductions at EC levels beyond 4.4 mS/cm. The local practice of producing tomatoes at EC levels between 2.0 and 3.5 mS/cm, seems to be acceptable for this cultivar.

1280. **Transformation of organic matter during co-composting of pig manure with sawdust.**
Huang, G F.; Wu, Q. T.; Wong, J. W. C.; and Nagar, B. B.
Bioresource Technology 97(15): 1834-1842. (2006)
NAL Call #: TD930.A32 ; ISSN: 0960-8524
Descriptors: absorbance/ aromatic compounds/ carbon nitrogen ratio/ chemical analysis/ chemical composition/ chromatography/ composting/ composts/ decomposition/ fractionation/ fulvic acids/ humic acids/ humification/ infrared spectroscopy/ organic carbon/ organic matter/ pig manure/ sawdust/ spectral analysis/ aromatics/ optical density
Abstract: Co-composting of pig manure with sawdust was studied in order to characterize the organic transformation during the process, using both chemical and spectroscopic methods. Humic acids (HA) and fulvic acids (FA) were fractionated from immature and mature pig manure compost, and characterized. After 63 days of composting, the ratio of total organic carbon and soluble organic carbon decreased to a satisfactory low level and the solid and soluble C/N ratios decreased rapidly for the first 35 days before attaining a constant value, indicating compost maturity. Humification could be responsible for the increase in humic acid proportion during composting. The increase in

the aromatic bonds after composting, as indicated by the reduction of C/H and C/O ratios of HA and FA, resulted in a more stabilized product. A substantial increase in high molecular weight compounds along with a small increase in low molecular weight compounds was found in mature compost. Moreover the HA also had more complex organic compounds at this stage. Fluorescence spectral analysis showed an increase in the maximum wavelength of HA associated with the contents of aromatic structures in solution. A decrease in relative absorbance of HA at 1160 cm-1, 2950 cm-1 and 2850 cm-1 was seen in the FTIR spectra indicating the decomposition of complex organic constituents, into simpler ones. Increase in the aromatic compounds with higher stability could account for the relative increase in the absorbance of HA at 1650 cm-1 and 1250 cm-1 of the mature compost. The composition of FA was not much altered, indicating most of the degradation of organic matter occurred in HA. Data from organic carbon, C/N ratio, elemental analysis, E_4E_6 ratio, gel chromatography, fluorescence and FTIR spectra indicated an increase in polycondensed structures and the presence of more stable organic matter in the mature compost.
This citation is from AGRICOLA.

1281. **Transition of soil nitrogen with high levels of compost application under greenhouse culture.**
Maruo, N.; Furukawa, Y.; Taira, K.; and Asano, T.
Bulletin of the Nara Prefectural Agricultural Experiment Station 33: 35-37. (2002); ISSN: 1345-6393
Descriptors: application rates/ cattle manure/ Chinese cabbages/ composts/ crop yield/ cultivation/ denitrification/ greenhouses/ nitrate/ nitrogen/ sawdust/ soil/ spinach/ uptake/ Capparales/ glasshouses
Abstract: In greenhouse plot trials, Chinese cabbage and spinach were grown in compost with or without addition of 150 t cattle manure compost with sawdust/ha. Application of compost increased nitrogen uptakes and yields. In most cases, denitrification was increased markedly up to 14 days after manure application. Cultivation decreased soil nitrate nitrogen when manure was applied but increased it when manure was not applied.
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1282. **Tree species and wood ash affect soil in Michigan's Upper Peninsula.**
Sartori, Fabio; Lal, Rattan; Ebinger, Michael H. ; and Miller, Raymond O.
Plant and Soil 298(1-2): 125-144. (Sept. 2007)
NAL Call #: 450 P696; ISSN: 0032-079X
Descriptors: Larix decidua/ wood ash/ Poplar/ Aspen/ short rotation woody crops/ soil carbon/ soil change/ soil cations
Abstract: Tree species and wood ash application in plantations of short-rotation woody crops (SRWC) may have important effects on the soil productive capacity through their influence on soil organic matter (SOM) and exchangeable cations. An experiment was conducted to assess changes in soil C and N contents and pH within the 0-50 cm depth, and exchangeable cation (Capo, Mgpo, K, and Na) and extractable acidity concentrations within the 0-10 cm depth. The effects of different species (European larch [Larix decidua P. Mill.], aspen [Populus tremula L. x Populus tremuloides Michx.], and four poplar [Populus spp.] clones) and wood ash applications (0, 9, and 18 Mg ha-p#) on soil properties were evaluated, using a common garden experiment (N = 70 stands) over 7 years of management in Michigan's Upper Peninsula. Soils were of the Onaway series (fine-loamy, mixed, active, frigid Inceptic Hapludalfs). The NM-6 poplar clone had the greatest soil C and N contents in almost all ash treatment levels. Soil C contents were 7.5, 19.4, and 10.7 Mg C ha-p# greater under the NM-6 poplar than under larch in the ash-free, medium-, and high-level plots, respectively. Within the surface layer, ash application increased soil C and N contents ($P < 0.05$) through the addition of about 0.7 Mg C ha-p# and 3 kg N ha-p# with the 9 Mg ha-p# ash application (twofold greater C and N amounts were added with the 18 Mg ha-p# application). During a decadal time scale, tree species had no effects--except for K--on the concentrations of the exchangeable cations, pH, and extractable acidity. In contrast, ash application increased soil pH and the concentration of Capo ($P < 0.05$), from 5.2 pl 0.4 cmolc kg-p# (ash-free plots) to 8.6 pl 0.4 cmolc kg-p# (high-level ash plots), and tended to increase the concentration of Mgpo ($P < 0.1$), while extractable acidity was reduced ($P < 0.05$) from 5.6 pl 0.2 cmolc kg-p# (ash-free plots) to 3.7 pl 0.2 cmolc kg-p# (high-level plots). Wood ash application, within certain limits, not only had a beneficial effect on soil properties important to the long-term productivity of fast-growing plantations but also enhanced long-term soil C sequestration.
This citation is from AGRICOLA.

1283. **Use of composted dairy cattle solid biomass, poultry litter and municipal biosolids as greenhouse growth media.**
Freeman, T. M. and Cawthon, D. L.
Compost Science and Utilization 7(3): 66-71. (1999)
NAL Call #: TD796.5.C58 ; ISSN: 1065-657X
Descriptors: biomass/ capacity/ cattle manure/ composting/ composts/ growing media/ hay/ mortality/ peat/ perlite/ porosity/ poultry manure/ refuse/ sawdust/ techniques/ vermiculite/ death rate/ municipal wastes/ potting composts/ poultry litter/ rooting media/ trash
Abstract: Studies were conducted to evaluate use of composted dairy cattle solid biomass, poultry litter, and municipal biosolids as partial or complete peat moss substitutes in greenhouse growth media. Using in-vessel techniques, four poultry litter composts were prepared using litter at 12.5 and 25% with hay or sawdust (v/v). Biosolids were composted with 50% sawdust (v/v) and dairy cattle solid biomass was composted alone. Each of the above six composts were blended with 0 or 50% peat moss and further mixed with 25% perlite and 25% vermiculite to prepare a total of 12 compost-based growth media. Peat moss blended with 25% perlite and 25% vermiculite served as the control. Dwarf marigold (Tagetes patula) cv. Bonanza Yellow were grown in 25 by 50 cm flats containing 36 cells. Media containing poultry litter co-composted with hay had low C:N ratios, high porosity and low water-holding capacity, and produced poor quality plants with high mortality rates. Biosolids and poultry litter co-composted with sawdust produced the tallest plants and the largest dry weight accumulation. Composted dairy biomass and the peat moss control produced plants of similar growth and appearance. Biosolids, poultry litter co-

composted with sawdust, and dairy biomass were effective peat moss substitutes. Addition of peat moss to the growth media was of little benefit except when the media exhibited high porosity.
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1284. **Use of composted greenhouse waste as a growing medium component will contribute to a sustainable waste management solution for vegetable greenhouses.**
Cheuk, W.; Lo, K. V.; and Fraser, B.
Biological Agriculture and Horticulture 21(4): 321-335. (2003)
NAL Call #: S605.5.B5 ; ISSN: 0144-8765
Descriptors: agricultural wastes/ buffering capacity/ composting/ composts/ crop quality/ crop residues/ crop yield/ growing media/ organic wastes/ porosity/ protected cultivation/ sawdust/ soil density/ soil ph/ soil water retention/ sustainability/ tomatoes/ waste management/ waste utilization/ cultivation under glass or plastic/ farm wastes/ potting composts/ rooting media
Abstract: As part of a study in sustainable greenhouse waste management, a growing medium component made from composted greenhouse waste was investigated and compared with the conventional sawdust growing medium used in most vegetable greenhouses in British Columbia, Canada. The compost provided higher moisture retention and density, and lower porosity; for optimal growing conditions, irrigation should be adjusted to take this into account. In a commercial tomato greenhouse trial setting, a mixture of 2:1 sawdust to compost by volume was found to be suitable as a growing medium, providing similar yield, crop health and fruit quality, and additional pH buffering compared with the conventional system. Since the waste processing is carried out on site, quality and consistency of the compost can be ensured. Successful application of compost in the growing medium can help provide a more sustainable waste management strategy through on-site recycling and conservation of organic resources, and may offer the grower disease suppression benefits.
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1285. **Use of fresh sawdust as a nitrogen source in sweet corn production.**
Brass, T. J.; Foshee, W. G. III; and Sibley, J. L.
Journal of Vegetable Crop Production 10(2): 89-98. (2004); ISSN: 1049-6467
Descriptors: ammonium nitrate/ chlorophyll/ crop yield/ maize/ nitrogen fertilizers/ particleboards/ plant height/ sawdust/ soil amendments/ sweetcorn/ urea formaldehyde/ chipboards/ corn
Abstract: Fresh sawdust from particleboard glued with urea formaldehyde was applied as a possible replacement for ammonium nitrate (NH_4NO_3) fertilization in sweetcorn (Zea mays) production. The treatments consisted of two combinations of sawdust and NH_4NO_3 combinations (25% sawdust:75% NH_4NO_3; 50% sawdust:50% NH_4NO_3); 100% sawdust; a standard NH_4NO_3 application (296 kg/ha); and a control treatment that consisted of preplant NH_4NO_3 only. Total N applied for all treatments was 139 kg/ha of N except for the control with 101 kg/ha of N. The elemental composition of the fresh sawdust had a high N composite (32.1 g/kg) and a low C:N ratio (15:1), making it favourable for direct use as an organic nitrogen fertilizer. Results indicated that the 25 and 50% sawdust treatments were similar to the standard NH_4NO_3 treatment in chlorophyll content at V6 and R1 stages, R1 plant height, and marketable yield. When the amount of NH_4NO_3 was increased, as is the case of the 25% sawdust, all measured responses were similar. Conversely, the use of 100% sawdust as a replacement for NH_4NO_3 fertilization resulted in decreased growth and yields. It appears that the use of sawdust from particleboard glued with urea formaldehyde has potential as a soil amendment with an aim in reducing the amount of NH_4NO_3 fertilizer needed in sweetcorn production.
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1286. **Use of organic and green mulches in an apple orchard.**
Hartley, M. J. and Rahman, A.
In: Proceedings of the Fifty First New Zealand Plant Protection Conference.Quality Hotel, Hamilton, New Zealand.); pp. 195-198; 1998.
Descriptors: apples/ composts/ crop yield/ cultural control/ mulches/ pest control/ sawdust/ straw mulches/ weed control/ mulching materials
Abstract: Four organic mulches, sawdust, straw, compost and wooldust and two green mulches, grass and clover were compared with herbicide for weed control in an established apple orchard (New Zealand). The green mulches Serra hard fescue (Festuca longifolia) and Tahora white clover (Trifolium repens) were established on plots previously treated with compost or wooldust. Hard fescue, established for only 3 years (1995-98) under these conditions, reduced apple yield but also reduced the proportion of small reject apples. Straw gave the most consistent weed control throughout the 6 year (1992-98) trial period. Although the mulches affected the chemical characteristics of the soil, they had little effect on the nutrient status of apple leaves or the fruit.
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1287. **Use of partially-decomposed cattle and ckicken manure amended with wood-ash in two South African arable soils with contrasting texture: Effect on nutrient uptake, early growth, and dry matter yield of maize.**
Materechera, S. A. and Salagae, A. M.
Communications in Soil Science and Plant Analysis 32(19-20): 3207-3228. (2001)
NAL Call #: S590.C63; ISSN: 0010-3624 [CSOSA2]
Descriptors: Zea mays / dry matter accumulation/ nutrient uptake/ nitrogen content/ phosphorus/ nutrient content/ poultry manure/ cattle manure/ wood ash/ clay soils/ silt loam soils/ protein content/ application rate/ plant height/ growth
Abstract: The study was conducted to determine the effects of applying wood-ash to two soils amended with partially-decomposed cattle and chicken manure on the uptake of nutrients, early growth and dry matter yields of maize (Zea mays L.). A clay and silty loam soils were used.

Manure was applied to each soil in pots at rates equivalent to 0, 5, and 15 t ha(-1) while ash was applied to each of the manure treatments at rates equivalent to 0 and 2 t ha(-1). In both soils, the addition of chicken manure produced higher plant height, stem diameter, leaves per plant, dry matter yield and tissue concentration of protein, nitrogen (N), and phosphorus (P) than cattle manure. The responses of maize due to manure application were higher in the loam than clay soil. Application of cattle manure produced responses, which were less than control in many cases. This was presumed to be due to microbial immobilization of nutrients. Generally, wood-ash improved the responses of maize in the loam but not in the clay soil. The addition of wood-ash to manure in clay soil reduced plant height, dry matter yield, plant tissue protein and phosphorus of maize compared to the control. In both soils however, the addition of wood-ash improved responses where cattle and not chicken manure was applied. In the latter, the increases in response due to manure rate were higher without ash than with ash. Within the cattle manure rates, wood-ash produced better responses when 5 t ha(-1) manure was applied
compared to 15 t ha(-1). It is suggested that higher rates of wood-ash application may have been necessary.
This citation is from AGRICOLA.

1288. **The use of sawdust deep litter for fattening pigs with regard to labour inputs on bedding and dung removal.**
Kaczor, A and Szyndler, J.
In: Problemy Intensyfikacji Produkcji Zwierzecej z Uwzglednieniem Ochrony Srodowiska i Przepisow UE VI Miedzynarodowa Konferencja Naukowa.Naukowa, Warszawa, Poland.); pp. 227-234; 2000.
Notes: Original title: Warunki stosowania gebokiej scioki trocinowej w utrzymaniu tucznikow przy uwzglednieniu nakadow pracy na scielenie i usuwanie obornika.
Descriptors: animal housing/ animal husbandry/ animal manures/ deep litter housing/ floors/ hygiene/ labour/ litter/ sawdust/ flooring/ hogs/ labor / swine
Abstract: Management of fattening pigs in pens on deep litter from sawdust is one of the more recent and ecological technologies. The present study attempted to determine the usefulness of sawdust deep litter for fattening pigs kept in standard pens about 10 sq m in area with regard to sawdust consumption, bedding method, animal hygiene and labour inputs on bedding, bed care and dung removal. The research involved Polish Large White pigs in two systems differing in pen equipment. It was concluded that the use of sawdust for pen bedding and pig hygiene were dependent on the type of bed. With management on sawdust deep litter in standard pens, the area per 1 animal is larger than under other systems. In pig management, total labour inputs were lower with deep litter from sawdust than with shallow litter from straw.
This citation is from AGRICOLA.

1289. **Use of the Bom Jesus soil with organic conditioners as horticultural substrates for plants.**
Fermino, M. H. and Kampf, T. N.
Pesquisa Agropecuaria Gaucha 9(1/2): 33-41. (2003); ISSN: 0104-9070.
Notes: Original title: Uso do solo Bom Jesus com condicionadores organicos como alternativade substrato para plantas.
Descriptors: aeration / bulk density/ horticulture/ Inceptisols/ organic amendments/ pines/ porosity/ rice husks/ salts/ sawdust/ soil organic matter/ soil ph/ soil types/ substrates/ sugarcane byproducts/ water availability/ organic matter in soil/ Pontederiales/ rice hulls
Abstract: A field experiment was conducted in Porto Alegre, Rio Grande do Sul, Brazil, to verify the viability of a Haplumbrept soil as a component of horticultural substrate mixes, along with organic conditioners. The soil was selected due to their high total porosity, high level of organic matter and low capacity to agricultural use. The soil was mixed at volumetric proportion of 1:1 with water hyacinth (Eichhornia crassipes), sugarcane residues, Pinus sp. sawdust and carbonized rice husks. The mixes were submitted to physical (bulk density, total porosity, water availability and aeration) and chemical characterization (pH and total soluble salt concentration). Except sawdust mixture, all mixes improved soil physical characteristics, providing lower bulk density, higher porosity and higher water availability. All conditioners, but water hyacinth, increased the mixes pH, and all of them increased soluble salts contents.
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1290. **Use of willow (Salix sp.) sawdust as a potting medium for calendula (Calendula officinalis) and marigold (Tagetes erecta) plant production.**
Gariglio, N. F.; Buyatti, M. A.; Bouzo, C. A.; Weber, M. E.; and Pilatti, R. A.
New Zealand Journal of Crop and Horticultural Science 32(1): 147-151. (2004)
NAL Call #: SB99.N45N45; ISSN: 0114-0671
Descriptors: buds/ crop yield/ dry matter/ dry matter distribution/ flowers/ growing media/ growth/ nitrogen fertilizers/ peat/ perlite/ plant height/ sawdust/ biomass distribution/ potting composts/ rooting media
Abstract: The growth of 'Fiesta Gitana' calendula (C. officinalis) in a growth medium prepared from 75% (v/v) composted willow (Salix sp.) sawdust (WS), with or without additional nitrogen (N) (4% w/w) during composting, and 25% (v/v) perlite was examined. Total plant dry matter, dry matter partitioning to flowers, and plant height at 77 days after planting were similar in media containing composted WS to values achieved in the sphagnum peat:perlite (75:25, v/v) control medium. Relative to these media, non-composted WS:perlite (75:25, v/v) resulted in average reductions of total dry matter (57%), dry matter partitioning to flowers (50%), plant height (43%), flower diameter (73%), and flower buds per plant (82%). In a further study, increasing the proportion of N-enriched composted WS in perlite from 25 to 75% did not affect total dry matter, plant height, or flower number per plant of 'Fiesta Gitana' calendula or 'Perfection Gold' marigold (T. erecta) compared to values achieved in the sphagnum peat:perlite control medium. Since flower diameter decreased in both species when the N-enriched composted WS exceeded 50%, we suggest that this "waste" product can substitute for all the sphagnum peat, but should not exceed 50% volume in a perlite mixture.
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1291. **The use of wood ash as liming and fertilising material in grasslands.**
Pineiro, J.; Santoalla, M. C.; Diaz, N.; Fernandez, A.; and Merino, A.
In: Land Use Systems in Grassland Dominated Regions. Proceedings of the 20th General Meeting of the European Grassland Federation.Luzern, Switzerland.); pp. 723-725; 2004.
Descriptors: acid soils/ cation exchange capacity/ clovers/ crop yield/ exchangeable aluminium/ fertilizers/ grassland soils/ grasslands/ herbage/ limestone/ liming/ liming materials/ phosphorus/ potassium/ soil acidity/ soil ph/ soil types/ sown grasslands/ wood ash/ exchangeable aluminum/ pasture soils/ sown pastures
Abstract: Forestry industries, of great importance in Galicia (NW Spain), burn bark to generate energy, which leads to huge amounts of ash that in most cases is stored without any use. In order to develop a use in agriculture, a trial was sown in September 2001 to investigate the liming and fertilising effect of wood ash in the establishment of grass-legume pastures on acid soils. The initial soil analysis was: pH (H_2O) 5.1; P (Olsen) 28 mg kg-1, K (NH_4NO_3) 79 mg kg-1 and Al CEC-1 (Cation Exchange Capacity) 0.52. Eight treatments were established: (1) Control (no lime or fertilisers), (2) Fertilisers (F) without lime, (3) Limestone3 (3 t ha-1 of ground limestone), (4) Limestone3+F, (5) Ash6 (6 t ha-1 ash), (6) Ash6+F, (7) Ash12 (12 t ha-1 ash) and (8) Ash12+F. F(kg ha-1)=40N-120P_2O_5-120K_2O. Average 2002 and 2003 dry matter yields (t ha-1) were 3.8, 4.9, 4.8, 6.2, 6.4, 7.3, 7.6 and 8.3, respectively. The soil pH (and corresponding exchangeable Al CEC-1) were 5.1(0.542), 5.1(0.532), 5.7(0.135), 5.7(0.164), 5.5(0.284), 5.5(0.258), 5.9(0.130), 5.8(0.129). These preliminary results show a clear effect of the ash on soil acidity and herbage yield.
This citation is from AGRICOLA.

1292. **Use of wood ash extract and germination to improve the feeding value of Ugandan Sekedo sorghum (Sorghum bicolor) for broiler chicks.**
Kyarisiima, C. C.; Okot, M. W.; and Svihus, B.
Animal Feed Science and Technology 120(1-2): 67-77. (May 2005); ISSN: 0377-8401
Descriptors: Sorghum bicolor/ varieties/ broiler feeding/ chicks/ broilers/ wood ash/ grain sprouting/ wood extracts/ feed processing/ chemical treatment/ soaking/ nutritive value/ tannins/ metabolizable energy/ feed conversion/ animal growth/ digestibility/ dietary protein/ dietary fat/ feed intake/ liveweight gain/ Uganda
This citation is from AGRICOLA.

1293. **Use of wood ash in the treatment of high tannin sorghum for poultry feeding.**
Kyarisiima, C. C.; Okot, M. W.; and Svihus, B.
South African Journal of Animal Science 34(2): 110-115. (2004); ISSN: 0375-1589
Descriptors: broilers / chemical composition/ digestibility/ feed intake/ fowl feeding/ growth rate/ nutritive value/ poultry/ tannins/ treatment/ wood ash/ chickens/ domesticated birds/ nutritional value/ quality for nutrition/ tannic acid
Abstract: A study was conducted to investigate the effects of wood ash treatment on the nutritional value of high tannin sorghum. High tannin sorghum was either soaked in wood ash slurry and then germinated for four days or soaked in wood ash extract and germinated for 28 hours or germinated after soaking in water. Chemical composition of the grain thus treated was determined. The feeding value of the wood ash extract treated grain was evaluated in a three-week experiment where sorghum replaced maize in broiler starter diets. Treatment of high tannin sorghum with wood ash extract was effective in reducing the tannin level and did not lower the nutrient content of the grain, unlike the treatment that involved the use of wood ash slurry. There was no significant difference in feed intake between the maize based diet and the diet that contained wood ash extract treated sorghum. There was a significant improvement in growth rate of chicks that were fed on diets that contained treated sorghum. This was also reflected in the improvement of the ileal digestibility of the diets that contained treated grain. Treatment of high tannin sorghum with wood ash extract improves its nutritive value.
This citation is from AGRICOLA.

1294. **Using cattails (Typha latifolia) as a substrate for Pleurotus ostreatus (Fr.) Kummer cultivation.**
Vetayasuporn, S.
Journal of Biological Sciences 7(1): 218-221. (2007); ISSN: 1727-3048
Descriptors: crop residues/ crop yield/ edible fungi/ growing media / sawdust/ substrates/ weeds/ Lentinaceae/ Poriales/ potting composts/ rooting media
Abstract: Different ratio of substrates combination between sawdust and cattails were used for P. ostreatus cultivation (in Thailand) and 3-6 flushes were obtained from these substrates. A substrate combination between cattails + sawdust or cattails alone was not accelerated the mushroom growing processes. The mycelial completed colonization, primordium initiation and fruiting body formation were delay when compare to sawdust alone (control). Less yields were revealed from all cattails cultivation substrates (112.10-289.63 g) and these yields were significantly different to those found from control (536.85 g) at a confidence level of 95%. Moreover, the percentage biological efficiency (%BE) values obtained from all cattails cultivation substrates were nearly two times less than those found in the control (95.02%). The cattails are undesirable weeds and provide economically acceptable substrates but result in low crop yields, low %BE and more time was consumed in mushroom growing processes, therefore the substrate combination of sawdust + cattails or cattails alone have shown low potential for use as a raw material for P. ostreatus cultivation.
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1295. **Using moss and sawdust as substrate components for root formation in plum and myrobalan plum cuttings.**
Samoshchenkov, E. G. and Tikhomirov, V. A.
Izvestiya Timiryazevskoi Sel' skokhozyaistvennoi Akademii 2: 119-131. (2000); ISSN: 0021-342X
Descriptors: clones/ cultivars/ cuttings/ frost resistance/ peat/ perlite/ plums/ rooting/ roots/ rootstocks/ sand/ sawdust/ soil/ substrates/ variety trials/ cultivated varieties
Abstract: During 1995-97, studies were conducted with plum cultivars Evraziya 21 and Volzhskaya krasavitsa, clonal rootstock 10-3-68, and frost-resistant myrobalan

forms 13-113 and 9-114. The effect of different combinations of sawdust, peat, soil, sand and moss on rooting of green cuttings was compared with rooting in perlite + peat (control). The best rooting results were achieved when sawdust was used in combination with sand, moss and perlite. Sawdust could also be used alone. Fresh sawdust (1-year-old) resulted in better rooting than old sawdust (stored for 3 years). Moss was the most effective in combination with sawdust, sand, and perlite, as well as on its own. Peat in combination with other substrates reduced rooting, and is only recommended for use in lower pot layers to improve development of the root system of rooted cuttings. In all substrates, cuttings of myrobalan 13-113 and clonal rootstock 10-3-68 showed better rooting than both plum cultivars.
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1296. **Using wood ash in agriculture.**
Susin, J.
SAD, Revija za Sadjarstvo, Vinogradnistvo in Vinarstvo 17(4): 25. (2006); ISSN: 0353-5711.
Notes: Original title: Uporaba lesnega pepela v kmetijstvu.
Descriptors: acid soils/ burning/ calcium fertilizers/ chemical composition/ fertilizer analysis/ fertilizers/ usage/ waste utilization/ wood ash/ flaming
Abstract: Ash from the burning of wood can be used as a mineral fertilizer in agriculture, although its chemical composition is widely variable (with the major component calcium, for example, ranging from 22 to 45%) and depends on tree species, climatic factors, age of the wood and method of burning. This
article briefly examines the chemical composition of wood ash and its use as a fertilizer, particularly on acid and weakly alkaline soils.
This citation is from AGRICOLA.

1297. **Utilization of phosphorus from vermicomposts by Italian ryegrass (Lolium multiflorum Lam.).**
Kalembasa, D.
Annales Universitatis Mariae Curie Skodowska Sectio E, Agricultura 59(4): 1905-1910. (2004)
NAL Call #: 512 L96AE ; ISSN: 0365-1118.
Notes: Original title: Wykorzystanie fosforu z wermikompostow przez zycice wielokwiatowa (Lolium multuflorum Lam.).
Descriptors: activated sludge/ crop yield/ farmyard manure/ phosphorus/ sawdust/ FYM/ vermicomposts
Abstract: Vermicomposts produced from waste activated sludges with sawdust, waste from meat processing and cattle farmyard manure (FYM) were used for the fertilizer application of Italian ryegrass (Lolium multiflorum) as the source of phosphorus. The yields of Italian ryegrass harvested from plots fertilized with vermicomposts were very similar to the yield of those harvested from plots fertilized with FYM and significantly higher than those from control. The phosphorus utilization coefficient reached the following values: 5.10% for vermicomposts produced on the basis of waste activated sludge, 9.24% for vermicompost produced from cattle FYM and 19.62% from FYM.
Reproduced with permission from the CAB Abstracts database.

1298. **Utilization of unused woody materials for bedding of cattle.**
Oizumi, C; Tsuchiya, H.; and Okazaki, Y.
Bulletin of the Chiba Prefectural Livestock Research Center (Japan) 5: 79-80. (Nov. 2005); ISSN: 1346-9746.
Notes: 3 tab. Citation notes: JP (Japan).
Descriptors: wood waste/ bedding/ cattle/ Japan

1299. **Variable impacts of enchytraeid worms and ectomycorrhizal fungi on plant growth in raw humus soil treated with wood ash.**
Liiri, M.; Ilmarinen, K.; and Setala, H.
Applied Soil Ecology 35(1)(Jan. 2007)
NAL Call #: QH541.5.S6 A67; ISSN: 0929-1393
Descriptors: Enchytraeidae/ earthworms/ ectomycorrhizae/ mycorrhizal fungi/ soil nematodes/ Pinus sylvestris/ forest trees/ seedling growth/ forest soils/ acid soils/ soil ph/ soil organic matter/ wood ash/ soil amendments/ Cognettia sphagnetorum
This citation is from AGRICOLA.

1300. **Vegetation manifestations of pepper seedlings, grown on different mixtures.**
Toskov, K.; Kanazirska, V.; and Dimov, I.
Bulgarian Journal of Agricultural Science 8(4): 353-357. (2002); ISSN: 1310-0351
Descriptors: biomass/ farmyard manure/ growing media/ nitrogen fertilizers/ peat/ perlite/ phosphorus fertilizers/ potassium fertilizers/ rice husks/ sand/ sawdust/ soil/ substrates/ vermiculite/ FYM/ phosphate fertilizers/ potash fertilizers/ potting composts/ rice hulls/ rooting media
Abstract: The effect of 12 mixtures from different combinations and ratios of organic and mineral substrata on the biomass formation rate of pricked-off pepper cv. Kurtovska kapiya 1619 seedlings was investigated in a glasshouse during 2000-01. Soil, farmyard manure, sphagnum peat (Lithuania), sawdust (composted), biohumus (organic by-products of red California worm (Eisenia fetida) processing), rice husk, perlite, vermiculite and sand were used for the mixture preparation. Considerable differences (from 31 to 35% compared to the control) in the biomass accumulation at the end of the growing period were recorded. The plants grown on peat mixtures accumulated the greatest biomass amount, while those grown on mixtures with rice husk as the main component accumulated the least. A high negative correlation between salt concentration of the nutrient medium and biomass accumulation was established. To improve the nutrient regime, enrichment of the mixtures containing biohumus with phosphorus and potassium fertilizers, and of the mixtures containing sawdust with nitrogen fertilizer, is necessary.
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1301. **Vineyard floor management improves wine quality in highly vigorous Vitis vinifera 'Cabernet Sauvignon' in New Zealand.**
Wheeler, S. J.; Black, A. S; and Pickering, G. J.
New Zealand Journal of Crop and Horticultural Science 33(3): 317-328. (2005)
NAL Call #: SB99.N45N45; ISSN: 0114-0671

Descriptors: ammonia/ anthocyanins/ aroma/ chemical composition/ chicory/ cover crops/ crop quality/ crop yield/ flavour/ fruits/ grapes/ growth/ herbicides/ leaves/ mineral content/ nitrate/ nutrient content/ petioles/ plant composition/ plant nutrition/ ripening/ sawdust/ sensory evaluation/ shoots/ soil water content/ titratable acidity/ wines/ chemical constituents of plants/ flavor/ Vitaceae/ weedicides/ weedkillers
Abstract: Five inter-row soil management techniques were applied to a vigorous Vitis vinifera 'Cabernet Sauvignon' vineyard in Hawke's Bay, New Zealand-a permanent chicory (Cichorium intybus var. sativum 'Puna') cover crop; chicory sprayed with herbicide before veraison; incorporated pine (Pinus radiata) sawdust and bare soil maintained using cultivation or non-selective herbicide. Both chicory treatments significantly reduced the soil water content and shoot growth late in the season compared to the other treatments. Petiole nitrate concentration and leaf size were lowest in the sawdust and both chicory treatments. The pruning weights in the two chicory treatments were reduced to about half those found in the other treatments. No significant differences among treatments were found in yield or other viticultural characteristics examined. Both chicory treatments resulted in advanced ripening (increased soluble solids and decreased titratable acids), increased anthocyanins, and reduced ammonia content of berries compared to other treatments. Sensory evaluation of wines produced from the cultivation (bare soil) and the permanent chicory cover crop treatment were conducted after 4 years of bottle age, and showed riper fruit aroma and flavour and a higher overall quality score in the chicory treatment. Competition imposed for two seasons using a permanent chicory cover crop has resulted in improved viticultural and oenological characteristics of a highly vigorous 'Cabernet Sauvignon' vineyard in a marginal site in New Zealand.

1302. **Waste wood recycling as animal bedding and development of bio-monitoring tool using the CALUX assay.**
Asari, M.; Takatsuki, H.; Yamazaki, M.; Azuma, T.; Takigami, H.; and Sakai, S.
Environment International 30(5): 639-49. (July 2004)
NAL Call #: TD169 .E54; ISSN: 0160-4120
Descriptors: animals/ Benzofurans: analysis/ biological assay/ carcinoma, hepatocellular: pathology/ conservation of natural resources/ environmental monitoring: methods/ environmental pollutants: analysis/ housing, animal/ Japan/ liver neoplasms: pathology/ Luciferases: analysis: biosynthesis/ polychlorinated biphenyls: analysis/ rats/ soil pollutants: analysis/ tetrachlorodibenzodioxin: analogs & derivatives: analysis/ tumor cells, cultured/ wood
Abstract: Animal bedding made of waste wood samples from seven different plants in Japan were chemically analyzed in terms of persistent organic pollutants (POPs) including polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/DFs), coplanar polychlorinated biphenyls (Co-PCBs), drin compounds, chlordane compounds and various inorganic toxic compounds (Cr, Cu, As, B, Cd and Pb) to investigate the chemical characteristics and levels of contamination. Further investigation was conducted to determine the success of applying the Chemically Activated Luciferase Expression (CALUX) bioassay to the waste wood samples in combination with a cleanup procedure for the detection of dioxin-like compounds in order to develop the CALUX bioassay as a rapid and cost-effective screening/monitoring method and a contributive tool to risk management in the waste wood recycling process. For the cleanup procedure, crude extracts from wood samples were prepared by dimethylsulfoxide (DMSO)/n-hexane extraction, and then the extracts were processed by silica gel-44% sulfuric acid reflux treatment at 70 degrees C for 60 min to yield the bioassay fractions. The presence of POPs and inorganic toxic compounds were confirmed in most of the litter samples. In particular, Co-PCBs in one sample (litter dust) showed a high concentration level (1200000 pg/g, 240 pg TEQ/g), suggesting the potential for contamination from demolition waste. The CALUX assay-determined TEQs (CALUX-TEQs) were significantly high in the sample after DMSO/n-hexane extraction, probably due to labile aryl hydrocarbon receptor (AhR) ligands such as PAHs; however, they were remarkably reduced through a single silica gel-44% sulfuric acid reflux treatment. The ratio between CALUX-TEQ values and WHO toxicity equivalent values (WHO-TEQ) obtained by congener-specific chemical analysis ranged from 0.058 to 22 and show comparatively good agreement. Underestimation in some samples, however, was observed where WHO-TEQ values of Co-PCBs contributed greatly to total WHO-TEQ values. Reasons for this gap could be lower CALUX assay-determined relative potencies (REPs) than the WHO-TEFs for these congeners or AhR-antagonistic effects of non dioxin-like PCBs which coexist at higher concentration than Co-PCBs. The CALUX assay is proposed as a promising application in the recycling process of wooden materials. This citation is from PubMed.

1303. **Water vapour emission and nitrogen balance from a sawdust deep litter system for weaned pigs.**
Nicks, Baudouin; Laitat, Martine; Vandenheede, Marc; Desiron, Alain; and Canart, Bernard
Annales de Zootechnie (Paris) 49(2): 119-128. (2000); ISSN: 0003-424X
Descriptors: Water vapor/ emission/ nitrogen balance/ sawdust/ litter/ pigs/ swine
Abstract: Five batches of a total of 180 weaned pigs were reared successively in an experimental room on 30 cm deep litter without cleaning between the batches. The litter was a mixture of sawdust from coniferous and beech trees. Water was added to the litter every 10 days to lower the dust concentration in the room. The total amounts of sawdust and water used were respectively 21.3 kg per pig and 10.2 l per pig. The mean temperature of the litter at 20 cm depth recorded during each of the 5 periods varied from 32.5 degreeC to 41.8 degreeC. The average liveweight of the pigs at the beginning and at the end of the post-weaning period was respectively 7.9+-1.2 kg and 24.5+-4.2 kg. The average daily gain was 392+-87 g. The temperature and the relative humidity of the air inside and outside the experimental room and the ventilation rate were continuously recorded in order to calculate the water vapour emission for each batch. The amount of water vapour produced was significantly correlated to the water consumption of the pigs and reached an average of 1732 g per pig per day. This amount is 36% greater than the reference used for pigs on slatted floors. This value may be used as a reference to calculate the minimum ventilation

rate for piggeries with pigs on sawdust deep litters. The amount of compost produced was 19.9 kg per pig with a dry matter content of 44.7%. The amount of nitrogen in the compost was 231 g per pig which is about 50% lower than the reference used for the slurry. The volatile nitrogen emissions are thus much higher from composts than from slurries.

1304. **Weed control and soil amendment effects on restoration plantings in an Oregon grassland.**
Huddleston, R. T. and Young, T. P.
Western North American Naturalist 65(4): 507-515. (2005); ISSN: 1527-0904
Descriptors: forbs/ glyphosate/ grasslands/ herbicides/ integrated control/ mulches/ mulching/ nitrogen/ nutrient availability/ sawdust/ soil amendments/ weed control/ weeds/ integrated plant protection/ mulching materials/ United States of America/ weedicides/ weedkillers
Abstract: The restoration of perennial grasslands in western North America often depends on effective weed control. We took advantage of a grassland restoration site on the Nature Conservancy's Agate Desert Preserve in southern Oregon (TNC 1997), where 3 sites had been previously burned, mowed, or both. At these sites we carried out a series of controlled, replicated experiments designed to test the effectiveness of 3 weed control measures: (1) sawdust, (2) glyphosate herbicide, and (3) herbicide plus an alfalfa mulch. All plots were seeded with a mix of 3 native perennial grasses. The soils of the 3 areas differing in previous vegetation management were similar, with the exception of total available soil nitrogen, which was significantly lower in the 2 burned sites. The sawdust treatment reduced total available soil nitrogen, but only in the unburned site, and only in the first few months after application. In all 3 areas the alfalfa mulch significantly increased total available soil nitrogen. However, none of these soil nitrogen differences significantly affected the success of weeds or planted perennial grasses. The herbicide treatment reduced exotic annual grasses and forbs and greatly increased the success of native forbs and the planted perennial grasses. The herbicide increased both initial establishment of the native grasses and their absolute cover and biomass. These results suggest that neither nitrogen impoverishment nor nitrogen enrichment was a useful restoration technique at this site, but weed control by herbicides can be of considerable assistance in restoring native perennial grasses.

1305. **Weed control efficacy of organic mulches in two organically managed bell pepper production systems.**
Law, D. M.; Rowell, A. B.; Snyder, J. C.; and Williams, M. A.
HortTechnology 16(2): 225-232. (2006)
NAL Call #: SB317.5.H68; ISSN: 10630198 [HORTF]
Descriptors: capsicum annuum/ compost/ corn gluten/ drip irrigation/ living mulch/ raised beds/ shallow cultivation/ straw/ trichogramma ostriniae/ wood chips/ capsicum/ capsicum annuum/ trichogramma ostriniae/ trifolium/ trifolium repens/ zea mays
Abstract: A 2-year field study in Lexington, Ky., evaluated weed control efficacy and influence on yields of several organic mulches in two organically managed bell pepper (Capsicum annuum) production systems. Five weed control treatments [straw, compost, wood chips, undersown white dutch clover (Trifolium repens) "living mulch," and the organically approved herbicide corn gluten] were applied to two production systems consisting of peppers planted in double rows in either flat, bare ground or on black polyethylene-covered raised beds. In the first year, treatments were applied at transplanting and no treatment was found to provide acceptable season-long weed control. As a result, bell pepper yields in both production systems were very low due to extensive weed competition. First year failures in weed control required a modification of the experimental protocol in the second year such that treatment application was delayed for 6 weeks, during which time three shallow cultivations were used to reduce early weed pressure and extend the control provided by the mulches. This approach increased the average weed control rating provided by the mulches from 45% in 2003 to 86% in 2004, and resulted in greatly improved yields. In both years, polyethylene-covered raised beds produced higher yields than the flat, bare ground system (8310 lb/acre compared to 1012 lb/acre in 2003 and 42,900 lb/acre compared to 29,700 lb/acre in 2004). In the second year, the polyethylene-covered bed system coupled with mulching in-between beds with compost or wood chips provided excellent weed control and yields. When using the wood chip mulch, which was obtained at no cost, net returns were $5587/acre, which is similar to typical returns for conventionally grown peppers in Kentucky. Net returns were substantially decreased when using compost due to the purchase cost. Results from this study indicate that shallow cultivation following transplanting, combined with midseason mulch application, resulted in high yields in an organically managed bell pepper system that were comparable to yields of most varieties grown conventionally in a variety trial conducted on the same farm.

1306. **Welfare and performance of yearling dairy heifers out-wintered on a wood-chip pad or housed indoors on two levels of nutrition.**
Boyle, L. A.; Boyle, R. M.; and French, P.
Animal 2(5): 769-778. (2008); ISSN: 17517311 .
Notes: doi: 10.1017/S1751731108001870.
Descriptors: behaviour/ dairy/ heifer/ performance/ welfare/ animalia/ Bos
Abstract: Wood-chip pads represent a low-cost alternative to housing for cattle during the winter. Considering the negative welfare implications associated with housing indoors on concrete, they may also offer welfare benefits to replacement dairy heifers. However, these animals may not be able to withstand winter weather conditions on a grass silage diet. The aim of this experiment was to evaluate behaviour, limb injuries, dirtiness scores, performance and climatic energy demand (CED) of yearling dairy heifers on two levels of nutrition kept outdoors on a wood-chip pad or indoors in cubicles during the winter. Ninety-six 10-month-old heifers were blocked and assigned in groups of eight, to one of the following four treatments in a 2 x 2 factorial design: (a) indoors, silage only; (b) indoors, silage plus concentrate; (c) outdoors, silage only; and (d) outdoors, silage plus concentrate. There were three replicate groups per treatment. All animals were inspected for skin lesions and were weighed and body condition scored (BCS) at the beginning and end of the trial. Instantaneous scan sampling

and continuous all-occurrence behaviour sampling were used to collect behaviour data during two 24-h periods. Animals were also dirtiness scored and group feed intakes were recorded during the trial. Significantly more comfort, social and play behaviours were recorded outdoors ($P < 0.05$) while trips, slips and falls were only recorded indoors ($P < 0.001$). Groups outdoors had significantly lower limb lesion scores at the end of the experiment ($P < 0.05$) and fewer groups outdoors were affected by all categories of limb lesions. However, they were consistently dirtier than animals indoors ($P < 0.001$). Low-nutrition animals had lower feed intakes, smaller BCS changes and lower average daily weight gains than high-nutrition animals ($P < 0.01$). Heifers outdoors had significantly lower average daily weight gains and BCS changes ($P < 0.05$) explained by lower feed intakes ($P < 0.01$). However, outdoor heifers on both the high- and low-nutrition diets and indoor animals on the low-nutrition diet had lower UFL (feed unit for maintenance and lactation (Irish Republic)) intakes (-0.36, -0.35 and -0.22, respectively) than that required to meet the daily live-weight gains they achieved. Heifers indoors on the high-nutrition diet gained 0.98 kg per day but consumed 0.17 UFL more than what would be recommended to achieve a daily weight gain of 1.0 kg. The CED for outdoor heifers was higher than that of indoor heifers (6.18 v. 5.47 MJ/day per m2 body surface area; $P < 0.001$, s.e.d. 0.044). However, CED did not exceed heat production in any treatment. Although animal performance was reduced outdoors, the wood-chip pad was associated with welfare benefits compared with cubicle housing. © 2008 The Animal Consortium.

1307. **Wood ash admixture to organic wastes improves compost and its performance.**
Kuba, T.; Tschcell, A.; Partl, C.; Meyer, K.; and Insam, H.
Agriculture, Ecosystems and Environment 127(1-2): 43-49. (Aug. 2008)
NAL Call #: S601.A34; ISSN: 0167-8809
Descriptors: wood ash / organic wastes/ nutrients/ micronutrients/ compost performance
Abstract: Throughout Europe, increasing amounts of wood ash are produced from biomass incineration plants. Most of these ashes are currently landfilled, despite their nutrient and micronutrient contents. The aim of this research was to find a way to return wood ash from biomass incineration plants into the natural cycle of matter. Three composts from source separated organic waste were produced with 0%, 8% and 16% ash admixture. The composting process was monitored by in situ measurements of temperature and CO concentration in the windrows. Maturation of the composts was observed through the parameters basal respiration, microbial biomass, metabolic quotient, Corg, Ntot, C/N-ratio and plant growth tests with cress. Mature composts were further analysed for potential pH, electrical conductivity as well as for nutrient (Mg, K, P) and heavy metal contents. The process indicators showed that ash admixture had no adverse effects and all legal standards were met. All produced composts met the requirements of the Austrian Compost Ordinance (Compost Quality A or even A+). In a field experiment - a recultivation trial on an alpine ski-run - we compared the effects of the three composts with an organic fertilizer and a mineral fertilizer. Best plant growth was found on the compost amended plots, followed by the organic fertilizer. Soil respiration measurements indicated a better performance of composts amended with 8% or 16% ash as compared to compost that did not contain ash. Concluding it may be stated that up to 16% ash admixture to organic wastes does not impair the composting process but is even able to improve the product quality. However, it has to be made sure that only bottom ashes of low heavy metal contents are being used and strict quality control is implemented.
This citation is from AGRICOLA.

1308. **Wood ash: An alternative liming material for agricultural soils.**
Alberta. Alberta Agriculture, Food and Rural Development. Edmonton: Alberta Agriculture, Food and Rural Development; Series: Agri-facts. (2002)
NAL Call #: S663 .W66 2002
Descriptors: wood ash / liming/ agricultural soils
This citation is from AGRICOLA.

1309. **Wood ash as a solution to the soil acidity problem in Alberta.**
Patterson, S. J.; Acharya, S. N.; Thomas, J. E.; and Bertschi, A. B.
Canadian Journal of Plant Science 81(1): 126. (2001)
NAL Call #: 450 C16; ISSN: 0008-4220
Descriptors: wood ash / soil acidity/ Alberta

1310. **Wood ash as fertilizer and soil acidity corrector: Effects on soil quality and crop yield.**
Mijangos, I; Garbisu, C; Aristegieta, A; Ibarra, A; Mendarte, S; and Albizu, I.
In: Sustainable Grassland Productivity: Proceedings of the 21st General Meeting of the European Grassland Federation.Badajoz, Spain.); pp. 808-810; 2006.
Descriptors: acid soils/ biodiversity/ biological activity in soil/ calcium/ calcium oxide/ Cambisols/ crop yield/ gley soils/ grasslands/ lime/ liming/ meadows/ microbial activities/ microbial flora/ mineralization/ nitrogen/ nitrogen fertilizers/ NPK fertilizers/ organic fertilizers/ soil acidity/ soil enzymes/ soil fertility/ soil types/ waste utilization/ wood ash / gleys/ microbial communities/ microflora/ soil quality/ soil respiration
Abstract: Soil acidity limits soil microbial activity and biodiversity as well as crop yield. In the Basque Country (northern Spain), the forestry industry annually generates great amounts of ash, which is considered a useless waste. In this context, a field assay was established to study the effect of the application of wood ash on the acidity (pH, % Al saturation), fertility (yield, forage quality) and soil biological quality (e.g., soil enzymes, potentially mineralizable nitrogen, respiration, abundance of earthworms, and microbial community metabolic profiles) of a typical acid soil of this region. This effect was also compared with that of lime (CaO), applied at the same rate of Ca. In March 2005, three contiguous areas of Lolium multiflorum Lam. received the following treatments, respectively: (1) ash (15.5 t ha-1 of wood ash and N fertilizer), (2) lime (1.1 t ha-1 CaO and N-P-K fertilizer, in order to equal the doses of nutrients) and (3) no addition. A contiguous native meadow was also studied as absolute

control (treatment 4). Soil and herbage samplings were made in May 2005. Results showed that wood ash can be a useful alternative as an acidity corrector, and is a useful means of utilizing a waste material.
This citation is from AGRICOLA.

1311. **Wood chips used for weed control in organic farming.**
Gruber, S.; Acharya, D.; and Claupein, W.
Journal of Plant Diseases and Proctection 21(Supplement): 395-400. (2008); ISSN: 18614051
Descriptors: allelopathic effects/ mulch/ soil properties/ weed regulation/ yield/ allelopathy/ crop rotation/ erosion control/ experimental study/ germination/ grass/ herb/ mulching/ organic farming/ testing method/ weed control/ wheat/ woody debris/ Alopecurus myosuroides/ Brassica napus/ Medicago sativa/ Papaver/ Papaver rhoeas/ Triticum aestivum
Abstract: The effect of wood chips mulch on weeds and yield was tested in a long-term experiment within a crop rotation in Organic Farming. The wood chips originated from hedge-rows and trees of the Experimental Station Kleinhohenheim of the University of Hohenheim. The material consisted for 25% of bark and had a CN ratio of 47. After annual mulching of crops with 0 (control), 80 and 160 m 3 ha-1 in spring, any mechanical weed control was omitted. There was no effect of mulching on yield in the years 2002-2006. In the season 2007, when the investigations were intensified, winter wheat yielded 7.0-7.2 t ha-1 or 607-626 ears m-2, and had protein contents of 10.8-10.9%, all without significant differences between the treatments. N min after harvest 2007 ranged from 83 and 104 kg ha-1. The water content of the soil after harvesting winter wheat 2007 was highest in the treatment with high application of wood chips. There was a quantitative effect of mulch application on weed infestation in field and model experiments. The application of wood chips significantly reduced weed infestation in lucerne/grass, and also significantly reduced volunteer lucerne in the following crop winter wheat. The highest number of annual weeds was found in winter wheat in the treatment "80 m3 ha-1". A germination test with wood chips extract for an investigation of potential allelopathic effects resulted in lowest germination rates of oilseed rape (Brassica napus), blackgrass (Alopecurus myosuroides) and field poppy (Papaver rhoeas) seeds when the highest eluate concentration was used. As a conclusion, wood chips are suitable to contribute to weed control in Organic Farming, and they additionally close the total farm's nutrient cycle. An increase of soil organic matter and higher water storage capacity can be expected in future due to the high input of C and N by wood chips in the further run of the experiment. Wood chips application can additionally be a flexible tool to control erosion on fields with a slope, and in crops with wide inter-row distance. © Eugen Ulmer KG.

1312. **Yield evaluation of Lentinus squarosulus (Mont) sing. on selected sawdust of economic tree species supplemented with 20% oil palm fruit fibers.**
Ayodele, S. M. and Akpaja, E. O.
Asian Journal of Plant Sciences 6(7): 1098-1102. (2007); ISSN: 1682-3974
Descriptors: crop yield/ emergence/ growth/ mycelium/ non wood forest products/ oil palms/ sawdust/ Brachystegia nigerica/ Combretodendron macrocarpon/ Lentinaceae/ Lentinus squarrosulus/ minor forest products/ non timber forest products/ Poriales
Abstract: The yield of Lentinus squarrosulus (Mont) singer was evaluated following its cultivation on sawdust from seven economic trees (Mansonia altissima, Piptadeniastrum africanum, Nesogordonia papaverifera, Combretodendron macrocarpum, Terminalia sp., Khaya ivorensis and Brachystegia nigerica). The sawdust in each case was supplemented with 20% oil palm fruit fibers. Good growth was observed in all the sawdust except Combretodendron macrocarpum. Between the control and each sample, differences in mean mycelial density were significant (p=0.05) but differences among the different supplemented sawdust media were not. Supplementation with 20% oil palm fruit fibers advanced the time of primordial emergence and enhanced the fresh weight and number of flushes of the mushroom. The sawdust giving the highest yield was Brachystegia nigerica while the one with the lowest was Combretodendron macrocarpum. Reproduced with permission from the CAB Abstracts database.

1313. **Yield of greenhouse-grown tomatoes cultivated in soil and substrates.**
Fontes, P. C. R.; Novo, A. A. C.; Silva, D. J. H. da; and Cecon, P. R.
Revista Ceres 53(305): 92-99. (2006)
NAL Call #: 9.2 C332; ISSN: 0034-737X.
Notes: Original title: Produtividade do tomateiro em ambiente protegido no solo e em substratos.
Descriptors: chemical composition/ coal/ composts/ crop yield/ fertigation/ fruits/ growing media/ leaves/ nitrogen fertilizers/ nutrient content/ plant composition/ protected cultivation/ sand/ sawdust/ soil/ subsoil/ substrates/ tomatoes/ chemical constituents of plants/ cultivation under glass or plastic/ fertirrigation/ potting composts/ rooting media
Abstract: The effects of planting tomato (cv. Carmen) on soil and substrates on leaf nutrient contents and fruit yield were studied under greenhouse conditions for 133 days. The treatments were: (1) control plot, transplanting on the soil of the unheated greenhouse, as done by growers; (2) FITO-2, transplanting in plastic bags containing 9 dm3 organic compost + sand treated with micro- and macronutrients except N and K, which were applied through the drip irrigation system; (3) FITO-2 + N, similar to FITO-2 but had an additional supply of 50% N; (4) subsoil, similar to FITO-2 but the substrate used was subsoil; (5) coal + sawdust: similar to FITO-2 but the substrates used were 50% coal + 50% sawdust (v/v); and 6-commercial, similar to FITO-2 but the substrate was bought in the market. The experiment was conducted in randomized blocks with 6 replications. The nutrient contents of leaves were affected by the treatments, whereas marketable and total fruit yields were not affected. The marketable fruit yield reached 92 t and 89-112 t ha-1 for plants grown on soil and substrates, respectively. The yields of plants grown on substrates and soil were on a par.
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1314. **Yield of seven strains of oyster mushrooms (Pleurotus spp.) grown on composted sawdust of Triplochiton scleroxylon.**
Obodai, M; Sawyerr, LCB; and Johnson, PNT
Tropical Science 40(2): 95-99. (2000); ISSN: 0041-3291 [TROSAC]
Descriptors: Pleurotus/ strains/ crop yield/ wet season/ dry season/ composts/ Triplochiton scleroxylon
This citation is from AGRICOLA.

1315. **The yield response of two sweetpotato cultivars grown in bags using different soil amendments.**
Seesahai, A. and Ferguson, T. U.
Tropical Agriculture 75(1/2): 29-34. (1998); ISSN: 0041-3216
Descriptors: amendments/ animal manures/ bagasse/ bulk density/ coir/ crop residues/ cultivars/ fertilizers/ husks/ incorporation/ manures/ rice husks/ sawdust/ soil amendments/ sweet potatoes/ coconut fibre/ cultivated varieties/ hulls/ rice hulls
Abstract: The effects of cattle, chicken and horse manures, sawdust, bagasse, grass, coconut coir, and coffee and rice hulls, and inorganic fertilizer, on soil physical and chemical properties and sweet potato (Ipomoea batatas) yield were examined. Results showed that cv. A28/7 produced a significantly higher tuber yield (254 g plant-1) than cv. 049 (211 g plant-1) but there were no significant differences between cultivars in response to soil amendments. Animal manures, coffee and rice hulls, and inorganic fertilizer significantly increased tuber dry matter yields (241-442 g plant-1) compared to plant manures (35-240 g plant-1). Bulk density was improved with the addition of both animal and plant manures and coffee hull but not with rice hull or inorganic fertilizer. Incorporation of residues with high C:N ratios resulted in reduced yields. Bagasse showed markedly reduced plant growth with chlorotic leaves. It is concluded that animal manures and coffee hulls can improve soil physical and chemical properties and can have beneficial effects on sweet potato tuber yields.

1316. **Yield, size and bacterial blotch resistance of Pleurotus eryngii grown on cottonseed hulls/oak sawdust supplemented with manganese, copper and whole ground soybean.**
Rodriguez Estrada, A. E. and Royse, D. J.
Bioresoure Technology 98(10): 1898-906. (July 2007)
NAL Call #: TD930.A32 ; ISSN: 0960-8524
Descriptors: analysis of variance/ copper: metabolism: pharmacology/ gossypium/ immunity, innate: drug effects: physiology/ manganese: metabolism: pharmacology/ nitrogen: metabolism/ pleurotus: classification: growth & development: metabolism/ pseudomonas: physiology/ quercus/ soybeans: metabolism
Abstract: Experiments were performed to determine effects of supplementation of cottonseed hull/sawdust substrate with Mn, Cu, and ground soybean on yield, mushroom size, and bacterial blotch resistance of two commercial strains of Pleurotus eryngii. A basal formulation (d.w.) of cottonseed hulls (62%), aged red oak sawdust (27%), whole ground soybean (6%), corn distiller's waste (4%) and calcium sulfate (1%) was supplemented to 50, 150 or 250 microg/g Mn or Cu and to 4%, 8% and 12% whole ground soybean. The cottonseed hulls content in the basal substrate was adjusted to compensate for the addition of ground soybean. Formulated substrates were mixed, placed in 1050ml bottles, and sterilized at 121 degrees C for 90min. Mushroom yields were significantly higher from substrates containing Mn at 50 microg/g and soybean at 8% and 12% supplementation compared to the basal substrate. As the level of soybean addition to substrate increased, yield also increased. The addition of Mn at levels of 150 and 250 microg/g significantly enhanced yield as well, although less than did the 50 microg/g treatment. To assess the influence of mushroom strain and substrate composition on blotch disease severity, pilei of P. eryngii were inoculated with Pseudomonas tolaasii. Strain WC888 was more resistant to disease than WC846. Disease severity was greater when substrates were amended with Cu to 150 or 250 microg/g. There was a significant difference in inherent levels of Cu in the basidiomata of different strains, but P. eryngii did not accumulate Cu and disease severity was not correlated with Cu content of the basidiomata.
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