

NAL Call #: TC970.D73--1993

Descriptors: Drainage---Handbooks, manuals, etc/ Irrigation---Handbooks, manuals, etc

This citation is from AGRICOLA.

380. Drainage of irrigated lands: A manual.

Ritzema, H. P.; Kselik, R. A. L.; Chanduvi, Fernando.; and Food and Agriculture Organization of the United Nations.

Rome: Food and Agriculture Organization of the United Nations; viii, 74 p.: ill.; Series: Irrigation water management training manual no. 9. (1996)

Notes: "M-56."--T.p. verso. Includes bibliographical references (p. 73-74).

NAL Call #: S621.R58--1996;

ISBN: 9251037795

Descriptors: Drainage/ Irrigation---Management

This citation is from AGRICOLA.

381. Drainage principles and applications.

International Institute for Land Reclamation and Improvement. Wageningen, Netherlands:

International Institute for Land Reclamation and Improvement; 1125 p.: ill., map; Series: Publication (International Institute for Land Reclamation and Improvement) 16. (1994)

Notes: 2nd ed.; Includes bibliographies and index.

NAL Call #: 54.9--ln8-no.16

Descriptors: Drainage

This citation is from AGRICOLA.

382. Dynamic cropping systems: An adaptable approach to crop production in the Great Plains.

Tanaka, D. L.; Krupinsky, J. M.; Liebig, M. A.; Merrill, S. D.; Ries, R. E.; Hendrickson, J. R.; Johnson, H. A.; and Hanson, J. D.

Agronomy Journal 94 (5): 957-961. (2002)

NAL Call #: 4-AM34P;

ISSN: 0002-1962

This citation is provided courtesy of CAB International/CABI Publishing.

383. Dynamics and availability of the non-exchangeable NH₄-N: A review.

Scherer HW

European Journal of Agronomy 2 (3): 149-160; 115 ref. (1993)

NAL Call #: SB13.E97

This citation is provided courtesy of CAB International/CABI Publishing.

384. Dynamics of leaf litter accumulation and its effects on riparian vegetation: A review.

Xiong ShaoJun and Nilsson, C.

Botanical Review 63 (3): 240-264. (1997)

NAL Call #: 450 B6527 DNAr;

ISSN: 0006-8101

This citation is provided courtesy of CAB International/CABI Publishing.

385. Earthen manure storage design considerations.

Wright, P.; Grajko, W.; Lake, D.; Perschke, S.; Schenne, J.; Sullivan, D.; and Tillapaugh, B.

Ithaca, N.Y.: Natural Resource, Agriculture, and Engineering Service, Cooperative Extension; Series: NRAES 109; ix, 90 p.: ill., map. (1999)
Notes: Includes bibliographical references (p. 90).

NAL Call #: S675-.N72-no.-109;

ISBN: 0935817387 (pbk.)

Descriptors: Farm manure---Storage/ Earth construction

Abstract: Earthen manure storages are becoming more common for economic, environmental, and management reasons, but there is a lack of information about safe, environmentally sound, practical designs. This book was written to meet the needs of producers, engineers, and design professionals who are seeking information about designing, constructing, and managing earthen storages. It covers environmental policies (both existing and pending legislation); design standards and planning documents (such as nutrient management and waste management plans); manure characteristics; storage planning (determining size and location, loading and unloading methods, on-site soils investigations, and regulations); storage design (stability and drainage issues, types of liners, and safety); construction (quality assurance, earthwork, topsoil placement, seeding, and documentation); management (maintaining the structure, clearing drains, and manure management); and liability. A lengthy appendix provides guidelines and calculations for soil liners; other appendixes provide pump information, cost estimate information, and addresses for helpful organizations.

© Natural Resource, Agriculture and Engineering Service (NRAES)

386. Eastern Sierra Nevada riparian field guide.

Weixelman, Dave.; Zamudio, Desiderio C.; and Zamudio, Karen A. Sparks, NV: Humboldt-Toiyabe National Forest; 1 v. (various pagings): ill. (some col.). (1999)
Notes: Humboldt National Forest (Nev.) and Toiyabe National Forest (Nev. and Calif.).

NAL Call #: QH541.5.R52-W436-1999

Descriptors: Riparian ecology---California---Sierra Nevada---Handbooks, manuals, etc/ Riparian ecology---Nevada---Sierra Nevada---Handbooks, manuals, etc
This citation is from AGRICOLA.

387. Ecological approaches and the development of "truly integrated" pest management.

Thomas, M. B.

Proceedings of the National Academy of Sciences 96 (11): 5944-5951. (1999);

ISSN: 0027-8424

Descriptors: Pest control/ Biological control/ Integrated control/ Crop production/ Reviews/ Insecta/ Insects/ Control/ Agricultural & general applied entomology

Abstract: Recent predictions of growth in human populations and food supply suggest that there will be a need to substantially increase food production in the near future. One possible approach to meeting this demand, at least in part, is the control of pests and diseases, which currently cause a 30-40% loss in available crop production. In recent years, strategies for controlling pests and diseases have tended to focus on short-term, single-technology interventions, particularly chemical pesticides. This model frequently applies even where so-called integrated pest management strategies are used because in reality these often are dominated by single technologies (e.g., biocontrol host plant resistance, or biopesticides) that are used as replacements for chemicals. Very little attention is given to the interaction or compatibility of the different technologies used. Unfortunately evidence suggests that such approaches rarely yield satisfactory results and are unlikely to provide sustainable pest control solutions for the future. Drawing on two case histories, this paper demonstrates that by increasing our basic understanding of how individual pest control

technologies act and interact, new opportunities for improving pest control can be revealed. This approach stresses the need to break away from the existing single-technology, pesticide-dominated paradigm and to adopt a more ecological approach built around a fundamental understanding of population biology at the local farm level and the true integration of renewable technologies such as host plant resistance and natural biological control, which are available to even the most resource-poor farmers.

© Cambridge Scientific Abstracts (CSA)

388. Ecological costs of livestock grazing in western North America.

Fleischner, T. L.

Conservation Biology 8 (3): 629-644. (1994)

NAL Call #: QH75.A1C5;

ISSN: 0888-8892

This citation is provided courtesy of CAB International/CABI Publishing.

389. Ecological forecasting and the urbanization of stream ecosystems: Challenges for economists, hydrologists, geomorphologists, and ecologists.

Nilsson, C.; Pizzuto, J. E.; Moglen, G. E.; Palmer, M. A.; Stanley, E. H.; Bockstael, N. E.; and Thompson, L. C.

Ecosystems 6 (7): 659-674. (2003)

NAL Call #: QH540.E3645;

ISSN: 1432-9840.

Notes: Number of References: 117;

Publisher: Springer-Verlag

Descriptors: Environment/ Ecology/ land use change/ ecological forecasts/ limitations of modeling/ streams/ urbanization/ watersheds/ urban land use/ headwater streams/ water resources/ riparian zones/ flow/ management/ nitrogen/ rivers/ cover/ sediment

Abstract: The quantity and quality of freshwater resources are now being seriously threatened, partly as a result of extensive worldwide changes in land use, and scientists are often called upon by policy makers and managers to predict the ecological consequences that these alterations will have for stream ecosystems. The effects of the urbanization of stream ecosystems in the United States over the next 20 years are of particular concern. To address this issue, we present a multidisciplinary research agenda designed to improve our

forecasting of the effects of land-use change on stream ecosystems. Currently, there are gaps in both our knowledge and the data that make it difficult to link the disparate models used by economists, hydrologists, geomorphologists, and ecologists. We identify a number of points that practitioners in each discipline were not comfortable compromising on-for example, by assuming an average condition for a given variable. We provide five instructive examples of the limitations to our ability to forecast the fate of stream and riverine ecosystems one drawn from each modeling step: (a) Accurate economic methods to forecast land-use changes over long periods (such as 20 years) are not available, especially not at spatially explicit scales; (b) geographic data are not always available at the appropriate resolution and are not always organized in categories that are hydrologically, ecologically, or economically meaningful; (c) the relationship between low flows and land use is sometimes hard to establish in anthropogenically affected catchments; (d) bed mobility, suspended sediment load, and channel form-all of which are important for ecological communities in streams-are difficult to predict; and (e) species distributions in rivers are not well documented, and the data that do exist are not always publicly available or have not been sampled at accurate scales, making it difficult to model ecological responses to specified levels of environmental change. Meeting these challenges will require both interdisciplinary cooperation and a reviewed commitment to intradisciplinary research in the fields of economics, geography, quantitative spatial analysis, hydrology, geomorphology, and ecology.

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390. Ecological impacts of arable intensification in Europe.

Stoate, C.; Boatman, N.; Borralho, R.; Carvalho, C.; Snoo, G.; and Eden, P.

Journal of environmental management 63 (4): 337-365. (2001)

NAL Call #: HC75.E5J6;

ISSN: 0301-4797.

Notes: Publisher: Academic Press

Descriptors: Agricultural practices/ Land use/ Agriculture/ Environmental impact/ Crops/ Biological diversity/ Soil contamination/ Groundwater

pollution/ Air pollution/ Ecology/ Europe/ Agricultural Runoff/ Cultivated Lands/ Soil Erosion/ Water Pollution Sources/ Surface Runoff/ Nutrients/ Pesticides/ Farms/ Organic Matter/ Environmental Quality/ Agricultural pollution/ Community composition/ Man induced effects/ Ecosystem disturbance/ Ecological crisis/ Biodiversity/ Pollution effects/ Nutrients (mineral)/ Eutrophication/ Europe/ arable landscapes/ Cultivated lands/ farms/ Environmental degradation / Environmental action/ Sources and fate of pollution/ Mechanical and natural changes

Abstract: Although arable landscapes have a long history, environmental problems have accelerated in recent decades. The effects of these changes are usually externalised, being greater for society as a whole than for the farms on which they operate, and incentives to correct them are therefore largely lacking. Arable landscapes are valued by society beyond the farming community, but increased mechanisation and farm size, simplification of crop rotations, and loss of non-crop features, have led to a reduction in landscape diversity. Low intensity arable systems have evolved a characteristic and diverse fauna and flora, but development of high input, simplified arable systems has been associated with a decline in biodiversity. Arable intensification has resulted in loss of non-crop habitats and simplification of plant and animal communities within crops, with consequent disruption to food chains and declines in many farmland species. Abandonment of arable management has also led to the replacement of such wildlife with more common and widespread species. Soils have deteriorated as a result of erosion, compaction, loss of organic matter and contamination with pesticides, and in some areas, heavy metals. Impacts on water are closely related to those on soils as nutrient and pesticide pollution of water results from surface runoff and subsurface flow, often associated with soil particles, which themselves have economic and ecological impacts. Nitrates and some pesticides also enter groundwater following leaching from arable land. Greatest impacts are associated with simplified, high input arable systems. Intensification of arable farming has been associated with pollution of air by pesticides, NO sub(2)and CO sub(2), while the loss

of soil organic matter has reduced the system's capacity for carbon sequestration. Copyright 2001 Academic Press
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391. Ecological implications of using thresholds for weed management.

Norris, R. F.

Journal of Crop Production 2 (1): 31-58. (1999)

NAL Call #: SB1.J683;

ISSN: 1092-678X [JCPRF8].

Notes: Special issue: Expanding the context of weed management / edited by Douglas D. Buhler.

Includes references.

Descriptors: weeds/ weed control/ integrated pest management/ environmental assessment/ tolerance/ crop weed competition/ decision making/ insect pests/ population dynamics/ economic analysis/ yield losses/ seed banks/ plant density/ seed output/ establishment/ literature reviews/ economic thresholds
This citation is from AGRICOLA.

392. Ecological issues related to wetland preservation, restoration, creation and assessment.

Whigham, Dennis F

Science of the Total Environment 240 (1-3): 31-40. (1999)

NAL Call #: RA565.S365;

ISSN: 0048-9697

Descriptors: ecologically based Hydrogeomorphic approach/ wetland assessment/ wetland creation/ wetland ecosystem function/ wetland-no-net-loss policy/ wetland preservation/ wetland restoration

Abstract: A wide range of local, state, federal, and private programs are available to support the national (USA) policy of wetland 'No Net Loss'. Implementation of programs, however, has resulted in the continued loss of natural wetlands on the premise that restored or created wetlands will replace the functions and values lost by destruction of natural wetlands. What are the ecological implications and consequences of these programs from a biodiversity and ecosystem perspective? From a biodiversity perspective, ongoing wetland protection policies may not be working because restored or created wetlands are often very different from natural wetlands. Wetland protection policies may also be inadequate to preserve

and restore ecological processes such as nutrient cycling because they mostly focus on individual wetlands and ignore the fact that wetlands are integral parts of landscapes. Wetland mitigation projects, for example, often result in the exchange of one type of wetland for another and result in a loss of wetland functions at the landscape level. The most striking weakness in the current national wetlands policy is the lack of protection for 'dry-end' wetlands that are often the focus of debate for what is and what is not a wetland. From an ecological perspective, dry-end wetlands such as isolated seasonal wetlands and riparian wetlands associated with first order streams may be the most important landscape elements. They often support a high biodiversity and they are impacted by human activities more than other types of wetlands. The failings of current wetland protection and mitigation policies are also due, in part, to the lack of ecologically sound wetland assessment methods for guiding decision making processes.

The ecologically based Hydrogeomorphic (HGM) approach to wetland assessment has the potential to be an effective tool in managing biodiversity and wetland ecosystem function in support of the national 'No Net Loss' policy.

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393. Ecological management of vertebrate pests in agricultural systems.

Van Vuren, D. and Smallwood, K. S. *Biological Agriculture and Horticulture* 13 (1): 39-62. (1996)

NAL Call #: S605.5.B5;

ISSN: 0144-8765 [BIAHDP]

Descriptors: vertebrate pests/ pest management/ farming systems/ sustainability/ control methods/ literature reviews

This citation is from AGRICOLA.

394. Ecological relative risk (EcoRR): Another approach for risk assessment of pesticides in agriculture.

Sanchez-Bayo, F.; Baskaran, S.; and Kennedy, I. R.

Agriculture, Ecosystems and Environment 9 (1/3): 37-57. (Sept. 2002)

NAL Call #: S601 .A34;

ISSN: 0167-8809 [AEENDO]

Descriptors: gossypium hirsutum/ environmental impact/ risk

assessment/ pesticides/ toxicity/ application rates/ evaluation/ persistence/ residual effects/ water/ sediment/ soil/ vegetation/ air/ simulation models

Abstract: Summary: A site-specific methodology was developed to assess and compare the ecotoxicological risk that agricultural pesticides pose to ecosystems. The ecological relative risk (EcoRR) is a composite scoring index for comparing relative risks between different plant protection products, and is used to assess the potential ecological impact their residues have after being applied to agricultural systems. The EcoRR model is based on standard frameworks for risk assessment (e.g. PEC/toxicity), but takes account of factors such as persistence of residues and biodiversity of ecosystems. The exposure module considers the environmental concentrations of a substance, its persistence, bioaccumulation and probability of exposure in several environmental compartments (water, sediment, soil, vegetation, air). The toxicity module takes into account the biodiversity of the ecosystems affected, whereby the endpoints used are weighted by the proportional contribution of each taxon in a given environmental compartment. EcoRR scores are calculated independently for each compartment and affected areas, thus enabling pinpointing of where risks will occur. The procedure to calculate EcoRR scores is explained using an example, and a sensitivity analysis of the model is included. A simulated risk assessment of 37 pesticides intended for use in a cotton development is also given as a case study. Exposure data were obtained using fugacity model II in areas previously defined by spray drift models. Toxicity data to vertebrate taxa and crustaceans were obtained from several databases, and biodiversity data from local sources. EcoRR scores were calculated for each compartment both on- and off-farm, during a normal growing season and during a flood, and a comparative relative assessment for all pesticides is discussed. EcoRR scores were also compared to traditional assessments using quotients for some taxa in the aquatic and terrestrial environments, revealing a good correlation between both models in some cases. It is apparent that EcoRR scores reflect adequately the potential risk of those

chemicals to ecosystems, though they are less dependent on toxicity to sensitive species than the simple quotient. This methodology can be used either with field measured data or model predicted data, so management options for new chemicals can be tested prior to their application on crops.

This citation is from AGRICOLA.

395. Ecological restoration and creation: A review.

Anderson, P.

Biological Journal of the Linnean Society 56 (suppl.A): 187-211. (Dec. 1995)

NAL Call #: QH301.B56;
ISSN: 0024-4066 [BJLSBG].

Notes: Special issue: The National Trust and Nature Conservation--100 years on / edited by D.J. Bullock and H.J. Harvey. Proceedings of a conference held June 20-21, 1994, London, England.

Includes references.

Descriptors: nature conservation/ wildlife conservation/ nature reserves/ habitat destruction/ grasslands/ heathland/ woodlands/ vegetation management/ grazing/ mowing/ prescribed burning/ literature reviews/ Europe/ habitat restoration/ habitat creation

This citation is from AGRICOLA.

396. Ecological risk assessment for aquatic organisms from over-water uses of glyphosate.

Solomon, Keith R and Thompson, Dean G

Journal of Toxicology and Environmental Health: Part B, Critical Reviews 6 (3): 289-324. (2003)

NAL Call #: RA565.A1J6;
ISSN: 1093-7404

Descriptors: Induce: pesticide, surfactant/ Roundup: pesticide, surfactant/ Vision: pesticide, surfactant / X 77: pesticide, surfactant, toxin/ glyphosate [Rodeo formulation]: accidental overspray, efficacy, enzyme inhibitor, herbicide, over water uses, soil pollutant, toxicodynamics, toxicokinetics, toxin, water pollutant/ estuary/ forestry area/ pond/ sediment/ soil/ stream/ water bodies/ wetland

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397. Ecology and integrated pest management.

Lenteren, J C van and Overholt, W A
Insect Science and its Application 15 (6): 557-582. (1994)

NAL Call #: QL461.I57;
ISSN: 0191-9040

Descriptors: animals (Animalia Unspecified)/ Animalia (Animalia Unspecified)/ animals/ behavior/ ecology/ integrated pest management/ pest/ pest management/ pesticides/ population dynamics

Abstract: The struggle to control Populations of organisms that feed on agricultural crops, livestock, and directly on humans is as old as recorded history, and will continue into the perceivable future. Only 30 years ago, the availability of relatively cheap and highly effective synthetic organic pesticides was thought to be the ultimate solution to pest populations. However, our naivete regarding the ability of pest Populations to rapidly adapt to simplistic man-induced selection pressures has become increasingly apparent, as have the detrimental impacts of pesticides on the environment. The evolution of the integrated pest management paradigm can be traced to these concerns, and it is now accepted that sustainable solutions to the management of pest populations will only be borne out of an increased understanding of the functioning of ecosystems. Knowledge of the population dynamics, and underlying causes of density changes in pest populations, behavioural ecology, and population genetics of pests and natural enemies, are essential elements for designing appropriate biologically intensive strategies for pest management. Progress is being made, and several examples of innovative strategies and promising areas of research, are discussed. Future work must continue to be based on a solid foundation of ecological understanding, to avoid the pitfalls of simple opportunistic solutions.

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398. Ecology and management of Arundo donax, and approaches to riparian habitat restoration in southern California.

Bell, G. P.

In: Plant invasions studies from North America and Europe/ Brock, J. H.; Wade, M.; Pysek, P.; and Green, D. Leiden, Netherlands: Backhuys, 1997; pp. 103-113.

ISBN: 9073348234

NAL Call #: SB613.5.P582-1997

Descriptors: arundo donax/ ecology/ weed control/ habitats/ riparian vegetation/ riparian forests/ plant succession/ wildfires/ water quality/ rivers/ plant competition/ wildlife/ species diversity/ competitive ability/ asexual reproduction/ integrated pest management/ glyphosate/ literature reviews/ California

This citation is from AGRICOLA.

399. Ecology of insect communities in nontidal wetlands.

Batzer, D. P. and Wissinger, S. A.

Annual Review of Entomology 41: 75-100. (1996)

NAL Call #: 421-An72;
ISSN: 0066-4170 [ARENA]

Descriptors: insects/ wetlands/ community ecology/ habitats/ interactions/ colonization/ nature conservation/ insect communities/ reviews/ freshwater ecology

This citation is from AGRICOLA.

400. The ecology of interfaces: Riparian zones.

Naiman, R. J. and Decamps, H.

Annual Review of Ecology and Systematics 28: 621-658. (1997);
ISSN: 0066-4162

This citation is provided courtesy of CAB International/CABI Publishing.

401. Ecology of wetlands and associated systems.

Majumdar, Shyamal K.; Miller, E.

Willard; and Brenner, Fred J. Easton, PA: Pennsylvania Academy of Science; xv, 685 p.: ill., maps. (1998)

NAL Call #: QH541.5.M3E38-1998;
ISBN: 094580914X

Descriptors: Wetland ecology/ Wetlands

This citation is from AGRICOLA.

402. The economic and environmental consequences of nutrient management in agriculture.

Huang, Wen Yuan. and Uri, Noel D.

Commack, N.Y.: Nova Science; viii, 174 p. (1999)

NAL Call #: S651-.H826-1999;
ISBN: 1560727543

Descriptors: Nitrogen fertilizers/ Nitrogen fertilizers---Environmental aspects

This citation is from AGRICOLA.

403. Economic and environmental contribution of wetlands in agricultural landscapes.

Janssen, Larry.
Brookings, S.D.: Economics Dept., South Dakota State University; ii, 34 p.: ill.; Series: Economic staff paper series no. 95-3. (1995)
Notes: "May 1995." Includes bibliographical references (p. 19-21).
NAL Call #: HD1775.S8E262--no.95-3
This citation is from AGRICOLA.

404. Economic and environmental contributions of wetlands in agricultural landscapes.

Janssen, Larry. and South Dakota State University. Economics Dept. Brookings, S.D.: Economics Dept. South Dakota State University; ii, 35 p.: ill., map; Series: Economics staff paper series 95-3. (1995)
Notes: "Revised July 1995." Includes bibliographical references (p. 19-21).
NAL Call #: HD1775.S8E262--no.95-3-1995
Descriptors: Wetlands---South Dakota/ Wetland conservation---South Dakota/ Wetland ecology---South Dakota
This citation is from AGRICOLA.

405. Economic evaluation of manure management and farm gate applications: A literature review of environmental and economic aspects of manure management in Alberta's livestock sectors.

Unterschultz, James R.
Edmonton, Canada: Dept. of Rural Economy, Faculty of Agriculture & Forestry, and Home Economics, University of Alberta; 64 p.: ill.; Series: Project report (University of Alberta. Dept. of Rural Economy) 01-03. (2001)
Notes: Includes bibliographical references (p. 35-43).
NAL Call #: HD1790.A35-P76-no.-2001-03
This citation is from AGRICOLA.

406. Economics and environmental benefits and costs of conservation tillage.

United States. Dept. of Agriculture. Economic Research Service and United States. Natural Resources Conservation Service.
Washington, DC: ERS, USDA; vi, 88 leaves: col. ill., col. maps. (1998)
Notes: Cover title. "February 1998"--P. [i]. Includes bibliographical references.
NAL Call #: aS604-.E26-1998

Descriptors: Conservation tillage---Environmental aspects/ Conservation tillage---Economic aspects
This citation is from AGRICOLA.

407. Economics of dryland cropping systems in the Great Plains: A review.

Dhuyvetter, K. C.; Thompson, C. R.; Norwood, C. A.; and Halvorson, A. D.
Journal of Production Agriculture 9 (2): 216-222. (1996)
NAL Call #: S539.5.J68;
ISSN: 0890-8524
This citation is provided courtesy of CAB International/CABI Publishing.

408. The economics of prescribed burning: A research review.

Hesseln, H.
Forestry Sciences 46 (3): 322-334. (Aug. 2000)
NAL Call #: 99.8-F7632;
ISSN: 0015-749X [FOSCAD]
Descriptors: prescribed burning/ wildfires/ risk factors/ economic analysis/ literature reviews/ fire management/ risk management
This citation is from AGRICOLA.

409. Ecosystems, sustainability, and animal agriculture.

Heitschmidt, R. K.; Short, R. E.; and Grings, E. E.
Journal of Animal Science 74 (6): 1395-1405. (June 1996)
NAL Call #: 49-J82;
ISSN: 0021-8812 [JANSAG].
Notes: Presented at a symposium titled "Toward Sustainability: Animal Agriculture in the Twenty-First Century" at the ASAS 86th Annu. Mtg., Minneapolis, MN. Includes references.
Descriptors: beef cattle/ animal production/ sustainability/ input output analysis/ ecological balance/ energy relations/ energy expenditure/ feed intake/ grazing/ dry lot feeding/ irrigated farming/ alfalfa hay/ maize silage/ barley/ pastures/ body weight/ body protein/ body fat/ calving rate
Abstract: The long-term sustainability of animal agriculture is examined in an ecological context. As an aid to defining agriculture, animal agriculture, and sustainable agriculture, a broad overview of the structural and functional aspects of ecosystems is presented. Energy output/cultural energy input ratios were then calculated for 11 beef cattle management systems as relative measures of their long-term sustainability. Energy output was

estimated by direct conversion of whole body mass of steers to caloric values. Cultural energy inputs were estimated using published forage and cereal grain production budgets in combination with estimated organic matter intakes. Cultural energy inputs included raw materials, manufacturing, distribution, maintenance, and depreciation of all equipment and products used in a 250-animal cow-calf farm/ranch operation. Management systems evaluated included 1) spring calving with slaughter beginning at either weaning (age of calf approximately 6 mo) or after 84, 168, or 252 d in postweaning finishing lot; 2) spring calving with slaughter beginning at about 18 mo of age after either 0, 42, 84, or 126 d in finishing lot; and 3) fall calving with slaughter beginning at about 14 mo of age after either 63, 126, or 189 d in finishing lot. Estimate efficiencies were < 1.0 in all treatments, even wine: assumed marketed calf crop was 100%. Product energy output/cultural energy input ratios ranged from a high of .40 in the spring calving leads to stocker leads to 126 d in finishing lot treatment to a low of .23 in the spring calving leads to slaughter at weaning treatment. The low levels of efficiency were found to be largely the result of the interaction effects of the high levels of culture energy required to maintain a productive cow herd and grow and finish calves in the rather harsh environment of the Northern Great Plains. Result pointedly reveal the high level of dependency of the U.S. beef cattle industry on fossil fuels. These finding in turn bring into question the ecological and economic risks associated with the current technology driving North American animal agriculture.
This citation is from AGRICOLA.

410. Ecotoxicity tests for compost applications.

Kapanen, A and Itavaara, M
Ecotoxicology and Environmental Safety 49 (1): 1-16. (2001)
NAL Call #: QH545.A1E29;
ISSN: 0147-6513
Descriptors: enzymes/ microbe (Microorganisms)/ plant (Plantae)/ Microorganisms/ Plants/ biodegradation/ composted material toxicity/ soil fauna
Abstract: Interest in the ecological effects of composting has been

growing recently. However, no established methods are available for testing the toxicity of composted materials. Despite this, international and national quality requirements define that compost shall not contain any environmentally harmful substances. Safety requirements have to be fulfilled if the produced compost is intended for agricultural use. This literature review focuses on methods that could potentially be used to evaluate the ecotoxicity of compost. The toxicity test methods discussed are those employing microbes, enzymes, soil fauna, and plants.

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411. Ecotoxicological risk assessment of soil fauna recovery from pesticide application.

Straalen, N. M. van. and Rijn, J. P. van
Reviews of Environmental Contamination and Toxicology 154: 83-141. (1998)

NAL Call #: TX501.R48;

ISSN: 0179-5953 [RCTOE4]

Descriptors: soil fauna/ pesticides/ toxicology/ risk assessment / literature reviews

This citation is from AGRICOLA.

412. Ecotoxicology and Wetland Ecosystems: Current Understanding and Future Needs.

Catalo, W. J.
Environmental Toxicology and Chemistry 12 (12): 2209-2224. (1993)
NAL Call #: QH545.A1E58;
ISSN: 0730-7268

Descriptors: wetlands/ contaminants/ ecosystem analysis/ toxins/ ecosystems/ pollutants/ environmental policy/ aquatic environment/ literature reviews/ ecotoxicology/ Wetlands/ Sources and fate of pollution/ Freshwater pollution/ Pollution Environment

Abstract: The term wetlands refers to a mosaic of important ecosystems that typically form transition zones between uplands and aquatic environments. These areas provide support functions for natural and living resources and mediate biogeochemical transformations of global significance. It is becoming clear that the introduction of toxic and other contaminants to large wetland areas has contributed to a series of undesirable trends in habitat quality; availability of valuable fish and wildlife; and quality of associated

resources, including surface and ground waters. The purpose of this review is to indicate the importance of wetlands to regional and global ecology and discusses research on the effects of contaminants in wetland ecosystems. Areas of needed future research also are suggested.

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413. Effect of Agricultural Production on the Chemistry of Natural Waters: A Survey.

Khilchevskiy, V. K.
Hydrobiological Journal / Gidrobiologicheskii Zhurnal 29/30 (1): 82-93. (1994);
ISSN: 0018-8166

Descriptors: literature reviews/ agricultural pollution/ water pollution/ agricultural runoff/ literature review/ natural waters/ geochemistry/ nonpoint pollution sources/ erosion/ nonpoint pollution/ Characteristics, behavior and fate/ Sources and fate of pollution/ Freshwater pollution

Abstract: The effect of agriculture on the chemical composition of natural waters is surveyed, focusing on the factors through which it acts (chemical melioration, use of pesticides, hydromelioration), the sources of pollution (surface runoff from nonirrigated farming, drainage from reclaimed lands, effluent from livestock-raising farms) and the role of erosion.

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414. Effect of animal production on environment.

Vondraskova S
Studijni Informace Zivocisna Vyroba 3: 1-31. (1998)

This citation is provided courtesy of CAB International/CABI Publishing.

415. Effect of Land Development and Forest Management on Hydrologic Response in Southeastern Coastal Wetlands: A Review.

Richardson, C. J. and McCarthy, E. J.
Wetlands 14 (1): 56-71. (1994)
NAL Call #: QH75.A1W47;
ISSN: 0277-5212

Descriptors: forest industry/ land use/ hydrology/ United States, Southeast/ wetlands/ literature reviews/ United States, North Carolina/ resource management/ runoff/ evapotranspiration/ environmental impact/ land development/ forest

management/ hydrologic models/ environmental effects/ forest management/ Mechanical and natural changes/ Ecosystems and energetics/ Freshwater pollution/ Effects on water of human nonwater activities/ Environmental degradation

Abstract: Land development activities such as agriculture, clear cutting, peat mining, and the planting of forest plantations on wetlands can affect the hydrologic behavior of these ecosystems by affecting their water storage and release patterns on the landscape. The effects of these development activities on hydrologic fluxes in peatlands (Typic Medisaprists) were compared to the effects of forest management practices in North Carolina using a field-tested hydrologic simulation model (DRAINMOD). Simulations revealed that natural peat-based (Histosol) pocosin systems lose 66% (80 cm) of the 123 cm of average annual rainfall by evapo-transpiration (ET) and 34% (42 cm/yr) via annual runoff. Annual runoff values were 63 cm/yr for peat mining areas, 48 cm/yr for cleared peatlands, 46 cm/yr for peatlands converted to agriculture and 34 cm/yr for pine plantations, once the forest canopy is closed. Thus, these wetlands alterations, except for forestry, significantly increased runoff and decreased ET compared to the natural ecosystem. Forest pine plantation management decreased runoff and increased ET. A case study of the effects of forest management practices was reviewed for a 15-year-old drained loblolly pine plantation growing on fine sandy loam soils (Thermic Typic umbraquults) in the coastal plains of North Carolina. Forestry activities such as thinning (i.e., reduced leaf area index by 50%) decreased ET and canopy interception and nearly doubled drainage loss (38 cm/yr to 60 cm/yr). Commonly applied forest practices, such as drainage, increased the average number of flow events with flows > 5 mm/day to 86 days per year from 26 days per year under natural conditions.

© Cambridge Scientific Abstracts (CSA)

416. The Effect of Macroenthos on the Mass Exchange at the Water-Sediment Interface (Review).

Brekhovskikh, V. F. and Vishnevskaya, G. N.
Water Resources / Vodnye Resursy 21 (3): 301-307. (1994);
ISSN: 0097-8078

Descriptors: Erosion and sedimentation/ Geochemistry of sediments

Abstract: The effect of macroenthos on the mass exchange at the water-sediment interface is considered. Evidence is presented on the intensification of mass exchange processes in the presence of benthos organisms, specifically, an increase in the dissolved substance fluxes through the water-sediment interface, the oxygen consumption by the sediment, as well as the washout of bound bottom material.

© Cambridge Scientific Abstracts (CSA)

417. Effect of milk yield level and feeding systems on N excretion in dairy cows.

Delaby L; Peyraud JL; and Verite R. In: *Zemes rencontres autour des recherches sur les ruminants.* (Held 13 1995 at Paris, France.); pp. 349-353; 1995.

Notes: 10 ref.

This citation is provided courtesy of CAB International/CABI Publishing.

418. Effect of phytase on production parameters and nutrient availability in broilers and laying hens: A review.

Hatten, L. F.; Ingram, D. R.; and Pittman, S. T.

Journal of Applied Poultry Research 10 (3): 274-278. (Fall 2001)

NAL Call #: SF481.J68;

ISSN: 1056-6171

Descriptors: broilers / hens/ phytase/ nutrient availability/ poultry manure/ nutrient content/ phosphorus/ leaching/ runoff/ excretion/ water pollution/ feed additives/ cations/ calcium/ magnesium/ zinc/ copper/ nitrogen/ proteinases/ phytic acid/ literature reviews

This citation is from AGRICOLA.

419. Effect of soil properties and water quality on concentrated flow erosion (rills, ephemeral gullies and pipes).

Bradford, J. M.; Shainberg, I.; Norton, L. D.; and United States-Israel Binational Agricultural Research and

Development Fund.

Bet Dagan, Israel: BARD; 1 v.

(various pagings): ill. (1996)

Notes: Final report. Project no. US-2039-91. Includes bibliographical references.

NAL Call #: S623.B69--1996

Descriptors: Soil erosion

This citation is from AGRICOLA.

420. Effect of Stream Channel Size on the Delivery of Nitrogen to the Gulf of Mexico: Nature.

Alexander, R. B.; Smith, R. A.; and Schwarz, G. E.

Macmillan Journals, 2000.

http://water.usgs.gov/nawqa/sparrow/nature/nature_alexetal.pdf (preprint)

NAL Call #: TD223.5-.A64-2000

Descriptors: Water---Nitrogen content---Environmental aspects---Mexico, Gulf of/ Eutrophication---Control---Mexico, Gulf of/ Hypoxia---Water---Mexico, Gulf of/ Agricultural chemicals---Environmental aspects---Mexico, Gulf of / Water Pollution---Environmental aspects---Mexico, Gulf of/ Rivers---Environmental aspects---Mexico, Gulf of/ Stream flow---Environmental aspects---Mexico, Gulf of/ Nitrogen/ Electronic publications/ Government publications/ Basins---Geology/ Mexico, Gulf of---Channels/ Mexico, Gulf of/ United States Dept of the Interior---Geological Survey

Abstract: The U.S. Geological Survey (USGS) presents the article entitled "Effect of Stream Channel Size on the Delivery of Nitrogen to the Gulf of Mexico," written by Richard B. Alexander, Richard A. Smith, and Gregory E. Schwarz. This paper offers an analysis of data from 374 U.S. monitoring stations that shows a rapid decline in the average first-order rate of nitrogen loss with channel size. The authors find that the closeness of sources to large streams and rivers is an important determinant of nitrogen delivery to the estuary in the Mississippi basin.

This citation is from AGRICOLA.

421. The effectiveness and restoration potential of riparian ecotones for the management of nonpoint source pollution, particularly nitrate.

Fennessy, M S and Cronk, J K
Critical Reviews in Environmental Science and Technology 27 (4): 285-317. (1997)

NAL Call #: QH545.A1C7;

ISSN: 1064-3389

Descriptors: carbon/ nitrate: loading,

pollutant, removal, uptake/ nutrients: surface retention/ channel morphology/ denitrification/ land use/ nitrogen cycling/ nonpoint source pollution/ restoration potential/ riparian ecotones/ seasonal dynamics/ stream vegetation/ subsurface flow/ surface water contamination/ terrestrial systems/ water quality

© Thomson

422. Effects of agricultural diversification on the abundance, distribution, and pest control potential of spiders: A review.

Sunderland, K. and Samu, F.

Entomologia Experimentalis et Applicata 1: 1-13. (2000);

ISSN: 0013-8703

Descriptors: Population density/ Population dynamics/ Agricultural practices/ Pest control/ Araneae/ Agricultural & general applied entomology

Abstract: A review of the literature showed that spider abundance was increased by diversification in 63% of studies. A comparison of diversification modes showed that spider abundance in the crop was increased in 33% of studies by 'aggregated diversification' (e.g. intercropping and non-crop strips) and in 80% of studies by 'interspersed diversification' (e.g., undersowing, partial weediness, mulching and reduced tillage). It is suggested that spiders tend to remain in diversified patches and that extending the diversification throughout the whole crop (as in interspersed diversification) offers the best prospects for improving pest control. There is little evidence that spiders walk in significant numbers into fields from uncultivated field edges, but diversification at the landscape level serves to foster large multi-species regional populations of spiders which are valuable as a source of aerial immigrants into newly planted crops. There are very few manipulative field studies where the impact of spiders on pests has been measured in diversified crops compared with undiversified controls. It is encouraging, however, that in those few studies an increased spider density resulted in improved pest control. Future work needs are identified.

© Cambridge Scientific Abstracts (CSA)

423. Effects of atmospheric ammonia (NH₃) on terrestrial vegetation: A review.

Krupa, S. V.

Environmental Pollution 124 (2): 179-221. (2003)

NAL Call #: QH545.A1E52;

ISSN: 0269-7491.

Notes: Number of References: 327

Descriptors: ammonia/ effects/ terrestrial vegetation/ ecosystems/ critical levels/ critical loads/ pine/ *Pinus sylvestris*/ *Vulgaris* l hull/ young coniferous trees/ long term exposure/ root zone acidity/ bound amino acids/ *Arnica Montana* l/ *Flexuosa* l trin/ nitrogen deposition/ air pollution

Abstract: At the global scale, among all N (nitrogen) species in the atmosphere and their deposition on to terrestrial vegetation and other receptors, NH₃ (ammonia) is considered to be the foremost. The major sources for atmospheric NH₃ are agricultural activities and animal feedlot operations, followed by biomass burning (including forest fires) and to a lesser extent fossil fuel combustion. Close to its sources, acute exposures to NH₃ can result in visible foliar injury on vegetation. NH₃ is deposited rapidly within the first 4-5 km from its source. However, NH₃ is also converted in the atmosphere to fine particle NH₄⁺ (ammonium) aerosols that are a regional scale problem. Much of our current knowledge of the effects of NH₃ on higher plants is predominantly derived from studies conducted in Europe. Adverse effects on vegetation occur when the rate of foliar uptake of NH₃ is greater than the rate and capacity for in vivo detoxification by the plants. Most to least sensitive plant species to NH₃ are native vegetation > forests > agricultural crops. There are also a number of studies on N deposition and lichens, mosses and green algae. Direct cause and effect relationships in most of those cases (exceptions being those locations very close to point sources) are confounded by other environmental factors, particularly changes in the ambient SO₂ (Sulfur dioxide) concentrations. In addition to direct foliar injury, adverse effects of NH₃ on higher plants include alterations in: growth and productivity, tissue content of nutrients and toxic elements, drought and frost tolerance, responses to insect pests and disease causing microorganisms (pathogens), development of beneficial root symbiotic or mycorrhizal associations

and inter species competition or biodiversity. In all these cases, the joint effects of NH₃ with other air pollutants such as all-pervasive O₃ or increasing CO₂ concentrations are poorly understood. While NH₃ uptake in higher plants occurs through the shoots, NH₄⁺ uptake occurs through the shoots, roots and through both pathways. However, NH₄⁺ is immobile in the soil and is converted to NO₃⁻ (nitrate). In agricultural systems, additions of NO₃⁻ to the soil (initially as NH₃ or NH₄⁺) and the consequent increases in the emissions of N₂O (nitrous oxide, a greenhouse gas) and leaching of NO₃⁻ into the ground and surface waters are of major environmental concern. At the ecosystem level NH₃ deposition cannot be viewed alone, but in the context of total N deposition. There are a number of forest ecosystems in North America that have been subjected to N saturation and the consequent negative effects. There are also heathlands and other plant communities in Europe that have been subjected to N-induced alterations. Regulatory mitigative approaches to these problems include the use of N saturation data or the concept of critical loads. Current information suggests that a critical load of 5-10 kg ha⁻¹ year⁻¹ of total N deposition (both dry and wet deposition combined of all atmospheric N species) would protect the most vulnerable terrestrial ecosystems (heaths, bogs, cryptogams) and values of 10-20 kg ha⁻¹ year⁻¹ would protect forests, depending on soil conditions. However, to derive the best analysis, the critical loa (C) 2002 Elsevier Science Ltd. All rights reserved. © Thomson ISI

424. Effects of Disturbance on Birds of Conservation Concern in Eastern Oregon and Washington.

Bull, E. L. and Wales, B. C.

Northwest Science 75 ([supplement]): 166-173. (2001)

NAL Call #: 470-N81;

ISSN: 0029-344X

Descriptors: Reviews/ Disturbance/ Rare species/ Conservation/ Fires/ Roads/ Human impact/ Forest management/ Aves/ *Haliaeetus leucocephalus*/ *Falco peregrinus*/ *Histrionicus histrionicus*/ *Bartramia longicauda*/ *Accipiter gentilis*/ *Buteo regalis*/ *Leucosticte atrata*/ *Pinus*

ponderosa/ United States, Washington/ United States, Oregon/ Birds/ Bald eagle/ Peregrine falcon/ Harlequin duck/ Upland sandpiper/ Northern goshawk/ Ferruginous hawk/ Black Rosy finch/ Ponderosa Pine/ Management

Abstract: The effects on birds of forest insects, tree diseases, wildfire, and management strategies designed to improve forest health (e.g., thinning, prescribed burns, road removal, and spraying with pesticides or biological microbial agents) are discussed. Those bird species of concern that occur in forested habitats in eastern Oregon and Washington include the bald eagle (*Haliaeetus leucocephalus*), peregrine falcon (*Falco peregrinus*), harlequin duck (*Histrionicus histrionicus*), upland sandpiper (*Bartramia longicauda*), northern goshawk (*Accipiter gentilis*), ferruginous hawk (*Buteo regalis*), and black rosy finch (*Leucosticte arctoa*). In addition, seven species of woodpeckers and nuthatches were considered because of their rare status. Forest disturbances that create dead trees and logs are critical to cavity-nesting birds because the dead trees with their subsequent decay provide nesting and roosting habitat. The insects associated with outbreaks or dead trees provide prey for the woodpeckers and nuthatches. The loss of nest or roost trees as a result of disturbance could be detrimental to bald eagles, goshawks, or ferruginous hawks, while the loss of canopy cover could be detrimental to harlequin ducks and goshawks or to prey of some of the raptors. The more open canopies created by thinning may be beneficial to a species like the black rosy finch, yet detrimental to some woodpeckers due to a decrease in cover. Prescribed burning may be beneficial to those woodpeckers primarily associated with ponderosa pine (*Pinus ponderosa*) stands and detrimental to other woodpeckers because of the loss of coarse woody debris. Removal of roads is likely to benefit most of these species because of the subsequent decrease in human activity. Recovery plans for bald eagles and peregrine falcons are available for managers to use in managing habitat for these species. © Cambridge Scientific Abstracts (CSA)

425. Effects of forest management on soil C and N storage: Meta analysis.

Johnson, D. W. and Curtis, P. S. *Forest Ecology and Management* 140 (2/3): 227-238. (Jan. 2001)
 NAL Call #: SD1.F73;
 ISSN: 0378-1127 [FECMDW]
Descriptors: forest management/ forest soils/ carbon/ nitrogen/ soil fertility/ nutrient availability/ data analysis/ carbon cycle/ nitrogen cycle/ logging/ species differences/ logs/ forest fires/ prescribed burning/ wildfires/ charcoal/ organic matter/ vegetation/ nitrogen fixation/ literature reviews

This citation is from AGRICOLA.

426. Effects of Forest Management on Surface Water Quality in Wetland Forests.

Shepard, J. P. *Wetlands* 14 (1): 18-26. (1994)
 NAL Call #: QH75.A1W47;
 ISSN: 0277-5212
Descriptors: wetlands/ water quality/ forest industry/ fertilizers/ harvesting/ literature reviews/ environmental impact/ United States/ nutrients (mineral)/ sediments/ resource management/ forest management/ literature review/ logging/ environmental effects/ Ecosystems and energetics/ Mechanical and natural changes/ Freshwater pollution/ Effects on water of human nonwater activities/ Environmental degradation
Abstract: A literature review on the effects of silvicultural practices on water quality in wetland forests was conducted. The review summarized results from nine wetland forests in five states (AL, FL, MI, NC, and SC). Silvicultural practices assessed were timber harvesting (including thinning and clearcutting), site preparation, bedding, planting, drainage, and fertilization. Many of the studies reviewed observed increased concentrations of suspended sediment and nutrients following silvicultural operations when compared with undisturbed controls. Water quality criteria were rarely exceeded by silvicultural operations, however, and effects on water quality were transient. Water quality parameters returned to undisturbed levels within a period ranging from months to several years.

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427. Effects of hay management on grassland songbirds in Saskatchewan.

Dale, B. C.; Martin, P. A.; and Taylor, P. S. *Wildlife Society Bulletin* 25 (3): 616-626 (1997)
 NAL Call #: SK357.A1W5
Descriptors: birds/ environmental impact/ agricultural practices
Abstract: Evaluated impacts of hay management on endemic grassland birds.

428. Effects of land application of waste water from Mexico City on soil fertility and heavy metal accumulation: A bibliographical review.

Gutierrez Ruiz, M. E.; Siebe, C.; and Sommer, I. *Environmental Review* 3 (3/4): 318-330. (1995)
 NAL Call #: GE140.E59;
 ISSN: 1181-8700
Descriptors: waste water/ irrigation water/ heavy metals/ concentration/ crops/ crop yield/ soil fertility/ nutrient content/ soil salinity/ application to land/ irrigation/ agricultural land/ Mexico

This citation is from AGRICOLA.

429. Effects of livestock grazing on stand dynamics and soils in upland forests of the interior west.

Belsky, A Joy and Blumenthal, Dana M *Conservation Biology* 11 (2): 315-327. (1997)
 NAL Call #: QH75.A1C5;
 ISSN: 0888-8892
Descriptors: pine (Coniferopsida)/ gymnosperms/ plants/ spermatophytes/ vascular plants/ conservation/ livestock grazing/ mixed conifer forests/ soil erosion/ species composition/ stand dynamics/ upland forests/ Western USA
Abstract: Many ponderosa pine and mixed-conifer forests of the western, interior United States have undergone substantial structural and compositional changes since settlement of the West by Euro-Americans. Historically, these forests consisted of widely spaced, fire-tolerant trees underlain by dense grass swards. Over the last 100 years they have developed into dense stands consisting of more fire-sensitive and disease-susceptible species. These changes, sometimes referred to as a decline in 'forest health,' have been attributed primarily

to two factors: active suppression of low-intensity fires (which formerly reduced tree recruitment, especially of fire-sensitive, shade-tolerant species), and selective logging of larger, more fire-tolerant trees. A third factor, livestock grazing, is seldom discussed, although it may be as important as the other two factors. Livestock alter forest dynamics by (1) reducing the biomass and density of understory grasses and sedges, which otherwise outcompete conifer seedlings and prevent dense tree recruitment, and (2) reducing the abundance of fine fuels, which formerly carried low-intensity fires through forests. Grazing by domestic livestock has thereby contributed to increasingly dense western forests and to changes in tree species composition. In addition, exclosure studies have shown that livestock alter ecosystem processes by reducing the cover of herbaceous plants and litter, disturbing and compacting soils, reducing water infiltration rates, and increasing soil erosion.

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430. Effects of manure amendments on environmental and production problems.

Moore, P. A. Jr.; Joern, B. C.; Edwards, D. R.; Wood, C. W.; and Daniel, T. C. In: White papers on animal agriculture and the environment/ National Center for Manure & Animal Waste Management; Midwest Plan Service; and U.S. Department of Agriculture; Raleigh, NC: National Center for Manure & Animal Waste Management, 2001.
 NAL Call #: TD930.2-.W45-2002
Descriptors: Agricultural wastes---Environmental aspects---United States

431. Effects of open marsh water management on selected tidal marsh resources: A review.

Wolfe, R. J. *Journal of the American Mosquito Control Association* 12 (4): 701-712. (Dec. 1996)
 NAL Call #: QL536.J686;
 ISSN: 8756-971X
Descriptors: pest control/ marshes/ water management/ reviews/ literature reviews/ aquatic insects/ literature review/ mosquito control/ ecological effects/ resources management/ Culicidae/ Diptera/ Diptera/ Medical &

veterinary entomology/ Control/ Species interactions: pests and control/ Ecological impact of water development/ Brackish water
Abstract: Open Marsh Water Management (OMWM) is a method of salt-marsh mosquito control that advocates source reduction and biological control through selective pond creation and ditching in mosquito breeding areas. This method has been used as an alternative to chemical insecticides in coastal wetlands for 30 years. This paper reviews the effects of OMWM on hydrology, topography, vegetation, mosquitoes, invertebrates, fishes, birds, mammals, and water quality. Other source reduction techniques and the economics of OMWM are also discussed.
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432. Effects of pesticides and other organic pollutants in the aquatic environment on immunity of fish: A review.

Dunier, M. and Siwicki, A. K.
Fish and Shellfish Immunology 3 (6): 423-438. (1993);
 ISSN: 1050-4648
Descriptors: pesticides/ organic compounds/ immunology/ disease resistance/ fish culture/ literature reviews/ pollutants/ immunity/ effects on/ aquatic environment/ Pisces/ reviews/ aquatic environments/ organic/ Fish culture/ Effects on organisms/ Reviews/ Reviews/ Freshwater pollution
Abstract: In the present paper the effects of various pollutants from industry or agriculture on the fish immune system are reviewed. The major xenobiotics involved as immunomodulators are pesticides (insecticides, herbicides, fungicides) and other organic pollutants such as polynuclear aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB) and tributyltin (TBT). Immunotoxicology in mammals has become a very active discipline, but there remains a scarcity of information concerning fish immunotoxicology. This review gathers the data available on the effects of certain pollutants in the aquatic environment on the humoral and cellular immunity of fish.
 © Cambridge Scientific Abstracts (CSA)

433. Effects of Pesticides on Soil and Water Microflora and Mesofauna in Wetland Ricefields: A Summary of Current Knowledge and Extrapolation to Temperate Environments.

Roger, P. A.; Simpson, I.; Oficial, R.; Ardales, S.; and Jimenez, R.
Australian Journal of Experimental Agriculture 34 (7): 1057-1068. (1994)
 NAL Call #: 23-Au792;
 ISSN: 0816-1089

Descriptors: reviews/ pesticides/ bibliographies/ wetlands/ rice/ temperate zone/ invertebrates/ fertilizers/ agricultural practices/ rice fields/ pollution effects/ microorganisms/ Invertebrata/ literature reviews/ agricultural pollution/ data collections/ biodiversity/ Effects of pollution/ Effects on organisms/ Freshwater pollution

Abstract: This review summarises information on the behaviour of pesticides and their impacts on microorganisms and non-target invertebrates that was collected in, or is applicable to, temperate wetland ricefields. An extensive bibliographic survey shows that current knowledge is fragmentary and partly outdated. Pesticides applied on soil at recommended levels rarely had a detrimental effect on microbial populations or their activities. They had more effect on invertebrate populations, inducing the blooming of individual species of floodwater zooplankton and reducing populations of aquatic oligochaetes in soil. Available information raises concerns regarding the long-term effects of pesticides on (i) microorganisms, primary producers, and invertebrates of importance to soil fertility, (ii) predators of rice pests and vectors, and (iii) microbial metabolism of pesticides.
 © Cambridge Scientific Abstracts (CSA)

434. Effects of Pollutants on Freshwater Organisms.

Hall, S.; Chamberlain, J.; and Godwin-Sadd, E.
Water Environment Research 67 (4): 713-718. (1995)
 NAL Call #: TD419.R47;
 ISSN: 1061-4303

Descriptors: literature review/ water pollution effects/ surface water/ ecosystems/ toxicity/ aquatic environment/ aquatic life/ metals/ pesticides/ Effects of pollution

Abstract: A myriad of "pollutants" enter freshwater from innumerable sources, and their effects on aquatic life are exhibited from the cellular to ecosystem levels. Much research has been published in these areas. This paper views some of the published research on the effects of chemicals on freshwater organisms.
 © Cambridge Scientific Abstracts (CSA)

435. Effects of Pollution on Saltwater Organisms.

Reish, D. J.; Oshida, P. S.; Mearns, A. J.; and Ginn, T. C.
Water Environment Research 65 (6): 573-585. (1993)
 NAL Call #: TD419.R47

Descriptors: Literature review/ Marine fisheries/ Marine life/ Marine pollution/ Oil pollution/ Reviews/ Toxicity/ Water pollution effects/ Bioassay/ Heavy metals/ Monitoring/ Organic compounds/ Organotin compounds/ Pesticides/ Polychlorinated biphenyls/ Shellfish/ Toxicology/ Wastewater disposal/ Effects of pollution

Abstract: The concentrations of metals, other elements, and organic compounds (including pesticides and polychlorinated biphenyls) in marine organisms were tabulated. Marine debris, mostly in the form of plastic, has caused the death of manatees off the Florida coast. Contamination of marine sediments by pollutants has in turn caused an increase in the incidence of tumors in marine fish. Abnormalities in mollusks caused by tributyltin continue to be reported. Culture techniques and early-life-stage (ELS) tests have been developed for the topsmelt, *Atherinops affinis*. Comparative ELS tests indicate that for 11 toxic chemicals, the topsmelt were equal to or more sensitive than the commonly used east coast inland silversides. A chemical toxicity and teratogenicity protocol was developed using silverside embryos to determine the effects of microbial pest control agents on fish eggs and larvae. Levels of heavy metals were studied in fish near ocean wastewater discharge outfalls. Chlorine, commonly used to disinfect wastewater and powerplant discharges, was toxic to various stages of northern anchovy eggs and larvae at concentrations well below recommended treatment doses. The effects of oil pollution were studied in Antarctic and North Sea fish and in

Norway seal pups. New monitoring and assessment techniques for marine pollution are reviewed. Several surveys of marine life and communities showed the effects of marine sediment pollution and water pollution in different parts of the world. Toxicity studies were also performed in fish, shellfish, and microalgae exposed to such pollutants as pesticides, wastewater sludge, mineral oil-based drilling mud, Hibernia crude oil, arsenate, copper, cadmium, mercury, lead, zinc, DDT, Arochlor 1254, and the water-soluble fraction of diesel fuel. (Geiger-PTT) 35 050508002
© Cambridge Scientific Abstracts (CSA)

436. Effects of prescribed burning on ecosystem processes and attributes in pine/hardwood forests of the southern Appalachians.

Vose, J. M.
Proceedings - Hardwood Symposium of the Hardwood Research Council (22): 81-90. (1994)
NAL Call #: SD397.H3H37;
ISSN: 0193-8495.
Notes: Paper presented at the symposium on Opportunities for the Hardwood Industry to Address Environmental Challenges held May 12-15, 1994, Cashiers, North Carolina. Includes references.
Descriptors: mixed forests/ ecosystems/ pinus/ hardwoods/ silvicultural systems/ prescribed burning/ revegetation/ species diversity/ nitrogen cycle/ nitrogen content/ losses from soil/ water erosion/ streams/ water quality/ stand density/ forest litter/ literature reviews/ North Carolina/ Appalachian states of USA/ South Carolina/ fell and burn/ nitrogen pool/ nitrogen loss
This citation is from AGRICOLA.

437. Effects of Rock Fragments on Soil Erosion by Water at Different Spatial Scales: A Review.

Poesen, J. W.; Torri, D.; and Bunte, K.
Catena 23 (1-2): 141-166. (1994)
NAL Call #: GB400.C3;
ISSN: 0341-8162.
Notes: Special issue: Rock fragments in soil: Surface dynamics
Descriptors: soil erosion/ rocks/ sediment yield/ soil properties/ rill erosion/ soil conservation/ Erosion and sedimentation
Abstract: This paper reviews the various effects of rock fragments on

soil erosion by water. Since these effects are scale dependent, they are investigated at three different nested spatial scales: the microplot (4 x 10 super(-6)-10 super(0) m super(2)), the mesoplot (10 super(-2)-10 super(2) m super(2)) and the macroplot (10 super(1)-10 super(4) m super(2)). For each scale the corresponding process mechanisms are discussed. Particular attention is paid to the effects of rock fragment cover on the intensity of soil erosion processes. At the mesoplot scale, i.e. on interrill areas, rock fragments at the soil surface can have negative as well as positive effects on sediment yield. These ambivalent effects are conditioned by the type of fine earth porosity, soil surface slope, vertical position and size of rock fragments and by the occurrence of horseshoe vortex erosion. At the microplot scale, i.e. the soil surface area which is covered by a single rock fragment, and at the macroplot scale, i.e. upland areas where both interrill and rill erosion takes place, rock fragments at the soil surface have a negative effect on sediment yield. In these two scales rock fragments can thus be considered as natural soil surface stabilizers. At the macroplot scale the mean decrease of relative interrill and rill sediment yield with rock fragment cover can be expressed by an exponential decay function. The scatter of the data indicates that a given rock fragment cover can have different efficiencies in reducing interrill and rill sediment yield depending on the varying intensities of the hydrological and erosion subprocesses. These findings have implications for erosion modelling and soil conservation.

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438. Effects of Sedimentation and Turbidity on Lotic Food Webs: A Concise Review for Natural Resource Managers.

Henley, W. F.; Patterson, M. A.; Neves, R. J.; and Lemly, A. D.
Reviews in Fisheries Science 8 (2): 125-139. (2000);
ISSN: 1064-1262
Descriptors: Sediment load/ Nephelometers/ Trophic levels/ Environmental impact/ Ecosystem disturbance/ Water quality control/ Population dynamics/ Food chains/ Turbidity/ Environment management/ Zooplankton/ Sedimentation/ Mollusks/ Fish/ Insects/ Watersheds/

Suspended Sediments/ Monitoring/ Streams/ Habitat community studies/ Mechanical and natural changes/ Erosion and sedimentation
Abstract: Sedimentation and turbidity are significant contributors to declines in populations of North American aquatic organisms. Impacts to lotic fauna may be expressed through pervasive alterations in local food chains beginning at the primary trophic level. Decreases in primary production are associated with increases in sedimentation and turbidity and produce negative cascading effects through depleted food availability to zooplankton, insects, freshwater mollusks, and fish. Direct effects at each trophic level are mortality, reduced physiological function, and avoidance; however, decreases in available food at trophic levels also result in depressed rates of growth, reproduction, and recruitment. Impacts of turbidity to aquatic organisms often seem inconsistent among watersheds and experiments, but this apparent difference is actually due to the lack of correlation between suspended sediment concentrations (mg/L) and units of measure (Nephelometric Turbidity Units, NTU). The use of NTU as a surrogate measurement of suspended sediment to predict biotic effects within watersheds is dubious. Similar NTU measurements from different watersheds may be correlated with different concentrations of suspended sediment. For monitoring the effects of turbidity within local watersheds, we recommend that the correlation between suspended sediment and NTUs be examined over a range of discharge recordings, and that this be used as a baseline to examine local effects. We recommend that riparian buffer strips and livestock fencing be used to reduce sediment input to streams.
© Cambridge Scientific Abstracts (CSA)

439. Effects of soil abiotic processes on the bioavailability of anthropogenic organic residues.

Ruggiero, P.; Pizzigallo, M. D. R.; and Crecchio, C.
In: Ecological significance of the interactions among clay minerals, organic matter and soil biota: 3rd Symposium on Soil Mineral-Organic Matter-Microorganism Interactions and Ecosystem Health. (Held 22 May

2000-26 May 2000 at Naples-Capri, Italy.) Violante, A.; Huang, P. M.; Bollag, J. M.; and Gianfreda, L. (eds.); pp. 95-133; 2002.
ISBN: 0-444-51039-7
 This citation is provided courtesy of CAB International/CABI Publishing.

440. Effects of soil solution on the dynamics of N₂O emissions: A review.

Heincke, M. and Kaupenjohann, M. *Nutrient Cycling in Agroecosystems* 55 (2): 133-157. (Oct. 1999)
NAL Call #: S631.F422;
ISSN: 1385-1314 [NCAGFC]
Descriptors: soil solution/ nitrous oxide/ emission/ soil air/ solubility/ nitrogen/ nutrient balance/ leaching/ mathematical models/ soil water content/ soil temperature/ movement in soil/ literature reviews
Abstract: In this review, which consists of two parts, major interactions between nitrous oxide (N₂O) and soil solution are described. In the first part, as an introduction, concentrations of dissolved N₂O in different aqueous systems are summarized. An inventory of data on maximal N₂O concentrations in soil solution (up to 9984 micrograms N₂O-N l⁻¹ and in soil air up to 8300 ppm) from literature is presented. The peak N₂O concentrations represent a N₂O supersaturation in the soil solution up to 30000 times with respect to ambient air and a soil air N₂O concentration about 25000 times higher than in the atmosphere. The main physicochemical parameters (solubility, diffusion) controlling N₂O distribution between soil solution and soil air are outlined. The influences of cultivation practice, nitrogen turnover, water content and temperature on N₂O accumulation in soil solution and soil air are reviewed. In the second part some models of N₂O dynamics in soils are discussed with emphasis on N₂O transport processes. A simple qualitative scheme is developed to categorize the effects of the soil solution on N₂O dynamics in soils. In this scheme the temporary, intensive N₂O oversaturation of the soil solution is interpreted as a result of gas diffusion inhibition by water (barrier function of soil solution) resulting in an accumulation of N₂O. In addition, N₂O supersaturation is an indication that transitory much N₂O can be stored in the soil solution (storage function of soil solution). Where the soil solution flows up-, down- or

sidewards it can act as a relevant transport medium for dissolved N₂O (transport function of soil solution). This scheme is applied to examples from the literature.
 This citation is from AGRICOLA.

441. Effects of timber management on the hydrology of wetland forests in the southern United States.

Sun, G.; McNulty, S. G.; Shepard, J. P.; Amatya, D. M.; Riekerk, H.; Comerford, N. B.; Skaggs, W.; and Swift, L. Jr. *Forest Ecology and Management* 143 (1/3): 227-236. (Apr. 2001)
NAL Call #: SD1.F73;
ISSN: 0378-1127 [FECMDW].
Notes: Special issue: The science of managing forests to sustain water resources / edited by R.T. Brooks and N. Lust. Paper presented at a conference held November 8-11, 1998, Sturbridge, Massachusetts. Includes references.
Descriptors: forests/ wetlands/ forest management/ hydrology/ logging/ site preparation/ drainage/ simulation models/ geographical information systems/ water table/ groundwater level/ storms/ runoff/ spatial variation/ temporal variation/ evapotranspiration/ literature reviews/ Alabama/ Georgia/ South Carolina/ Texas/ Virginia/ North Carolina/ Florida
 This citation is from AGRICOLA.

442. The Effects of Uv-B Radiation and Endocrine-Disrupting Chemicals (Edcs) on the Biology of Amphibians.

Crump, D. *Environmental Reviews* 9 (2): 61-80. (2001)
NAL Call #: GE140.E59;
ISSN: 1208-6053
Descriptors: Toxicity / Xenobiotics/ Chemical pollution/ Pollution effects/ Ultraviolet radiation/ Polycyclic aromatic hydrocarbons/ Pesticides/ endocrine disruptors/ population decline/ metamorphosis/ Breeding success/ Survival/ Mortality/ Population dynamics/ Water Pollution Effects/ Ecological Effects/ Animal Populations/ Amphibians/ Growth/ Sexual Reproduction/ Reviews/ Amphibia/ Amphibians/ endocrine disrupting chemicals/ endocrine disruptors/ Freshwater pollution/ Effects on organisms/ Effects of pollution
Abstract: Statistical meta-analysis of large and diverse data sets has

indicated that amphibians have been declining worldwide since the 1960s. Exposure to UV-B radiation (280-320 nm) and endocrine-disrupting chemicals (EDCs) have been considered as possible hypotheses to explain the observed declines. Equivocal conclusions have been reached with respect to the effects of UV-B on amphibian populations. Field and laboratory studies employing both ecologically relevant and enhanced UV-B levels have been conducted using a variety of amphibian species and reports differ with respect to the most sensitive developmental stage and the ultimate implications. UV-B radiation has also been shown to interact with other stressors (e.g., pesticides, polycyclic aromatic hydrocarbons, low pH) resulting in decreased survivorship for several amphibian species. Limited evidence of reproductive toxicity of xenobiotics in amphibians exist; however, early exposure to EDCs could cause abnormal development of the amphibian reproductive system, inhibit vital hormone messages that drive metamorphosis, and ultimately contribute to the decline of some amphibian populations. The available evidence suggests that more than one agent is contributing to amphibian population declines and the following review narrows the focus to address the existing data on the effects of UV-B, alone and in combination with other stressors, and EDCs on amphibian survivorship and development.
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443. Effects of windbreaks on airflow, microclimates and crops yields.

Cleugh, H. A. *Agroforestry Systems* 41 (1): 55-84. (1998)
NAL Call #: SD387.M8A3;
ISSN: 0167-4366 [AGSYE6].
Notes: Special issue: Windbreaks in support of agricultural production in Australia / edited by R. Prinsley. Includes references.
Descriptors: shelterbelts/ microclimate/ crop yield/ crops/ air flow/ evaporation/ mathematical models/ turbulence/ permeability/ air temperature/ relative humidity/ heat/ shade/ lodging/ water use efficiency/ literature reviews
 This citation is from AGRICOLA.

444. Efficiency and uniformity of the LEPA and spray sprinkler methods: A review.

Schneider, A. D.

Transactions of the ASAE 43 (4): 937-944. (July 2000-Aug. 2000)

NAL Call #: 290.9-Am32T;

ISSN: 0001-2351 [TAAEAJ]

Descriptors: sprinkler irrigation/ application methods/ runoff/ evaporation/ drift/ efficiency/ low energy precision application/ uniformity coefficient

Abstract: Application efficiencies and uniformity coefficients reported for the low energy precision application (LEPA) and spray sprinkler irrigation methods are reviewed and summarized. The relative sizes of the water loss pathways for the two sprinkler methods are also summarized. With negligible runoff and deep percolation, reported application efficiencies for LEPA are typically in the 95 to 98% range. Measurements such as chemical tracers, weighing lysimeter catches, and energy balance modeling are believed to be more accurate than small collector measurements for estimating spray application efficiency. Spray application efficiencies based on these other measurements exceed 90% when runoff and deep percolation are negligible. Because of the start and stop nature of mechanical move irrigation systems, uniformity coefficients for LEPA and spray are measured both along the irrigation system mainline and in the direction of travel. Along the mainline, reported uniformity coefficients are generally in the 0.94 to 0.97 range for LEPA and in the 0.75 to 0.85 range for spray. In the direction of travel, the uniformity coefficients are generally in the 0.75 to 0.85 range for LEPA with furrow diking and in the 0.75 to 0.90 range for spray. On start and stop sprinkler systems, basin tillage on a 2 to 4 m spacing is critical for uniform LEPA irrigation because the basins prevent runoff and average the applications during several unequal start and stop times. Runoff is the largest potential water loss pathway for both LEPA and spray irrigation. For the spray method, runoff can exceed either droplet evaporation and drift or non-beneficial canopy evaporation.

This citation is from AGRICOLA.

445. Efficiency of nutrient utilization and sustaining soil fertility with particular reference to phosphorus.

Helyar, K. R.

Field Crops Research 56 (1/2):

187-195. (1998)

NAL Call #: SB183.F5;

ISSN: 0378-4290 [FCREDZ].

Notes: Special issue: Nutrient use efficiency in rice cropping systems / edited by K.G. Cassman and H.R. Lafitte. Includes references.

Descriptors: phosphorus/ nutrition physiology/ soil fertility/ use efficiency/ sustainability/ phosphorus fertilizers/ crop management/ economic analysis/ cultivars/ nutrient availability/ application rates/ runoff/ erosion/ leachates/ crop yield/ roots/ rotations/ surface area/ literature reviews

This citation is from AGRICOLA.

446. Efficient feed nutrient utilization to reduce pollutants in poultry and swine manure.

Nahm, K H

Critical Reviews in Environmental Science and Technology 32 (1): 1-16.

(2002)

NAL Call #: QH545.A1C7;

ISSN: 1064-3389

Descriptors: amino acids: feed additive, synthetic/ ammonia: emissions/ enzymes: feed supplement/ growth promoting substances/ nitrogen: environmental contaminant, nutrient/ phosphorus: environmental contaminant, nutrient/ phytase: feed supplement/ protein: reduced feed content/ chicken (Galliformes): broiler, chick, commercial species, layer, livestock/ pig (Suidae): commercial species, finishing, livestock, piglet/ Animals / Artiodactyls/ Birds/ Chordates/ Mammals/ Nonhuman Mammals/ Nonhuman Vertebrates/ Vertebrates/ diet modification/ efficient feed nutrient utilization/ feed manufacturing technique modification/ highly digestible raw feed materials/ manure dry matter weight [manure DM weight]/ odor/ pollutant reduction/ poultry manure: environmental contaminant/ swine manure: environmental contaminant
© Thomson

447. Effluent treatment: Options for treating pig slurry.

Kilgallen P and O'Shea J.

In: Concepts in pig science 2001: The 3rd annual Turtle Lake Pig Science Conference.

Lyons TP and Cole DJ (eds.)

Nottingham, UK: Nottingham

University Press; pp. 97-105; 2001.

This citation is provided courtesy of CAB International/CABI Publishing.

448. Efforts by industry to improve the environmental safety of pesticides.

James, J. R.; Tweedy, B. G.; and Newby, L. C.

Annual Review of Phytopathology 31: 423-439. (1993)

NAL Call #: 464.8-An72;

ISSN: 0066-4286 [APPYAG]

Descriptors: pesticides/ agricultural chemicals/ environmental impact/ product development/ environmental protection/ toxicology/ safety/ health hazards/ trends/ plant disease control/ literature reviews

This citation is from AGRICOLA.

449. El Nino as a window of opportunity for the restoration of degraded arid ecosystems.

Holmgren, Milena and

Scheffer, Marten

Ecosystems 4 (2): 151-159. (2001)

NAL Call #: QH540.E3645;

ISSN: 1432-9840

Descriptors: El Nino Southern Oscillation [ENSO]/ agriculture/ alternative stable states/ arid ecosystems: degradation, restoration/ biomass depletion/ climatic oscillation/ desertification/ graphic models/ overexploitation/ overgrazing/ rangelands/ soil erosion/ vegetation shifts/ wood harvesting

Abstract: Most arid ecosystems have suffered from severe overexploitation by excessive wood harvesting, overgrazing, and agriculture, resulting in depletion of vegetation biomass and soil erosion. These changes are often difficult to reverse due to positive feedbacks that tend to stabilize the new situation. In this paper, we briefly review evidence for the idea that different states in these ecosystems might represent alternative equilibria and present a graphic model that summarizes the implications for their response to changing environmental conditions. We show how, in the light of this theoretical framework, climatic oscillations such as El Nino Southern Oscillation (ENSO) could be used in combination with grazer control to restore degraded and ecosystems. We also present evidence that, depending on grazing pressure, ENSO episodes can trigger structural

and long-lasting changes in these ecosystems.

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450. Electrical conductivity methods for measuring and mapping soil salinity.

Rhoades, J. D.

Advances in Agronomy 49:

201-251. (1993)

NAL Call #: 30-Ad9;

ISSN: 0065-2113 [ADAGA7]

Descriptors: soil salinity/ mapping/ measurement/ methodology/ sensors/ site factors/ electrical conductivity/ irrigated soils/ literature reviews/ mathematical models/ soil physical properties

This citation is from AGRICOLA.

451. Eliminating waste: Strategies for sustainable manure management: Review.

Richard, T. L. and Choi, H. L.

Asian Australasian Journal of Animal Sciences 12 (7): 1162-1169. (1999)

NAL Call #: SF55.A78A7;

ISSN: 1011-2367

This citation is provided courtesy of CAB International/CABI Publishing.

452. Emerging Pathogens: Viruses, Protozoa, and Algal Toxins.

AWWA Research Division
Microbiological Contaminants
Research Committee

Journal of the American Water Works Association 91 (9): 110-121. (1999);
ISSN: 0003-150X.

Notes: Title: Committee Report

Descriptors: Reviews/ Water borne diseases/ Water supplies/ Drinking water/ Water treatment/ Pathogens/ Protozoa/ Algae/ Toxins/ Viruses/ Water Quality/ Bacteria/ Data Collections/ Calicivirus/ Enterovirus/ Hepatitis D virus/ Norwalk virus/ Cyanophyta/ Microsporidia/ Toxoplasma gondii/ Cyclospora/ viruses/ Epidemiology/ Other water systems/ Protozoa: human/ Water treatment and distribution/ Plants

Abstract: The list of constituents of concern in drinking water now includes viruses, protozoa, and algal toxins as well as more widely known bacteria. Information about these less well known constituents can be difficult to gather, a difficulty this AWWA committee report helps to alleviate. The report reviews six increasingly important viral and protozoan organisms and an algal toxin, all of which are documented in water and have been linked to

disease: the caliciviruses, particularly Norwalk virus, enteroviruses, and hepatitis virus; the protozoans Cyclospora, microsporidia, and Toxoplasma gondii; and cyanobacterial toxins. The good news is that none of these constituents is considered of great concern in drinking water treatment. Norwalk virus and other caliciviruses, Cyclospora, microsporidia, and algal toxins are rated as of moderate concern, largely because waterborne outbreaks are documented for most, but little is known about their occurrence or how to control them. This report will serve as a convenient first source of information for water suppliers.

© Cambridge Scientific Abstracts (CSA)

453. Emission of nitrous oxide from salts used for agriculture.

Freney, J. R.

Nutrient Cycling in Agroecosystems 49 (1/3): 1-6. (1997)

NAL Call #: S631.F422;

ISSN: 1385-1314 [NCAGFC].

Notes: Paper presented at the International Symposium on "Soil-Source and Sink of Greenhouse Gases" held September 18-21, 1995, Nanjing, China. Includes references.
Descriptors: agricultural soils/ nitrous oxide/ emission/ losses from soil/ sources/ biomass/ prescribed burning/ nitrification/ denitrification/ nitrogen fertilizers/ nitrogen fixing bacteria/ anaerobiosis/ flooding/ soil management/ nitrogen/ use efficiency/ reviews/ greenhouse gases

Abstract: Nitrous oxide is emitted into the atmosphere as a result of biomass burning, and biological processes in soils. Biomass burning is not only an instantaneous source of nitrous oxide, but it results in a longer term enhancement of the biogenic production of this gas. Measurements of nitrous oxide emissions from soils before and after a controlled burn showed that significantly more nitrous oxide was exhaled after the burn. The current belief is that 90% of the emissions come from soils. Nitrous oxide is formed in soils during the microbiological processes nitrification and denitrification. Because nitrous oxide is a gas it can escape from soil during these transformations. Nitrous oxide production is controlled by temperature, pH, water holding capacity of the soil, irrigation practices, fertilizer rate, tillage

practice, soil type, oxygen concentration, availability of carbon, vegetation, land use practices and use of chemicals. Nitrous oxide emissions from agricultural soils are increased by the addition of fertilizer nitrogen and by the growth of legumes to fix atmospheric nitrogen. A recent analysis suggests that emissions of nitrous oxide from fertilized soils are not related to the type of fertilizer nitrogen applied and emissions can be calculated from the amount of nitrogen applied. Legumes also contribute to nitrous oxide emission in a number of ways, viz. atmospheric nitrogen fixed by legumes can be nitrified and denitrified in the same way as fertilizer nitrogen, thus providing a source of nitrous oxide, and symbiotically living Rhizobia in root nodules are able to denitrify and produce nitrous oxide. Conversion of tropical forests to crop production and pasture has a significant effect on the emission of nitrous oxide. Emissions of nitrous oxide increased by about a factor of two when a forest in central Brazil was clear cut, and pasture soils in the same area produced three times as much nitrous oxide as adjacent forest soils. Studies on temperate and tropical rice fields show that less than 0.1% of the applied nitrogen is emitted as nitrous oxide if the soils are flooded for a number of days before fertilizer application. However, if mineral nitrogen is present in the soil before flooding it will serve as a source of nitrous oxide during wetting and drying cycles before permanent flooding. Thus dry seeded rice can be a source of considerable nitrous oxide. There are also indirect contributions to nitrous oxide emission through volatilization of ammonia and emission of nitric oxides into the atmosphere, and their redistribution over the landscape through wet and dry deposition. In general nitrous oxide emissions can be decreased by management practices which optimize the crop's natural ability to compete with processes whereby plant available nitrogen is lost from the soil-plant system. If these options were implemented they would also result in increased productivity and reduced inputs.

This citation is from AGRICOLA.

454. Emission of pesticides into the air.

Berg, F. van den; Kubiak, R.; Benjey, W. G.; Majewski, M. S.; Yates, S. R.; Reeves, G. L.; Smelt, J. H.; and Linden, A. M. A. van der.

Water, Air and Soil Pollution 115 (1/4): 195-218. (Oct. 1999)

NAL Call #: TD172.W36;

ISSN: 0049-6979 [WAPLAC].

Notes: Special section: Fate of pesticides in the atmosphere: Implications for environmental risk assessment. Proceedings of a workshop held April 22-24, 1998, Driebergen, The Netherlands. Includes references.

Descriptors: pesticides/ pesticide residues/ emission/ air/ air pollution/ air pollutants/ volatilization/ drift/ agricultural soils/ polluted soils/ greenhouses/ simulation models/ mathematical models/ literature reviews/ regional emissions
This citation is from AGRICOLA.

455. Emissions of aerial pollutants in livestock buildings in northern Europe: Overview of a multinational project.

Wathes, C. M.; Phillips, V. R.; Holden, M. R.; Sneath, R. W.; Short, J. L.; White, R. P.; Hartung, J.; Seedorf, J.; Schroder, M.; and Linkert, K. H.

Journal of Agricultural Engineering Research 70 (1): 3-9. (May 1998)

NAL Call #: 58.8-J82;

ISSN: 0021-8634 [JAERA2].

Notes: Special issue: Emissions of aerial pollutants in livestock buildings in Northern Europe / edited by D. White, C. M. Wathes and V. R. Phillips. Includes references.

Descriptors: air pollution/ animal housing/ emission/ research projects/ organization of research/ methodology/ international cooperation/ environmental protection/ England/ Netherlands/ Denmark/ Germany
This citation is from AGRICOLA.

456. Emissions of N₂O and NO associated with nitrogen fertilization in intensive agriculture, and the potential for mitigation.

Smith, K A; McTaggart, I P; and Tsuruta, H

Soil Use and Management 13 (4 [supplement]): 296-304. (1997)

NAL Call #: S590.S68;

ISSN: 0266-0032

Descriptors: nitric oxide: emission, greenhouse gas/ nitrogen: fertilizer/ nitrous oxide: emission, greenhouse

gas/ greenhouse gas emission mitigation potential/ intensive agriculture

Abstract: Increases in the atmospheric concentrations of nitrous oxide (N₂O) contribute to global warming and to ozone depletion in the stratosphere. Nitric oxide (NO) is a cause of acid rain and tropospheric ozone. The use of N fertilizers in agriculture has direct and indirect effects on the emissions of both these gases, which are the result of microbial nitrification and denitrification in the soil, and which are controlled principally by soil water and mineral N contents, temperature and labile organic matter. The global emission of N₂O from cultivated land is now estimated at 3.5 Tg N annually, of which 1.5 Tg has been directly attributed to synthetic N fertilizers, out of a total quantity applied in 1990 of about 77Tg N. This amount was 150% above the 1970 figure. The total fertilizer-induced emissions of NO are somewhere in the range 0.5-5 Tg N. Mineral N fertilizers can also be indirect as well as direct sources of N₂O and NO emissions, via deposition of volatilized NH₃ on natural ecosystems and denitrification of leached nitrate in subsoils, waters and sediments. IPCC currently assume an N₂O emission factor of 1.25 +- 1.0% of fertilizer N applied. No allowance is made for different fertilizer types, on the basis that soil management and cropping systems, and unpredictable rainfall inputs, are more important variables. However, recent results show substantial reductions in emissions from grassland by matching fertilizer type to environmental conditions, and in arable systems by using controlled release fertilizers and nitrification inhibitors. Also, better timing and placement of N, application of the minimum amount of N to achieve satisfactory yield, and optimization of soil physical conditions, particularly avoidance of excessive wetness and compaction, would be expected to reduce the average emission factor for N₂O. Some of these adjustments would also reduce NO emissions. However, increasing global fertilizer use is likely to cause an upward trend in total emissions even if these mitigating practices become widely adopted.

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457. Emissions of organic air toxics from open burning: A comprehensive review.

Lemieux, P. M.; Lutes, C. C.; and Santoianni, D. A.

Progress in Energy and Combustion Science 30 (1): 1-32. (2004);

ISSN: 0360-1285.

Notes: Number of References: 93; Publisher: Pergamon-Elsevier Science Ltd

Descriptors: Environmental Engineering & Energy/ uncontrolled combustion/ open burning/ HAPS/ air toxics/ emissions/ polycyclic aromatic hydrocarbons/ dibenzo p dioxins/ Kuwaiti oil fires/ molecular tracers/ landfill fires/ aerosols/ waste/ identification/ combustion/ particle

Abstract: Emissions from open burning, on a mass pollutant per mass fuel (emission factor) basis, are greater than those from well-controlled combustion sources. Some types of open burning (e.g. biomass) are large sources on a global scale in comparison to other broad classes of sources (e.g. mobile and industrial sources). A detailed literature search was performed to collect and collate available data reporting emissions of organic air toxics from open burning sources. The sources that were included in this paper are: Accidental Fires, Agricultural Burning of Crop Residue, Agricultural Plastic Film, Animal Carcasses, Automobile Shredder Fluff Fires, Camp Fires, Car-Boat-Train (the vehicle not cargo) Fires, Construction Debris Fires, Copper Wire Reclamation, Crude Oil and Oil Spill Fires, Electronics Waste, Fiberglass, Fireworks, Grain Silo Fires, Household Waste, Land Clearing Debris (biomass), Landfills/Dumps, Prescribed Burning and Savanna/Forest Fires, Structural Fires, Tire Fires, and Yard Waste Fires. Availability of data varied according to the source and the class of air toxics of interest. Volatile organic compound (VOC) and polycyclic aromatic hydrocarbon (PAH) data were available for many of the sources. Non-PAH semi-volatile organic compound (SVOC) data were available for several sources. Carbonyl and polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofuran (PCDD/F) data were available for only a few sources. There were several known sources for which no emissions data were available at all. It is desirable that emissions from those sources be tested so that the relative degree of

hazard they pose can be assessed. Several observations were made including: Biomass open burning sources typically emitted less VOCs than open burning sources with anthropogenic fuels on a mass emitted per mass burned basis, particularly those where polymers were concerned. Biomass open burning sources typically emitted less SVOCs and PAHs than anthropogenic sources on a mass emitted per mass burned basis. Burning pools of crude oil and diesel fuel produced significant amounts of PAHs relative to other types of open burning. PAH emissions were highest when combustion of polymers was taking place. Based on very limited data, biomass open burning sources typically produced higher levels of carbonyls than anthropogenic sources on a mass emitted per mass burned basis, probably due to oxygenated structures resulting from thermal decomposition of cellulose. It must be noted that local burn conditions could significantly change these relative levels. Based on very limited data, PCDD/F and other persistent bioaccumulative toxic (PBT) emissions varied greatly from source to source and exhibited significant variations within source categories. This high degree of variation is likely due to a combination of factors, including fuel composition, fuel heating value, bulk density, oxygen transport, and combustion conditions. This highlights the importance of having acceptable test data for PCDD/F and PBT emissions from open burning so that contributions of sources to the overall PCDD/F and PBT emissions inventory can be better quantified. (C) 2003 Elsevier Ltd. All rights reserved.
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458. Encyclopedia of pest management.

Pimentel, D.: Marcel Dekker; 903 p. (2002); ISBN: 0824708474
Descriptors: disease and pest management/ integrated pest management/ pests/ pest control/ laws and regulations/ semiochemicals/ pesticides/ pesticide application/ human health/ cost analysis

459. Encyclopedia of soil science.

Lal, R.: Marcel Dekker; 1450 p. (2002); ISBN: 0824708466
Descriptors: soil science/ agriculture/ soil productivity/ sustainable agriculture/ environmental quality

460. Encyclopedia of water science.

Stewart, B. A. and Howell, T. A. New York: Marcel Dekker. (2003); ISBN: 0824709489
Descriptors: Agricultural water supply/ Water in agriculture/ Irrigation efficiency

461. Endangered species and irrigated agriculture: Water resource competition in western river systems.

Moore, Michael R.; Mulville, Aimee.; Weinberg, Marca.; and United States. Dept. of Agriculture. Economic Research Service. Washington, D.C.: U.S. Dept. of Agriculture, Economic Research Service; iv, 20 p.: ill., maps; Series: Agriculture information bulletin no. 720 (An Economic Research Service report). (1995)
Notes: Cover title. Distributed to depository libraries in microfiche. Shipping list no.: 97-0500-M. "November 1995"--P. [i]. Includes bibliographical references (p. 18-19). SUDOCs: A 1.75:720.
NAL Call #: Fiche--S-133-A-1.75:720-
Descriptors: Endangered species---West---United States/ Water resources development---West---United States/ Irrigation farming---West---United States
This citation is from AGRICOLA.

462. Engineering systems to enhance irrigation performance.

Hoffman, G. J. and Martin, D. L. *Irrigation Science* 14 (2): 53-63. (1993)
NAL Call #: S612.I756;
ISSN: 0342-7188 [IRSCD2].
Notes: Paper presented at the First Volcani International Symposium on The Limits of Water Use Efficiency in Agriculture, October 1992, Bet Dagan, Israel. Includes references.
Descriptors: irrigation systems/ water use efficiency/ irrigation water/ engineering/ surface irrigation/ sprinkler irrigation/ irrigation scheduling/ performance/ microirrigation
Abstract: The desirable irrigation system applies water at a rate that allows all water to infiltrate and

distributes the water in space and time to match crop requirements in each parcel of the field. Various types of irrigation systems and management strategies have been developed in attempts to achieve the "desired" system. Our objective is to review various methods of enhancing irrigation performance. Although the "desired" system has not been attained, considerable improvements have been made based upon selection and management technologies which generate profits within the constraints of environmental prudence. Each irrigation system has inherent opportunities for enhancing irrigation performance. Likewise, each has limitations in achieving maximum crop productivity per unit of applied water. Methods to improve the performance or surface irrigation can be grouped into those that increase the uniformity of water intake, reduce runoff losses, or decrease spatial variability. Two surface irrigation systems that enhance performance are surge-flow and level-basin. The uniformity and efficiency of sprinkler systems can be enhanced by computer-based design procedures and, in some cases, by applying low-energy, precision application concepts. Advantages of microirrigation are less surface area wetted, which minimizes evaporation and weed growth, and improved application uniformity which is specifically designed into the distribution network. An appropriate management strategy is necessary to attain the potential of an irrigation system engineered to match crop water requirements, and soil and environmental conditions. The best irrigation method applies the amount of water desired at the appropriate time while providing for leaching requirements, agronomic operations, and environmental considerations. With enhanced engineering and computer capabilities and improved knowledge of the soil-plant-water continuum, irrigators will adopt "prescription" irrigation. Prescription systems apply precisely the prescribed amounts of water, nutrients, and pesticides to match the production capacity of each parcel of land.
This citation is from AGRICOLA.

463. Enhancing riparian habitat for fish, wildlife, and timber in managed forests.

Newton, Michael; Willis, Ruth; Walsh, Jennifer; Cole, Elizabeth; and Chan, Samuel

Weed Technology 10 (2): 429-438. (1996)

NAL Call #: SB610.W39;

ISSN: 0890-037X

Descriptors: conifer (Coniferopsida)/ fish (Pisces Unspecified) / Pisces (Pisces Unspecified)/ animals/ chordates/ fish/ gymnosperms/ nonhuman vertebrates/ plants/ spermatophytes/ vascular plants/ vertebrates/ conservation/ forestry/ riparian habitat

Abstract: The productivity of riparian sites in managed forests can be focused to provide productive fish and wildlife habitat while yielding most of its productive capacity for other than amenity values. Establishment of habitat protection goals and measures of achievement permit flexible approaches for meeting them. Once the protection standards are set, intensive management of the woody cover is logically dependent on minimum disturbance methods, in general, for both vegetation management and harvest. Several currently registered chemical products and non-chemical methods are helpful and safe in achieving both yield and protection goals.

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464. Enhancing the carbon sink in European agricultural soils: Including trace gas fluxes in estimates of carbon mitigation potential.

Smith, P.; Goulding, K. W.; Smith, K. A.; Powlson, D. S.; Smith, J. U.; Falloon, P.; and Coleman, K.

Nutrient Cycling in Agroecosystems 60 (1/3): 237-252. (2001)

NAL Call #: S631 .F422;

ISSN: 1385-1314 [NCAGFC]

Descriptors: agricultural soils/ carbon/ efflux/ climatic change/ methane/ gases/ forestry/ land use/ animal manures/ sewage sludge/ no-tillage/ rotations/ woodlands/ bioenergy/ agricultural land/ ecosystems/ environmental impact/ literature reviews/ Europe

Abstract: The possibility that the carbon sink in agricultural soils can be enhanced has taken on great political significance since the Kyoto Protocol was finalised in December 1997. The Kyoto Protocol allows carbon

emissions to be offset by demonstrable removal of carbon from the atmosphere. Thus, forestry activities (Article 3.3) and changes in the use of agricultural soils (Article 3.4) that are shown to reduce atmospheric CO₂ levels may be included in the Kyoto emission reduction targets. The European Union is committed to a reduction in CO₂ emissions to 92% of baseline (1990) levels during the first commitment period (2008-2012). We have shown recently that there are a number of agricultural land-management changes that show some potential to increase the carbon sink in agricultural soils and others that allow alternative forms of carbon mitigation (i.e. through fossil fuel substitution), but the options differ greatly in their potential for carbon mitigation. The changes examined were, (a) switching all animal manure use to arable land, (b) applying all sewage sludge to arable land, (c) incorporating all surplus cereal straw, (d) conversion to no-till agriculture, (e) use of surplus arable land to de-intensify 1/3 of current intensive crop production (through use of 1/3 grass/arable rotations), (f) use of surplus arable land to allow natural woodland regeneration, and (g) use of surplus arable land for bioenergy crop production. In this paper, we attempt for the first time to assess other (non-CO₂) effects of these land-management changes on (a) the emission of the other important agricultural greenhouse gases, methane and nitrous oxide, and (b) other aspects of the ecology of the agroecosystems. We find that the relative importance of trace gas fluxes varies enormously among the scenarios. In some such as the sewage sludge, woodland regeneration and bioenergy production scenarios, the inclusion of trace gases makes only a small (<10%) difference to the CO₂-C mitigation potential. In other cases, for example the no-till, animal manure and agricultural de-intensification scenarios, trace gases have a large impact, sometimes halving or more than doubling the CO₂-C mitigation potential. The scenarios showing the greatest increase when including trace gases are those in which manure management changes significantly. In the one scenario (no-till) where the carbon mitigation potential was reduced greatly, a small increase in methane oxidation was

outweighed by a sharp increase in N₂O emissions. When these land-management options are combined to examine the whole agricultural land area of Europe, most of the changes in mitigation potential are small, but depending upon assumptions for the animal manure scenario, the total mitigation potential either increases by about 20% or decreases by about 10%, shifting the mitigation potential of the scenario from just above the EU's 8% Kyoto emission reduction target (98.9 Tg C y⁻¹) to just below it. Our results suggest that (a) trace gas fluxes may change the mitigation potential of a land management option significantly and should always be considered alongside CO₂-C mitigation potentials and (b) agricultural management options show considerable potential for carbon mitigation even after accounting for trace gas fluxes. This citation is from AGRICOLA.

465. Enhancing water use efficiency in irrigated agriculture.

Howell, T. A.

Agronomy Journal 93 (2): 281-289.

(Mar. 2001-Apr. 2001)

NAL Call #: 4-AM34P;

ISSN: 0002-1962 [AGJOAT].

Notes: Paper presented at the symposium "Improving crop water use efficiency and yield: Management influences" held November 2, 1999, Salt Lake City, Utah.

Includes references.

Descriptors: agriculture/ water use efficiency/ irrigation/ irrigation systems/ trends/ rain/ surface water/ environmental degradation/ crops/ literature reviews/ sustainability

Abstract: Irrigated agriculture is a vital component of total agriculture and supplies many of the fruits, vegetables, and cereal foods consumed by humans; the grains fed to animals that are used as human food; and the feed to sustain animals for work in many parts of the world. Irrigation worldwide was practiced on about 263 Mha in 1996, and about 49% of the world's irrigation occurred in India, China, and the USA. The objectives of this paper are to (i) review irrigation worldwide in its ability to meet our growing needs for food production, (ii) review irrigation trends in the USA, (iii) discuss various concepts that define water use efficiency (WUE) in irrigated agriculture from both engineering and agronomic viewpoints, and (iv)

discuss the impacts of enhanced WUE on water conservation. Scarcely one-third of our rainfall, surface water, or ground water is used to produce plants that are useful to mankind. Without appropriate management, irrigated agriculture can be detrimental to the environment and endanger sustainability. Irrigated agriculture is facing growing competition for low-cost, high-quality water. In irrigated agriculture, WUE is broader in scope than most agronomic applications and must be considered on a watershed, basin, irrigation district, or catchment scale. The main pathways for enhancing WUE in irrigated agriculture are to increase the output per unit of water (engineering and agronomic management aspects), reduce losses of water to unusable sinks, reduce water degradation (environmental aspects), and reallocate water to higher priority uses (societal aspects). This citation is from AGRICOLA.

466. Entomology and nature conservation.

New, T. R.
European Journal of Entomology
96 (1): 11-17. (1999);
ISSN: 1210-5759

This citation is provided courtesy of CAB International/CABI Publishing.

467. Environment-friendly swine feed formulation to reduce nitrogen and phosphorus excretion.

Honeyman MS
American Journal of Alternative Agriculture 8 (3): 128-132; 28 ref. (1993)
NAL Call #: S605.5.A43

This citation is provided courtesy of CAB International/CABI Publishing.

468. Environmental activation of pesticides.

Wolfe, Martha F and Seiber, James N
Occupational Medicine 8 (3): 561-574. (1993);
ISSN: 0885-114X

Descriptors: Hominidae (Hominidae)/ animals/ chordates/ humans/ mammals/ primates/ vertebrates/ human exposure

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469. Environmental analysis of volatile organic compounds in water and sediment by gas chromatography.

Kuran, P and Sojak, L
Journal of Chromatography A 733 (1-2): 119-141. (1996)
NAL Call #: QD272.C4J68;
ISSN: 0021-9673
Descriptors: analytical method/ environmental surveillance
Abstract: Considerable attention is still devoted to the analysis of volatile organic compounds (VOCs) owing to their occurrence in various fields and also harmful effects on health. The techniques used for their analysis are also manifold. The use of headspace techniques in the analysis of VOCs in various matrices has been well reviewed several times, but other techniques have been discussed only very briefly. The aim of this review is to give a brief survey of all techniques used in the environmental analysis of volatiles in water and sediment with emphasis on new trends and the applicability of these techniques in the analysis of water and sediment samples.

© Thomson

470. Environmental and Economic Costs of Soil Erosion and Conservation Benefits.

Pimentel, David; Harvey, C; Resosudarmo, P; Sinclair, K; Kurz, D; Ncnair, M; Crist, S; Shpritz, L; Fitton, L; Saffouri, R; and Blair, R
Science 267 (5201): 1117-1123. (1995)
NAL Call #: 470 Sci2;
ISSN: 0036-8075

Descriptors: agriculture sustainability/ cropland/ food productivity/ pasture
Abstract: Soil erosion is a major environmental threat to the sustainability and productive capacity of agriculture. During the last 40 years, nearly one-third of the world's arable land has been lost by erosion and continues to be lost at a rate of more than 10 million hectares per year. With the addition of a quarter of a million people each day, the world population's food demand is increasing at a time when per capita food productivity is beginning to decline.

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471. Environmental behavior and analysis of veterinary and human drugs in soils, sediments and sludge.

Diaz Cruz, M Silvia; Lopez de Alda, Maria J; and Barcelo, Damia
Trends in Analytical Chemistry 22 (6): 340-351. (2003)
NAL Call #: QD71.T7;
ISSN: 0165-9936

Descriptors: human drugs: detection, environmental fate, extraction, pharmaceutical, pollutant, sediment content, sludge content, soil content, soil pollutant/ veterinary drugs: detection, environmental fate, extraction, pharmaceutical, pollutant, sediment content, sludge content, soil content, soil pollutant/ environmental contamination

Abstract: Human and veterinary drugs are continually being released in the environment mainly as a result of manufacturing processes, disposal of unused or expired products, and excreta. Because of their physical and chemical properties, many of these substances or their bioactive metabolites end up in soils and sediments, where they can accumulate and induce adverse effects in terrestrial or aquatic organisms. Among these effects, bacterial resistance is increasingly observed and is caused by the extensive use of antibiotics in animal and fish farming and the growing practice of adding manure and sewage sludge to agricultural fields, which is of particular concern. Literature on the environmental analysis and occurrence of drugs has addressed a very small percentage of these compounds, so very little information is available about the fate and the potential effects of drugs in the environment. This article presents an overview of recent developments in the determination of veterinary and human drugs in solid environmental matrices, including soil, sediment and sludge. The analysis of pharmaceuticals in the such samples has always been carried out by high-performance liquid chromatography coupled to ultraviolet detection, and, to a lesser extent, to mass spectrometry and fluorescence detection. In most cases, sample pretreatment includes extraction of the solid sample and further purification of the extract by solid phase extraction with C18 sorbents. In addition to analytical articles, this overview includes papers concerning usage of drugs, as well as sources,

fate, persistence, and effects of pharmaceuticals in solid environmental matrices.

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472. The environmental benefits and costs of conservation tillage.

Uri, N D; Atwood, J D; and Sanabria, J

Environmental Geology 38 (2): 111-140. (1999)

NAL Call #: QE1.E5;

ISSN: 0943-0105

Descriptors: conservation tillage/ environmental benefits

Abstract: Every production practice, including conservation tillage, has positive or negative environmental consequences that may involve air, land, water, and/or the health and ecological status of wildlife. The negative impacts associated with agricultural production, and the use of conventional tillage systems in particular, include soil erosion, energy use, leaching and runoff of agricultural chemicals, and carbon emissions. Several of these impacts are quantified. The conclusions suggest that the use of conservation tillage does result in less of an adverse impact on the environment from agricultural production than does conventional tillage by reducing surface water runoff and wind erosion. Additionally, wildlife habitat will be enhanced to some extent with the adoption of conservation tillage and the benefits to be gained from carbon sequestration will depend on the soil remaining undisturbed. Finally, further expansion of conservation tillage on highly erodible land will unquestionably result in an increase in social benefits, but the expected gains will be modest.

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473. Environmental benefits of genetically modified crops: Global and European perspectives on their ability to reduce pesticide use.

Phipps, R H and Park, J R

Journal of Animal and Feed Sciences 11 (1): 1-18. (2002); ISSN: 1230-1388

Descriptors: carbon dioxide/ pesticide/ cotton (Malvaceae): fiber crop/ maize (Gramineae): grain crop/ oil seed rape (Cruciferae): oil crop/ soyabean (Leguminosae): oil crop/ sugar beet (Chenopodiaceae): sugar crop/ Angiosperms/ Dicots/ Monocots/ Plants/ Spermatophytes/ Vascular Plants/ European Union/ Green

Revolution/ diesel/ environment/ genetically modified crops/ public health

Abstract: The Green Revolution, which brought together improved varieties, increased use of fertilizer, irrigation and synthetic pesticides, is credited with helping to feed the current global population of 6 billion. While this paper recognizes the ability of pesticides to reduce crop losses, it also discusses their potential negative effects on public health, with particular emphasis in developing countries, and the environment. The response of the agricultural industry in bringing forward new technology such as reduced application rates of targeted pesticides with lower toxicity and persistency is noted. However, with increasing world population, a slowing of the rate of crop improvement through conventional breeding and a declining area of land available for food production there is a need for new technologies to produce more food of improved nutritional value in an environmentally acceptable and sustainable manner. Whilst the authors recognize that the introduction of genetically modified (GM) crops is controversial, the benefits of these crops, including their effect on pesticide use is only now beginning to be documented. Published data are used to estimate what effect GM crops have had on pesticide use first on a global basis, and then to predict what effect they would have if widely grown in the European Union (EU). On a global basis GM technology has reduced pesticide use, with the size of the reduction varying between crops and the introduced trait. It is estimated that the use of GM soyabean, oil seed rape, cotton and maize varieties modified for herbicide tolerance and insect protected GM varieties of cotton reduced pesticide use by a total of 22.3 million kg of formulated product in the year 2000. Estimates indicate that if 50% of the maize, oil seed rape, sugar beet, and cotton grown in the EU were GM varieties, pesticide used in the EU/annum would decrease by 14.5 million kg of formulated product (4.4 million kg active ingredient). In addition there would be a reduction of 7.5 million ha sprayed which would save 20.5 million litres of diesel and result in a reduction of approximately 73,000 t of carbon dioxide being released into the atmosphere. The paper also points to

areas where GM technology may make further marked reductions in global pesticide use.

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474. Environmental consequences of alternative practices for intensifying crop production.

Gregory, P. J.; Ingram, J. S. I.; Andersson, R.; Betts, R. A.; Brovkin, V.; Chase, T. N.; Grace, P. R.; Gray, A. J.; Hamilton, N.; and Hardy, T. B. *Agriculture, Ecosystems and Environment* 88 (3): 279-290. (Mar. 2002)

NAL Call #: S601 .A34;

ISSN: 0167-8809 [AEENDO]

Descriptors: crop production/ intensive farming/ intensification/ environmental impact/ crop yield/ seasonal variation/ site preparation/ germplasm/ irrigation/ fertilizers/ pest control/ efficiency/ farm inputs/ climatic change/ water quality/ soil/ genetic engineering/ literature reviews

Abstract: Summary: The increasing global demand for food will be met chiefly by increased intensification of production. For crops, this will be achieved largely by increased yields per area with a smaller contribution from an increased number of crops grown in a seasonal cycle. Production systems show a spectrum of intensification practices characterised by varying methods of site preparation and pest control, and inputs of germplasm, nutrients and water. This paper highlights three main types of intensification (based largely on the quantity and efficiency of use of external inputs) and examines both the on- and off-site environmental consequences of each for soils, water quantity and quality, and climate forcing and regional climate change. The use of low amounts of external inputs is generally regarded as being the most environmentally-benign although this advantage over systems with higher inputs may disappear if the consequences are expressed per unit of product rather than per unit area. The adverse effects of production systems with high external inputs, especially losses of nutrients from fertilisers and manures to water courses and contributions of gases to climate forcing, have been quantified. Future intensification, including the use of improved germplasm via genetic modification, will seek to increase the efficiency of use of added inputs while minimising adverse effects on the environment.

However, reducing the loss of nutrients from fertilisers and manures, and increasing the efficiency of water utilisation in crop production, remain considerable challenges. This citation is from AGRICOLA.

475. Environmental consequences of increasing production: Some current perspectives.

Bennett, A. J.
Agriculture, Ecosystems and Environment 82 (1/3): 89-95. (Dec. 2000)
NAL Call #: S601.A34;
ISSN: 0167-8809 [AEENDO].
Notes: Special issue: Food and forestry: Global change and global challenges / edited by P.J. Gregory and J.S.I. Ingram. Paper presented at a conference held September 1999, Reading, UK. Includes references.
Descriptors: food production/ environmental impact/ prediction/ environmental degradation/ climatic change/ population growth/ demand/ supply balance/ land use/ soil/ water availability/ literature reviews
Abstract: Thomas Malthus, in his 'Essay on Population' in 1798, argued that food production would not be able to keep pace with our capacity to produce. Contrary to this prediction there seems to be no evidence that our ability to produce food has been a lasting break on population growth. There are, however, several major areas of concern regarding environmental degradation associated with production having kept pace with demand. This paper examines some of the current drivers of development and environmental change. It identifies some of the impacts of growth and development on land use, soils, water availability and the possible consequences of climate change. Finally the paper returns to the question--will Malthus be proved right.
This citation is from AGRICOLA.

476. Environmental consequences of soil sodicity.

Fitzpatrick, R W; Boucher, S C; Naidu, R; and Fritsch, E
Australian Journal of Soil Research 32 (5): 1069-1093. (1994)
NAL Call #: 56.8 Au7;
ISSN: 0004-9573
Descriptors: agricultural productivity/ dryland salinity/ management strategies/ water erosion/ water quality/ waterlogging
© Thomson

477. Environmental conservation and locust control: Possible conflicts and solutions.

Peveling, R.
Journal of Orthoptera Research 10 (2): 171-187. (2001);
ISSN: 1082-6467.
Notes: Publisher: Orthopterists' Society
Descriptors: Pest control/ Insecticides/ Habitat preferences/ Acrididae/ Orthoptera/ Grasshoppers/ Agricultural & general applied entomology
Abstract: In contrast to pests developing in close association with a particular host crop, locusts and grasshoppers are often controlled in natural or semi-natural landscapes, exposing structurally and functionally diverse communities to agrochemicals, chemicals to which they are not adapted. This suggests that insecticide-induced perturbations may be severe. On the other hand, with acridids being highly mobile, exposure of non-target biota at any one location tends to be rare, and insecticides might be seen as yet another component in a canon of stochastic and deterministic, natural or human-induced environmental catastrophes and selective forces, shaping communities and ecosystems. Moreover, habitat loss is by far the most important single threat to biodiversity, so why should doubt be cast on the potential and resilience of populations to recover from occasional insecticide stress? This paper reviews the environmental impact, as well as ecological and conceptual characteristics of acridid pest control. It concludes that ecologically significant risks may arise, in particular in ecosystems exposed to multiple stressors. Four priorities in ecological risk assessment and acridid pest management are proposed: 1) delimitation and characterization of sensitive areas within locust and grasshopper habitats, 2) ecosystem-specific, long-term field studies and operational monitoring, 3) real-time stewardship of control campaigns, with adequate participation of stakeholders, and 4) incorporation of the precautionary principle into decision-making and risk management.
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478. Environmental control of dormancy in weed seed banks in soil.

Benech Arnold, R. L.; Sanchez, R. A.; Forcella, F.; Kruk, B. C.; and Ghera, C. M.
Field Crops Research 67 (2): 105-122. (2000)
NAL Call #: SB183.F5;
ISSN: 0378-4290 [FCREDZ].
Notes: Special issue: Plant phenology and the management of crop-weed interactions / edited by C.M. Ghera. Paper presented at a workshop held October 13-15, 1997, Buenos Aires, Argentina. Includes references.
Descriptors: weeds/ seed banks/ weed biology/ seed dormancy/ seedling emergence/ dormancy breaking/ prediction / soil temperature/ soil water content/ light/ nitrate/ nutrient availability/ seed germination/ carbon dioxide/ ethylene/ tillage/ flooding/ crop residues/ prescribed burning/ fertilizers/ application rates/ literature reviews
This citation is from AGRICOLA.

479. The environmental effects of genetically modified crops resistant to insects.

Fontes, E. M. G.; Pires, C. S. S.; Sujii, E. R.; and Panizzi, A. R.
Neotropical Entomology 31 (4): 497-513. (Oct. 2002-Dec. 2002)
NAL Call #: QL461-.S64;
ISSN: 1519-566X [NEENDV]
Descriptors: environmental impact/ transgenic plants/ crops/ pest resistance/ insect pests/ cultivars/ risk/ risk assessment/ ecology/ commercial hybrids/ biosafety/ agricultural adjustment/ pest management/ world markets/ insecticide resistance/ transgenics/ plant protection/ bacterial toxins/ endotoxins/ bacillus thuringiensis/ nontarget organisms/ gene flow/ insecticide residues/ weeds/ wild plants/ ecosystems/ literature reviews/ insecticidal action/ gene expression/ enzyme inhibitors/ proteinase inhibitors/ amylases/ transgenic crops
Abstract: Transgenic crops are currently being cultivated on a commercial scale in many countries. The area devoted to transgenic pest resistant varieties worldwide reached 13 million hectares in 2001. These varieties offer valuable benefits but also pose potential risks. Assessments of their impact on the environment are conducted before they are approved for commercial use, as required by the regulatory

biosafety frameworks. In this review, we discuss the potential ecological consequences of the commercial use in agriculture of genetically modified insect resistant crops. We also discuss the impacts caused by the change in agricultural practices, and attempt to identify gaps and possible opportunities for research, considering this new technological tool. We based our analysis and comments on the current knowledge of the risks and benefits of these genetically modified insect resistant crops, within the context of traditional insect management strategies. This citation is from AGRICOLA.

480. The environmental fate of phthalate esters: A literature review.

Staples, Charles A; Peterson, Dennis R; Parkerton, Thomas F; and Adams, William J
Chemosphere 35 (4): 667-749. (1997)
 NAL Call #: TD172.C54;
 ISSN: 0045-6535
Descriptors: abiotic transformations/ aquatic foodchain/ bioaccumulation processes/ biotic transformations/ partitioning behavior/ phthalate esters/ physicochemical properties/ pollution/ sediment/ soil/ surface waters/ terrestrial foodchain/ toxicology
Abstract: A comprehensive and critical review was performed on the environmental fate of eighteen commercial phthalate esters with alkyl chains ranging from 1 to 13 carbons. A synthesis of the extensive literature data on physicochemical properties, partitioning behavior, abiotic and biotic transformations and bioaccumulation processes of these chemicals is presented. This chemical class exhibits an eight order of magnitude increase in octanol-water partition coefficients (K_{ow}) and a four order of magnitude decrease in vapor pressure (VP) as alkyl chain length increases from 1 to 13 carbons. A critical review of water solubility measurements for higher molecular weight phthalate esters (i.e. alkyl chains greater than 6 carbons) reveals that most published values exceed true water solubilities due to experimental difficulties associated with solubility determinations for these hydrophobic organic liquids. Laboratory and field studies show that partitioning to suspended solids, soils, sediments and aerosols increase as K_{ow} increases and VP decreases. Photodegradation via free radical

attack is expected to be the dominant degradation pathway in the atmosphere with predicted half-lives of ca. 1 day for most of the phthalate esters investigated. Numerous studies indicate that phthalate esters are degraded by a wide range of bacteria and actinomycetes under both aerobic and anaerobic conditions. Standardized aerobic biodegradation tests with sewage sludge inocula show that phthalate esters undergo greater than 50% ultimate degradation within 28 days. Biodegradation is expected to be the dominant loss mechanism in surface soils and sediments. Primary degradation half-lives in surface and marine waters range from 1 day to 2 weeks and in soils from 1 week to several months. Longer half-lives may occur in anaerobic, oligotrophic, or cold environments. Numerous experiments have shown that the bioaccumulation of phthalate esters in the aquatic and terrestrial food-chain is limited by biotransformation, which increases with increasing trophic level. Consequently, models that ignore biotransformation grossly exaggerate bioaccumulation potential of higher molecular weight phthalate esters. This review provides the logical first step in elucidating multimedia exposure to phthalate esters.
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481. Environmental impact assessment of conventional and organic milk production.

Boer, I. J. M. de
Livestock Production Science 80 (1/2): 69-77. (2003)
 NAL Call #: SF1.L5;
 ISSN: 0301-6226
 This citation is provided courtesy of CAB International/CABI Publishing.

482. Environmental impact assessment of irrigation and drainage projects.

Dougherty, T. C.; Hall, A. W.; and Food and Agriculture Organization of the United Nations.
 Rome: Food and Agriculture Organization of the United Nations; x, 74 p.: ill.; Series: FAO irrigation and drainage paper 0254-5284 53. (1995)
Notes: "M-56"--T.p. verso. Includes bibliographical references (p. 68-71).
 NAL Call #: S612.1754--no.53;
 ISBN: 9251037310
Descriptors: Irrigation farming---Environmental aspects---Developing countries/ Drainage---Environmental

aspects---Developing countries/
 Environmental impact analysis---
 Developing countries/ Agriculture---
 Environmental aspects---Developing countries
 This citation is from AGRICOLA.

483. Environmental impact of fertilizing soils by using sewage and animal wastes.

Benckiser, G. and Simarmata, T.
Fertilizer Research 37 (1): 1-22. (1994)
 NAL Call #: S631.F422;
 ISSN: 0167-1731 [FRESDF]
Descriptors: organic wastes/ sewage sludge/ animal wastes/ animal manures/ slurries/ application to land/ environmental impact/ macronutrients/ carbon/ nitrogen/ phosphorus/ cycling/ heavy metals/ soil pollution/ pathogens/ contamination/ soil flora/ biological activity in soil/ Germany
Abstract: The European Community is producing annually about 300 X 10⁶ tons of sewage sludges as well as about 150, 950, 160 and 200 tons of domestic, agricultural, industrial and other wastes (street litter, dead leaves etc.). About 20-25% of the German sewage sludges, which contain in average about 3.8, 1.6, 0.4, 0.6, 5.3% DM-1 N, P, K, Mg and Ca, 202, 5, 131, 349, 53, 3 and 1446 mg kg⁻¹ DM Pb, Cd, Cr, Cu, Ni, Hg, Zn as well as ca. 37 and 5 mg kg⁻¹ Dm polychlorinated hydrocarbons and biphenyls, are recycled annually as fertilizer. In addition environmental impacts on the arable land of Germany may derive from 76, 19.2, 64.7, 33.6, 7.8 and 0.1 kg ha⁻¹ a⁻¹ of N, P, K, Ca, Mg and Cu added as animal manures. Besides heavy metals and hazardous organics pathogens are disseminated with organic wastes. Crop production and soil fertility generally profit from the considerable amounts of plant nutrients and carbon in sewage sludges, animal slurries and manures, but the physicochemical soil properties, the composition of microbial, faunal and plant communities as well as the metabolic processes in the soil-, rhizo- and phyllosphere are changed by organic manuring. Consequences for the soil carbon-, nitrogen and phosphorus-cycle are discussed. Impacts of heavy metals and hazardous organics on the soil biomass and its habitat as well as on transport mechanisms and survival times of disseminated pathogens in soils are reviewed with emphasis on

the German situation. A proposal for future strategies (landscape recycling) is made.

This citation is from AGRICOLA.

484. Environmental impacts of forest monocultures: Water use, acidification, wildlife conservation, and carbon storage.

Cannell, M. G. R.

New Forests 17/18 (1/3/1): 239-262. (1999)

NAL Call #: SD409.N48;

ISSN: 0169-4286.

Notes: Special issue: Planted forests: Contributions to the quest for sustainable societies / edited by J. R. Boyle, J. Winjum, K. Kavanagh and E. Jensen. Paper presented at a symposium held June 1995, Portland, Oregon. Includes references.

Descriptors: forest plantations/ monoculture/ sustainability/ water use/ species diversity/ wildlife/ habitats/ wildlife conservation/ carbon/ carbon cycle/ evapotranspiration/ plant height/ pollutants/ surface water/ water pollution/ forest management/ volume/ yields/ plant succession/ botanical composition/ stand structure/ literature reviews

Abstract: A broad assessment is given of the contentions that plantation forests are high consumers of water, increase acidification, sustain a low diversity of wildlife, and store more carbon than do unmanaged forests. The following conclusions are drawn: (1) Evapotranspiration from planted forest monocultures is greater than from short vegetation, as a result of greater interception loss. Water loss from conifer forests is usually greater than from deciduous hardwoods, but evapotranspiration from Eucalyptus in the dry tropics is often no greater than from native hardwoods. (2) Compared to short vegetation, forests can significantly increase the transfer of acidifying pollutants from the air to the soil and surface waters, and conifers are more likely to enhance acidification than are hardwoods. (3) There are normally sufficient plantation management options available to make most plantation landscapes the homes of a rich diversity of flora and fauna. (4) An area covered with a plantation managed for maximum volume yield will normally contain substantially less carbon than the same area of unmanaged forest.

This citation is from AGRICOLA.

485. Environmental impacts of livestock on U.S. grazing lands.

Krueger, W. C. and Sanderson, M. A. Council for Agricultural Science and Technology (CAST); Issue Paper Number 22, 2002. 16 p.

http://cast-science.org/cast-science.lh/pubs/grazinglands_ip.pdf

Descriptors: land management/ range management/ grazing/ soil quality/ water quality/ riparian areas/ invasive species

486. Environmental impacts of nitrogen and phosphorus cycling in grassland systems.

Watson CJ and Foy RH

Outlook on Agriculture 30 (2): 117-127; 61 ref. (2001)

NAL Call #: 10 Ou8

This citation is provided courtesy of CAB International/CABI Publishing.

487. Environmental implications of excessive selenium: A review.

Lemly, A Dennis

Biomedical and Environmental Sciences 10 (4): 415-435. (1997); ISSN: 0895-3988

Descriptors: selenium: trace metals/ agricultural irrigation/ fossil fuel waste disposal/ human activities/ land management/ public health/ water management

Abstract: Selenium is a naturally occurring trace element that is nutritionally required in small amounts but it can become toxic at concentrations only twice those required. The narrow margin between beneficial and harmful levels has important implications for human activities that increase the amount of selenium in the environment. Two of these activities, disposal of fossil fuel wastes and agricultural irrigation of arid, seleniferous soils, have poisoned fish and wildlife, and threatened public health at several locations in the United States. Research studies of these episodes have generated a data base that clearly illustrates the environmental hazard of excessive selenium. It is strongly bioaccumulated by aquatic organisms and even slight increases in waterborne concentrations can quickly result in toxic effects such as deformed embryos and reproductive failure in wildlife. The selenium data base has been very beneficial in developing hazard assessment procedures and establishing environmentally sound water quality criteria. The two faces of selenium,

required nutrient and potent toxin, make it a particularly important trace element in the health of both animals and man. Because of this paradox, environmental selenium in relation to agriculture, fisheries, and wildlife will continue to raise important land and water-management issues for decades to come. If these issues are dealt with using prudence and the available environmental selenium data base, adverse impacts to natural resources and public health can be avoided.

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488. Environmental implications of wood production in intensively managed plantations.

Bowyer, J. L.

Wood and Fiber Science 33 (3): 318-333. (July 2001)

NAL Call #: TA419.W6;

ISSN: 0735-6161 [WFSCD4]

Descriptors: forest plantations/ forest management/ intensive silviculture/ environmental impact/ environmental protection/ forest trees/ biomass production/ forests/ literature reviews
This citation is from AGRICOLA.

489. Environmental indicators of pesticide leaching and runoff from farm fields.

Kellogg, Robert L. and United States. Natural Resources Conservation Service.

Washington, D.C.: U.S. Dept. of Agriculture, Natural Resources Conservation Service. (2000)
Notes: Title from web page. "February 2000." "Presented at a Conference on "Agricultural Productivity: Data, Methods, and Measures," Description based on content viewed May 15, 2003. Includes bibliographical references.

NAL Call #: aTD196.P38-E48-2000
http://www.nrcs.usda.gov/technical/land/pubs/eip_pap.html

Descriptors: Pesticides---Environmental aspects---United States---Measurement/ Pesticides---Risk assessment---United States/ Pesticides degradation---United States/ Runoff---United States/ Indicators---Biology---United States
This citation is from AGRICOLA.

490. Environmental management best practice guidelines for the nursery industry.

South Perth, WA: Dept. of Agriculture, Water and Rivers Commission, Government of Western Australia; ii,

44 p.: ill.; Series: Miscellaneous publication (Western Australia. Dept. of Agriculture) 2002/2. (2002)
Notes: "April 2002"--Cover. Includes bibliographical references (p. 39).
NAL Call #: S397-.M57-no.-2002/2
 This citation is from AGRICOLA.

491. Environmental performance reviews: United States.

Organisation for Economic Co-operation and Development. Paris: Organisation for Economic Co-operation and Development; 274 p.: col. ill., maps. (1996)

Notes: OECD environmental performance reviews; Includes bibliographical references.

NAL Call #: GE180.E586--1996;

ISBN: 9264147713

Descriptors: Ecology--United States/ Environmental policy--United States/ Environmental protection--United States/ Environmental monitoring--United States

This citation is from AGRICOLA.

492. An Environmental Planning Model for the Design of Buffer Zones.

Cacho, M.; Radke, J. D.; and Kondolf, G. M.

In: Buffer Zones: Their Processes and Potential in Water Protection Conference Handbook. (Held 2 Aug 1930-2 Sep 1996 at Oxfordshire, UK.) Cardigan, UK: Samara Publishing Limited; pp. 31-32; 1996.

Notes: Conference: Int. Conf. Buffer Zones: Their Processes and Potential in Water Protection, Woodstock, Oxfordshire (UK), 30 Aug-2 Sep 1996

Descriptors: planning / zones/ model studies/ decision making/ environmental policy/ information systems/ design criteria/ literature review/ buffer zones/ Water quality control/ Techniques of planning

Abstract: Even after an exhaustive review of the scientific literature on buffer zones (with compilation and annotation of over 230 publications on the topic) we must still conclude that the design of buffer zones is difficult and its implementation conflictive. The difficulty of buffer zone design lies in its own nature, one dominated by variability. This variability stems from its natural composition, its geomorphic and geographic locations, and its functions. We identify the main problem in the designing of the buffer zones in the lack of a sound planning model which integrates its principal components: science, decision

makers and land ownership. An environmental planning model is proposed for the design of buffer zones. This model is intended to be used by decision makers (e.g. watershed managers). It provides the decision makers with the framework to design the buffer zone under different conditions, for specific problems and objectives. This model systematically integrates existing (historical) and current research of buffer zones within a decision making process. It provides a feedback mechanism which sustains the application of specific formulas and models for the calculation of the buffer zone. It has two components: 1. A conceptual component which defines an environmental planning approach where a framework is established to integrate science into the planning process not as the solution to the problem but as a component of the problem resolution. It brings together scientific work done in the field and establishes a framework where future work can be incorporated. 2. An operative component which establishes a Geographic Information System (GIS), a Library and a Graphic User Interface (GUI). This component helps the decision maker to build the necessary infrastructure to accommodate the planning process.
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493. Environmental policy: The other global pollutant: Nitrogen proves tough to curb.

Kaiser, J.

Science 294 (5545): 1268-1269. (2001)

NAL Call #: 470 Sci2;

ISSN: 0036-8075.

Notes: Publisher: American Association for the Advancement of Science

Descriptors: Reviews/ Nitrogen/ Air pollution/ Environmental policy / International cooperation/ Ozone/ Greenhouse gases/ Chlorofluorocarbons/ Nitrogen cycle/ Fertilizers/ Environmental impact / Ecosystem disturbance/ Pollution effects/ Pollution control/ Air pollution control/ Human Population Atmosphere Interactions/ Mechanical and natural changes/ Environmental action/ General Environmental Engineering

Abstract: Experts call for international cooperation to slash nitrogen pollution, which they say ranks with

greenhouse gases as an environmental threat. Nitrogen is an essential element for the crops that feed the world's 6 billion people. But a surfeit of nitrogen, from fertilizers and the burning of fossil fuels, is harming ecosystems and threatening public health. Although the disruption of the nitrogen cycle has largely failed to attract the sweeping public attention accorded to other global pollutants, such as chlorofluorocarbons that fray the Antarctic ozone layer and carbon dioxide that spurs global warming, ecologists say that nitrogen's impacts are at least as great.

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494. Environmental properties and effects of nonionic surfactant adjuvants in pesticides: A review.

Krogh, K. A.; Halling-Soerensen, B.; Mogensen, B. B.; and Vejrup, K. V.

Chemosphere 50 (7): 871-901. (2003)

NAL Call #: TD172.C54;

ISSN: 0045-6535

Descriptors: Surfactants/ Pesticides/ Agricultural pollution/ Fate/ Leaching/ Agricultural runoff/ Degradation/ Pollution dispersion/ Chemical pollutants/ Pollution effects/ Aquatic environment/ Reviews/ Chemical pollution/ adjuvants/ Characteristics, behavior and fate/ Pollution Environment/ Freshwater pollution/ Water Pollution: Monitoring, Control & Remediation

Abstract: Little is known about the environmental fate of adjuvants after application on the agricultural land. Adjuvants constitute a broad range of substances, of which solvents and surfactants are the major types.

Nonionic surfactants such as alcohol ethoxylates (AEOs) and alkylamine ethoxylates (ANEOS) are typically examples of pesticide adjuvants. In view of their chemical structure this paper outlines present knowledge on occurrence, fate and effect on the aquatic and terrestrial environment of the two adjuvants: AEOs and ANEOs. Both AEOs and ANEOs are used as technical mixtures. This implies that they are not one single compound but a whole range of compounds present in different ratios. Structurally both groups of substances have a mutual core with side chains of varying lengths. Each of these compounds besides having the overall ability to distribute between different phases also possesses some single compound behaviour. This is reflected

in the parameters describing the fate e.g. distribution coefficient, leaching, run-off, adsorption to soil, degradation and effects of these substances. The adsorption behaviour of ANEOs in contrast to AEOs is particularly variable and matrix dependent due to the ability of the compound to ionise at environmentally relevant pH.

Probably because the compounds exceeds high soil adsorption and are easily degradable which is reflected in the low environmental concentrations generally found in monitoring studies. The compounds generally possess low potency to both terrestrial and aquatic organisms. The major environmental problem related to these compounds is the ability to enhance the mobility of other pollutants in the soil column.

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495. The Environmental Protection Agency's white paper on *Bacillus thuringiensis* plant-pesticide resistance management.

United States. Environmental Protection Agency. Prevention, Pesticides and Toxic Substances. Washington, DC: U.S. Environmental Protection Agency, Prevention, Pesticides and Toxic Substances; ii, 86 p.: ill. (1998)

Notes: Cover title. "May 1998." "EPA 739-S-98-001." "PB98-153133." Includes bibliographical references (p. 82-86).

NAL Call #: SB976.M55-E58-1998

Descriptors: Microbial pesticides/ *Bacillus thuringiensis*/ Plant parasites--Control

This citation is from AGRICOLA.

496. Environmental regulations and technology: Control of pathogens and vector attraction in sewage sludge.

Center for Environmental Research Information (U.S.) and United States. Environmental Protection Agency. Office of Research and Development. Washington, DC: U.S. Environmental Protection Agency, Office of Research Development. (1999)

Notes: Original title: Environmental regulations and technology: Control of pathogens and vector attraction in sewage sludge (including domestic septage) under 40 CFR part 503. Rev. Oct. 1999: Control of pathogens and vector attraction in sewage sludge. "EPA/625/R-92/013." Includes bibliographical references.

NAL Call #: TD768-E57-1999

<http://www.epa.gov/ORD/NRMRL/Pubs/1992/625R92013.pdf>

Descriptors: Sewage sludge---Disinfection---United States/ Sewage disposal---United States/ Waste management

This citation is from AGRICOLA.

497. Environmental science in the coastal zone: Issues for further research.

National Research Council. Commission on Geosciences, Environment and Resources Washington DC: National Academies Press; 184 p. (1994); *ISBN:* 0-309-04980-6

<http://www.nap.edu/books/0309049806/html/>

Descriptors: coastal plains/ ecosystem management/ wetlands/ pollution/ waste management

498. Environmental significance of ice to streamflow in cold regions.

Prowse, T D *Freshwater Biology* 32 (2): 241-259. (1994)

NAL Call #: QH96.F6;

ISSN: 0046-5070

Descriptors: arctic nival/ ice effects/ moisture source/ proglacial/ runoff pathway/ spring fed/ subarctic nival/ wetland

Abstract: 1. The five major hydrologic regimes of cold regions are typically classified as proglacial, wetland, spring-fed, arctic nival and subarctic nival. Each has a distinctive hydrograph determined by the source and timing of runoff. 2. The hydrologic response of streams in cold regions is influenced significantly by the source and pathways of moisture from the landscape to the stream channel. Snow and ice masses, such as snow cover, permafrost and icings, play principal and unique roles as major moisture sources, and in affecting runoff pathways. 3. Once flow has been routed from the landscape into a channel system, the effects of floating ice begin to control the flow system. Notably, many of the most significant hydrologic events in cold regions, such as floods and low flows, are more the result of in-channel ice effects than of landscape runoff processes. This has not been adequately recognized in general assessments of cold-regions water resources. 4. Only recently have the broader environmental effects of river ice been addressed in any concerted

fashion. This paper reviews the various stages of ice formation, growth and break-up, and summarizes the major hydrologic and ecological effects associated with each. Priority research topics are also identified.

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499. Environmental soil testing for phosphorus.

Sims, J T *Journal of Production Agriculture* 6 (4): 501-507. (1993)

NAL Call #: S539.5.J68;

ISSN: 0890-8524

Descriptors: phosphorus/ agriculture/ fertilizers/ management/ manure/ nonpoint source pollution potential/ surface waters

Abstract: Many soils in the USA have extremely high soil test P levels from long-term fertilization and manuring. Sediment-bound and soluble P in runoff from these soils may contribute to eutrophication of surface waters. A field rating system, the 'P index,' has been developed to assess the potential for soil P to contribute to nonpoint source pollution. A critical component in this index is soil test P. The primary objective of this paper is to discuss the roles soil testing programs can play in the development of nutrient management strategies, such as the P index, that are needed to minimize nonpoint source pollution by soil P. A survey of soil testing labs participating in four regional soil testing committees (North Central, Northeast, Mid-Atlantic, Southeast) was conducted in 1991-1992 to determine current approaches to soil P testing, the percentage of soils testing in the high or excessive range, and major concerns with high P soils. Results indicated a need for more consistency in defining and identifying soils that are excessive in P, from an environmental standpoint, and that P management in animal waste-amended soils was the major environmental issue for most states. Soil P testing for environmental purposes will require a careful re-evaluation of the sampling, analytical, interpretive, and educational roles of soil testing programs. Alternatives considered in this paper include integration of soil testing databases with land-use planning information via geographic information systems, the use of special soil tests for biologically available P, or to estimate P sorption/desorption, and expanded

educational efforts focused not only on farmers, but on advisory and regulatory agencies and the general public.

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500. Environmental threats and environmental future of estuaries.

Kennish, M. J.

Environmental Conservation 29 (1): 78-107. (2002)

NAL Call #: QH540.E55;

ISSN: 0376-8929

This citation is provided courtesy of CAB International/CABI Publishing.

501. Environmentally degradable polymeric materials (EDPM) in agricultural applications: An overview.

Chiellini, E. M. O.; Cinelli, Patrizia; D'Antone, Salvatore; and Ilieva, Vassilka Ivanova

Polimery / Polymers 47 (7-8): 538-544. (2002);

ISSN: 0032-2725.

Notes: Published: Warszawa (Warsaw, Poland), Instytut Tworzyw Sztucznych

Descriptors: Glass/ Waste disposal/ Packaging/ Biodegradation/ Recycling/ Environmental impact/ Environmentally degradable polymeric materials (EDPM)/ Plastics Products/ Glass/ Industrial Wastes Treatment/ Packaging/ Biotechnology/ Biochemistry

Abstract: Owing to their low production cost, good physical properties and lightweight, plastic objects have slowly substituted glass, paper and metals in several fields of application including agriculture. At the same time, the current huge global production of plastics (200 million tons/year) has generated an enormous environmental concerns, mainly related to the waste generation by plastic packaging, which are responsible for 35-40% share of annual plastics consumption. Where recovery of plastics is not economically feasible, viable, controllable or attractive, plastics often remain as litter. This is the case in most of agricultural applications of polymeric materials. The market for biodegradable polymers is at this moment focusing on products in which biodegradability provides beneficial effects (e.g. waste-disposal, recycling) and a number of biodegradable materials are already being marketed or are close to market introduction and customer

acceptance. This overview is meant to provide an outline on the history and recent developments in biodegradable polymeric materials applied in agricultural practices with particular reference to the mulching segment. Special attention has been devoted to material based on renewable resources or utilization of waste products from the agroindustrial sector, thus suggesting cost-effective and environmentally sound solutions to specific social needs.

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502. The environmentally-sound management of agricultural phosphorus.

Sharpley, Andrew N and Withers, Paul J A

Fertilizer Research 39 (2): 133-146. (1994)

NAL Call #: S631.F422;

ISSN: 0167-1731

Descriptors: phosphorus/ plant (Plantae Unspecified)/ Angiospermae (Angiospermae)/ angiosperms/ plants/ spermatophytes/ vascular plants/ agriculture/ fertilizer use/ manure/ runoff/ water pollution

Abstract: Freshwater eutrophication is often accelerated by increased phosphorus (P) inputs, a greater share of which now come from agricultural nonpoint sources than two decades ago. Maintenance of soil P at levels sufficient for crop needs is an essential part of sustainable agriculture. However, in areas of intensive crop and livestock production in Europe and the U.S.A., P has accumulated in soils to levels that are a long-term eutrophication rather than agronomic concern. Also, changes in land management in Europe and the U.S.A. have increased the potential for P loss in surface runoff and drainage. There is, thus, a need for information on how these factors influence the loss of P in agricultural runoff. The processes controlling the build-up of P in soil, its transport in surface and subsurface drainage in dissolved and particulate forms, and their biological availability in freshwater systems, are discussed in terms of environmentally sound P management. Such management will involve identifying P sources within watersheds; targeting cost-effective remedial measures to minimize P losses; and accounting for different water quality objectives within watersheds. The means by which this

can be achieved are identified and include developing soil tests to determine the relative potential for P enrichment of agricultural runoff to occur; establishing threshold soil P levels which are of environmental concern; finding alternative uses for animal manures to decrease land area limitations for application; and adopting management systems integrating measures to reduce P sources as well as runoff and erosion potential.

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503. Envisioning the agenda for water resources research in the twenty-first century.

National Research Council
Washington DC: National Academy Press; 61 p. (2001)

Notes: Bibliography: p. 50;

ISBN: 0309075661

<http://www.nap.edu/books/0309075661/html/>

Descriptors: water supply/ water quality/ hydrologic data/ water use/ laws and regulations

504. Epistemology of environmental microbiology.

Madsen, Eugene L

Environmental Science and Technology 32 (4): 429-439. (1998)

NAL Call #: TD420.A1E5;

ISSN: 0013-936X

Descriptors: human (Hominidae)/ microorganisms (Microorganisms)/ Animals/ Chordates/ Humans/ Mammals/ Microorganisms/ Primates/ Vertebrates/ environmental microbiology/ epistemology/ molecular biology/ sediments/ soils

Abstract: Despite critical geochemical roles of microorganisms in biosphere maintenance, knowledge of microorganisms as they function in soils, sediments, and waters is limited. Constraints on knowledge are caused largely by methodologies that do not contend well with the complexity of field sites, with the scale differential between microorganisms and humans, and with artifacts that may arise in characterizing microorganisms using laboratory-based physiological, biochemical, genetic, and molecular biological assays. A paradigm describing how knowledge is obtained in environmental microbiology suggests that the constraints on knowledge will yield to relationships developing

between methodological innovations and their iterative application to naturally occurring microorganisms in field sites.

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505. Equipment technologies for precision agriculture.

Stombaugh, T. S. and Shearer, S. *Journal of Soil and Water Conservation* 55 (1): 6-11. (2000)
NAL Call #: 56.8 J822

This citation is provided courtesy of CAB International/CABI Publishing.

506. Eradication and pest management.

Myers, J. H.; Savoie, A.; and Randen, E. van *Annual Review of Entomology* 43: 471-491. (1998);
ISSN: 0066-4170

Descriptors: Eradication/ Pest control/ Insecta/ Agricultural & general applied entomology

Abstract: Eradication is the elimination of every single individual of a species from an area to which recolonization is unlikely to occur. Cost-benefit analyses of eradication programs involve biases that tend to underestimate the costs and overestimate the benefits. In this review, we (a) highlight limitations of current cost-benefit analyses, (b) assess eradication strategies from biological and sociological perspectives by discussing particular cases of successful and failed eradication efforts, and (c) briefly contrast eradication and ongoing area-wide control as pest management strategies. Two successful eradication programs involve the screwworm and cattle ticks. Gypsy moth and medfly eradication programs have not been successful, and subsequent captures of insects recur in eradication areas. In situations where heterogeneity of land use patterns make it difficult to prevent reinvasion of the pest, education and area-wide suppression are probably more realistic goals than eradication.

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507. Erosion and sedimentation as multiscale, fractal processes: Implications for models, experiments and the real world.

Noordwijk, M. van; Roode, M. van; McCallie, E. L.; and Lusiana, B. In: Soil erosion at multiple scales:

Principles and methods for assessing causes and impacts/ Penning de Vries, F. W. T.; Agus, F.; and Kerr, J. Wallingford, UK: CAB International, 1998; pp. 223-253.
ISBN: 0-85199-290-0

This citation is provided courtesy of CAB International/CABI Publishing.

508. Erosion and sedimentation processes on irrigated fields.

Trout, T. J. and Neibling, W. H. *Journal of Irrigation and Drainage Engineering* 119 (6): 947-963. (1993)
NAL Call #: 290.9 AM3Ps (IR);
ISSN: 0733-9437

This citation is provided courtesy of CAB International/CABI Publishing.

509. Erosion control research update.

Biocycle 43 (4): 78-79. (2002)
NAL Call #: 57.8-C734;
ISSN: 0276-5055

This citation is provided courtesy of CAB International/CABI Publishing.

510. Erosion models: Quality of spatial predictions.

Jetten, V.; Govers, G.; and Hessel, R. *Hydrological Processes* 17 (5): 887-900. (2003)
NAL Call #: GB651.H93;
ISSN: 0885-6087.

Notes: Issue editors: Ritchie, J. C.; Walling, D. E.; Peters, N. E. This citation is provided courtesy of CAB International/CABI Publishing.

511. Esterases as Markers of Exposure to Organophosphates and Carbamates.

Thompson, H. M. *Ecotoxicology* 8 (5): 369-384. (1999)
NAL Call #: RA565.A1 E27;
ISSN: 0963-9292.

Notes: Special Issue: Biomarkers
Descriptors: Organophosphates/ Carbamate compounds/ Agrochemicals/ Bioindicators/ Enzymes/ Esters/ Wildlife/ Toxicity/ Biochemistry/ Pesticides (carbamates)/ Pesticides (organophosphorus) / Reviews/ Pollution indicators/ Chemical pollution/ esterase/ Literature reviews/ Pesticides/ Biomarkers/ Pollution effects/ Biological sampling/ Sample storage/ Analytical techniques/ Agricultural pollution/ wildlife/ esterases/ Toxicology and health/ Analytical procedures/ Methods and instruments

Abstract: Esterases have been widely used over the last 20 years initially to

assess the exposure of spray operators and then wildlife to organophosphorus and carbamate agricultural pesticides. They have also been used to determine whether these chemicals have been the cause of wildlife casualties. Given the correct assay techniques and control data a significant amount of information can be derived from inhibition of esterase activity. This chapter aims to provide detailed guidance on the collection of samples, storage, assay (including reactivation techniques) and the problems associated with the interpretation of collected data together with a brief review of how esterases have been used in assessing the exposure of wildlife to agricultural insecticides.
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512. Estimates of minimum viable population sizes for vertebrates and factors influencing those estimates.

Reed, D. H.; O'Grady, J. J.; Brook, B. W.; Ballou, J. D.; and Frankham, R. *Biological Conservation* 113 (1): 23-34. (2003)

NAL Call #: S900.B5;
ISSN: 0006-3207.

Notes: Number of References: 92; Publisher: Elsevier Sci Ltd
Descriptors: Environment/ Ecology/ demographic stochasticity/ endangered species/ extinction/ minimum viable population size/ population variability/ population viability analysis/ spatial pva models/ inbreeding depression/ density dependence/ conservation biology/ viability analysis/ extinction risk/ butterfly metapopulation/ orb spiders/ variability/ dynamics

Abstract: Population size is a major determinant of extinction risk. However, controversy remains as to how large populations need to be to ensure persistence. It is generally believed that minimum viable population sizes (MVPs) would be highly specific, depending on the environmental and life history characteristics of the species. We used population viability analysis to estimate MVPs for 102 species. We define a minimum viable population size as one with a 99% probability of persistence for 40 generations. The models are comprehensive and include age-structure, catastrophes, demographic stochasticity, environmental stochasticity, and

inbreeding depression. The mean and median estimates of MVP were 7316 and 5816 adults, respectively. This is slightly larger than, but in general agreement with, previous estimates of MVP. MVPs did not differ significantly among major taxa, or with latitude or trophic level, but were negatively correlated with population growth rate and positively correlated with the length of the study used to parameterize the model. A doubling of study duration increased the estimated MVP by approximately 67%. The increase in extinction risk is associated with greater temporal variation in population size for models built from longer data sets. Short-term studies consistently underestimate the true variances for demographic parameters in populations. Thus, the lack of long-term studies for endangered species leads to widespread underestimation of extinction risk. The results of our simulations suggest that conservation programs, for wild populations, need to be designed to conserve habitat capable of supporting approximately 7000 adult vertebrates in order to ensure long-term persistence. (C) 2003 Elsevier Science Ltd. All rights reserved.
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513. European perspective of compost co-utilization for horticulture.

Szmidt, Robin
In: Beneficial co-utilization of agricultural, municipal and industrial by-products/ Brown, S.; Angle, J. S.; and Jacobs, L.
Norwell, MA: Kluwer Academic, 1998; pp. 55-68.
ISBN: 0792351894; Proceedings of the Beltsville Symposium XXII, Beltsville, Maryland, USA, May 4-8, 1997; Conference Sponsors: Beltsville Agricultural Research Center, Agricultural Research Service, US Dept. of Agriculture with the cooperation of Friends of Agriculture Research - Beltsville (FAR-B)
NAL Call #: TD796.5.B45 1998
Descriptors: Horticulture (Agriculture)/ Waste Management (Sanitation)/ compost co-utilization/ waste treatment methods
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514. Evaluating Extension-Based Water Resource Outreach Programs: Are We Meeting the Challenge?

Shepard, R.
Journal of Extension [Also available as: *Journal of Extension*, February 2002, Volume 40 Number 1; ISSN 1077-5315], 2002 (text/html)
NAL Call #: LC45.4 J682
<http://www.joe.org/joe/2002february/a3.html>
Descriptors: program evaluation/ program planning/ water quality/ water resources/ watershed management/ surveys/ agricultural education/ extension education/ United States
This citation is from AGRICOLA.

515. Evaluation and demonstration of deads composting as an option for dead animal management in Saskatchewan.

University of Saskatchewan.
Agriculture and Bioresource Engineering. Saskatchewan.
Agriculture Development Fund.
Saskatchewan: Saskatchewan Agriculture Development Fund; 1 v. (various pagings): ill. (2001)
Notes: "March 2001." "101-05424"-- Mounted on label. Includes bibliographical references. ADF Project 98000245.
NAL Call #: QL87.5-.E92-2001
Descriptors: Dead animals-- Saskatchewan/ Dead animal disposal--Saskatchewan/ Compost-- Saskatchewan
This citation is from AGRICOLA.

516. Evaluation of seven sampling techniques for wireworms (Coleoptera : Elateridae).

Simmons, C. L.; Pedigo, L. P.; and Rice, M. E.
Environmental Entomology 27 (5): 1062-1068. (Oct. 1998)
NAL Call #: QL461.E532;
ISSN: 0046-225X [EVETBX]
Descriptors: elateridae/ sampling/ population density/ conservation areas/ costs/ Iowa/ Conservation Reserve Program
Abstract: During 1995 and 1996, 7 sampling techniques were examined to develop a farmer or consultant-oriented system of sampling for wireworms (Coleoptera: Elateridae) to determine field populations. In an intensive sampling program, the soil core (absolute) sampling technique was compared with 6 relative sampling techniques [corn (*Zea mays* L.)/wheat (*Triticum aestivum* L.) bait,

melon (*Cucumis melo* L.) bait, potato (*Solanum tuberosum* L.) bait, wire-mesh bait, pheromone trap, and pitfall trap]. In an extensive sampling program, the corn/wheat bait was examined for its utility in Conservation Reserve Program habitats. Each relative method was evaluated for its precision and accuracy in determining populations of Elateridae. The corn/wheat bait showed the highest level of precision and accuracy in the intensive sampling program. Acceptable levels of precision for the corn/wheat baits were also found in the extensive sampling program. In terms of cost, the corn/wheat bait was a cost-effective method for a sampling program. When examining relative net precision, the corn/wheat bait was the most efficient and effective sampling technique for determining wireworm populations in agricultural habitats and in conservation land returning to production.
This citation is from AGRICOLA.

517. Evaluation of soil organic carbon under forests, cool-season and warm-season grasses in the northeastern US.

Corre, M. D.; Schnabel, R. R.; and Shaffer, J. A.
Soil Biology and Biochemistry 31 (11): 1531-1539. (Oct. 1999);
ISSN: 0038-0717
Descriptors: Organic matter/ Soil nutrients/ Forests/ Grasslands/ Northeast/ soil organic carbon/ Soil/ Temperate grasslands/ Temperate forests/ United States
Abstract: There is insufficient information on whether or not soil organic carbon (SOC) under forest and grass vegetation differs, and such information is needed by conservation programs targeted for C sequestration. When these contrasting types of vegetation are used for restoration of degraded riparian areas, evaluation of water-extractable and bioavailable dissolved organic carbon (WEOC and BDOC, respectively) is also important for assessing their potential in supplying available SOC for microbial degradation of nonpoint-source pollutants (e.g. nitrate removal by denitrification). Our objective was to compare the total SOC, WEOC and BDOC under forests, cool-season (C sub(3)) and warm-season (C sub(4)) grasses in the northeastern U S. Six locations were selected which had mature stands of forests, C sub(3)

and C sub(4) grasses. The total SOC, WEOC and BDOC were measured to a depth of 1 m. Analysis based on pooled data from all locations showed no difference in total SOC under forest (averages between 17-48 Mg C ha super(-1) at 0-5 cm depth), C sub(3) (19-35 mg C ha super(-1)) and C sub(4) grasses (13-39 mg C ha super(-1)). However, analysis conducted at each location indicated that total SOC was, in part, influenced by vegetation age. When vegetation age is the same, temperature was also implicated to influence changes in SOC. Neither forests nor C sub(3) and C sub(4) grasses consistently supported the highest amounts of WEOC, BDOC and the proportion of BDOC to WEOC (%BDOC) across locations. The %BDOC ranged from 2 to 84% and averages were 47% under forest, 49% under C sub(3) grass, 39% under C sub(4) grass, 41% above 60 cm depth, 47% below 60 cm depth. The uniform %BDOC with depth suggested similar amounts of available C resource for denitrifiers under these vegetation types. Conversion of C sub(3) grass to C sub(4) grass resulted to a loss of SOC during the early years of C sub(4) grass establishment. It took 16 to 18 y after planting for the total SOC under C sub(4) grass to approach that under the original C sub(3) grass. Under 16-y and 18-y C sub(4) grasses, the contribution of C sub(4)-derived SOC ranged from 53% to 72% of the total SOC under the original C sub(3) grass. The slow accumulation of C sub(4)-derived SOC is an important consideration for its use in restoring riparian and conservation areas in the northeastern US.

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518. Evaluation of the environmental impact of agriculture at the farm level: A comparison and analysis of 12 indicator-based methods.

Werf, H. M. G. van der. and Petit, J. *Agriculture, Ecosystems and Environment* 93 (1/3): 131-145. (Dec. 2002)

NAL Call #: S601 .A34;
ISSN: 0167-8809 [AEENDO]

Descriptors: farms/ agriculture/ environmental impact/ estimation/ techniques/ evaluation/ indicators/ guidelines/ erosion/ water quality/ farm management/ data collection
Abstract: An increasing variety of

evaluation methods is being proposed to address the question of the environmental impacts of agriculture. This paper compares and analyses 12 indicator-based approaches to assessing environmental impact at the farm level, in order to propose a set of guidelines for the evaluation or development of such methods. These methods take into account a number of environmental objectives (e.g. soil erosion, water quality). A set of indicators is used to quantify the degree to which these objectives are attained. A total of 26 objectives were taken into account by one or several of the methods. A great diversity in breadth of analysis exists: the number of objectives considered per method varies from 2 to 13. Indicator-based methods for environmental evaluation at the farm level should take into account a range of objectives covering both local and global effects. Indicators based on the environmental effects of farmer practices are preferable to indicators based on farmer practices as the link with the objective is direct and the choice of means is left to the farmer. Indicators based on farmer practices cost less in data collection but do not allow an actual evaluation of environmental impact. Indicators allowing expression of impacts both per unit surface and per unit product are preferable. Indicators producing output in the form of values are preferred to indicators producing scores. If possible, science-based threshold values should be defined for indicators. The method should be validated with respect to (a) the appropriateness of its set of objectives relative to its purpose and (b) its indicators.

This citation is from AGRICOLA.

519. Evaluation of the RUSLE soil erosion model.

Yoder, D. C.; Foster, G. R.; Weesies, G. A.; Renard, K. G.; McCool, D. K.; and Lown, J. B.

In: ASAE Annual International Meeting. (Held 12 Jul 1998-16 Jul 1998 at Orlando, Florida.)

St. Joseph, Mich.: American Society of Agricultural Engineers (ASAE); 9 p.; 1998.

Notes: ASAE Paper no. 982197

This citation is provided courtesy of CAB International/CABI Publishing.

520. An evaluation of vernal pool creation projects in New England: Project documentation from 1991-2000.

Lichko, L. E. and Calhoun, AJK. *Environmental Management* 32 (1): 141-151. (2003)
NAL Call #: HC79.E5E5;
ISSN: 0364-152X.

Notes: Number of References: 55;
Publisher: Springer-Verlag
Descriptors: Environment/ Ecology/ vernal pool/ wetland creation/ compensatory mitigation/ wetland monitoring/ reference wetlands/ New England/ metapopulation dynamics/ amphibian conservation/ temporary wetlands/ self design/ mitigation/ landscape/ declines/ biodiversity/ populations/ hydroperiod

Abstract: Vernal pools are vulnerable to loss through development and agricultural and forestry practices owing to their isolation from open water bodies and their small size. Some vernal pool-dependent species are already listed in New England as Endangered, Threatened, or Species of Special Concern. Vernal pool creation is becoming more common in compensatory mitigation as open water ponds, in general, may be easier to create than wooded wetlands. However, research on vernal pool creation is limited. A recent National Research Council study (2001) cites vernal pools as "challenging to recreate." We reviewed documentation on 15 vernal pool creation projects in New England that were required by federal regulatory action. Our purpose was to determine whether vernal pool creation for compensatory mitigation in New England replaced key vernal pool functions by assessing project goals and documentation (including mitigation plans, pool design criteria, monitoring protocols, and performance standards). Our results indicate that creation attempts often fail to replicate lost pool functions. Pool design specifications are often based on conjecture rather than on reference wetlands or created pools that function successfully. Project monitoring lacks consistency and reliability, and record keeping by regulatory agencies is inadequate. Strengthening of protection of isolated wetlands in general, and standardization across all aspects of vernal pool creation, is needed to

ensure success and to promote conservation of the long-term landscape functions of vernal pools.
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521. Evaluation of water quality projects in the Lake Tahoe basin.

Schuster, S. and Grismer, M. E.
Environmental Monitoring and Assessment 90 (1-3): 225-242. (2004)
NAL Call #: TD194.E5;
ISSN: 0167-6369.

Notes: Number of References: 61;
Publisher: Kluwer Academic Publ
Descriptors: Environment/ Ecology/
best management practices/ erosion/
eutrophication/ nutrient loadings/
water quality/ California Nevada/
detention ponds/ constructed
wetlands/ nutrient transport/ surface
runoff/ Sierra Nevada/ removal/
improvement/ enrichment/
Washington

Abstract: Lake Tahoe is a large sub alpine lake located in the Sierra Nevada Range in the states of California and Nevada. The Lake Tahoe watershed is relatively small (800 km²) and is made up of soils with a very low nutrient content and when combined with the Lake's enormous volume (156 km³) produces water of unparalleled clarity. However, urbanization around the Lake during the past 50 yr has greatly increased nutrient flux into the Lake resulting in increased algae production and rapidly declining water clarity. Lake transition from nitrogen limiting to phosphorous limiting during the last 30 yr suggests the onset of cultural eutrophication of Lake Tahoe. Protecting Lake Tahoe's water quality has become a major public concern and much time, effort, and money has been, and will be, spent on this undertaking. The effectiveness of remedial actions is the subject of some debate. Local regulatory agencies have mandated implementation of best management practices (BMPs) to mitigate the effects of development, sometimes at great additional expense for developers and homeowners who question their effectiveness. Conclusive studies on the BMP effectiveness are also expensive and can be difficult to accomplish such that very few such studies have been completed. However, several project evaluations have been completed and more are underway. Such study usually demonstrates support of the project's effectiveness in decreasing

nutrient flux to Lake Tahoe. Here, we review the existing state of knowledge of nutrient loading to the Lake and to highlight the need for further evaluative investigations of BMPs in order to improve their performance in present and future regulatory actions.
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522. Evapotranspiration parameters for variably-sized wetlands.

Allen, R. G.; Hill, R. W.; and Srikanth, V.
In: 1994 International Summer Meeting sponsored by the American Society of Agricultural Engineers. (Held 19 Jun 1994-22 Jun 1994 at Kansas City, Missouri.)
St. Joseph, Mich.: American Society of Agricultural Engineers; 24 p.: 1994.
Notes: Paper numbers: 94-2120/94-2155;
ISSN: 0149-9890

NAL Call #: 290.9-Am32P
Descriptors: wetlands /
evapotranspiration/ arid regions/
water use/ vegetation/ plant height/
plant density/ open water/ algorithms/
equations/ literature reviews
This citation is from AGRICOLA.

523. Evapotranspiration responses of plants and crops to carbon dioxide and temperature.

Allen, L. H. Jr.
Journal of Crop Production 2 (2): 37-70. (1999)
NAL Call #: SB1.J683;
ISSN: 1092-678X [JCPRF8].
Notes: Special issue: Water use in crop production / edited by M.B. Kirkham. Includes references.
Descriptors: plants/ crops/
evapotranspiration/ carbon dioxide/
environmental temperature/ carbon
dioxide enrichment/ climatic change/
prediction/ air temperature/ water use
efficiency/ leaf conductance/ stomatal
resistance/ water vapor/ temperature/
leaves/ leaf area/ crop yield/ seed
output/ biomass production/
mathematical models/ glycine max/
zea mays/ irrigation/ precipitation/
water use/ literature reviews/ leaf
temperature
This citation is from AGRICOLA.

524. Examination of the wetland hydrologic criterion and its application in the determination of wetland hydrologic status.

Hunt, W. F.; Water Resources Research Institute of the University of North Carolina; Geological Survey

(U.S.); and North Carolina Agricultural Research Service
Raleigh, NC: Water Resources Research Institute of the University of North Carolina; Series: Report (Water Resources Research Institute of the University of North Carolina) no. 333; xxii, 119 p.: ill., map. (2001)
Notes: "June 2001." "UNC-WRRI-2001-333." "The research on which this report is based was supported in part by the United States Department of the Interior, Geological Survey, the Water Resources Research Institute of the University of North Carolina and by the North Carolina Agricultural Research Service." Includes bibliographical references (p. 61-63).
Water Resources Research Institute. Number 70137.
NAL Call #: TD201-.N6-no.-333
Descriptors: Wetland hydrology/
Water quality---Standards
This citation is from AGRICOLA.

525. Expected Climate Change Impacts on Soil Erosion Rates: A Review.

Nearing, M. A.; Pruski, F. F.; and O'Neal, M. R.
Journal of Soil and Water Conservation 59 (1): 43-50.
(Jan. 2004-Feb. 2004)
NAL Call #: 56.8 J822;
ISSN: 0022-4561
Descriptors: Climate Change/ Runoff/
Sediment/ Soil Erosion/ Soil Loss/
Midwestern United States/
Greenhouse Gas/ Model/
Precipitation/ Simulation/ Circulation/
Variability/ Yields
Abstract: Global warming is expected to lead to a more vigorous hydrological cycle, including more total rainfall and more frequent high intensity rainfall events. Rainfall amounts and intensities increased on average in the United States during the 20th century, and according to climate change models they are expected to continue to increase during the 21st century. These rainfall changes, along with expected changes in temperature, solar radiation, and atmospheric CO₂ concentrations, will have significant impacts on soil erosion rates. The processes involved in the impact of climate change on soil erosion by water are complex, involving changes in rainfall amounts and intensities, number of days of precipitation, ratio of rain to snow, plant biomass production, plant residue decomposition rates, soil microbial

activity, evapo-transpiration rates, and shifts in land use necessary to accommodate a new climatic regime. This paper reviews several recent studies conducted by the authors that address the potential effects of climate change on soil erosion rates. The results show cause for concern. Rainfall erosivity levels may be on the rise across much of the United States. Where rainfall amounts increase, erosion and runoff will increase at an even greater rate: the ratio of erosion increase to annual rainfall increase is on the order of 1.7. Even in cases where annual rainfall would decrease, system feedbacks related to decreased biomass production could lead to greater susceptibility of the soil to erode. Results also show how farmers' response to climate change can potentially exacerbate, or ameliorate, the changes in erosion rates expected.

© Thomson ISI

526. Experimental basin studies: An international and historical perspective of forest impacts.

Whitehead, P. G. and Robinson, M. *Journal of Hydrology* 145 (3/4): 217-230. (May 1993)

NAL Call #: 292.8-J82;

ISSN: 0022-1694 [JHYDA].

Notes: Special Issue: The Balquhider Catchment and Process Studies / edited by P.G. Whitehead and I.R. Calder. Literature review. Includes references.

Descriptors: watersheds/ forests/ catchment hydrology/ forest influences/ stream flow/ precipitation/ site factors/ land use/ forestry practices/ research/ literature reviews

Abstract: The long tradition of catchment studies in hydrology results from the need to understand the water balance operating in basins, the processes controlling water movements and the impacts of land-use change on water quantity and quality. The interactions between physical, chemical and biological behaviour have become an increasingly dominant theme in recent years, and this has been boosted by global environmental problems such as acid rain and climatic change. After a historical summary of catchment studies, a brief review is given of some of the most influential experiments and their underlying objectives and results, concentrating on those concerned with one land-use change in particular--to/from forestry.

In interpreting the effects of a change in forest cover, it is necessary also to consider impacts of the associated site disturbance, including possible soil compaction and road construction as a result of logging and any artificial drainage before tree planting. The recent tendency to link basin studies into networks is discussed, with examples of currently active networks. This citation is from AGRICOLA.

527. Experimental evidence of transport of pesticides through field soils: A review.

Flury, M.

Journal of Environmental Quality 25 (1): 24-45. (Jan. 1996-Feb. 1996)

NAL Call #: QH540.J6;

ISSN: 0047-2425 [JEVQAA]

Abstract: Much information is available in the literature about pesticide transport through soils at the field scale. The purpose of this study is to review the literature with a focus on pesticide leaching to groundwater.

The literature was compiled and discussed with respect to different factors that influence pesticide leaching. Pesticide leaching below the root zone has been demonstrated in sandy as well as in loamy soils. Particularly in loamy soils, there is evidence that even strongly adsorbing chemicals can move along preferential flow pathways and that the travel times of pesticides are comparable to those of conservative solutes. The amounts of pesticides leached below the root zone by worst case rainfall events depend on the chemical properties and can reach up to 5% of the applied mass. When there is no heavy rainfall shortly following application of chemicals, the mass annually leached below the root zone is in the range of < 0.1 to 1%, occasionally it can reach up to 4%. Although a direct comparison cannot be made, the mass lost by leaching seems generally to be smaller than that lost by runoff, depending of course on the slope of the fields. Several factors that affect pesticide leaching, such as surface preparation, soil structure, soil water content, type of irrigation, pesticide formulation, time of application and rainfall events, are discussed with support of experimental evidence. While some factors showed inconsistent effects, others show promise in controlling leaching mechanisms. These latter factors include initial water content, surface preparation, and time of

pesticide application. Based on the reviewed literature, recommendations were made for future research activities.

This citation is from AGRICOLA.

528. Expert system applications in irrigation management: An overview.

Mohan, S and Arumugam, N *Computers and Electronics in Agriculture* 17 (3): 263-280. (1997)
NAL Call #: S494.5.D3C652;
ISSN: 0168-1699

Descriptors: bioprocess engineering/ computer language/ computerized technique/ expert system applications/ irrigation management/ reservoir operation/ soil science/ user interface

Abstract: Due to the complexity of irrigation management problems, reliance on experience and experts is necessary for effective decision-making in this domain. Expert systems (ES) are efficient means for providing decision support to tasks that primarily require experience based knowledge. This paper reviews the adoptability and suitability of ES applications in the domain of irrigation management. Core concepts of ES are briefly discussed. A detailed review of the existing applications of ES is presented under three classes of ES applications: (a) expert systems proper, (b) intelligent front-ends, and (c) hybrid systems. This review of literature shows that the ES approach is applied more recently to broader domain areas in contrast to the earlier systems that were focused on narrower domain problems. Additional research on ES application to domains such as real-time irrigation scheduling, reservoir operation involving stochastic nature of inflows and evapotranspiration demand, and integrated operation of irrigation system components is needed to evolve guidelines for optimal water use. The problem of handling multiple experts to evolve decisions that are less biased than an individual expert needs to be addressed. A methodology that takes into account the uncertainty of the ES decisions is also warranted. Further, there is a need for practical evaluation of the quality of recommendations made by the ES which would result in the successful implementation of the ES.

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529. Exploitation of composting management for either reclamation of organic wastes or solid-phase treatment of contaminated environmental matrices.

Vallini, Giovanni; Di Gregorio, Simona; Pera, Antonio; Queda, A; and Cunha, Cristina F
Environmental Reviews 10 (4): 195-207. (2002)
 NAL Call #: GE140.E59;
 ISSN: 1181-8700
 Descriptors: bioremediation/ contaminated sediments/ contaminated soils
 © Thomson

530. Exploring the opportunities for agroforestry in changing rural landscapes: Selected papers from the 5th Biennial Conference on Agroforestry in North America, August 3-6, 1997.

Lassoie, J. P. and Buck, L. E.
Agroforestry Systems 44 (2/3): 106-357. (1999)
 NAL Call #: SD387.M8A3;
 ISSN: 0167-4366.
 Notes: Special issue.
 This citation is provided courtesy of CAB International/CABI Publishing.

531. Extraction and purification of microbial DNA from soil and sediment samples.

Roose, Amsaleg C L; Garnier, Sillam E; and Harry, M
Applied Soil Ecology 18 (1): 47-60. (2001)
 NAL Call #: QH541.5.S6A67;
 ISSN: 0929-1393
 Descriptors: microbial DNA: extraction, purification, sediment, soil/ microbes (Microorganisms): diversity/ Microorganisms/ cell fragment removal/ contaminant extraction/ extraction/ purification efficiency: environmental sample dependent
 Abstract: Knowledge of the microbial diversity in natural ecosystems has long been limited because only a minority of naturally occurring microbes can be cultured using standard techniques. Several protocols for the extraction of nucleic acids directly from the environmental matrix have been recently developed to circumvent this problem and this review covers the major extraction procedures currently used to obtain microbial DNA from environmental samples. DNA extraction procedures can involve cell extraction or direct lysis, depending on whether or not the microbial cells are isolated from their

matrix. An extraction protocol generally comprises three steps: cell lysis that can be chemical, mechanical and enzymatic, removal of cell fragments and nucleic acid precipitation and purification. Direct lysis methods are more often used than cell extraction ones because they are less time consuming and give a better recovery, resulting in an extracted DNA more representative of the whole microbial community present in the sample. However, with direct lysis, contaminants are also extracted which interfere with the DNA extract. As a consequence, a more extensive purification step is required. At least four types of purification are commonly used: cesium chloride density gradient ultracentrifugation, chromatography, electrophoresis and dialysis and filtration. To remove all contaminants, it could be recommended that several purification procedures be combined, depending on the environmental matrix. The efficiency of extraction/purification depends on the properties of the environmental sample, and each step of the extraction procedure must be adjusted for each sample. Moreover, each step of the procedure suffers from shortcomings, and each additional step inevitably induces a DNA loss. Thus, the choice of a protocol must be a compromise between the recovery of DNA that will be the most representative of the microbial community and the quality of the DNA obtained that is imposed by the objectives of the work, such as detection of specific organisms or assessment of the total microbial community structure. Nevertheless, molecular techniques, that could be used in combination with cultivation techniques, are powerful methods for surveying the microbial diversity in environmental samples, although investigators must be aware that such techniques are not exempt of methodological biases.
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532. Factors affecting the performance of stormwater treatment wetlands.

Carleton, J N; Grizzard, T J; Godrej, A N; and Post, H E
Water Research 35 (6): 1552-1562. (2001)
 NAL Call #: TD420.W3;
 ISSN: 0043-1354
 Descriptors: ammonia: pollutant/

nitrate: pollutant/ phosphorus: pollutant/ hydraulic loading rate/ pollutant input/ pollutant removal/ stormwater runoff/ stormwater treatment wetlands/ wastewater treatment
 Abstract: Data from 35 studies on 49 wetland systems used to treat stormwater runoff or runoff-impacted surface waters were examined and compared in order to identify any obvious trends that may aid future stormwater treatment wetland design efforts. Despite the intermittent nature of hydrologic and pollutant inputs from stormwater runoff, our analysis demonstrates that steady-state first-order plug-flow models commonly used to analyze wastewater treatment wetlands can be adapted for use with stormwater wetlands. Long-term pollutant removals are analyzed as functions of long-term mean hydraulic loading rate and nominal detention time. First-order removal rate constants for total phosphorus, ammonia, and nitrate generated in this fashion are demonstrated to be similar to values reported in the literature for wastewater treatment wetlands. Constituent removals are also demonstrated via regression analyses to be functions of the ratio of wetland area to watershed area. Resulting equations between these variables can be used as preliminary design tools in the absence of more site-specific details, with the understanding that they should be employed cautiously.
 © Thomson

533. Factors determining the effects of pesticides upon butterflies inhabiting arable farmland.

Longley, M. and Sotherton, N. W.
Agriculture, Ecosystems and Environment 61 (1): 1-12. (Jan. 1997)
 NAL Call #: S601.A34;
 ISSN: 0167-8809 [AEENDO]
 Descriptors: agricultural land/ pesticides/ exposure/ nontarget effects/ lepidoptera/ sublethal effects/ mortality/ fecundity/ longevity/ toxicity/ environmental factors/ farm management/ reviews
 This citation is from AGRICOLA.

534. Factors of variation of the fate of nitrogen from cattle ejections on forage surfaces.

Simon JC; Decau ML; and Morvan T.
 In: Cinquiemes rencontres autour des recherches sur les ruminants:

Rencontres-Recherches-Ruminants. (Held 2 Dec 1998-3 Dec 1998 at Paris, France.); Vol. 5.; pp. 193-200; 1998.

This citation is provided courtesy of CAB International/CABI Publishing.

535. Farm scale composting: Biocycle.

Emmaus, Pa.: JG Press; 80 p.: ill. (some col.). (1995)

Notes: Cover title. "A Biocycle publication."

NAL Call #: S661.F37--1995

Descriptors: Compost---Management/ Compost---Economic aspects

This citation is from AGRICOLA.

536. Farming for a better environment: A white paper.

Soil and Water Conservation Society (U.S.).

Ankeny, Iowa: Soil and Water Conservation Society; vii, 67 p. (1995)

NAL Call #: S604.F28--1995;

ISBN: 0935734376

Descriptors: Conservation tillage/ Soil conservation/ Soil erosion

This citation is from AGRICOLA.

537. Farming systems and conservation needs in the Northwest Wheat Region.

Papendick, R. I.

American Journal of Alternative Agriculture 11 (2/3): 52-57. (1996)

NAL Call #: S605.5.A43;

ISSN: 0889-1893

This citation is provided courtesy of CAB International/CABI Publishing.

538. Farmland biodiversity: Is habitat heterogeneity the key?

Benton, T. G.; Vickery, J. A.; and Wilson, J. D.

Trends in Ecology and Evolution 18 (4): 182-188. (2003)

NAL Call #: QH540.T742;

ISSN: 0169-5347

This citation is provided courtesy of CAB International/CABI Publishing.

539. Faster, better data for burned watersheds needing emergency rehab.

Lachowski, H.; Hardwick, P.; Griffith, R.; Parsons, A.; and Warbington, R.

Journal of Forestry 95 (6): 4-8. (1997);

ISSN: 0022-1201

This citation is provided courtesy of CAB International/CABI Publishing.

540. The fate and transport of phosphorus in agricultural systems.

Hansen, N. C.; Daniel, T. C.; Sharpley, A. N.; and Lemunyon, J. L.

Journal of Soil and Water Conservation 57 (6): 408-417.

(Nov. 2002-Dec. 2002)

NAL Call #: 56.8 J822;

ISSN: 0022-4561 [JSWCA3]

Descriptors: nitrogen / losses from soil/ nitrogen fertilizers/ animal manures/ nitrogen cycle/ soil flora/ biological activity in soil/ nitrous oxide/ emission/ nitrate/ leaching/ simulation models/ use efficiency/ water pollution/ soil biology/ water erosion

This citation is from AGRICOLA.

541. Fate and transport of surface water pathogens in watersheds.

Ferguson, C.; Husman, A. M. de R.; Altavilla, N.; Deere, D.; and Ashbolt, N.

Critical Reviews in Environmental Science and Technology 33 (3):

299-361. (2003)

NAL Call #: QH545.A1C7;

ISSN: 1064-3389

This citation is provided courtesy of CAB International/CABI Publishing.

542. Fate, Dissipation and Environmental Effects of Pesticides in Southern Forests: A Review of a Decade of Research Progress.

Neary, D. G.; Bush, P. B.; and Michael, J. L.

Environmental Toxicology and Chemistry 12 (3): 411-428. (1993)

NAL Call #: QH545.A1E58

[ETOC DK]

Descriptors: Descriptors: Dissipation/ Fate of pollutants/ Leaching/ Literature review/ Path of pollutants/ Pesticides/ CREAMS Model/ Carbofuran/ Environmental effects/ Fenvalerate/ GLEAMS Model/ Hexazinone/ Infiltration/ Lindane/ Malathion/ Model studies/ Nitrates/ PRZM Model/ Picloram/ Sediment yield/ Sulfometuron methyl/ Surface runoff/ Triclopyr/ Water pollution effects/ Sources and fate of pollution/ Ultimate disposal of wastes

Abstract: Ten years of watershed-scale research has been conducted on the fate of forestry-use pesticides in forested catchments under mainly operational conditions throughout the southern U.S. Studies have evaluated chemicals such as hexazinone, picloram, sulfometuron methyl, met-sulfuron methyl, azinphosmethyl,

triclopyr, carbofuran, lindane, malathion, fenvalerate, copper-chromium-arsenic, and pentachlorophenol. Model verifications of pesticide fate and dissipation and risk analyses have been conducted using simulation models such as GLEAMS, CREAMS, and PRZM. Field study data indicate that movement is controlled by the main hydrologic pathways (e.g., surface runoff, infiltration, interflow, and leaching below the root zone). Peak residue concentrations tend to be low (<500 microgm/L), except where direct applications are made to perennial streams or to ephemeral channels, and where buffer strips are not used and do not persist for extended periods of time. Indirect effects noted from the use of pesticides in forested watersheds include temporarily increased nitrate nitrogen losses, reduced sediment yields, temporal changes in terrestrial invertebrate abundance, reduced plant diversity, and changes in particulate organic matter transport in streams. Analyses conducted in regional environmental impact statements indicate that the low concentrations and short persistence of forestry pesticides in surface water and groundwater do not post a significant risk to water quality, aquatic biota, or human health. (Author's abstract)
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543. Fate of Applied Fertilizer Nitrogen in Rainfed and Irrigated Rice Soils Under Green Manuring Condition: A Review.

Mohanty, S. and Mandal, S. R. *Environment and Ecology* 17 (1): 157-163. (1999);

ISSN: 0970-0420

Descriptors: Fertilizers/ Nitrogen/ Rice/ Irrigation/ Hydrology/ Fate of Pollutants/ Sources and fate of pollution

Abstract: Basic studies to quantify the fate of added fertilizer nitrogen in rice soil previously enriched with green manures under irrigated and rainfed condition has summarily been presented here. Results suggest that with similar N-use efficiency, green manure-N is less prone to loss mechanisms that mineral-N fertilizers and may therefore contribute to long term residual effects on productivity. The various channels through which applied fertilizer nitrogen gets

distributed after application under different hydrologic conditions and subsequently the effect of green manuring modifying the trends have been elucidated.

© Cambridge Scientific Abstracts (CSA)

544. Fate of Environmental Pollutants.

Davis, J. F. and Kratzer, T. W. *Water Environment Research* 69 (4): 861-869. (June 1997)
NAL Call #: TD419.R47;
ISSN: 1061-4303

Descriptors: literature review/ fate of pollutants/ surface water/ surveys/ contamination/ water pollution sources/ kinetics/ ecosystems/ acidification/ metals/ nutrients/ pathogens/ organic compounds/ literature reviews/ pollution dispersion/ chemical kinetics/ literature review/ Sources and fate of pollution/ Behavior and fate characteristics/ Freshwater pollution

Abstract: This review covers studies related to the fate of pollutants in natural surface waters including surveys of contamination, assessment of pollutant sources, measurement of reaction kinetics, and modeling and analysis of aquatic ecosystems. Sections are provided on acidification and humic substances, metals, nutrients, pathogens, and xenobiotic organics.

© Cambridge Scientific Abstracts (CSA)

545. Fate of poultry manure estrogens in soils: A review.

Hanselman, T. A.; Graetz, D. A.; and Wilkie, A. C. *Soil and Crop Science Society of Florida: Proceedings* 62: 8-12. (2003)
NAL Call #: 56.9 So32;
ISSN: 0096-4522

Descriptors: Agriculture/ Agronomy/ pka values/ 17 beta estradiol / estrone/ litter/ estradiol/ hormones/ runoff/ testosterone/ persistence/ exposure

Abstract: Agricultural drainage waters may become contaminated with natural steroidal estrogen hormones, i.e. estradiol and estrone, when poultry wastes are land-applied at agronomic rates. Estrogen contamination of waterways is a concern because low concentrations (ng L⁻¹) of these chemicals in water can adversely affect the reproductive biology of aquatic vertebrates (fish, turtles, frogs, etc.) by disrupting the

normal function of their endocrine systems. This review provides some information about the physicochemical properties of estradiol and estrone and summarizes current knowledge of estrogen fate and transport in soils. Estradiol and estrone are nonionic (pKa 10.3 to 10.8), slightly hydrophobic (log K_{ow} 3.1 to 4.0) compounds that have low solubility in water (0.8 to 13.0 mg L⁻¹). The fate of manure-borne estrogens in soils is not well-established. Laboratory studies suggest that estrogens should be rapidly dissipated in soils due to sorption and transformation, but field studies have demonstrated that estrogens are sufficiently mobile and persistent to impact surface and ground water quality. More information is needed about the types and amounts of estrogens that occur in various poultry wastes, e.g. broiler litter vs. layer manure. More information is also needed about the sorption, biodegradation, and leaching potential of estradiol and estrone in soils.

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546. Feasibility of prescription pesticide use in the United States.

Coble, Harold D. Ames, IA: Council for Agricultural Science and Technology; Series: CAST issue paper no. 9. (1998)
Notes: Caption title. "August 1998."
NAL Call #: S441-.187-no.-9
Descriptors: Pesticides---Government policy---United States/ Pesticide regulations
This citation is from AGRICOLA.

547. Feeding and management system to reduce environmental pollution in swine production.

Han IK; Lee JH; Piao XS; Li DeFa; and Li DF *Asian Australasian Journal of Animal Sciences* 14 (3): 432-444; 81 ref. (2001)
NAL Call #: SF55.A78A7
This citation is provided courtesy of CAB International/CABI Publishing.

548. Fertilizer and Manure Application Equipment.

Bartok, J. W. Ithaca, NY: Natural Resource, Agriculture, and Engineering Service NRAES-57; 22 p. (1994)
Descriptors: animal manures/ fertilizer application/ application equipment/ manure storage
Abstract: This publication discusses

types of fertilizer and manure nutrient values and provides guidance on equipment selection. Procedures for calibrating fertilizer and manure application equipment are reviewed. The publication includes over thirty illustrations, six tables, a plan for a fertilizer storage shed, and a glossary of terms.

© Natural Resource, Agriculture and Engineering Service (NRAES)

549. Fertilizer recommendations for intensively managed grassland.

Unwin RJ and Vellinga TH. In: *Grassland and society: Proceedings of the 15th General Meeting of the European Grassland Federation.* (Held 6 Jun 1994-9 Jun 1994 at Wageningen, The Netherlands.) Mannetje, L. and Frame, J. (eds.) Wageningen, The Netherlands: Wageningen Pers; pp. 590-602; 1994. This citation is provided courtesy of CAB International/CABI Publishing.

550. Fertilizers and manures.

Hall, Daniel and Smith, A. M. Delhi: Biotech Books; xvii, 333 p.: ill. (2002)
Notes: 5th ed. (Rev.); Includes bibliographical references and index.
NAL Call #: S654-.H362-2002;
ISBN: 8176220663
Descriptors: Fertilizers/ Manures
This citation is from AGRICOLA.

551. Fertilizers and the environment.

Ayoub, A. T. *Nutrient Cycling in Agroecosystems* 55 (2): 117-121. (Oct. 1999)
NAL Call #: S631.F422;
ISSN: 1385-1314 [NCAGFC]
Descriptors: fertilizers/ soil fertility/ soil degradation/ cultivation/ deforestation/ land clearance/ erosion/ ecosystems/ pollutants/ socioeconomics/ technology transfer/ sustainability/ eutrophication/ global warming/ ozone/ acid rain/ algae/ environmental impact/ literature reviews/ water pollution
Abstract: Soil fertility decline is occurring over large parts of the world, particularly the developing world. It occurs mainly through intensive cultivation and the inadequate application of replacement nutrients, and through deforestation and clearance of vegetation on sandy soils. Large amounts of soil nutrients are also lost to the terrestrial ecosystems through wind and water

erosion. Low soil fertility is considered as one of the most important constraints on improved agricultural production. To sustain the future world population more fertilizers are required, which may become an environmental hazard, unless adequate technical and socio-economic measures are taken. It is estimated that, by the year 2020 at a global level, 70% of plant nutrients will have to come from fertilizers. Fertilizers are thus indispensable for sustained food production, but excessive use of mineral fertilizers has roused environmental concerns. Chief among these concerns are eutrophication of fresh water bodies, global warming and stratospheric ozone depletion, proliferation of algal blooms in coastal waters and contribution towards acid rain. This citation is from AGRICOLA.

552. Fertilizers in agroforestry systems.

Szott, L T and Kass, D C L
Agroforestry Systems 23 (2-3): 157-176. (1993)

NAL Call #: SD387.M8A3;
ISSN: 0167-4366

Descriptors: plant (Plantae Unspecified)/ tree (Spermatophyta)/ Plantae (Plantae Unspecified)/ plants/ spermatophytes/ vascular plants/ agriculture/ alley cropping/ ecology/ forestry/ home gardens/ nutrient cycling/ organic fertilizer/ shaded perennial

Abstract: This review encompasses results of fertilization experiments on several agroforestry systems - alley cropping, perennial shade systems, home gardens - in which fertilizer use is a likely management alternative. Fertilizer response was found to be most common in alley cropping, variable in perennial shade systems, and rarely reported in home gardens. Level of nutrient removal in harvested products is probably the overriding factor in determining fertilizer response; greater accumulation of organic residues, slower growth under shade, and longer periods of nutrient uptake probably also contribute to the relatively smaller fertilizer response of the perennial shade systems and home gardens. Considerable knowledge gaps exist regarding the breakdown of organic residues, and interactions between mineral and organic amendments. Systems based on annual crops (e.g., alley cropping) are likely to be less nutrient-efficient

and sustainable than systems based on perennial crops, due to reduced fixation and transfer of N to the crops, the tendency of the trees to compete for and sequester nutrients, relatively high P requirements of the crops, and the high labor cost of tree management. The possible benefits of fertilization of specific components in home gardens, and relative advantages of including low-value tree legumes, high-value shade trees, and fertilization in shaded perennial systems are only beginning to receive research attention.

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553. Field effects of simazine at lower trophic levels: A review.

Strandberg, Morten T and Scott Fordsmand, Janeck J

Science of the Total Environment 296 (1-3): 117-137. (2002)

NAL Call #: RA565.S365;
ISSN: 0048-9697

Descriptors: simazine: aerial fallout rain concentrations, application rate, bioaccumulation, disappearance time, dissipation, fate, field effects, fresh water concentrations, herbicide, lower trophic level effects, phytotoxicity, pollutant, sediment decomposition, toxicity/ algae (Algae)/ aquatic invertebrate (Invertebrata)/ bacteria (Bacteria)/ fungi (Fungi)/ plant (Plantae)/ terrestrial invertebrate (Invertebrata)/ Algae/ Animals/ Bacteria/ Eubacteria/ Fungi/ Invertebrates/ Microorganisms/ Nonvascular Plants/ Plants/ dissipation pathways/ drought/ field studies/ laboratory studies/ low temperatures

Abstract: Simazine is a triazine herbicide used in agriculture, pot-plant and tree production. The total concentrations (dissolved + adsorbed) in soil depend on the application rate, for example an application rate of 1500 g simazine/ha will result in approximately 4 mg simazine/kg in the top 1 cm. It may be spread to adjacent areas due to drift, runoff or evaporation. In fresh water concentrations approximately 4 mug simazine/l has been recorded. In aerial fallout-rain-concentrations of 0.680 mug simazine/l has been recorded. In both soil and water, degradation studies have in most cases shown DT50 times that vary between a few days and 150 days, indicating that total or near total disappearance time may be at least three times longer. Low temperatures

and drought may prolong the dissipation time by a factor of two or more. Laboratory studies indicate that the primary site of decomposition in the aquatic environment is the sediment. Field studies showed deleterious effects of simazine on terrestrial invertebrates at application rates below 2 kg simazine/ha. The direct toxicity was not confirmed by laboratory results, however, these were sparse and did not cover a broad range of soil organisms. No field studies were found dealing with invertebrates, but laboratory studies have shown deleterious effects of simazine on aquatic invertebrates at concentrations above 20 mug simazine/l. Simazine is phytotoxic to many non-target species at rates below the recommended rate. At least under some environmental conditions, simazine can remain for a long time in the active layer and still be toxic to sensitive plants 1 year after application. Despite its phytotoxicity many plant species become more and more tolerant in cases of repeated use for many years and some have become resistant. Simazine is not highly toxic to soil microflora and algae, although some species definitely are affected both in an inhibitory and a stimulatory way. Most investigations predict no long-term consequences to soil and aquatic microflora in association with recommended and appropriate use giving rise to maximum expected environmental concentrations of 5 mg simazine/kg in soil and 4 mug simazine/l in water.

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554. A field guide for the assessment of erosion, sediment transport, and deposition in incised channels of the southwestern United States.

Parker, John T. C.; United States. Bureau of Indian Affairs; and Geological Survey (U.S.).

Tucson, Ariz.: U.S. Dept. of the Interior, U.S. Geological Survey; vi, 34 p.: col. ill.; Series: Water-resources investigations report 99-4227. (2000)

Notes: Shipping list no.: 2000-0371-P. Includes bibliographical references (p 34).

NAL Call #: GB701 .W375
no. 99-4227

Descriptors: Erosion---Southwestern States/ Sedimentation and deposition--Southwestern States/ Sediment

transport---Southwestern States/
River channels---Southwestern States
This citation is from AGRICOLA.

555. Field guide to coastal wetland plants of the southeastern United States.

Tiner, Ralph W.
Amherst: University of Massachusetts Press; xiii, 328 p.: ill. (1993)
Notes: Includes bibliographical references (p. 311-313) and index.
NAL Call #: QK125.T55--1993;
ISBN: 0870238329 (cloth: alk. paper); 0870238337 (pbk.: alk. paper)
Descriptors: Wetland plants---Southern States---Identification/Coastal plants---Southern States---Identification/ Wetland plants---Southern States---Pictorial works/Coastal plants---Southern States---Pictorial works
This citation is from AGRICOLA.

556. Field guide to compost use.

Composting Council.
Alexandria, Va.: Composting Council; 128 p.: col. ill. (1996)
Notes: Cover title. Includes bibliographical references (p. 124).
NAL Call #: S661-.F54-1996
Descriptors: Compost
This citation is from AGRICOLA.

557. Field guide to on-farm composting.

Dougherty, Mark and Natural Resource, Agriculture and Engineering Service. Cooperative Extension.
Ithaca, N.Y.: Natural Resource, Agriculture, and Engineering Service, Cooperative Extension; x, 118 p.: ill. (some col.); Series: NRAES 114. (1999)
Notes: Includes bibliographical references (p. 115-118).
NAL Call #: S675-.N72-no.-114;
ISBN: 0935817395 (pbk.)
Descriptors: Compost---Handbooks, manuals, etc
Abstract: Topics discussed in the book include: operations and equipment; raw materials and recipe making; process control and evaluation; site considerations, environmental management, and safety; composting livestock and poultry mortalities; and compost utilization on the farm. Highlights of the guide include an equipment identification table, diagrams showing windrow formation and shapes, examples and equations for recipe making and compost use estimation,

a troubleshooting guide, and 24 full-color photos.
© Natural Resource, Agriculture and Engineering Service (NRAES)

558. Field measurement of soil surface hydraulic properties by disc and ring infiltrometers a review and recent developments.

Angulo-Jaramillo, R.; Vandervaere, J. P.; Roulier, S.; Thony, J. L.; Gaudet, J. P.; and Vauclin, M.
Soil and Tillage Research 55 (1/2): 1-29. (2000)
NAL Call #: S590.S48;
ISSN: 0167-1987
This citation is provided courtesy of CAB International/CABI Publishing.

559. Field methods for measurement of fluvial sediment.

Edwards, Thomas K.; Glysson, G. Douglas.; and Geological Survey (U.S.).
Reston, Va.: U.S. Geological Survey; Denver, Co.: Information Services; viii, 89 p.: ill.; Series: Techniques of water-resources investigations of the United States Geological Survey. Book 3, Applications of hydraulics, ch. C2. (1999)
Notes: Revised edition; "U.S. Department of the Interior, U.S. Geological Survey"--Verso t.p.
Includes bibliographical references (p. 87-89).
NAL Call #: TC409 .U5 Book 3, ch. C2; *ISBN:* 0607897384
Descriptors: Alluvium---Measurement/ Sediment transport---Measurement
This citation is from AGRICOLA.

560. Field studies on pesticides and birds: Unexpected and unique relations.

Blus, Lawrence J and Henny, Charles J
Ecological Applications 7 (4): 1125-1132. (1997)
NAL Call #: QH540.E23;
ISSN: 1051-0761
Descriptors: dicofol: pesticide/ famphur: pesticide/ pesticide/ DDE: pesticide/ DDT: pesticide/ bird (Aves)/ Animals/ Birds/ Chordates/ Nonhuman Vertebrates/ Vertebrates/ eggshell thickness/ population stability/ productivity/ reproductive success/ survival/ trophic level bioaccumulation
Abstract: We review the advantages and disadvantages of experimental and field studies for determining effects of pesticides on birds.

Important problems or principles initially discovered in the field include effects of DDT (through its metabolite DDE) on eggshell thickness, reproductive success, and population stability; trophic-level bioaccumulation of the lipid-soluble organochlorine pesticides; indirect effects on productivity and survival through reductions in the food supply and cover by herbicides and insecticides; unexpected toxic effects and routes of exposure of organophosphorus compounds such as famphur and dimethoate; effects related to simultaneous application at full strength of several pesticides of different classes; and others. Also, potentially serious bird problems with dicofol, based on laboratory studies, later proved negligible in the field. In refining field tests of pesticides, the selection of a species or group of species to study is important, because exposure routes may vary greatly, and 10-fold interspecific differences in sensitivity to pesticides are relatively common. Although there are limitations with field investigations, particularly uncontrollable variables that must be addressed, the value of a well-designed field study far outweighs its shortcomings.
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561. Fields of change: A new crop of American farmers finds alternatives to pesticides.

Curtis, Jennifer. and Natural Resources Defense Council.
New York, NY: Natural Resources Defense Council; ix, 230 p.: ill., map. (1998)
Notes: "July, 1998." Includes bibliographical references (p. 223-228).
NAL Call #: S494.5.A65-C78-1998
Descriptors: Alternative agriculture---United States/ Agricultural chemicals--Environmental aspects---United States/ Pesticides---Environmental aspects---United States
This citation is from AGRICOLA.

562. Fifty years of crop evapotranspiration studies in Puerto Rico.

Harmsen, E. W.
Journal of Soil and Water Conservation 58 (4): 214-223. (2003)
NAL Call #: 56.8 J822;
ISSN: 0022-4561
Descriptors: crops/ water use/ evapotranspiration/ water resources/ Puerto Rico

563. Fifty years of entomological research in orchard and vegetable crops in British Columbia.

Vernon, R. S.

Journal of the Entomological Society of British Columbia 98: 143-151.

(2001)

NAL Call #: 420-B77;

ISSN: 0071-0733 [JEBCA4]

Descriptors: tree fruits/ vegetables/ arthropod pests/ insect pests/ mites/ aphidoidea/ pest management/ pesticides/ entomology/ research/ literature reviews/ British Columbia/ root maggots/ flea beetles
This citation is from AGRICOLA.

564. Final report of the Riparian Forest Buffer Panel.

Riparian Forest Buffer Panel.

Chesapeake Bay Program (U.S.) and Chesapeake Executive Council.

Philadelphia, Pa.: U.S. Environmental Protection Agency, Region III; 8 p.;

Series: CBP/TRS 96/158. (1996)

Notes: "October 1996." "Printed by the U.S. Environmental Protection Agency for the Chesapeake Bay Program"--P. [2] of cover. "EPA 903-R-96-015."

NAL Call #: QH541.5.R52-R58-1996

Descriptors: Riparian forests---Chesapeake Bay---Md and Va/ Water quality management---Chesapeake Bay Watershed---Md and Va/ Natural resources---Chesapeake Bay Watershed---Md and Va/ Chesapeake Bay Watershed---Md and Va
This citation is from AGRICOLA.

565. Fire and Aquatic Ecosystems in Forested Biomes of North America.

Gresswell, R. E.

Transactions of the American

Fisheries Society 2: 193-221. (1999);

ISSN: 0002-8487.

Notes: Publisher: American Fisheries Society

Descriptors: Aquatic ecosystems/ Forests/ Fires/ Vegetation patterns/ North America/ Ecosystem disturbance/ Fire/ Environmental protection/ Freshwater fish/ Ecosystem resilience/ Zoobenthos/ Nature conservation/ Aquatic communities/ Forest Fires/ Ecosystems/ Watersheds/ Fish/ Benthos/ Literature Review/ Habitats/ Aquatic environment/ Vegetation/ Weather/ Habitat/ Biota/ Wildlife/ Pisces/ Bacillariophyceae/ Invertebrata/ North America/ Freshwater/ Habitat community studies/ Mechanical and natural

changes/ Watershed protection/ Environmental action

Abstract: Synthesis of the literature suggests that physical, chemical, and biological elements of a watershed interact with long-term climate to influence fire regime, and that these factors, in concordance with the postfire vegetation mosaic, combine with local-scale weather to govern the trajectory and magnitude of change following a fire event. Perturbation associated with hydrological processes is probably the primary factor influencing postfire persistence of fishes, benthic macroinvertebrates, and diatoms in fluvial systems. It is apparent that salmonids have evolved strategies to survive perturbations occurring at the frequency of wildland fires (100-102 years), but local populations of a species may be more ephemeral. Habitat alteration probably has the greatest impact on individual organisms and local populations that are the least mobile, and reinvasion will be most rapid by aquatic organisms with high mobility. It is becoming increasingly apparent that during the past century fire suppression has altered fire regimes in some vegetation types, and consequently, the probability of large stand-replacing fires has increased in those areas. Current evidence suggests, however, that even in the case of extensive high-severity fires, local extirpation of fishes is patchy, and recolonization is rapid. Lasting detrimental effects on fish populations have been limited to areas where native populations have declined and become increasingly isolated because of anthropogenic activities. A strategy of protecting robust aquatic communities and restoring aquatic habitat structure and life history complexity in degraded areas may be the most effective means for insuring the persistence of native biota where the probability of large-scale fires has increased.

© Cambridge Scientific Abstracts (CSA)

566. Fish and land-inland water ecotones: Overview and synthesis.

Zalewski, M.; Schiemer, F.; and Thorpe, J.

International journal of ecohydrology and hydrobiology 1 (1-2): 261-266.

(2001)

NAL Call #: QH541.15.E19 I58;

ISSN: 1642-3593.

Notes: Special Issue: Catchment

Processes Land/Water Ecotones and Fish Communities

Descriptors: Freshwater fish/ Riparian environments/ Species diversity/ Population number/ Water quality/ Fishery management/ Stock assessment and management/ Conservation, wildlife management and recreation

Abstract: The dramatic depletion of diversity and standing crop of freshwater fish has been due mostly to degradation of their habitats and water quality. To halt and reverse this negative trend, a new approach is needed urgently toward sustainability of fish resources. The UNESCO MAB programme on the role of land-water ecotones has opened a new perspective towards solving problems in landscape management and conservation. Land-water ecotones, if restored and managed in a sustainable way, can buffer and filter impacts on aquatic ecosystems due to catchment development, by moderating hydrological processes, improving water quality, and increasing spatial complexity of habitats. This way, fish resources can be safeguarded, restored and sustained. The programme of the "Fish and Land-Inland Water Ecotones" (FLIWE) team has shown strong links between fish life histories and structures and processes in land-water ecotones. To be able to sustain freshwater fish populations a good understanding is needed of the biological linkages and pathways through land-water ecotones; of biogeochemistry; of modern techniques for habitat inventories; and of methods of habitat evaluation, planning and assessment of socio-economic feedback.

© Cambridge Scientific Abstracts (CSA)

567. Flood control and drainage engineering.

Ghosh, S. N.

Rotterdam; Brookfield, VT: A.A.

Balkema; xiv, 299 p.: ill. (1997)

Notes: 2nd ed.; Includes bibliographical references and index.

NAL Call #: TC530.G56--1997;

ISBN: 9061914817

Descriptors: Flood control/ Drainage
This citation is from AGRICOLA.

568. Flood pulsing in wetlands: Restoring the natural hydrological balance.

Middleton, Beth.
New York: Wiley, c2002. xii, 308 p.: ill., maps. (2002)
NAL Call #: QH541.5.V3-F46-2002;
ISBN: 0471418072 (alk. paper)
Descriptors: Floodplain ecology---North America/ Wetland restoration---North America
This citation is from AGRICOLA.

569. Flow Duration Curves 2: A Review of Applications in Water Resources Planning.

Vogel, R. M. and Fennessey, N. M.
Water Resources Bulletin 31 (6): 1029-1039. (1995);
ISSN: 0043-1370
Descriptors: water resources/ hydrology/ stream flow rate/ river engineering/ flood control/ water resources planning/ streamflow/ hydraulics/ engineering/ flow duration/ hydroelectric plants/ river regulation/ water allocation/ instream flow/ Dynamics of lakes and rivers/ Techniques of planning
Abstract: A streamflow duration curve illustrates the relationship between the frequency and magnitude of streamflow. Flow duration curves have a long history in the field of water-resource engineering and have been used to solve problems in water-quality management, hydropower, instream flow methodologies, water-use planning, flood control, and river and reservoir sedimentation, and for scientific comparisons of streamflow characteristics across watersheds. This paper reviews traditional applications and provides extensions to some new applications, including water allocation, wasteload allocation, river and wetland inundation mapping, and the economic selection of a water-resource project.
© Cambridge Scientific Abstracts (CSA)

570. Fluorimetric analysis of pesticides: Methods, recent developments and applications.

Coly, Atanasse and Aaron, Jean Jacques
Talanta 46 (5): 815-843. (1998);
ISSN: 0039-9140
Descriptors: pesticides: analysis/ photochemical reactivity/ photodegradation pathway
Abstract: The fluorimetric analysis of pesticides is reviewed with emphasis on the description of direct and

indirect fluorimetric methods, including chemical derivatization, fluorogenic labelling, and photochemically-induced fluorescence. The use of fluorescence detection in TLC, HPLC and FIA as well as applications to environmental samples are discussed in detail.
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571. Fluorimetric determination of nitrate and nitrite.

Virirot, M L; Mahieuxe, B; Carre, M C; and Andre, J C
Analisis 23 (7): 312-319. (1995)
NAL Call #: QD71.A52;
ISSN: 0365-4877
Descriptors: nitrate/ nitrite/ analytical method/ environmental chemistry/ fertilizer
© Thomson

572. Forage based farming, manure handling and farm composting.

Koepf, Herbert H.
East Troy, Wis.: Michael Fields Agricultural Institute; 48 p.: ill.; Series: Michael Fields Agricultural Institute bulletin no. 4. (1993)
Notes: "This is a compilation of the proceedings of a one day conference held on Thursday, March 18, 1993, at Michael Fields Agricultural Institute, Inc., in East Troy, Wisconsin."
Includes bibliographical references.
NAL Call #: S494.5.S86M53--no.4
Descriptors: Forage plants---Congresses/ Manure handling---Congresses/ Sustainable agriculture--Congresses
This citation is from AGRICOLA.

573. Forest ecosystem recovery in the southeast US: Soil ecology as an essential component of ecosystem management.

Johnston, J. M. and Crossley, D. A. Jr.
Forest Ecology and Management 155 (1/3): 187-203. (2002)
NAL Call #: SD1.F73;
ISSN: 0378-1127
This citation is provided courtesy of CAB International/CABI Publishing.

574. Forest harvesting and riparian management guidelines: A review.

Boothroyd, Ian.; Langer, E. R.; and National Institute of Water and Atmospheric Research (N.Z.).
Wellington: NIWA; 53, 5 p.: ill.; Series: NIWA technical report 1174-2631 (56). (1999)
Notes: Includes bibliographical references (p. 48-53).

NAL Call #: SD391-.B66-1999;
ISBN: 0478084773
Descriptors: Forests and forestry/ Riparian areas---Management
This citation is from AGRICOLA.

575. Forest health monitoring in the United States: First four years.

Alexander, S. A. and Palmer, C. J.
Environmental Monitoring and Assessment 55 (2): 267-277. (1999)
NAL Call #: TD194.E5;
ISSN: 0167-6369
Descriptors: Federal programs/ Government programs/ Environmental monitoring/ Forests/ Research programs/ EPA/ United States/ Land pollution/ Management
Abstract: To address the need for more effective methods for evaluating and assessing forest ecosystem health, the USDA-Forest Service and the US Environmental Protection Agency through its Environmental Monitoring and Assessment Program developed the Forest Health Monitoring program. The program was initiated in 1990 and by 1994 was present in the major areas of the United States. This paper presents an overview of the program, the indicators and methods developed for the program, and some of the results after four years of monitoring and research.
© Cambridge Scientific Abstracts (CSA)

576. Forest management and wildlife in forested wetlands of the southern Appalachians.

Wigley, T Bently and Roberts, Thomas H
Water Air and Soil Pollution 77 (3-4): 445-456. (1994)
NAL Call #: TD172.W36;
ISSN: 0049-6979
Descriptors: animal (Animalia Unspecified)/ plant (Plantae Unspecified)/ Animalia (Animalia Unspecified)/ Plantae (Plantae Unspecified)/ animals/ plants/ biodiversity/ ecology/ environmental protection/ forestry/ habitat/ resource management
Abstract: The southern Appalachian region contains a variety of forested wetland types. Among the more prevalent types are riparian and bottomland hardwood forests. In this paper we discuss the temporal and spatial changes in wildlife diversity and abundance often associated with forest management practices within bottomland and riparian forests.

Common silvicultural practices within the southern Appalachians are diameter-limit cutting, clearcutting, single-tree selection, and group selection. These practices alter forest composition, structure, and spatial heterogeneity, thereby changing the composition, abundance, and diversity of wildlife communities. They also can impact special habitat features such as snags, den trees, and dead and down woody material. The value of wetland forests as habitat also is affected by characteristics of adjacent habitats. More research is needed to fully understand the impacts of forest management in wetlands of the southern Appalachians.
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577. Forest & Riparian Buffer Conservation: Local Case Studies From the Chesapeake Bay Program.

Stabenfeldt, L.; Chesapeake Bay Program, Forestry Workgroup of the Nutrient Subcommittee. Chesapeake Bay Program, 1996 (application/pdf)
NAL Call #: aQH104.5.C45 S73 1996
<http://www.chesapeakebay.net/pubs/158.pdf>

Descriptors: riparian areas/ riparian buffers/ riparian forests/ forest ecology/ conservation buffers/ ecological restoration/ watershed management/ citizen participation/ local government/ urban areas/ wildlife habitats/ public finance/ case studies/ Delaware/ District of Columbia/ Maryland/ Pennsylvania/ Virginia/ West Virginia/ Chesapeake Bay/ GIS
Abstract: A collection of case-studies that highlight accomplishments of local governments and citizen organizations to recognize the importance of forests to their communities and to take action to retain and restore those forests. This citation is from AGRICOLA.

578. Forested wetlands: Functions, benefits and the use of best management practices.

Welsch, David J. and United States. State and Private Forestry. Northeastern Area. Radnor, PA: U.S. Dept. of Agriculture, Forest Service, Natural Resources Conservation Service; S.I.: U.S. Army Corps of Engineers: U.S. Environmental Protection Agency: U.S. Dept. of the Interior, Fish and

Wildlife Service; 62 p.: col. ill., col maps. (1995)
Notes: Cover title. Authors: David J. Welsch ... [et al.]. "NA-PR-01-95." Includes bibliographical references.
NAL Call #: aQH541.5.M3F67--1995
Descriptors: Forest ecology---United States/ Wetland ecology---United States
This citation is from AGRICOLA.

579. Forests planted for ecosystem restoration or conservation.

Harrington, C. A. *New Forests* 17/18 (1/3/1): 175-190. (1999)
NAL Call #: SD409.N48; ISSN: 0169-4286.
Notes: Special issue: Planted forests: Contributions to the quest for sustainable societies / edited by J. R. Boyle, J. Winjum, K. Kavanagh and E. Jensen. Paper presented at a symposium held June 1995, Portland, Oregon. Includes references.
Descriptors: forest plantations/ ecosystems/ forest ecology/ nature conservation/ sustainability/ afforestation/ disturbed land/ planting/ land management/ stand establishment/ forest management/ fertilizers/ placement/ liming/ cultivation/ site preparation/ herbivores/ browsing/ vegetation management/ plant competition/ abiotic injuries/ wind/ sun/ species differences/ growth/ nurse trees/ literature reviews

Abstract: Although the phrase, "planting for ecosystem restoration," is of recent origin, many of the earliest large-scale tree plantings were made for what we now refer to as "restoration" or "conservation" goals. Forest restoration activities may be needed when ecosystems are disturbed by either natural or anthropogenic forces. Disturbances can impact (1) basic components of the system (e.g., plant and animal composition, soil pools, and atmospheric pools), (2) ecosystem processes, i.e., interactions among basic components, or (3) both components and processes. Early efforts at restoration or site rehabilitation focused primarily on reducing off-site impacts, such as sediment introduced into streams from ecosystems that had been severely disturbed. More recent restoration programs include ecosystems in which only some of the components are missing or some of the processes have been impacted.

Restoration activities can begin immediately after the disturbance has ended. Although forest restoration projects can include many activities, planting is almost always a key component. When planning an ecosystem restoration project, land managers need to be aware that commonly used plant establishment and management procedures may need to be altered to meet project objectives. Some systems may have been so severely impacted that ameliorative activities, e.g., fertilization, liming, land contouring, and microsite preparation, will be necessary, prior to planting. Managers may also need to take special measures to reduce herbivory, control competing vegetation, or reduce physical damage from wind or sun. Choice of species needs careful consideration. Desired species may not grow well on degraded sites, may need a nurse species to become established, or may not provide an opportunity to harvest a short-term crop to reduce restoration costs. New methods may need to be developed for projects that require underplanting or interplanting. The end result of restoration should be an ecosystem with the same level of heterogeneity inherent in an undisturbed system; thus, managers should consider how pre- and postplanting activities will affect system variability. As our understanding of ecosystems has increased, so has our expectation that restored ecosystems have the same components and function in the same manner as do undisturbed systems. These expectations require that land managers have more sophisticated information than was considered necessary previously. In the absence of more pertinent information, we can prescribe restoration activities based on results from related ecosystems or on theoretical considerations. Additional research, careful monitoring, and adaptive management are critical to our long-term success.
This citation is from AGRICOLA.

580. The Fourth no-till Q&A book: Practical down-to-earth answers to 184 of the most commonly asked questions about all aspects of no-till farming.

Lessiter, Frank. Brookfield, WI: Lessiter Publications; 48 p.: ill. (1993)
Notes: 4th ed.

NAL Call #: S604.N675--1993

Descriptors: No tillage---United States/ Conservation tillage---United States

This citation is from AGRICOLA.

581. Fractionation studies of trace elements in contaminated soils and sediments: A review of sequential extraction procedures.

Gleyzes, Christine; Tellier, Sylvaine; and Astruc, Michel

Trends in Analytical Chemistry 21 (6-7): 451-467. (2002)

NAL Call #: QD71.T7;

ISSN: 0165-9936

Descriptors: aluminum hydrous oxides/ anionic species/ hydrogen peroxide/ hydroxylamine/ iron hydrous oxides / manganese hydrous oxides/ metals: solid phase forms/ oxalate/ oxalic acid buffered solution/ sodium dithionite/ sodium hydroxide/ sodium hypochlorite/ sodium pyrophosphate/ trace elements/ agricultural soils/ contaminated sediments/ contaminated soils

Abstract: Sequential selective extraction techniques are commonly used to fractionate the solid-phase forms of metals in soils. Many sequential extraction procedures have been developed, particularly for sediments or agricultural soils, and, despite numerous criticisms, they remain very useful. This article reviews the reagents used in the various schemes, with their advantages and disadvantages. The particular case of elements giving anionic species is also developed. Finally, there is discussion of the limits of sequential extraction procedures.

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582. A framework for evaluating BMP effects on N discharges from watersheds.

Shukla S and Mostaghimi S.

In: ASAE Annual International Meeting. (Held 12 Jul 1998-16 Jul 1998 at Orlando, Florida.)

St. Joseph, Mich.: American Society of Agricultural Engineers (ASAE); 21 p.; 1998.

Notes: ASAE Paper no. 982008

NAL Call #: S671.3 .A54

This citation is provided courtesy of CAB International/CABI Publishing.

583. Framework for wetland systems management: Earth resources perspective: Final report.

Warne, Andrew G.; Smith, Lawson M.; United States. Army. Corps of Engineers; U.S. Army Engineer Waterways Experiment Station; and Wetlands Research Program (U.S.). Vickburg, Miss: U.S. Army Engineer Waterways Experiment Station; viii, 143 p.: ill. maps; Series: Wetlands Research Program technical report WRP-SM-12. (1995)

Notes: "October 1995." Includes bibliographical references (p. 131-143).

NAL Call #: QH541.5.M3W37--1995

Descriptors: Wetland ecology---United States---Management/ Wetlands---United States---Management/ Ecosystems management---United States

This citation is from AGRICOLA.

584. Fremont cottonwood-Goodding willow riparian forests: A review of their ecology, threats, and recovery potential.

Stromberg, J. C.

Journal of the Arizona-Nevada Academy of Science 27 (1): 97-110. (1993)

NAL Call #: 500-Ar44;

ISSN: 0193-8509 [JAASDM]

Descriptors: populus fremontii/ salix/ forest ecology/ riparian forests/ endangered species/ forest resources/ literature reviews/ nature conservation/ Arizona/ California/ Utah/ salix gooddingii

This citation is from AGRICOLA.

585. Freshwater liming.

Henrikson, L; Hindar, A; and Thornelof, E

Water Air and Soil Pollution 85 (1): 131-142. (1995)

NAL Call #: TD172.W36;

ISSN: 0049-6979

Descriptors: calcium carbonate/ aluminum/ acid deposition/ air pollution/ aluminum/ calcium carbonate/ cost benefit analyses/ environmental contamination/ lake/ neutralization/ organic matter/ stream/ water pollution/ wetlands

Abstract: Operational liming of surface waters is part of Sweden and Norway's strategy to counteract freshwater acidification caused by air pollutants. Smaller scale liming efforts are performed as research or experimental programs in other countries. Yearly, approx. 300,000

tons of fine-grained limestone (CaCO₃) is spread in lakes and streams and on wetlands to raise the Ph in surface water at a cost of approximately 40-50 million US. The chemical target is set by the biological goals and objectives. A total of over 11,000 lakes and streams are treated on a continuing basis. Dose calculations consider pH, inorganic monomeric Al, dissolved organic matter and the necessary buffering. Lake liming, limedosers at streams and terrestrial liming are used. A mix of different liming techniques is often preferred to get an optimal result. The vast majority of changes are desirable and expected. Undesirable effects may appear and damaged wetlands are probably the most serious ones. Cost-benefit analysis show that liming may be profitable for the society. Recovery of the systems can take up to 10-20 years. Liming will in the long run restore the ecosystems but will not make them identical to what may be the original ones. In some cases, complementary measures, e.g. facilitation of recolonization, are necessary to enhance recovery. Reduced emissions of acidifying pollutants according to signed protocols will decrease the need for liming, but still liming is needed for several decades in large regions to preserve biodiversity.

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586. Freshwater sediment toxicity tests: Technical evaluations and responses with receiving water sediments.

Haley, Richard K. and National Council of the Paper Industry for Air and Stream Improvement (U.S.). Research Triangle Park, NC: National Council of the Paper Industry for Air and Stream Improvement; iii, 69, 6 p.: ill.; Series: Technical bulletin (National Council of the Paper Industry for Air and Stream Improvement (U.S.): 1981) no. 719. (1996)

Notes: Cover title. Prepared by Richard K. Haley. "July 1996." Includes bibliographical references (p. 67-69).

NAL Call #: TD899.P3N34--no.719

Descriptors: Toxicity testing---Methodology/ Sediments---Geology---Toxicology---United States/ Water quality biological assessment---United States/ Effluent quality---United States

This citation is from AGRICOLA.

587. From laboratory to field: Uses and limitations of pesticide behaviour models for the soil/plant system.

Boesten, J. J. T. I.
Weed Research 40 (1): 123-138.

(Feb. 2000)

NAL Call #: 79.8-W412;

ISSN: 0043-1737 [WEREAT]

Descriptors: pesticides/ soil/ mathematical models/ simulation models/ pollution/ contamination/ movement in soil/ volatilization/ surfaces/ rain/ plants/ persistence/ groundwater/ groundwater pollution/ simulation/ leaching/ water quality/ validity/ literature reviews/ pesticide residues

This citation is from AGRICOLA.

588. A functional classification of wetland plants.

Boutin, C. and Keddy, P. A.
Journal of Vegetation Science 4 (5): 591-600. (1993)

NAL Call #: QK900.J67;

ISSN: 1100-9233

Descriptors: bog plants/ community ecology/ plant ecology/ wetlands/ literature reviews/ pot experimentation/ North America/ eastern North America

This citation is from AGRICOLA.

589. Functional ecology of vesicular arbuscular mycorrhizas as influenced by phosphate fertilization and tillage in an agricultural ecosystem.

Miller, M. H.; McGonigle, T. P.; and Addy, H. D.

Critical Reviews in Biotechnology 15 (3/4): 241-255. (1995)

NAL Call #: TP248.13.C74;

ISSN: 0738-8551

This citation is provided courtesy of CAB International/CABI Publishing.

590. Fungicide resistance. Lessons for herbicide resistance management?

Peever, Tobin L and

Milgroom, Michael G

Weed Technology 9 (4):

840-849. (1995)

NAL Call #: SB610.W39;

ISSN: 0890-037X

Descriptors: cross resistance/ fitness/ pathogen populations

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591. Future benefits from biological nitrogen fixation: An ecological approach to agriculture.

Giller KE and Cadisch G

Plant and Soil 174 (1-2): 255-277.

(1995)

NAL Call #: 450 P696.

Notes: Number of References: 105;

Extended versions of papers presented at Management of biological nitrogen fixation for the development of more productive and sustainable agricultural systems:

Symposium on biological nitrogen fixation for sustainable agriculture at the 15th Congress of Soil Science / Acapulco, Mexico, 1994

This citation is provided courtesy of CAB International/CABI Publishing.

592. Future directions for biodiversity conservation in managed forests: Indicator species, impact studies and monitoring programs.

Lindenmayer, D. B.

Forest Ecology and Management

115 (2/3): 277-287. (1999)

NAL Call #: SD1.F73;

ISSN: 0378-1127

This citation is provided courtesy of CAB International/CABI Publishing.

593. The future of herbicides in weed control systems of the Great Plains.

Lyon, D. J.; Miller, S. D.; and Wicks, G. A.

Journal of Production Agriculture 9 (2): 209-215. (1996)

NAL Call #: S539.5.J68;

ISSN: 0890-8524

This citation is provided courtesy of CAB International/CABI Publishing.

594. Future of irrigated agriculture.

Vaux, H.

Ames, IA: Council for Agricultural Science and Technology, 1996. 76 p.

Notes: "August 1996."

Descriptors: agriculture/ irrigation/ Western United States/ agricultural policy/ groundwater/ water supply

This citation is from AGRICOLA.

595. The future role of biotechnology in integrated pest management.

Osir, E O and Gould, F

Insect Science and its Application 15 (6): 621-631. (1994)

NAL Call #: QL461.I57;

ISSN: 0191-9040

Descriptors: animal (Animalia Unspecified)/ animalia (Animalia

Unspecified)/ animals/ agriculture/ biological control/ biotechnology/ crop loss/ integrated pest management/ pest/ pest management/ population dynamics

Abstract: Crop losses caused by pests are a major problem in both developed and developing countries. Increasing awareness of the environmental consequences of indiscriminate use of chemical pesticides has provided new impetus for the search for alternative ways of managing pests. Particular emphasis has been placed on strategies that cause less pollution to the

environment and those that are affordable, especially for the less developed countries. One concept that has received a lot of attention is integrated pest management (IPM), which seeks to manage pests and minimise crop losses by using methods that are economically viable and less harmful to the environment. At least three distinct classes of new biotechnologies can have impacts on integrated pest management. These include microbial biotechnologies, plant molecular biology and genetics, and insect molecular biology and genetics. For example, recent advances in molecular biology have enabled scientists to overcome species barriers and to genetically alter plants, animals and microorganisms in ways that were not possible before. Already, several genetically altered plants which express genes that confer protection against pests have been produced. The techniques of biotechnology have also played important roles in elucidating pest populations and in studying the population dynamics of biological control agents and other types of organisms that live in association with crop plants. This article examines some of the major developments in the areas of molecular biology, genetics and biotechnology and the potential impacts that they could have on integrated pest management worldwide.

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596. The future role of pesticides in US agriculture.

National Research Council (U.S.).

Committee on the Future Role of

Pesticides in US Agriculture and

National Research Council (U.S.).

Board on Environmental Studies and

Toxicology.

Washington, D.C.: National Academy Press; xx, 301 p.: ill. (2000)
 NAL Call #: SB950.2.A1-F88-2000;
 ISBN: 0309065267 (case bound)
<http://www.nap.edu/books/0309065267/html/>

Descriptors: Pesticides---
 United States

This citation is from AGRICOLA.

597. Fuzzy environmental decision-making: Applications to air pollution.

Fisher, Bernard

Atmospheric Environment 37 (14): 1865-1877. (2003)

NAL Call #: TD881.A822;

ISSN: 1352-2310

Descriptors: air pollution/ air quality management/ environmental decision making/ fuzzy set theory/ human health assessment/ integrated pollution prevention/ uncertainty/ urban air quality

Abstract: This paper illustrates ways in which concepts from fuzzy set theory may be applied to decision-making in the environmental sciences. Examples of its application to uncertainty, particularly in air pollution, are illustrated. No one of a number of methods for dealing with uncertainty is advocated, but rather a choice from a range of techniques should be made, appropriate to the application. Use of fuzzy sets formalises the underlying assumptions regarding uncertainty and therefore leads to better decision-making. This paper illustrates the flexibility of the approach, taking examples from air quality management, integrated pollution prevention and control, and human health assessment.

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598. The General Ecology of Beavers (Castor Spp.), As Related to Their Influence on Stream Ecosystems and Riparian Habitats, and the Subsequent Effects on Fish: A Review.

Collen, P and Gibson, RJ

Reviews in Fish Biology and Fisheries 10 (4): 439-461. (2000);

ISSN: 0960-3166

Descriptors: Aquatic mammals/ Freshwater ecology/ Habitat selection/ Environmental impact/ Interspecific relationships/ Sedimentation/ Nature conservation/ Environmental protection/ Habitat changes/ Water

temperature/ Hydrology/ Dams/ Reviews/ Streams/ Riparian environments / Aquatic ecosystems/ Castor/ Salmonidae/ Castor canadensis/ Castor fiber/ Beavers/ Salmonids/ American Beaver/ European Beaver/ Species interactions: general/ Mammals

Abstract: The Eurasian and North American beavers are similar in their ecological requirements, and require water deep enough to cover the entrance to their lodge or burrow. A food cache is often built next to the lodge or burrow, except in some southern areas. On small streams (up to fourth order) dams are frequently built to create an impoundment, generally on low gradient streams, although at high population densities dams may be built on steeper gradient streams. On large rivers or in lakes, simply a lodge with its food cache may be built. The beaver is a keystone riparian species in that the landscape can be considerably altered by its activities and a new ecosystem created. The stream above a dam changes from lotic to lentic conditions. There are hydrological, temperature and chemical changes, depending on types of dams and locations. Although the invertebrates may be fewer per unit area, total number of organisms increases, and diversity increases as the pond ages. In cool, small order streams, the impoundments provide better habitat for large trout, possibly creating angling opportunities. However, at sites where water temperatures rise above their optimum preference, salmonids may be replaced by other species, such as cyprinids, catostomids, percids or centrarchids. As the habitat is altered, interactions amongst co-habiting species may change. For example, brown trout or brook trout (charr) may become dominant over Atlantic salmon. In warm water streams there may be a shift from faster water dwellers to pond dwellers. Larger bodied fish, such as centrarchids and esocids may displace smaller bodied fish such as cyprinids, providing better angling. Refugia from high or low water flows, low oxygen or high temperatures, may be provided in adverse conditions in winter or summer. However, in some cases dams are obstructions to upstream

migration, and sediment may be deposited in former spawning areas. The practicality and benefits of introducing or restoring beaver populations will vary according to location, and should be considered in conjunction with a management plan to control their densities.

© Cambridge Scientific Abstracts (CSA)

599. Genetically modified crops and the environment.

Barton, J. E. and Dracup, M.

Agronomy Journal 92 (4): 797-803.

(July 2000-Aug. 2000)

NAL Call #: 4-AM34P;

ISSN: 0002-1962 [AGJOAT]

Descriptors: crops/ genetic engineering/ environmental protection/ nature conservation/ crop management/ risk assessment/ gene flow/ ecosystems/ environmental impact/ temporal variation/ spatial variation/ decision making/ monitoring/ sustainability/ literature reviews/ transgenic plants

This citation is from AGRICOLA.

600. Geochemical processes and nutrient uptake by plants in hydric soils.

McKee, W. H. Jr. and McKeivlin, M. R.

Environmental Toxicology and Chemistry 12 (12): 2197-2207.

(Dec. 1993)

NAL Call #: QH545.A1E58;

ISSN: 0730-7268 [ETOC DK].

Notes: Annual Review Issue: Wetland Ecotoxicology and Chemistry. Includes references.

Descriptors: wetland soils/ flooding/ biological production/ plant water relations/ plant nutrition/ metabolism/ mineral nutrition/ nutrient uptake/ soil physical properties/ reduction

This citation is from AGRICOLA.

601. Geographically isolated wetlands: A preliminary assessment of their characteristics and status in selected areas of the United States.

Tiner, Ralph W. and U.S. Fish and Wildlife Service. Region 5.

Hadley, Mass.: U.S. Fish and Wildlife Service, Northeast Region. (2002)

Notes: Title from web page. "June 2002." Description based on content viewed July 3, 2003. Includes bibliographical references.

NAL Call #: QH87.3-.G64-2002
<http://wetlands.fws.gov/Pubs%5FReports/isolated/report.htm>

Descriptors: Wetlands---United States/ Wetland ecology---United States

This citation is from AGRICOLA.

602. Geology, climate, land, and water quality.

Fox, D. G.; Jemison, R.; Potter, D. U.; Valett, H. M.; and Watts, R.

In: Ecology, diversity, and sustainability of the Middle Rio Grande Basin; Fort Collins, Colo.: U.S. Dept. of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, 1995. pp. 52-79.

NAL Call #: aSD11.A42-no.268

Descriptors: pollutants/ geology/ climate/ water quality/ rivers/ ecosystems/ topography/ hydrology/ river valleys/ drainage/ watersheds/ history/ human activity/ dams/ contamination/ water pollution/ organic compounds/ biocides/ radionuclides/ heavy metals/ nutrients/ water availability/ water resources/ carbon cycle/ sediment/ literature reviews/ New Mexico
 This citation is from AGRICOLA.

603. Geomorphic thresholds in riverine landscapes.

Church, Michael

Freshwater Biology 47 (4): 541-557. (2002)

NAL Call #: QH96.F6;

ISSN: 0046-5070

Descriptors: alluvial deposits/ drainage basins/ flow regimes/ fluvial competence/ fluvial geomorphology/ geomorphic thresholds/ habitat types/ human activity/ river channels: form, processes/ river organization/ riverine landscapes/ sediment caliber/ sediment quality/ sediment transport/ topography

Abstract: 1. Rivers are subject to thresholds of several types that define significant changes in processes and morphology and delimit distinctive riverine landscapes and habitats. Thresholds are set by the conditions that govern river channel process and form, amongst which the most important are the flow regime, the quantity and calibre of sediment delivered to the channel, and the topographic setting (which determines the gradient of the channel). These factors determine the sediment transport regime and the character of alluvial deposits along the channel. 2.

Changes occur systematically along the drainage system as flow, gradient and sediment character change, so a characteristic sequence of morphological and habitat types - hence of riverine landscapes - can be described from uplands to distal channels. The sequence is closely associated with stream competence to move sediment and with bank stability. 3. The paper proposes a first order classification of river channel and landscape types based on these factors. The riverine landscape is affected seasonally by flow thresholds, and further seasonal thresholds in northern rivers are conditioned by the ice regime. 4. It is important to understand geomorphic thresholds in rivers not only for the way they determine morphology and habitat, but because human activity can precipitate threshold crossings which change these features significantly, through either planned or inadvertent actions. Hence, human actions frequently dictate the character of the riverine landscape.

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604. Global estimates of potential mitigation of greenhouse gas emissions by agriculture.

Cole, C. V.; Duxbury, J.; Freney, J.; Heinemeyer, O.; Minami, K.; Mosier, A.; Paustian, K.; Rosenberg, N.; Sampson, N.; Sauerbeck, D.; and Zhao, Q.

Nutrient Cycling in Agroecosystems 49 (1/3): 221-228. (1997)

NAL Call #: S631 .F422

This citation is provided courtesy of CAB International/CABI Publishing.

605. Global patterns of dissolved N, P and Si in large rivers.

Turner, R. E.; Rabalais, N. N.; Justic, D.; and Dortch, Q.

Biogeochemistry 64 (3): 297-317. (2003)

NAL Call #: QH345.B564;

ISSN: 0168-2563

Descriptors: Environment/ Ecology/ coastal waters/ estuaries/ large rivers/ limnology/ nitrogen/ nutrient ratios/ phosphate/ silicate/ stoichiometry/ Mississippi River/ coastal eutrophication/ Brest, France/ food webs/ nitrogen/ silicate/ phytoplankton/ nutrient/ waters/ ocean

Abstract: The concentration of dissolved inorganic nitrogen (DIN), dissolved nitrate-N, Total-N (TN), dissolved inorganic phosphate (DIP), total phosphorus (TP), dissolved

silicate-Si (DSi) and their ratios in the world's largest rivers are examined using a global data base that includes 37% of the earth's watershed area and half its population. These data were compared to water quality in 42 subbasins of the relatively well-monitored Mississippi River basin (MRB) and of 82 small watersheds of the United States. The average total nitrogen concentration varies over three orders of magnitude among both world river watersheds and the MRB, and is primarily dependent on variations in dissolved nitrate concentration, rather than particulate or dissolved organic matter or ammonium. There is also a direct relationship between the DIN: DIP ratio and nitrate concentration. When nitrate-N exceeds 100 µg-at l(-1), the DIN: DIP ratio is generally above the Redfield ratio (16:1), which implies phosphorus limitation of phytoplankton growth. Compared to nitrate, the among river variation in the DSi concentration is relatively small so that the DSi loading (mass/area/time) is largely controlled by runoff volume. The well-documented influence of human activities on dissolved inorganic nitrogen loading thus exceeds the influences arising from the great variability in soil types, climate and geography among these watersheds. The DSi: nitrate-N ratio is controlled primarily by nitrogen loading and is shown to be inversely correlated with an index of landscape development - the "City Lights" nighttime imagery. Increased nitrogen loading is thus driving the world's largest rivers towards a higher DIN: DIP ratio and a lower DSi: DIN ratio. About 7.3 and 21% of the world's population lives in watersheds with a DSi: nitrate-N ratio near a 1:1 and 2:1 ratio, respectively. The empirical evidence is that this percentage will increase with further economic development. When the DSi: nitrate-N atomic ratio is near 1:1, aquatic food webs leading from diatoms (which require silicate) to fish may be compromised and the frequency or size of harmful or noxious algal blooms may increase. Used together, the DSi: nitrate-N ratio and nitrate-N concentration are useful and robust comparative indicators of eutrophication in large rivers. Finally, we estimate the riverine loading to the ocean for nitrate-N, TN, DIP, TP and DSi to be 16.2, 21, 2.6, 3.7 to 5.6, and 194 Tg yr(-1), respectively.

© Thomson ISI

606. Glyphosate-resistant soybean as a weed management tool: Opportunities and challenges.

Reddy, K. N.

Weed Biology and Management 1 (4): 193-202. (2001)

NAL Call #: SB610-W447;

ISSN: 1444-6162

Descriptors: glycine max/ glyphosate/ herbicide resistance/ weed control/ transgenic plants/ weeds/ costs/ innovation adoption/ integrated pest management/ literature reviews
This citation is from AGRICOLA.

607. Grass roots range management education with a high-tech twist.

Surber, G. and Porter, S.

In: *People and rangelands: Building the future: Proceedings of the VI International Rangeland Congress.* (Held 19 Jul 1999-23 Jul 1999 at Townsville, Queensland, Australia.) Eldridge, D. and Freudenberger, D. (eds.); Vol. 1-2.

Aitkenvale, Australia: International Rangeland Congress; pp. 358-362; 1999. ISBN: 0-9577394-0-0

This citation is provided courtesy of CAB International/CABI Publishing.

608. Grass versus trees: Managing riparian areas to benefit streams of central North America.

Lyons, J.; Trimble, S. W.; and Paine, L. K.

Journal of the American Water Resources Association 36 (4): 919-930. (Aug. 2000)

NAL Call #: GB651.W315;

ISSN: 1093-474X [JWRAF5]

Abstract: Forestation of riparian areas has long been promoted to restore stream ecosystems degraded by agriculture in central North America. Although trees and shrubs in the riparian zone can provide many benefits to streams, grassy or herbaceous riparian vegetation can also provide benefits and may be more appropriate in some situations. Here we review some of the positive and negative implications of grassy versus wooded riparian zones and discuss potential management outcomes. Compared to wooded areas, grassy riparian areas result in stream reaches with different patterns of bank stability, erosion, channel morphology, cover for fish, terrestrial runoff, hydrology, water temperature, organic matter inputs, primary production, aquatic macroinvertebrates, and fish. Of

particular relevance in agricultural regions, grassy riparian areas may be more effective in reducing bank erosion and trapping suspended sediments than wooded areas. Maintenance of grassy riparian vegetation usually requires active management (e.g., mowing, burning, herbicide treatments, and grazing), as successional processes will tend ultimately to favor woody vegetation. Riparian agricultural practices that promote a dense, healthy, grassy turf, such as certain types of intensively managed livestock grazing, have potential to restore degraded stream ecosystems.
This citation is from AGRICOLA.

609. Grazing animals as weed control agents.

Popay, I. and Field, R.

Weed Technology 10 (1): 217-231.

(Mar. 1996)

NAL Call #: SB610.W39;

ISSN: 0890-037X

Descriptors: weed control/ grazing/ reviews/ cattle/ goats/ sheep/ Control
Abstract: Literature on the effectiveness of grazing animals (especially cattle, goats, and sheep) in controlling weeds is reviewed. Availability of animals and the ability to fence them onto or off weed infestations are essential. Weeds of pastures are the most suitable subjects for control, although weeds of arable crops, forestry, and waste places are sometimes amenable to control by grazing animals. Although grazing animals themselves often cause weed problems in pasture, adjusting grazing timing or intensity or both can sometimes redress the balance. Increasing sheep or cattle stocking rates prevents animals from grazing selectively and can help control some weeds. Adjusting grazing pressure can also improve the growth of desirable pasture species so that these are more competitive and able to resist invasion of annual or biennial weeds. Introducing a different class of stock, like sheep into a cattle system or goats into a sheep system can control many weeds. Goats are capable of browsing on and controlling spiny or poisonous brush weeds, including gorse and poison ivy, without suffering adverse effects. Examples are given of the use of grazing animals for weed control in crops and forestry.

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610. Grazing management for riparian wetland areas.

Leonard, S. G.; National Applied Resource Sciences Center (U.S.); and United States. Forest Service. Denver, CO: U.S. Dept. of the Interior, Bureau of Land Management, National Applied Resource Sciences Center; viii, 63 p.: ill.; Series: Riparian area management. Technical reference (United States. Bureau of Land Management) 1737-14. (1997)
Notes: "U.S. Department of Agriculture, Forest Service"--Cover. Shipping list no.: 98-0126-P. "BLM/RS/ST-97/002+1737"--P. [2] of cover. Includes bibliographical references (p. 57-63). SUDOCs: I 53.35:1737-14.

NAL Call #: SF85.3.G75--1997

Descriptors: Range management---United States/ Grazing---

Environmental aspects---United

States/ Riparian ecology---United

States/ Wetland conservation---United

States

This citation is from AGRICOLA.

611. Green-Ampt runoff model: A review.

Manivannan, S. and Raman, S. S.

Indian Journal of Soil Conservation 31 (2): 105-113. (2003)

NAL Call #: S625.I47S6;

ISSN: 0970-3349

This citation is provided courtesy of CAB International/CABI Publishing.

612. Green revolution: Preparing for the 21st century.

Khush, G. S.

Genome 42 (4): 646-655. (Aug. 1999)

NAL Call #: QH431.G452;

ISSN: 0831-2796 [GENOE3].

Notes: Genetic resources, biotechnology and world food supply: A special symposium held June 20-21, 1997, London, Ontario, Canada. Includes references.

Descriptors: green revolution/ genetic improvement/ food security/ sustainability/ agriculture/ maximum yield/ high yielding varieties/ yield increases/ food production/ population growth/ triticum aestivum/ oryza sativa/ fertilizers/ lodging/ resistance/ disease resistance/ pest resistance/ genetic resistance/ irrigation/ government policy/ literature reviews
Abstract: In the 1960s there were large-scale concerns about the world's ability to feed itself. However, widespread adoption of "green revolution" technology led to major increases in food-grain production.

Between 1966 and 1990, the population of the densely populated low-income countries grew by 80%, but food production more than doubled. The technological advance that led to the dramatic achievements in world food production over the last 30 years was the development of high-yielding varieties of wheat and rice. These varieties are responsive to fertilizer inputs, are lodging resistant, and their yield potential is 2-3 times that of varieties available prior to the green revolution. In addition, these varieties have multiple resistance to diseases and insects and thus have yield stability. The development of irrigation facilities, the availability of inorganic fertilizers, and benign government policies have all facilitated the adoption of green-revolution technology. In the 1990s, the rate of growth in food-grain production has been lower than the rate of growth in population. If this trend is not reversed, serious food shortages will occur in the next century. To meet the challenge of feeding 8 billion people by 2020, we have to prepare now and develop the technology for raising farm productivity. We have to develop cereal cultivars with higher yield potential and greater yield stability. We must also develop strategies for integrated nutrient management, integrated pest management, and efficient utilization of water and soil resources.

This citation is from AGRICOLA.

613. The green technology of selenium phytoremediation.

Banuelos, G S
Biofactors 14 (1-4): 255-260. (2001);
ISSN: 0951-6433

Descriptors: selenium; pollutant, toxin/ selenoprotein/ Brassica sp. (Cruciferae)/ canola (Cruciferae)/ microorganism (Microorganisms)/ Angiosperms/ Dicots/ Microorganisms/ Plants/ Spermatophytes/ Vascular Plants/ agricultural effluent/ contaminated sediments/ selenium laden soil

Abstract: Selenium toxicity is encountered in arid and semi-arid regions of the world with alkaline, seleniferous soils derived from marine sediments. Once present in soils and waters at high concentrations, Se is very complicated and highly expensive to remove with conventional physical and chemical techniques. Phytoremediation is a

plant-based technology that is being considered for managing Se in central California soils. The technology involves the use of plants in conjunction with microbial activity associated with the plants to extract, accumulate, and volatilize Se. Once absorbed by plant roots, Se is translocated to the shoot where it may be harvested and removed from the site. Therefore, plant species used for phytoremediation of Se-laden soils may by plant uptake and volatilization minimize the Se load eventually entering agricultural effluent and the harvested crop can be carefully blended with animal forage and fed to animals in Se-deficient areas.

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614. Greenhouse gas emissions from farmed organic soils: A review.

Kasimir, Klemedtsson A;
Klemedtsson, L; Berglund, K;
Martikainen, P; Silvola, J; and
Oenema, O
Soil Use and Management
13 (4 [supplement]): 245-250. (1997)
NAL Call #: S590.S68;
ISSN: 0266-0032

Descriptors: carbon dioxide: greenhouse gas/ methane: greenhouse gas/ nitrous oxide: greenhouse gas/ agriculture/ climate change/ farmed organic soil/ greenhouse gas emission/ soil management

Abstract: The large boreal peatland ecosystems sequester carbon and nitrogen from the atmosphere due to a low oxygen pressure in waterlogged peat. Consequently they are sinks for CO₂ and strong emitters of CH₄. Drainage and cultivation of peatlands allows oxygen to enter the soil, which initiates decomposition of the stored organic material, and in turn CO₂ and N₂O emissions increase while CH₄ emissions decrease. Compared to undrained peat, draining of organic soils for agricultural purposes increases the emissions of greenhouse gases (CO₂, CH₄ and N₂O) by roughly 1 t CO₂ equivalents/ha per year. Although farmed organic soils in most European countries represent a minor part of the total agricultural area, these soils contribute significantly to national greenhouse gas budgets. Consequently, farmed organic soils are potential targets for policy makers in search of socially acceptable and economically cost-efficient measures

to mitigate climate gas emissions from agriculture. Despite a scarcity of knowledge about greenhouse gas emissions from these soils, this paper addresses the emissions and possible control of the three greenhouse gases by different managements of organic soils. More precise information is needed regarding the present trace gas fluxes from these soils, as well as predictions of future emissions under alternative management regimes, before any definite policies can be devised.

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615. A greenhouse without pesticides: Fact or fantasy.

Lenteren, J. C. van.
Crop Protection 19 (6): 375-384.
(July 2000)

NAL Call #: SB599.C8;
ISSN: 0261-2194 [CRPTD6]
Descriptors: greenhouse culture/ plant protection/ crops/ integrated pest management/ plant disease control/ biological control/ natural enemies/ literature reviews
This citation is from AGRICOLA.

616. Ground water contaminants and their sources-a review of state reports.

Canter, L. W. and Maness, K.
International Journal of Environmental Studies 47 (1): 1-17. (1995);
ISSN: 0020-7233
This citation is provided courtesy of CAB International/CABI Publishing.

617. Groundwater as a Geologic Agent: An Overview of the Causes, Processes, and Manifestations.

Toth, J.
Hydrogeology Journal 7 (1): 1-14.
(1999);
ISSN: 1431-2174.
Notes: DOI: 10.1007/s100400050176
Descriptors: Groundwater/ Geology/ Porous Media/ Geohydrologic Units/ Hydraulics/ Geochemistry/ Soil Mechanics/ Rock Mechanics/ Geomorphology/ Groundwater
Abstract: The objective of the present paper is to show that groundwater is a general geologic agent. This perception could not, and did not, evolve until the system nature of basinal groundwater flow and its properties, geometries, and controlling factors became recognized and understood through the 1960s and 1970s. The two fundamental causes for groundwater's active role in nature are its ability to interact with

the ambient environment and the systematized spatial distribution of its flow. Interaction and flow occur simultaneously at all scales of space and time, although at correspondingly varying rates and intensities. Thus, effects of groundwater flow are created from the land surface to the greatest depths of the porous parts of the Earth's crust, and from a day's length through geologic times. Three main types of interaction between groundwater and environment are identified in this paper, with several special processes for each one, namely: (1) Chemical interaction, with processes of dissolution, hydration, hydrolysis, oxidation-reduction, attack by acids, chemical precipitation, base exchange, sulfate reduction, concentration, and ultrafiltration or osmosis; (2) Physical interaction, with processes of lubrication and pore-pressure modification; and (3) Kinetic interaction, with the transport processes of water, aqueous and nonaqueous matter, and heat. Owing to the transporting ability and spatial patterns of basal flow, the effects of interaction are cumulative and distributed according to the geometries of the flow systems. The number and diversity of natural phenomena that are generated by groundwater flow are almost unlimited, due to the fact that the relatively few basic types are modified by some or all of the three components of the hydrogeologic environment: topography, geology, and climate. The six basic groups into which manifestations of groundwater flow have been divided are: (1) Hydrology and hydraulics; (2) Chemistry and mineralogy; (3) Vegetation; (4) Soil and rock mechanics; (5) Geomorphology; and (6) Transport and accumulation. Based on such a diversity of effects and manifestations, it is concluded that groundwater is a general geologic agent.
© Cambridge Scientific Abstracts (CSA)

618. Groundwater quality.

Mayer, A. S.; Imhoff, P. T.; Mitchell, R. J.; Rabideau, A. J.; McBride, J. F.; and Miller, C. T.
Water Environment Research 66 (4): 532-585. (June 1994)
NAL Call #: TD419.R47;
ISSN: 1061-4303 [WAERED]
Descriptors: groundwater pollution/ pollutants/ transport processes/ water

quality/ monitoring/ biodegradation/ movement in soil/ groundwater flow/ sorption/ desorption/ pesticides/ leaching/ models/ literature reviews
This citation is from AGRICOLA.

619. Groundwater quality.

Mayer, A. S.; Mitchell, R. J.; Carriere, P. P. E.; Hein, G. L.; Rabideau, A. J.; and Wojick, C. L.
Water Environment Research 67 (4): 629-685. (1995)
NAL Call #: TD419.R47;
ISSN: 1047-7624
This citation is provided courtesy of CAB International/CABI Publishing.

620. Groundwater quality.

Mayer, A. S.; Carriere, P. P. E.; Gallo, C.; Pennell, K. D.; Taylor, T. P.; Williams, G. A.; and Zhong, L.
Water Environment Research 69 (4): 777-844. (1997)
NAL Call #: TD419.R47;
ISSN: 1047-7624
This citation is provided courtesy of CAB International/CABI Publishing.

621. Growth and functioning of roots and of root systems subjected to soil compaction: Towards a system with multiple signalling?

Tardieu, F.
Soil and Tillage Research 30 (2/4): 217-243. (1994)
NAL Call #: S590.S48;
ISSN: 0167-1987.
Notes: Issue editor: Jensen, H. E.
This citation is provided courtesy of CAB International/CABI Publishing.

622. A guidebook for application of hydrogeomorphic assessments to riverine wetlands.

Brinson, Mark M. and United States Army. Corps of Engineers. U.S. Army Engineer Waterways Experiment Station. Wetlands Research Program (U.S.).
Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station; Series: Wetlands Research Program technical report WRP-DE-11. (1995)
Notes: Title from caption. At head of title: Wetlands Research Program. "December 1995 - Operational draft." Includes bibliographical references.
NAL Call #: GB621-.G84-1995
<http://www.wes.army.mil/el/wetlands/pdfs/wrpde11.pdf>
Descriptors: Wetlands Classification/ Ecosystem management/ Wetlands--- Law and legislation---United States
This citation is from AGRICOLA.

623. Guideline for dairy manure management from barn to storage.

Weeks, Stanley A.
Ithaca, N.Y.: Northeast Regional Agricultural Engineering Service; vii, 36 p.: ill.; Series: NRAES 108. (1998)
Notes: Includes bibliographical references (p. 36).
NAL Call #: S675-.N72-no.108;
ISBN: 0935817271
Abstract: The 36-page guideline covers the following topics: planning the development or improvement of a manure handling system, getting technical information and assistance, and meeting regulations; manure characteristics and production; alternatives for manure management; options for transferring manure from barn to storage; and manure storage types and storage management.
© Natural Resource, Agriculture and Engineering Service (NRAES)

624. Guideline for dairy odor management.

Wright, P. E.; Graves, R. E.; and Koelsch, R. K.
Ithaca, NY: Natural Resource, Agriculture, and Engineering Service//Dairy Practices Council NRAES-146; 34 p. (2001);
ISBN: 0-935817-65-4
Descriptors: dairy farm management/ odor control/ animal manure management
Abstract: This guideline, a joint publication between NRAES and the Dairy Practices Council, presents various ways to reduce or eliminate odor from dairy manure and other sources on dairy farms. Topics covered include odors: perception, characteristics, and measurement; sources of on-farm odors; preventing and reducing odors from livestock and other facilities; preventing and reducing odors from manure handling systems; reducing odors during land application; and neighbor relations and regulation. An appendix provides an off-site odor report that can be used by producers to survey farm neighbors and help pinpoint odor problems. Nineteen figures and three tables supplement the text.
© Natural Resource, Agriculture and Engineering Service (NRAES)

625. Guideline for milking center wastewater.

Wright, P. and Graves, R. E.
Ithaca, NY: Natural Resource, Agriculture, and Engineering Service NRAES-115; 34 p. (1998);

ISBN: 0-935817-26-3

Descriptors: wastewater/ milking/ drainage/ laws and regulations / animal manure management

Abstract: Topics covered include wastewater characteristics and estimating the amount of waste produced; source control of milking center wastewater; the milking center drainage system, including codes and regulations, components, and drainage systems for the milking center; and treatment alternatives, including liquid manure system, short-term storage and land application with manure spreader, settling tanks, grass filter, aerobic lagoon, organic filter bed, septic system, constructed wetlands, stone-filled treatment trench, spray irrigation, lime flocculator treatment, and aerated septic system. Safety and health concerns are also summarized.
© Natural Resource, Agriculture and Engineering Service (NRAES)

626. Guidelines for managing cattle grazing in riparian areas to protect water quality: Review of research and best management practices policy.

Mosley, Jeffrey C.

Moscow, ID: Idaho Forest, Wildlife and Range Policy Analysis Group, University of Idaho; v, 67 p.: col. ill.; Series: Report (Idaho Forest, Wildlife, and Range Policy Analysis Group) no. 15. (1997)

Notes: "December 1997"--Cover.

Includes bibliographical references (p. 51-63).

NAL Call #: SF85.35.I2G95--1997

Descriptors: Grazing--Idaho--Management/ Water quality--Idaho/ Riparian areas--Idaho--Management / Stream conservation--Idaho
This citation is from AGRICOLA.

627. Guiding concepts for the application of indicators to interpret change in soil properties and processes in forests.

Raison, R. J. and Rab, M. A.

In: Criteria and indicators for sustainable forest management: Papers presented at a IUFRO/CIFOR/FAO conference, Sustainable forest management: Fostering stakeholder input to advance development of scientifically based indicators. (Held Aug 1998 at Melbourne, Australia.) Raison, R. J.; Brown, A. G.; and Flinn, D. W. (eds.)

Wallingford, UK: CAB International; pp. 231-258; 2001.

ISBN: 0-85199-392-3

This citation is provided courtesy of CAB International/CABI Publishing.

628. Guiding principles for constructed treatment wetlands: Providing for water quality and wildlife habitat.

Interagency Workgroup on Constructed Wetlands (U.S.) and United States. Environmental Protection Agency. Office of Wetlands, Oceans and Watersheds. Washington, DC: U.S. Environmental Protection Agency, Office of Wetlands, Oceans and Watersheds. (2001)

Notes: Rev. 06/26/2001, Original document published in 2000; Title from web page. Developed by Interagency Workgroup on Constructed Wetlands. "October 2000" Description based on content viewed April 11, 2002. "EPA-843-B-00-003" Includes bibliographical references.

NAL Call #: TD756.5-.G85-2000
<http://www.epa.gov/owow/wetlands/constructed/toc.html>

Descriptors: Constructed wetlands--United States/ Water quality--United States/ Water quality management--United States/ Wetland ecology--United States

Abstract: This User's Guide provides: guiding principles for planning, siting, design, construction, operation, maintenance, and monitoring of constructed treatment wetlands; information on current [Environmental Protection] Agency policies, permits, regulations, and resources; and answers to common questions.
This citation is from AGRICOLA.

629. Gully erosion and environmental change: Importance and research needs.

Poesen, J.; Nachtergaele, J.; Verstraeten, G.; and Valentin, C. *Catena* 50 (2/4): 91-133. (2003)

NAL Call #: GB400.C3;

ISSN: 0341-8162

This citation is provided courtesy of CAB International/CABI Publishing.

630. Habitat coupling in lake ecosystems.

Schindler, Daniel E and Scheuerell, Mark D

Oikos 98 (2): 177-189. (2002); *ISSN:* 0030-1299

Descriptors: nutrients/ aquatic

organism (Organisms)/ fish (Pisces): habitat couplers, omnivore/ organism (Organisms): alien species, benthivorous consumer, carnivore/ plankton (Organisms)/ Animals/ Chordates/ Fish/ Nonhuman Vertebrates/ Vertebrates/ anthropogenic disturbances/ benthic habitats/ biological processes/ chemical processes/ ecological characteristics/ ecosystem processes/ energy flow/ eutrophication/ evolutionary characteristics/ exotic species introduction/ food web stability/ food web structure/ habitat coupling/ habitat modification/ lake ecosystems/ nutrient cycling/ pelagic habitats/ physical processes/ population dynamics/ predator prey interactions/ riparian habitats
Abstract: Lakes are complex ecosystems composed of distinct habitats coupled by biological, physical and chemical processes. While the ecological and evolutionary characteristics of aquatic organisms reflect habitat coupling in lakes, aquatic ecology has largely studied pelagic, benthic and riparian habitats in isolation from each other. Here, we summarize several ecological and evolutionary patterns that highlight the importance of habitat coupling and discuss their implications for understanding ecosystem processes in lakes. We pay special attention to fishes because they play particularly important roles as habitat couplers as a result of their high mobility and flexible foraging tactics that lead to inter-habitat omnivory. Habitat coupling has important consequences for nutrient cycling, predator-prey interactions, and food web structure and stability. For example, nutrient excretion by benthivorous consumers can account for a substantial fraction of inputs to pelagic nutrient cycles. Benthic resources also subsidize carnivore populations that have important predatory effects on plankton communities. These benthic subsidies stabilize population dynamics of pelagic carnivores and intensify the strength of their interactions with planktonic food webs. Furthermore, anthropogenic disturbances such as eutrophication, habitat modification, and exotic species introductions may severely alter habitat connections and, therefore, the fundamental flows of nutrients and energy in lake ecosystems.
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631. Handbook for wetland creation on reclaimed surface mines.

Brooks, Robert P.; Gardner, T. W.; United States. Office of Surface Mining Reclamation and Enforcement; Pennsylvania State University, Environmental Resources Research Institute; and Penn State Cooperative Wetlands Center
University Park, PA: Environmental Resources Research Institute, Pennsylvania State University and Penn State Cooperative Wetlands Center; Series: Report (Pennsylvania State University, Environmental Resources Research Institute) no. ER9503; iv, 59 p.: ill. (1995)
Notes: "May 1995" Includes bibliographical references (p. 55-59). Prepared under Office of Surface Mining cooperative agreement. GR196421.
NAL Call #: S621.5.S8B762--1995
Descriptors: Abandoned mined lands reclamation/ Wetlands/ Constructed wetlands/ Strip mining-- Environmental aspects/ Reclamation of land
This citation is from AGRICOLA.

632. A handbook of constructed wetlands: A guide to creating wetlands for: Agricultural wastewater, domestic wastewater, coal mine drainage, stormwater in the Mid-Atlantic Region.

Davis, Luise.; United States. Natural Resources Conservation Service; United States. Environmental Protection Agency. Region III; and Pennsylvania. Dept. of Environmental Resources.
Washington, D.C.: U.S. Department of Agriculture. (1995)
Notes: "This document was prepared by Luise Davis"--P. [2] of cover; Contents note: v.1. General considerations -- v.2. Domestic wastewater -- v.3. Agricultural wastewater -- v.4. Coal mine drainage -- v.5. Stormwater.
NAL Call #: TD756.5.D39--1995; *ISBN:* 0160529999 (v.1); 0160530008 (v.2); 0160530016 (v.3); 0160530024 (v.4); 0160530032 (v.5)
Descriptors: Constructed wetlands-- Middle Atlantic States--Handbooks, manuals, etc/ Sewage Purification-- Handbooks, manuals, etc/ Agricultural pollution--Handbooks, manuals, etc/ Coal mine waste--Handbooks, manuals, etc / Storm sewers-- Handbooks, manuals, etc
This citation is from AGRICOLA.

633. Harvesting, propagating, and planting wetland plants.

Hoag, J. Chris. and
Plant Materials Center
Aberdeen, ID: USDA, Natural Resources Conservation Service, Plant Materials Center; Series: Riparian/Wetland Project information series no. 14. (2000)
Notes: Title from web page. "July, 2000." Description based on content viewed May 8, 2002. Includes bibliographical references.
NAL Call #: aQK115-.H63-2000
<http://plant-materials.nrcs.usda.gov/pubs/idpmcar/wproj14.pdf>
Descriptors: Wetland plants--United States/ Wetland plants--Harvesting--United States/ Wetland plants--Propagation--United States/ Wetland plants--Planting--United States/ Wetland plants--Transplanting--United States/ Riparian ecology--United States/ Revegetation--United States/ Wetlands--United States
This citation is from AGRICOLA.

634. Hazardous air pollutants (HAPS) and their effects on biodiversity: An overview of the atmospheric pathways of persistent organic pollutants (POPS) and suggestions for future studies.

Finizio, A.; Di Guardo, A.; and Cartmale, L.
Environmental Monitoring and Assessment 49 (2/3): 327-336. (Feb. 1998)
NAL Call #: TD194.E5; *ISSN:* 0167-6369 [EMASDH].
Notes: In the special issue: Atmospheric change and biodiversity: formulating a Canadian science agenda / edited by R.E. Munn. Proceedings of the workshop held February 26-29, 1996, in Toronto, Canada. Includes references.
Descriptors: organic compounds/ organochlorine pesticides/ air pollutants/ persistence/ biodiversity/ ecosystems/ toxicity/ atmosphere/ world/ cycling/ global atmospheric change
This citation is from AGRICOLA.

635. Health Effects Associated With Wastewater Treatment, Disposal, and Reuse.

Kindziarski, W. B.; Rogers, R. E.; and Low, N. J.
Water Environment Research 65 (6): 599-605. (1993)
NAL Call #: TD419.R47

Descriptors: Literature review/ Public health/ Reviews/ Wastewater disposal/ Wastewater renovation/ Wastewater treatment/ Water pollution effects/ Water reuse/ Chlorination/ Drinking water/ Hazardous wastes/ Human pathogens/ Nitrates/ Odors/ Organic compounds/ Shellfish/ Swimming pools/ Viruses/ Wastewater treatment processes/ Ultimate disposal of wastes/ Preparation of reviews
Abstract: The incidence of conditions such as cardiovascular and respiratory diseases is higher among retired sanitation workers of New York City than among closely matched relatives. Infectious human immunodeficiency virus is reported to be fairly stable in wastewater for up to 12 hr, but it experiences a 2-log to 3-log reduction in infectivity after 48 hr. Other studies of public-health implications of exposure to wastes and wastewater include: the survival of hepatitis A virus on human hands and its transfer on contact with animate and inanimate surfaces; the contamination of water supplies and shellfish by *Giardia* cysts, *Legionella pneumophila*, hookworm (*Necator americanus*), *Aeromonas* strains, *Clostridium perfringens*, *Enterobacteriaceae*, *Campylobacter jejuni*, and fecal coliforms; ill health in children aged 6-11 who used recreational beaches contaminated with wastewater; viral contamination of adjacent coastal bathing waters by wastewater outfalls and rivers; and pathogen removal efficiency of wastewater treatment and renovation schemes for purposes of wastewater irrigation. Residents near a wastewater treatment plant quantified odors by completing a numerical odor rating form for a 6-month period. A methodology for predicting volatile organic chemical levels immediately downwind of surface aeration wastewater treatment plants under neutral or stable atmospheric conditions was developed. The effects on human health of chemical contamination of drinking water supplies was studied for arsenic, methylmercury, organic solvents, chloroform, chlorine, and nitrate. An outbreak of cryptosporidiosis in swimming pools was reported. Densely populated cities discharging untreated wastewater into an estuary of Venezuela were likely responsible for the presence of infectious

enteroviruses in the water and sediments. (Geiger-PTT)
© Cambridge Scientific Abstracts (CSA)

636. Health Effects Associated With Wastewater Treatment, Disposal, and Reuse.

Kindziarski, W. B. and Gabos, S.
Water Environment Research 67 (4): 749-755. (1995)

NAL Call #: TD419.R47;

ISSN: 1061-4303

Descriptors: literature review/ public health/ wastewater treatment/ wastewater disposal/ water reuse/ wastewater collection/ water treatment facilities/ diseases/ human diseases/ disease transmission/ pathogens/ waste water/ waste utilization/ hazard assessment/ Effects of pollution/ Public health/ medicines/ dangerous organisms
© Cambridge Scientific Abstracts (CSA)

637. Health effects of aerial emissions from animal production and waste management systems.

Schiffman, S. S.; Auverman, B. W.; and Bottcher, R. W.

In: White papers on animal agriculture and the environment/ National Center for Manure & Animal Waste Management; Midwest Plan Service; and U.S. Department of Agriculture; Raleigh, NC: National Center for Manure & Animal Waste Management, 2001.

NAL Call #: TD930.2-W45-2002

Descriptors: Agricultural wastes---Environmental aspects---United States

638. Health risks caused by freshwater cyanobacteria in recreational waters.

Chorus, I.; Falconer, I. R.; Salas, H. J.; and Bartram, J.

Journal of Toxicology and Environmental Health: Part B, Critical Reviews 3 (4): 323-347. (2000)

NAL Call #: RA565.A1J6;

ISSN: 1093-7404

This citation is provided courtesy of CAB International/CABI Publishing.

639. Herbaceous stubble height as a warning of impending cattle grazing damage to riparian areas.

Hall, Frederick C.; Bryant, Larry.; and Pacific Northwest Research Station
Portland, Or.: U.S. Dept. of Agriculture, Forest Service, Pacific Northwest Research Station; Series:

General technical report PNW 362; 10 p.: ill. (1995)

Notes: Cover title. Distributed to depository libraries in microfiche.

Shipping list no.: 97-0633-M.

"September 1995." Includes

bibliographical references (p. 7-9).

SUDOCs: A 13.88:PNW-GTR-362.

NAL Call #: Fiche-S-133-A-

13.88:PNW-GTR-362

Descriptors: Grazing---Environmental aspects---United States/ Riparian areas---United States/ Riparian ecology---United States/ Vegetation monitoring---United States
This citation is from AGRICOLA.

640. Herbicide dissipation studies in southern forest ecosystems.

Michael, J. L. and Neary, D. G.

Environmental Toxicology and Chemistry 12 (3): 405-410.

(Mar. 1993)

NAL Call #: QH545.A1E58;

ISSN: 0730-7268 [ETOCDK].

Notes: Paper presented at the "Symposium on Pesticides in Forest Management, 11th Annual Meeting of the Society of Environmental Toxicology and Chemistry," November 11-15, 1990, Arlington, Virginia. Literature review. Includes references.

Descriptors: watersheds/ forests/ picloram/ hexazinone/ imazapyr/ sulfonylurea herbicides/ pollution/ application methods/ surface water/ streams/ forest soils/ vegetation/ persistence/ degradation/ half life/ literature reviews/ forestry/ southeastern states of USA/ sulfometuron methyl
This citation is from AGRICOLA.

641. Herbicide effects on ground-layer vegetation in southern pinelands (USA): A review.

Litt, Andrea R; Herring, Brenda J; and Provencher, Louis

Natural Areas Journal 21 (2):

177-188. (2001)

NAL Call #: QH76.N37;

ISSN: 0885-8608

Descriptors: herbicides: pollutant, toxin/ *Aristida beyrichiana* [wiregrass] (Gramineae): nontarget organism/ *Aristida stricta* [wiregrass] (Gramineae): nontarget organism/ *Pinus palustris* [longleaf pine] (Coniferopsida)/ woody plants (Spermatophyta): endangered species, threatened species/ Angiosperms/ Gymnosperms/ Monocots/ Plants/ Spermatophytes/ Vascular Plants/ ecotoxicology/

experimental design/ ground layer vegetation/ hardwoods/ pine plantations/ quantitative data/ southern pinelands/ species richness/ woody plant cover

Abstract: Despite the fact that herbicides are widely used across the southeastern United States, their effects on ground-layer vegetation (woody and herbaceous species <1.4 m tall) are not well understood. We conducted a literature review to examine published studies and compile available data. More than 125 studies were examined, based on several criteria (e.g., a sound experimental design, quantitative data, study conducted in southern pinelands). Only 21 studies were retained for our review, and the majority of studies were conducted in pine plantations. Few clear, consistent results were revealed, probably due in large part, to the wide array of herbicides and diverse response variables examined in the studies. Woody plant cover generally declined with herbicide application, an expected result from use of hardwood-specific herbicides in most studies, but results for herbaceous plant cover were mixed. Most studies showed a decrease in total (woody and herbaceous plant) species richness. We also examined the response of plant species of special concern to herbicide application. Most species declined, while wiregrass (*Aristida beyrichiana* Trinius and Ruprecht (syn. *A. stricta* Michx. s.i.)) showed mixed responses across studies. Because our findings show that few studies have been conducted under natural conditions, experimental design shortfalls have been common, and study conclusions have been widely divergent, we suggest that research precede extensive herbicide use in pinelands.

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642. Herbicide-soil interactions in reduced tillage and plant residue management systems.

Locke, M. A. and Bryson, C. T.

Weed Science 45 (2): 307-320.

(Mar. 1997-Apr. 1997)

NAL Call #: 79.8-W41;

ISSN: 0043-1745 [WEESA6]

Descriptors: herbicides/ soil/ interactions/ no-tillage/ crop residues/ crop management/ sustainability/ cover crops/ erosion/ soil water content/ weeds/ seedling emergence/ tillage/ conservation tillage/ tillage/

degradation/ leaching/ runoff/ sorption/ literature reviews

Abstract: Recent changes in technology; governmental regulation and scrutiny, and public opinion have motivated the agricultural community to examine current management practices from the perspective of how they fit into a sustainable agricultural framework. One aspect which can be incorporated into many existing farming systems is plant residue management (e.g., reduced tillage, cover crops). Many residue management systems are designed to enhance accumulation of plant residue at the soil surface. The plant residue covering the soil surface provides many benefits, including protection from soil erosion, soil moisture conservation by acting as a barrier against evaporation, improved soil tilth, and inhibition of weed emergence. This review summarizes recent literature (ca. last 25 yr) concerning the effects of plant residue management on the soil environment and how those changes impact herbicide interactions. This citation is from AGRICOLA.

643. Herbicides: A two-edged sword.

Kudsk, P and Streibig, J C
Weed Research 43 (2): 90-102. (2003)
NAL Call #: 79.8-W412;
ISSN: 0043-1737
Descriptors: herbicide: discovery, fate, resistance/ crop plant (Angiospermae)/ weed (Tracheophyta)/ Angiosperms/ Plants/ Spermatophytes/ Vascular Plants
Abstract: Weeds cause yield losses and reductions in crop quality. Prior to the introduction of selective herbicides, the drudgery of manual weeding forced farmers to adhere to a suit of weed management tactics by carefully combining crop rotation, appropriate tillage and fallow systems. The introduction of selective herbicides in the late 1940s and the constant flow of new herbicides in the succeeding decades provided farmers with a new tool, 'the chemical hoe', putting them in a position to consider weed control more independently of the crop production system than hitherto. The reliance on herbicides for weed control, however, resulted in shifts in the weed flora and the selection of herbicide-resistant biotypes. In the 1980s, the public concern about side-effects of

herbicides on the environment and human health resulted in increasingly strict registration requirements and, in some countries, political initiatives to reduce the use of pesticides were launched. Today, the number of new herbicides being introduced has decreased significantly and integrated weed management has become the guiding concept. Farmers also have the option of growing herbicide-resistant crops where the biology of the crop has been adapted to tolerate herbicides considered safe to humans and environmentally benign. This paper discusses some of the recent developments in herbicide discovery, technology and fate, and sketches important future developments.
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644. Higher performance through combined improvements in irrigation methods and scheduling: A discussion.

Pereira, Luis S
Agricultural Water Management 40 (2-3): 153-169. (1999)
NAL Call #: S494.5.W3A3;
ISSN: 0378-3774
Abstract: Prior to the discussion on approaches to combine irrigation scheduling and water application practices, several farm irrigation performance indicators are defined and analysed. These indicators concern the uniformity of water distribution along an irrigated field and the efficiency of on-farm water application. Then, the analysis focus is on three main irrigation systems: surface, sprinkler and microirrigation. For each of these systems, the analysis concerns the main characteristics and constraints of the systems, more relevant aspects influencing irrigation performances, and approaches which could lead to a more appropriate coupling of irrigation scheduling and water application methods. Conclusions point out on the need for combined improvements in irrigation scheduling and methods, for expanding field evaluation of irrigation in farmers fields, for improved design of on-farm systems, and for quality control of irrigation equipments and design.
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645. Higher plants as accumulative bioindicators.

Weiss, P.; Offenthaler, I.; Öhlinger, R.; and Wimmer, J.
In: *Bioindicators and biomonitors: Principles, concepts and applications/* Markert, B. A.; Breure, A. M.; and Zechmeister, H. G., 2003; pp. 465-500.
ISBN: 0-08-044177-7
This citation is provided courtesy of CAB International/CABI Publishing.

646. Higher-tier laboratory methods for assessing the aquatic toxicity of pesticides.

Boxall, Alistair B A; Brown, Colin D; and Barrett, Katie L
Pest Management Science 58 (7): 637-648. (2002)
NAL Call #: SB951-.P47;
ISSN: 1526-498X
Descriptors: pesticides: aquatic toxicity/ risk assessment
Abstract: Registration schemes for plant-protection products require applicants to assess the potential ecological risk of their products using a tiered approach. Standard aquatic ecotoxicity tests are used at lower tiers and clearly defined methodologies are available for assessing the potential environmental risks. Safety factors are incorporated into the assessment process to account for the uncertainties associated with the use of lower-tier single-species ecotoxicity studies. If lower-tier assessments indicate that a substance may pose a risk to the environment, impacts can be assessed using more environmentally realistic conditions through the use of either pond mesocosms, artificial streams or field monitoring studies. Whilst these approaches provide more realistic assessments, the results are difficult to interpret and extrapolation to other systems is problematic. Recently it has been recognised that laboratory approaches that are intermediate between standard aquatic toxicity tests and field/mesocosm studies may provide useful data and help reduce the uncertainties associated with standard single-species tests. However, limited guidance is available on what tests are available and how they can be incorporated into the risk-assessment process. This paper reviews a number of these higher-tier laboratory techniques, including modified exposure studies, species sensitivity studies, population studies

and tests with sensitive life stages. Recommendations are provided on how the approaches can be incorporated into the risk-assessment process.

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647. The hindrance in the development of pit additive products for swine manure odor control: A review.

Zhu, J.; Bundy, D. S.; Li, X.; and Rashid, N.

Journal of Environmental Science and Health: Part A, Environmental Science and Engineering and Toxic and Hazardous Substance Control A32 (9/10): 2429-2448. (1997)
 NAL Call #: TD172.J6;
 ISSN: 1077-1204 [JESHE6]
 Descriptors: pig manure/ odor abatement/ intensive livestock farming/ literature reviews
 This citation is from AGRICOLA.

648. Historical overview of vermicomposting.

Edwards, C. A.

Biocycle 36 (6): 56-58. (June 1995)
 NAL Call #: 57.8-C734;
 ISSN: 0276-5055
 Descriptors: vermicomposting/ organic wastes/ waste utilization/ earthworms
 This citation is from AGRICOLA.

649. History, Development and Characteristics of Lake Ecological Models.

Xu, Fu-Liu; Tao, S. H.;

Dawson, R. W.; and Lu, Xiao-Yan
Journal of Environmental Sciences (China) 14 (2): 255-263. (2002);
 ISSN: 1001-0742

Descriptors: Lakes/ Aquatic Habitats/ Ecosystems/ Model Studies/ Water Quality/ Eutrophication/ Wetlands/ Model Testing/ Models/ Historical account/ Literature reviews/ Freshwater ecology/ Acidification / Pollution effects/ Ecosystem management/ Lake dynamics/ Aquatic environment/ metals/ pesticides/ Lakes/ Habitat community studies/ Environmental Modeling
 Abstract: This paper provides some introductory information on the history, development, and characteristics of various lake ecosystem models. The modeling of lake ecological processes began to gain importance in the early 1960s. There are a number of models available today, with varying levels of complexity to cope with the variety of

environmental problems found in lake environments, e.g. eutrophication, acidification, oxygen depletion, wetland management, heavy metal and pesticide pollution, as well as hydrodynamic problems. In particular, this paper focuses on lake eutrophication and wetland models, as well as addressing strategies appropriate for the design and development of reliable lake ecological models.

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650. History of coordinated resources management planning (CRMP) in Oregon: An overview.

Anderson, E. W.

Rangelands 21 (2): 6-11. (Apr. 1999)
 NAL Call #: SF85.A1R32;
 ISSN: 0190-0528

Descriptors: range management/ resource conservation/ game animals/ prescribed burning/ watershed management/ environmental protection/ regional planning/ Oregon
 This citation is from AGRICOLA.

651. Hormonal regulation in insects: Facts, gaps, and future directions.

Gaede, G.; Hoffmann, K. H.; and Spring, J. H.

Physiological Reviews 77 (4): 963-1032. (1997);
 ISSN: 1031-9333

Descriptors: ecdysteroids/ juvenile hormones/ neuropeptide hormones/ reviews/ Insecta/ Neuroendocrinology/ Hormones

Abstract: There are two main classes of hormones in insects: 1) the true hormones produced by epithelial glands and belonging to the ecdysteroids or juvenile hormones and 2) the neuropeptide hormones produced by neurosecretory cells. Members of these classes regulate physiological, developmental, and behavioral events in insects. Detailed accounts are given on isolation, identification, structure-activity relationships, mode of action, biological function, biosynthesis, inactivation, metabolism, and feedback for hormones involved in 1) metabolic regulation such as the adipokinetic/hypertrehalosemic peptides and the diuretic and antidiuretic peptides; 2) stimulation or inhibition of muscle activity such as the myotropic peptides; 3) control of reproduction, growth, and development such as allatotropins,

allatostatins, juvenile hormones, ecdysteroids, folliculostimulins and folliculostatins, ecdysis-triggering and eclosion hormones, pheromone biosynthesis activating neuropeptides, and diapause hormones; and 4) regulation of tanning and of color change. Because of the improvements in techniques for isolation and structure elucidation, there has been rapid progress in our knowledge of the chemistry of certain neuropeptide families. With the employment of molecular biological techniques, the genes of some neuropeptides have been successfully characterized. There are, however, areas that are still quite underdeveloped. These are, for example, 1) receptor studies, which are still in their infancy; 2) the hormonal status of certain sequenced peptides is not clarified; and 3) functional studies are lacking even for established hormones. The authors plead for a concerted effort to continue research in this field, which will also advance our knowledge into the use of insect hormones as safer and species-specific molecules for insect pest management.

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652. How can increased use of biological N₂ fixation in agriculture benefit the environment?

Jensen, E. S. and

Hauggaard-Nielsen, H.

Plant and Soil 252 (1): 177-186. (2003)

NAL Call #: 450 P696;

ISSN: 0032-079X

This citation is provided courtesy of CAB International/CABI Publishing.

653. How much biodiversity is enough.

Main, A. R.

Agroforestry Systems 45 (1/3): 23-41. (1999)

NAL Call #: SD387.M8A3;

ISSN: 0167-4366 [AGSYE6].

Notes: Special issue: Agriculture as a mimic of natural ecosystems / edited by E.C. Lefroy, R.J. Hobbs, M.H. O'Connor and J.S. Pate. Paper presented at a workshop held September 2-6, 1997, Williams, Western Australia, Australia. Includes references.

Descriptors: biodiversity/ agriculture/ ecosystems/ sustainability/ genetic diversity/ species diversity/ history/ crop yield/ salinity/ erosion/

groundwater/ leaching/ soil fertility/
risk reduction/ cycling/ plant pests/
plant diseases/ literature reviews
This citation is from AGRICOLA.

654. Hungry water: Effects of dams and gravel mining on river channels.

Kondolf, G Mathias
Environmental Management
21 (4): 533-551. (1997)
NAL Call #: HC79.E5E5;
ISSN: 0364-152X

Descriptors: channel instability/
conservation/ damming/ floodplain
gravel pits/ gravel loss/ gravel mining/
reservoirs/ resource management/
river channels/ River Rhine/ sediment
deposition/ sediment transport/
spawning habitat

Abstract: Rivers transport sediment from eroding uplands to depositional areas near sea level. If the continuity of sediment transport is interrupted by dams or removal of sediment from the channel by gravel mining, the flow may become sediment-starved (hungry water) and prone to erode the channel bed and banks, producing channel incision (downcutting), coarsening of bed material, and loss of spawning gravels for salmon and trout (as smaller gravels are transported without replacement from upstream). Gravel is artificially added to the River Rhine to prevent further incision and to many other rivers in attempts to restore spawning habitat. It is possible to pass incoming sediment through some small reservoirs, thereby maintaining the continuity of sediment transport through the system. Damming and mining have reduced sediment delivery from rivers to many coastal areas, leading to accelerated beach erosion. Sand and gravel are mined for construction aggregate from river channel and floodplains. In-channel mining commonly causes incision, which may propagate up- and downstream of the mine, undermining bridges, inducing channel instability, and lowering alluvial water tables. Floodplain gravel pits have the potential to become wildlife habitat upon reclamation, but may be captured by the active channel and thereby become instream pits. Management of sand and gravel in rivers must be done on a regional basis, restoring the continuity of

sediment transport where possible and encouraging alternatives to river-derived aggregate sources.
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655. Hydraulic agitation of an earthen manure storage: Final report.

Stock, Wayne F.; Prairie Agricultural Machinery Institute (Canada); and Saskatchewan. Agriculture Development Fund.
Regina, Saskatchewan:
Saskatchewan Agriculture Development Fund.; 15 p.: ill. (2000)
Notes: Cover title. "19980116."
"February 2000." Project Technologist Wayne Stock ... [et al.]. Cf. prelim.
NAL Call #: TD930.2-.H92-2000
This citation is from AGRICOLA.

656. A hydrogeomorphic classification for wetlands.

Brinson, Mark M.; Wetlands Research Program (U.S.); United States. Army. Corps of Engineers; and U.S. Army Engineer Waterways Experiment Station.
Vicksburg, Miss.: U.S. Army Engineer Waterways Experiment Station; Series: Technical report (U.S. Army Engineer Waterways Experiment Station) WRP-DE-4. (1993)
Notes: Title from caption. "August 1993." At head of title: "Wetlands Research Program." "Final report." Includes bibliographical references.
NAL Call #: GB621.B75-1993
<http://www.wes.army.mil/el/wetlands/pdfs/wrpde4.pdf>
Descriptors: Wetlands Classification/ Geomorphology/ Hydrology/ Wetland ecology
This citation is from AGRICOLA.

657. Hydrologic and water quality impacts of agricultural drainage.

Skaggs, R W; Breve, M A; and Gilliamg, J W
Critical Reviews in Environmental Science and Technology 24 (1): 1-32. (1994)
NAL Call #: QH545.A1C7;
ISSN: 1064-3389
Descriptors: nutrient loss/ pesticides/ pollutant load/ runoff/ salinity/ sediment loss/ water table
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658. The Hydrological and Geomorphological Significance of Forested Floodplains.

Gurnell, A
Global Ecology and Biogeography Letters 6 (3-4): 219-229. (1997);

ISSN: 0960-7447.

Notes: Conference: Floodplain Forests: Structure, Functioning and Management, Leicester (UK), Mar 1995; Publisher: Blackwell Science Ltd
Descriptors: flood plains/ forests/ hydrology/ geomorphology/ vegetation/ riparian environments/ Vegetation cover/ Riparian Vegetation/ interactions/ Woodlands/ Habitat community studies / Streamflow and runoff
Abstract: Within river corridors, the distribution of plant species and communities is heavily influenced by hydrological and geomorphological processes. Furthermore, the vegetation can have a direct influence on the detailed character and rate of hydrogeomorphological processes. This paper reviews such interactions at a variety of spatial scales ranging from vegetation gradients across entire floodplains from hillslope to river channel, to the local influences of bank vegetation and in-channel accumulations of woody debris.
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659. Hydrological processes in abandoned and restored peatlands: An overview of management approaches.

Price, J S; Heathwaite, A L; and Baird, A J
Wetlands Ecology and Management 11 (1-2): 65-83. (2003)
NAL Call #: QH541.5.M3 W472;
ISSN: 0923-4861
Descriptors: methane: production/ Sphagnum (Sphagnobrya)/ Bryophytes/ Nonvascular Plants/ Plants/ abandoned peatland/ ditch blocking/ drainage/ ecological processes/ hydraulic conductivity/ hydrological processes/ management approach overview/ microclimate management/ pore water pressure/ restoration peatland/ soil wetness/ spring snowmelt/ water balance component restoration/ water management options/ water tension/ wetlands ecology/ winter precipitation
Abstract: Mined peatlands do not readily recover their hydrological function, mainly because the dominant peat-forming plant genus, Sphagnum, cannot easily reestablish on the degraded surface peat found on cutover sites. Drainage and removal of the acrotelm can result in surface subsidence of up to 3.7 cm y⁻¹ m⁻¹ of peat shortly after drainage

(compression), and long-term rates up to 0.3 cm y⁻¹ m⁻¹ (compression and oxidation). This can decrease the hydraulic conductivity by over 75%, and decrease the water retention capacity and specific yield. In old abandoned systems, drainage ditches may continue to facilitate a significant seasonal water loss. Colonization of abandoned sites by trees may increase the evapotranspirative losses by as much as 25%, and interception losses can be as high as 32% of rainfall. Without natural or planned occlusion of ditches, some peatlands become drier over time. Blocking ditches may largely restore water balance components, although the hydrological regime requires years to stabilise sufficiently for Sphagnum recolonization, especially where residual peat is well decomposed, having inadequate water storage capacity. Consequently, winter precipitation (Europe) and spring snowmelt (North America) are critical recharge periods. Over the long term, consolidation of the peat due to drainage and methane production (where drainage systems are blocked and soils reflooded) decreases hydraulic conductivity, thereby reducing lateral seepage losses. This may actually assist in Sphagnum recolonization. A regenerated cover of Sphagnum increases soil wetness and reduces water tension (increases pore-water pressure) in the substrate, thus ameliorating its own environment. However, natural recolonization and recovery of many hydrological and ecological processes may not occur, or may require many decades. Water management and selective plant reintroduction can accelerate this. Water management options such as blocking ditches, constructing bunds, reconfiguring the surface and managing microclimate have met with varying degrees of success. No standard management prescription can be made because each site presents unique challenges.
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660. Hydrology and wetland conservation.

Gilman, Kevin.
Chichester; New York: Wiley; xii, 101 p.: ill., maps; Series: Water science series. (1994)
Notes: "Published on behalf of the Institute of Hydrology" Includes bibliographical references.

NAL Call #: GB628.43.G55--1994;
ISBN: 0471951528
Descriptors: Wetlands---Great Britain/
Wetland conservation---Great Britain
This citation is from AGRICOLA.

661. Hydrolysis of sulfonylurea herbicides in soils and aqueous solutions: A review.

Sarmah, Ajit K and Sabadie, Jean
Journal of agricultural and food chemistry 50 (22): 6253-6265. (2002)
NAL Call #: 381 J8223;
ISSN: 0021-8561
Descriptors: minerals / sulfonylureas: herbicide, hydrolysis, pyridinic ring, pyrimidine ring, triazinic ring/ aqueous solutions/ pH effect/ soils/ temperature effect
Abstract: Sulfonylureas are a unique group of herbicides used for controlling a range of weeds and some grasses in a variety of crops and vegetables. They have been extremely popular worldwide because of their low mammalian toxicity, low use rate, and unprecedented herbicidal activity. Knowledge about the fate and behavior of sulfonylurea herbicides in the soil-water environment appears to be of utmost importance for agronomic systems and environmental protection. Because these herbicides are applied at a very low rate, and their mobility is greatly affected by the chemicals' anionic nature in alkaline soils, a thorough understanding of their degradation/hydrolysis processes and mechanisms under aqueous and soil systems is important. This review brings together published information on the hydrolysis of several sulfonylureas in aqueous and soil solutions that includes the effects of pH, temperature, functional relationship between pH vs hydrolysis rate constants, and hydrolysis behavior of sulfonylureas in the presence of minerals. In addition, the transformations of sulfonylureas in soil, under laboratory and field experiments, have been discussed in connection with the compounds' varied structural features, i.e., sulfonylureas that are with or without the pyridinic, pyrimidine, and triazinic ring.

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662. Identification of pesticide poisoning in wildlife.

Brown, Peter; Charlton, Andrew; Cuthbert, Mary; Barnett, Libby; Ross, Leigh; Green, Margaret; Gillies, Liz; Shaw, Kathryn; and Fletcher, Mark
Journal of Chromatography A 754 (1-2): 463-478. (1996)
NAL Call #: QD272.C4J68;
ISSN: 0021-9673
Descriptors: strychnine/ chloralose/ metaldehyde/ paraquat/ animal (Animalia Unspecified)/ Animalia (Animalia Unspecified)/ animals/ analytical method/ analytical methods/ chloralose/ environmental analysis/ metaldehyde/ methodology/ nontarget organism/ paraquat/ pesticide poisoning/ pesticides/ pollution/ strychnine/ toxicity/ toxicology/ wildlife
Abstract: The Wildlife Incident Investigation Scheme investigates incidents of suspected poisoning of wildlife (also honey bees and companion animals) by pesticides in the United Kingdom. The approach to these investigations has evolved over the past 30 years. Field investigations, postmortem examinations, toxicological data and experience of previous poisoning incidents assist in the selection and interpretation of appropriate chemical analyses. Several 'multi-residue' and several 'individual compound' analytical methods for pesticides in wildlife are currently in use; these are described.
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663. Identifying the major sources of nutrient water pollution.

Puckett, L. J.
Environmental Science and Technology 29 (9): 408A-414A. (1995)
NAL Call #: TD420.A1E5;
ISSN: 0013-936X [ESTHAG]
This citation is from AGRICOLA.

664. IDMP guidelines: How to prepare an irrigation and drainage management plan.

NSW Agriculture.
New South Wales: NSW Agriculture, c2002. 17 p.: col. ill., col. maps. (2002)
Notes: WaterWise on the farm.
NAL Call #: TC812-.I36-2002;
ISBN: 0734714122
Descriptors: Irrigation---Australia---New South Wales---Management/ Drainage---Australia---New South Wales---Management/ Irrigation---Australia---New South Wales---

Planning/ Drainage---Australia---New South Wales---Planning
This citation is from AGRICOLA.

665. Illustrations and guidelines for selecting statistical methods for quantifying spatial pattern in ecological data.

Perry, J N; Liebhold, A M; Rosenberg, M S; Dungan, J; Miriti, M; Jakomulska, A; and Citron, Pousty S
Ecography 25 (5): 578-600. (2002);
ISSN: 0906-7590

Descriptors: animal (Animalia)/ plant (Plantae)/ Animals/ Plants/ animal ecology/ coastal regions/ deserts/ frequency distributions/ geostatistics/ landscape ecology/ mapping/ mountainous regions/ philosophy/ plant ecology/ rangeland types/ sampling effects/ shrub cover/ spatial patterns: quantification/ spatially explicit data/ variance mean indices/ visualization techniques

Abstract: This paper aims to provide guidance to ecologists with limited experience in spatial analysis to help in their choice of techniques. It uses examples to compare methods of spatial analysis for ecological field data. A taxonomy of different data types is presented, including point- and area-referenced data, with and without attributes. Spatially and non-spatially explicit data are distinguished. The effects of sampling and other transformations that convert one data type to another are discussed; the possible loss of spatial information is considered. Techniques for analyzing spatial pattern, developed in plant ecology, animal ecology, landscape ecology, geostatistics and applied statistics are reviewed briefly and their overlap in methodology and philosophy noted. The techniques are categorized according to their output and the inferences that may be drawn from them, in a discursive style without formulae. Methods are compared for four case studies with field data covering a range of types. These are: 1) percentage cover of three shrubs along a line transect; 2) locations and volume of a desert plant in a 1 ha area; 3) a remotely-sensed spectral index and elevation from 105 km² of a mountainous region; and 4) land cover from three rangeland types within 800 km² of a coastal region. Initial approaches utilize mapping, frequency distributions and variance-mean indices. Analysis techniques we compare include: local quadrat

variance, block quadrat variance, correlograms, variograms, angular correlation, directional variograms, wavelets, SADIE, nearest neighbour methods, Ripley's L(t), and various landscape ecology metrics. Our advice to ecologists is to use simple visualization techniques for initial analysis, and subsequently to select methods that are appropriate for the data type and that answer their specific questions of interest. It is usually prudent to employ several different techniques.
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666. Immunoassays for Pesticides.

Meulenbergh, E. P.; Mulder, W. H.; and Stoks, P. G.

Environmental Science and Technology 29 (3): 553-561. (1995)
NAL Call #: TD420.A1E5;
ISSN: 0013-936X

Descriptors: assay/ pollutants/ pesticides/ assessments/ cost benefit analysis/ sampling/ water analysis/ water pollution control/ water quality standards/ immunoassays/ water sampling/ reviews/ water quality/ water quality control/ toxicity tests/ bioassays/ immunology/ pollution detection/ immunoassay/ Identification of pollutants/ Freshwater pollution/ Analytical procedures/ Immunology/ Instrumentation and process engineering/ Methods and instruments

Abstract: Immunoassay is recognized as a promising method for screening environmental contaminants. Numerous immunoassays have already been developed, and especially the rapidity, sensitivity, and cost-effectiveness of this method are considered as advantageous for screening purposes to reduce sample load for conventional analyses. A particular interesting application involves water quality control with regard to pesticides, for which in Europe a threshold concentration of 0.1 µg/L applies. An overview is given of the various pesticides for which immunoassays have been developed, including commercially available kits. Pros and cons, applicability, and results of field tests are discussed. Additionally, a survey is given on further developments for improvement of existing or new immunoassays and on the application of immunochemistry in other embodiments (immunoaffinity chromatography, immunosensors). Particular emphasis is laid on

validation and standardization of immunoassays.

© Cambridge Scientific Abstracts (CSA)

667. Impact and management of purple loosestrife (*Lythrum salicaria*) in North America.

Blossey, Bernd; Skinner, Luke C; and Taylor, Janith
Biodiversity and Conservation 10 (10): 1787-1807. (2001);
ISSN: 0960-3115

Descriptors: *Lythrum salicaria* [purple loosestrife] (Lythraceae): weed/ black tern (Charadriiformes)/ insects (Insecta)/ least bittern (Ciconiiformes)/ marsh wren (Passeriformes)/ pied billed grebe (Podicipediformes)/ Angiosperms/ Animals/ Arthropods/ Birds/ Chordates/ Dicots/ Insects/ Invertebrates/ Nonhuman Vertebrates/ Plants/ Spermatophytes/ Vascular Plants/ Vertebrates/ biological invasions/ ecological succession/ ecosystem function/ ecosystem integrity/ environmental impact/ weed management: benefits, risks/ wetland habitats: encroachment

Abstract: The invasion of non-indigenous plants is considered a primary threat to integrity and function of ecosystems. However, there is little quantitative or experimental evidence for ecosystem impacts of invasive species. Justifications for control are often based on potential, but not presently realized, recognized or quantified, negative impacts. Should lack of scientific certainty about impacts of non-indigenous species result in postponing measures to prevent degradation? Recently, management of purple loosestrife (*Lythrum salicaria*), has been criticized for (1) lack of evidence demonstrating negative impacts of *L. salicaria*, and (2) management using biocontrol for lack of evidence documenting the failure of conventional control methods. Although little quantitative evidence on negative impacts on native wetland biota and wetland function was available at the onset of the control program in 1985, recent work has demonstrated that the invasion of purple loosestrife into North American freshwater wetlands alters decomposition rates and nutrient cycling, leads to reductions in wetland plant diversity, reduces pollination and seed output of the native *Lythrum alatum*, and reduces habitat suitability for specialized wetland bird species

such as black terns, least bitterns, pied-billed grebes, and marsh wrens. Conventional methods (physical, mechanical or chemical), have continuously failed to curb the spread of purple loosestrife or to provide satisfactory control. Although a number of generalist insect and bird species utilize purple loosestrife, wetland habitat specialists are excluded by encroachment of *L. salicaria*. We conclude that (1) negative ecosystem impacts of purple loosestrife in North America justify control of the species and that (2) detrimental effects of purple loosestrife on wetland systems and biota and the potential benefits of control outweigh potential risks associated with the introduction of biocontrol agents. Long-term experiments and monitoring programs that are in place will evaluate the impact of these insects on purple loosestrife, on wetland plant succession and other wetland biota. © Thomson

668. The impact of agricultural practices on biodiversity.

McLaughlin, A. and Mineau, P. *Agriculture, Ecosystems and Environment* 55 (3): 201-212. (1995)
NAL Call #: S601 .A34;
ISSN: 0167-8809

This citation is provided courtesy of CAB International/CABI Publishing.

669. Impact of alien plants on Grant Basin rangelands.

Young, James A and Longland, William S
Weed Technology 10 (2): 384-391. (1996)
NAL Call #: SB610.W39;
ISSN: 0890-037X
Descriptors: weeds (Tracheophyta)/ *Artemisia tridentata* (Compositae)/ angiosperms/ dicots/ plants/ spermatophytes/ vascular plants/ alien plants/ big sagebrush/ ecosystem function/ environmental sciences/ terrestrial ecology/ great basin rangeland/ pest assessment control and management/ succession
Abstract: Our purpose is to discuss the impact of alien plants on rangeland ecosystems of the Great Basin in terms of their effects on biological functions. The sagebrush/bunchgrass ranges of western North America are used as a model ecosystem for the impact of alien plants. Alien weed species have been introduced in successive waves,

with the success of each new introduction dependent on how well adapted to the environment and how competitive the new weed is with those previously introduced. Annual species have been successful across extensive areas of Great Basin rangelands. Biennial and short- and long-lived perennial introductions have been restricted to much more specific habitats. Alien plants impact rangelands through stand renewal and successional processes. Alien weeds can cause such processes to be accelerated and/or truncated depending on the species and range site.

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670. Impact of composting strategies on the treatment of soils contaminated with organic pollutants.

Semple, K T; Reid, B J; and Fermor, T R
Environmental Pollution 112 (2): 269-283. (2001)
NAL Call #: QH545.A1E52;
ISSN: 0269-7491

Descriptors: organic compounds: degradation, pollutant, soil, toxin/ actinomycetes (Actinomycetes and Related Organisms): decomposer, xenobiotic degrading microorganism/ bacteria (Bacteria): decomposer, xenobiotic degrading microorganism/ fungi (Fungi): decomposer, lignolytic, xenobiotic degrading microorganism/ Bacteria/ Eubacteria/ Fungi/ Microorganisms/ Nonvascular Plants/ Plants/ pollutant bioavailability/ pollutant biotransformation/ soil contamination
Abstract: Chemical pollution of the environment has become a major source of concern. Studies on degradation of organic compounds have shown that some microorganisms are extremely versatile at catabolizing recalcitrant molecules. By harnessing this catabolic potential, it is possible to bioremediate some chemically contaminated environmental systems. Composting matrices and composts are rich sources of xenobiotic-degrading microorganisms including bacteria, actinomycetes and lignolytic fungi, which can degrade pollutants to innocuous compounds such as carbon dioxide and water. These microorganisms can also biotransform pollutants into less toxic substances and/or lock up pollutants within the organic matrix, thereby reducing

pollutant bioavailability. The success or failure of a composting/compost remediation strategy depends however on a number of factors, the most important of which are pollutant bioavailability and biodegradability. This review discusses the interactions of pollutants with soils; look critically at the clean up of soils contaminated with a variety of pollutants using various composting strategies and assess the feasibility of using composting technologies to bioremediate contaminated soil. © Thomson

671. The impact of conservation tillage on pesticide runoff into surface water: A review and analysis.

Fawcett, R. S.; Christensen, B. R.; and Tierney, D. P.
Journal of Soil and Water Conservation 49 (2): 126-135. (1994)
NAL Call #: 56.8 J822;
ISSN: 0022-4561
This citation is provided courtesy of CAB International/CABI Publishing.

672. Impact of crop rotation and land management on soil erosion and rehabilitation.

Amir, J.
In: *Soil erosion, conservation and rehabilitation/ Agassi, M.*
New York: Marcel Dekker, 1996; pp. 375-397.
ISBN: 0-8247-8984-9
This citation is provided courtesy of CAB International/CABI Publishing.

673. Impact of environmental regulations on cattle production.

Morse, D.
Journal of Animal Science 74 (12): 3103-3111. (Dec. 1996)
NAL Call #: 49-J82;
ISSN: 0021-8812 [JANSAG].
Notes: Paper presented at the symposium "Ruminant Nutrition from an Environmental Perspective" at the ASAS 87th Annual Meeting, July 1995, Orlando, Florida. Includes references.
Descriptors: livestock farming/ water quality/ environmental legislation/ regulations/ endangered species/ riparian vegetation/ environmental protection/ economic impact/ animal manures/ application to land/ pollution control/ dairy farms/ poultry manure/ United States/ Florida
Abstract: A greater focus of legislative mandates is directed toward nonpoint sources of pollution.

This article focuses on environmental regulations and their impact on cattle production. Key legislation will be reviewed to stress how variations in the type of law, degree of impact, enforcement mechanism, and time line for compliance affect the ability for research to be designed and accomplished in a desired time frame and to yield data on which imposed management practices should be based. Science-based regulations are desired to maximize beneficial impacts of management practices; however, many regulations are developed and management practices are imposed prior to research to minimize liability of the regulatory agency in case natural resources are degraded in the absence of management practices. The technology adoption process will be reviewed. Documented impact of imposed management practices (technology adoption) will be presented. Of particular interest is the importance of documenting the economic and resource impacts of regulations on livestock operators. Types of research needed prior to implementing management practices will be reviewed. Local involvement can increase the adoption rate of practices and technologies. This citation is from AGRICOLA.

674. The impact of human activities on freshwater aquatic systems.

Skurlatov, Yu I and Ernestova, L S
Acta Hydrochimica et Hydrobiologica
26 (1): 5-12. (1998);
ISSN: 0323-4320

Descriptors: hydrogen peroxide/ hydroxyl radicals/ manganese: pollutant/ oxygen/ sulfur: pollutant/ superoxide radicals/ atmospheric fallout/ biogeochemical cycling/ biological quality/ bottom sediment composition/ environmental quality/ freshwater aquatic systems/ human activities/ wastewater treatment
Abstract: The roles of oxygen and its activated species (superoxide radicals, hydrogen peroxide, hydroxyl radicals), as well as that of sulfur compounds, are considered in relation to biological quality and the self-cleaning capacity of freshwater aquatic systems. The effects on the aquatic redox-processes are discussed in terms of atmospheric fallout of sulfur compounds, bottom sediment composition, and input of wastewaters containing reducing substances. It is shown that the

totality of anthropogenic influences, and/or unfavourable natural geochemical conditions, as well as climatic effects in a region can increase the significance of one-electron transfer processes in biogeochemical cycles of oxygen, sulfur and manganese, compared with the significance of two-electron transfer processes. The resulting, reactive intermediate products of one-electron transfer processes are very important with respect to the composition and properties of aquatic systems. Examples are given of practical applications of wastewater treatment, using hydrogen peroxide and UV-irradiation, and of regulation of consumers' activities which affect natural waters.
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675. Impact of insecticide resistance mechanisms on management strategies.

Horowitz, A. R. and Denholm, I.
In: Biochemical sites of insecticide action and resistance/ Ishaaya, Isaac.
Berlin: Springer-Verlag, 2001; pp. 323-338.

ISBN: 3540676252

Descriptors: insecticides/ applied entomology/ evolutionary biology/ insecticide resistance/ management strategies/ Pest Assessment Control and Management/ Pesticides/ in vitro assay: analytical method/ applied entomology/ evolutionary biology/ insecticide resistance/ management strategies
© Thomson

676. Impact of nutrition on reduction of environmental pollution by pigs: An overview of recent research.

Jongbloed AW; Lenis NP; and Mroz Z
Veterinary Quarterly 19 (3): 130-134; 36 ref. (1997)

This citation is provided courtesy of CAB International/CABI Publishing.

677. Impact of ploughless soil tillage on yield and soil quality: A Scandinavian review.

Rasmussen, K. J.
Soil and Tillage Research 53 (1): 3-14. (1999)

NAL Call #: S590.S48;

ISSN: 0167-1987.

Notes: Issue editor: Arshad, M. A.
This citation is provided courtesy of CAB International/CABI Publishing.

678. The impact of reduced tillage on soilborne plant pathogens.

Bockus, W. W. and Shroyer, J. P.
Annual Review of Phytopathology
36: 485-500. (1998)
NAL Call #: 464.8-An72;
ISSN: 0066-4286 [APPYAG]
Descriptors: plant pathogens/ soil flora/ no-tillage/ crop residues/ erosion/ soil water content/ crop yield/ degradation/ soil temperature/ plant disease control/ biological control/ cultural control/ disease resistance/ rotations/ literature reviews
This citation is from AGRICOLA.

679. Impact of soil erosion on crop yields in North America.

Biggelaar, C. den.; Lal, R.; Wiebe, K.; and Breneman, V.

Advances in Agronomy
72: 1-52. (2001)

NAL Call #: 30-Ad9;

ISSN: 0065-2113 [ADAGA7]

Descriptors: crop yield/ erosion/ soil degradation/ data analysis/ data collection/ yield losses/ experimental design/ techniques/ soil management/ technology/ history/ agricultural research/ agricultural policy/ economic analysis / literature reviews/ North America

This citation is from AGRICOLA.

680. Impacts of agricultural herbicide use on terrestrial wildlife in temperate landscapes: A review with special reference to North America.

Freemark, K. and Boutin, C.
Agriculture, Ecosystems and Environment 52 (2/3): 67-91.
(Feb. 1995)

NAL Call #: S601.A34;

ISSN: 0167-8809 [AEENDO]

Abstract: The existing literature was examined to assess the extent to which wildlife (plants, soil organisms, above-ground insects/arthropods, mammals, birds) living in terrestrial habitats has been affected by use of agricultural herbicides in temperate landscapes. Although North America was of special interest for regulatory reasons, the review was extended to western Europe because the most extensive and intensive work has been done there. The half-life of herbicides in the environment ranges from less than 1 month to more than 1 year. Wildlife within fields is most likely to be exposed to herbicides, particularly when fields are planted with crops (e.g. corn, soybean, wheat, cotton) which are routinely sprayed.

Wildlife is also likely to be exposed in non-crop habitats adjoining croplands, primarily from direct overspray (especially during aerial application), and drift during and/or volatilisation after application. The most conclusive scientific evidence for direct effects of herbicides on arable weeds, and associated indirect effects on insects and birds exists in the United Kingdom. Evidence for similar effects in North America is primarily circumstantial at present. Little work has been done anywhere on impacts of herbicides on plants and their associated fauna in non-crop habitats adjoining treated fields. Chemical farming (in particular, the use of herbicides) has dramatically altered the habitat pattern of temperate landscapes in North America and western Europe. Strong evidence exists for adverse effects of changes in habitat pattern on beneficial insects and arthropods in the United Kingdom, and on birds in North America and western Europe. Toxicity testing guidelines for non-target plant protection need to be developed and enforced to support pesticide registration. In addition, research is needed to include more ecologically relevant plant species in laboratory tests, to develop multi-species tests (particularly in the field), to improve methods for risk assessment, and to develop options for mitigating risks. Large scale, long-term trans-disciplinary research of different farming systems is needed, particularly in North America, to integrate and better evaluate ecological, agronomic, and socio-economic costs and benefits of agricultural herbicide use in temperate landscapes.

This citation is from AGRICOLA.

681. Impacts of agricultural practices on subsurface microbial ecology.

Madsen, E. L.

Advances in Agronomy 54: 1-67. (1995)

NAL Call #: 30-Ad9;

ISSN: 0065-2113 [ADAGA7]

Descriptors: bacteria/ microorganisms/ groundwater/ community ecology/ environmental factors/ agriculture/ irrigation/ agricultural chemicals/ leaching/ pollutants/ groundwater pollution/ literature reviews

This citation is from AGRICOLA.

682. Impacts of animal manure management on ground and surface water quality.

Sharpley, A.; Meisinger, J. J.; Breeuwsma, A.; Sims, J. T.; Daniel, T. C.; and Schepers, J. S.

In: *Animal waste utilization: Effective use of manure as a soil resource/ Hatfield, J. L. and Stewart, B. A.*

Chelsea, MI: Ann Arbor Press, 1998; pp. 173-242

NAL Call #: S655.A57 1998

This citation is provided courtesy of CAB International/CABI Publishing.

683. Impacts of Atrazine in Aquatic Ecosystems.

Graymore, M.; Stagnitti, F.; and Allinson, G.

Environment International 26 (7-8): 483-495. (2001)

NAL Call #: TD169.E54;

ISSN: 0160-4120

Descriptors: Atrazine / Ecology/ Water quality (Natural waters)/ Herbicides/ Runoff/ Groundwater/ Leaching/ Aquatic environment/ Community structure/ Environmental impact/ Pollution effects/ Ecosystems/ Aquatic organisms/ Community composition/ Water Pollution Effects/ Pesticides/ Aquatic Life/ Groundwater Pollution/ Agricultural Runoff/ atrazine/ Water Quality/ Freshwater pollution/ Effects on organisms/ Effects of pollution

Abstract: A portion of all herbicides applied to forests, croplands, road sides, and gardens are inevitably lost to water bodies either directly through runoff or indirectly by leaching through groundwater into ephemeral streams and lakes. Once in the aquatic environment, herbicides may cause stress within aquatic communities and radically alter community structure. Atrazine is one of the most effective and inexpensive herbicides in the world and is consequently used more frequently than any other herbicide. Atrazine is frequently detected in aquatic waters, and has been known to affect reproduction of aquatic flora and fauna, which in turn impacts on the community structure as a whole. This paper presents a summary of the reported direct and indirect impacts of atrazine on aquatic organisms and community structure. The information can be used for developing improved management guidelines and legislation. It is concluded that a single universal maximum limit on the atrazine application in catchments, as suggested by many regulatory

authorities, does not provide adequate protection of the aquatic environment. Rather, it is advocated that flexible limits on the application of atrazine be developed in line with the potential risk of contamination to surface and subsurface water and fragility of the aquatic environment. © Cambridge Scientific Abstracts (CSA)

684. Impacts of Changing Precipitation Patterns on Water Quality.

Hatfield, J. L. and Prueger, J. H.

Journal of Soil and Water Conservation 59 (1): 51-58.

(Jan. 2004-Feb. 2004)

NAL Call #: 56.8 J822;

ISSN: 0022-4561

Descriptors: Conservation Practices/ Drainage/ Soil Management/ Soil Water Balance/ Surface Runoff/ Water Quality/ Conservation Tillage/ Management Systems/ Manure Application/ Swine Manure/ Runoff/ Phosphorus/ Soil/ Nitrogen/ Nitrate/ Surface

Abstract: Changing climate across the United States has been observed in the increasing intensity and amount of precipitation. One of the predicted areas for this impact is in the upper Midwest or the Corn Belt, and one concern is that current soil management practices in this region may not adequately protect the soil under these changes resulting in water quality impacts. To address this concern, this study was conducted to survey the current literature on the water quality impacts from current soil management practices and evaluate potential impacts on runoff and drainage from soil management practices under a number of precipitation scenarios. Soil management practices, e.g., crop residue, no-tilt, incorporation of manure, provide protection under today's climate. However, increasing precipitation amounts, or frequencies, rapidly decrease the effectiveness of these practices with the deleterious effect being even greater on soils with low water holding capacity and limited depth. The water quality impacts may be even more dramatic with the likelihood of increased surface runoff events. Soil management practices need to be developed and evaluated under precipitation patterns that may

represent future scenarios so that producers can begin to adopt these practices into their management programs.

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685. Impacts of Climate Change on Aquatic Ecosystem Functioning and Health.

Meyer, J. L.; Sale, M. J.; Mulholland, P. J.; and Leroy Poff, N.

Journal of the American Water Resources Association 35 (6): 1373-1386. (1999)

NAL Call #: GB651.W315;

ISSN: 1093-474X.

Notes: Special issue on water resources and climate change; Publisher: American Water Resources Association

Descriptors: USA/ Ecosystems/ Climatic Changes/ Food Chains/ Reviews/ Mixing/ Runoff/ Instream Flow/ Model Studies/ Risk/ Benefits/ Cost Analysis/ Inland water environment/ Environmental impact/ Fresh water/ Ecosystem disturbance/ Freshwater environments/ Water quality/ Nutrient loading/ Hydrology/ North America/ Ecology/ Climate/ Food chains/ Hazard/ Economics/ United States/ Mechanical and natural changes/ Air pollution/ Water Resources and Supplies

Abstract: We review published analyses of the effects of climate change on goods and services provided by freshwater ecosystems in the United States. Climate-induced changes must be assessed in the context of massive anthropogenic changes in water quantity and quality resulting from altered patterns of land use, water withdrawal, and species invasions; these may dwarf or exacerbate climate-induced changes. Water to meet instream needs is competing with other uses of water, and that competition is likely to be increased by climate change. We review recent predictions of the impacts of climate change on aquatic ecosystems in eight regions of North America. Impacts include warmer temperatures that alter lake mixing regimes and availability of fish habitat; changed magnitude and seasonality of runoff regimes that alter nutrient loading and limit habitat availability at low flow; and loss of prairie pothole wetlands that reduces waterfowl populations. Many of the predicted changes in aquatic ecosystems are a consequence of climatic effects on terrestrial ecosystems; shifts in

riparian vegetation and hydrology are particularly critical. We review models that could be used to explore potential effects of climate change on freshwater ecosystems; these include models of instream flow, bioenergetics models, nutrient spiraling models, and models relating riverine food webs to hydrologic regime. We discuss potential ecological risks, benefits, and costs of climate change and identify information needs and model improvements that are required to improve our ability to predict and identify climate change impacts and to evaluate management options.
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686. Impacts of disturbance on detritus food webs in agro-ecosystems of contrasting tillage and weed management practices.

Wardle, D. A.

Advances in Ecological Research 26: 105-185. (1995);

ISSN: 0065-2504

This citation is provided courtesy of CAB International/CABI Publishing.

687. The impacts of irrigation and drainage on the environment = Les impacts de l'irrigation et du drainage sur l'environnement.

Jensen, Marvin Eli

The Hague, the Netherlands: ICID; 26 p.: ill.; Series: N.D. Gulhati memorial lecture (5th). (1993)

Notes: Includes bibliographical references (p. 24-26).

NAL Call #: TC809-.J46-1993

Descriptors: Irrigation---

Environmental aspects

This citation is from AGRICOLA.

688. Impacts of riparian vegetation on hydrological processes.

Tabacchi, E.; Lambs, L.; Guilloy, H.; Planty-Tabacchi, A. M.; Muller, E.; and Decamps, H.

Hydrological Processes 14 (16/17): 2959-2976. (2000)

NAL Call #: GB651.H93;

ISSN: 0885-6087

This citation is provided courtesy of CAB International/CABI Publishing.

689. The Implications of Grassland and Heathland Management for the Conservation of Spider Communities: A Review.

Bell, JR; Wheeler, CP; and Cullen, WR

Journal of Zoology 255 (3): 377-387. (2001);

ISSN: 0952-8369

Descriptors: Heaths/ Grasslands/ Conservation/ Community composition/ Habitat/ Management/ Araneae/ Spiders/ Populations & general ecology/ Conservation
Abstract: Both intensity and type of habitat management in grasslands and heathlands affect spider communities. With high intensity management, spider communities often lack diversity and are dominated by a few r-selected species affiliated with bare ground. Low intensity management produces more complex communities introducing more niches for aerial web spinners and climbing spiders. The preferred management will be site-dependent and may not be appropriate for all spiders in all situations, particularly for some rare or threatened species. Providing natural cover is recommended when using extreme forms of management or intensive grazing (particularly by sheep). In extreme cases, or where trampling is heavy, the litter layer should be conserved. We advocate research and survey before and after major management implementation. Habitat management for spiders should not be considered alone, but integrated into a holistic plan. Management for spiders may conflict with rare plant conservation and small reserves should examine the viability of providing two contrasting regimes.
© Cambridge Scientific Abstracts (CSA)

690. Implications of grazing vs. no grazing on today's rangelands.

Laycock, W. A.

In: Ecological implications of livestock herbivory in the West/ Vavra, M.; Laycock, W. A.; and Pieper, R. D. Denver, CO: Society for Range Management, 1994; pp. 250-280. ISBN: 1-884930-00-X; Proceedings of the 42nd annual meeting of the American Institute of Biological Sciences.

NAL Call #: SF85.35.A17E28

This citation is provided courtesy of CAB International/CABI Publishing.

691. Implications of movement in developing and deploying integrated pest management strategies.

Irwin, Michael E

Agricultural and Forest Meteorology 97 (4): 235-248. (1999)

NAL Call #: 340.8-AG8;

ISSN: 0168-1923

Descriptors: aphid (Homoptera)/ vector/ soybean mosaic potyvirus (Potyvirus)/ pathogen/ Animals/ Arthropods/ Insects/ Invertebrates/ Microorganisms/ Plant Viruses/ Viruses/ integrated pest management/ pest movement/ disease transmission/ movement/ soybean mosaic potyvirus/ disease vectors/ case studies/ information needs/ flight/ disease prevention/ epidemiology/ simulation models/ mathematical models/ aphididae/ glycine max/ aerial insects/ air microbiology/ literature reviews

Abstract: To develop an integrated pest management (IPM) program, one must rely on detailed knowledge of pest movement at several levels. The tenets of IPM and the three tiers of information (fundamental, tactical, and operational) needed to deploy an IPM program are considered. I highlight the soybean mosaic potyvirus pathosystem, a pest system that is nearly impossible to control once the pathogen enters a field, to illustrate how the pathogen can be contained through IPM practices, but only with a reasonable understanding of pathogen transport by insect vectors. The virus is transmitted by a suite of aphids with different flight activity modes. Disease spread is rapid and irreversible if initial inoculum is high and vector flight activity is great. For that reason, the management mode must be preventive, not remedial. The complex epidemiology involves vector movement over both landscape and ecoregional scales, and movement, especially as it is influenced by atmospheric motion systems over both scales, should be understood to effectively manage soybean mosaic virus epidemics. The importance of conceptual, simulation, and predictive models that take into consideration vector movement cannot be overstated when dealing with a pest complex of this nature.

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692. Implications of phytic acid and supplemental microbial phytase in poultry nutrition: A review.

Sebastian, S.; Touchburn, S. P.; and Chavez, E. R.

World's Poultry Science Journal 54 (1): 27-47. (Mar. 1998)

NAL Call #: 47.8-W89;

ISSN: 0043-9339 [WPSJAO]

Descriptors: broilers/ turkeys/

bioavailability/ phosphorus/ phytic acid/ nutrient-nutrient interactions/ female animals/ male animals/ enzyme preparations/ feed additives/ dietary minerals/ calcium/ fiber content/ copper/ zinc/ cereals/ grain legumes/ oilseeds/ age differences/ sex differences/ protein digestibility/ excretion/ poultry manure/ literature reviews

This citation is from AGRICOLA.

693. Implications of weed seedbank dynamics to weed management.

Buhler, D. D.; Hartzler, R. G.; and Forcella, F.

Weed Science 45 (3): 329-336.

(May 1997-June 1997)

NAL Call #: 79.8-W41;

ISSN: 0043-1745 [WEESA6].

Notes: Paper presented at the Weed Science Society of America Meeting on Importance of weed biology to weed management held February 6, 1996, Norfolk, VA.

Includes references.

Descriptors: weeds/ seed banks/ population dynamics/ weed control/ tillage/ weed biology/ population ecology/ botanical composition/ cropping systems/ depth/ rotations/ integrated pest management/ decision making/ mathematical models/ yield losses/ crop yield/ light/ requirements/ literature reviews

Abstract: The species composition and density of weed seed in the soil vary greatly and are closely linked to the cropping history of the land. Altering tillage practices changes weed seed depth in the soil, which plays a role in weed species shifts and affects efficacy of control practices. Crop rotation and weed control practices also affect the weed seedbank. Information on the influence of cropping practices on the weed seedbank should be a useful tool for integrated weed management. Decision aid models use information on the weed seedbank to estimate weed populations, crop yield loss, and recommend weed control tactics. Understanding the light requirements of weed seed may provide new approaches to weed management. Improving and applying our understanding of weed seedbank dynamics is essential to developing improved weed management systems. The principles of plant ecology must be integrated with the science of weed management to develop strategies that take advantage of basic plant responses in

weed management systems for agronomic crops.

This citation is from AGRICOLA.

694. The importance of different scale processes for the restoration of floodplain woodlands.

Hughes, F M R; Adams, W M; Muller, E; Nilsson, C; Richards, K S;

Barsoum, N; Decamps, H;

Foussadier, R; Girel, J; Guilloy, H;

Hayes, A; Johansson, M; Lambs, L;

Pautou, G; Peiry, J L; Perrow, M;

Vautier, F; and Winfield, M

Regulated Rivers Research and

Management 17 (4-5): 325-345.

(2001)

NAL Call #: TC530.R43;

ISSN: 0886-9375

Descriptors: trees (Spermatophyta): seedling/ Plants/ Spermatophytes/ Vascular Plants/ channel movements/ ecosystem responses/ environmental flows/ environmental management/ flood events/ floodplain woodlands: restoration/ geomorphological processes/ hydrology/ mortality/ river restoration/ sediment inputs/ sedimentation sites/ spatial scale processes/ tree regeneration/ water tables

Abstract: The restoration of floodplain woodlands demands an understanding of the linkages between process, form and past management history at both a local and catchment scale. Site and reach scale processes that influence the species composition of floodplain woodland species are described with a particular focus on the relationships between hydrological and sediment inputs to floodplains and the regeneration response by tree species. The importance of integrating natural science knowledge gained at the site reach scale with decisions taken at the catchment scale on water allocation priorities is then discussed. Research was carried out on the River Ore in Sweden, The River Ouse in the United Kingdom and the River Isere and River Garonne in France. Research results at the site and reach scale allow broad definition of ideal conditions for the regeneration and growth of floodplain tree species and the flows that provide them: (1) channel movement has to occur for the creation of sedimentation sites required for the regeneration of early successional species and the flows that provide them; (2) flooding events should occur periodically to cause both channel movement and recharge

floodplain water tables; (3) water table decline rates following a flood event must be slow enough that seedling roots can maintain contact with the retreating water front; (4) unseasonal flood events can cause high mortality of seedlings and prevent successful regeneration in any season. Some of the requirements for the restoration of floodplain woodlands can be delivered through site and reach scale restoration projects with reasonably predictable ecological outcomes. A more holistic approach to the provision of regeneration sites for floodplain woodlands would also include water allocation decisions targeted at providing flow conditions which could restore geomorphological processes. However, it is difficult to predict ecosystem responses to catchment scale flow allocation measures and, therefore, in the intensively managed river corridors of Western Europe, river restoration initiatives tend to be restricted to the site and reach scale.
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695. Importance of mechanisms and processes of the stabilisation of soil organic matter for modelling carbon turnover.

Krull, E. S.; Baldock, J. A.; and Skjemstad, J. O.
Functional Plant Biology 30 (2): 207-222. (2003);
ISSN: 1445-4408
This citation is provided courtesy of CAB International/CABI Publishing.

696. The Importance of Palaeolimnology to Lake Restoration.

Battarbee, R. W.
Hydrobiologia 395/396: 149-159. (1999)
NAL Call #: 410 H992;
ISSN: 0018-8158
Descriptors: Lake Restoration/ Paleolimnology/ Reviews/ Lake Sediments/ Lakes/ Paleoecology/ Methodology/ Environmental restoration/ Restoration/ Eutrophication/ Acidification/ Environment management/ Palaeolimnology/ Lake deposits/ Ecosystem management/ transfer functions/ Lakes/ Methodology general/ Protective measures and control/ Freshwater pollution/ Water quality control/ Reclamation
Abstract: Palaeolimnology has developed rapidly over the last two decades to deal with problems of

eutrophication, and acidification. This paper reviews the techniques for coring, dating and interpreting sediments. The applications of palaeolimnology in interpreting the past through 'transfer functions' calculated from biological indices are reviewed. Rates of change, the causes of change, and the restoration of lakes to some predefined target are reviewed and the direction of future developments considered.
© Cambridge Scientific Abstracts (CSA)

697. The Importance of Pathogenic Organisms in Sewage and Sewage Sludge.

Dumontet, S.; Scopa, A.; Kerje, S.; and Krovacek, K.
Journal of the Air and Waste Management Association 51 (6): 848-860. (2001);
ISSN: 1047-3289
Descriptors: Pathogens/ Sewage/ Sewage sludge/ Waste treatment/ Soil amendment/ Reviews/ Viruses/ Bacteria/ Yeasts/ Fungi/ Parasites/ Recycling/ Epidemiology/ Waste management/ Wastewater/ Sludge/ Organic Matter/ Public Health/ epidemiology/ Non patents/ Waste management/ Wastewater treatment processes/ Waste Management/ Sewage & wastewater treatment
Abstract: Deficient sanitation poses a serious threat to human and animal health, involving complex relationships between environments, animals, refuse, food, pathogens, parasites, and man. However, by sanitizing and stabilizing the organic matter of sewage sludge, agriculture can utilize it to maintain soil, water, and air quality. As ingredients in soil amendments, such bioresidues are a source of nutrients for plants. Stabilization and sanitation of sewage sludge safely couple its recycling and disposal. This coupling becomes increasingly important as economic and environmental constraints make strategies for waste disposal more difficult to apply. The occurrence of viruses, bacteria, yeasts, fungi, and zooparasites in sewage sludge is reviewed in this article, and consequential epidemiologic concerns that arise from sewage sludge recycling is also addressed.
© Cambridge Scientific Abstracts (CSA)

698. The importance of pesticides and other pest management practices in U.S. alfalfa production.

Hower, Arthur A.; Harper, Jayson K.; Harvey, R. Gordon.; and National Agricultural Pesticide Impact Assessment Program (U.S.).
United States: s.n.; xi, 221 p.: map;
Series: NAPIAP report no. 2-CA-99. (1999)
Notes: Includes bibliographical references (p. 124-131). Funded by U.S. Dept. of Agriculture, National Agricultural Pesticide Impact Assessment Program.
NAL Call #: SB608.A5-H69-1999
Descriptors: Alfalfa---Diseases and pests---Control---United States/ Pesticides---United States/ Pests---Control/ Weeds---Control/ Alfalfa industry---United States
This citation is from AGRICOLA.

699. The importance of pesticides and other pest management practices in U.S. tomato production.

Davis, R. Michael.
United States: s.n.; x, 263 p.: maps;
Series: NAPIAP report no. 1-CA-98. (1998)
Notes: "A special funded project of the United States Department of Agriculture, National Agricultural Pesticide Impact assessment Program, document number 1-CA-98." Includes bibliographical references (p. 262-263).
NAL Call #: SB608.T75-148-1998
Descriptors: Tomatoes---Diseases and pests---Control---United States/ Tomato industry---United States/ Pesticides---Economic aspects---United States
This citation is from AGRICOLA.

700. The importance of scouting in cotton IPM.

Matthews, G. A.
Crop Protection 15 (4): 369-374. (1996)
NAL Call #: SB599.C8;
ISSN: 0261-2194
This citation is provided courtesy of CAB International/CABI Publishing.

701. Importance of the riparian zone to the conservation and management of freshwater fish: A review.

Pusey, Bradley J and Arthington, Angela H
Marine and Freshwater Research 54 (1): 1-16. (2003);
ISSN: 1323-1650

Descriptors: nutrients/ fish (Pisces): alien species, egg, freshwater species, larva/ grass (Gramineae): alien species, exotic pasture species, insolation, proliferation/ Angiosperms/ Animals/ Chordates/ Fish/ Monocots/ Nonhuman Vertebrates/ Plants/ Spermatophytes/ Vascular Plants/ Vertebrates/ UV B irradiation/ atmosphere/ biodiversity/ body morphology/ coarse organic matter/ disease resistance/ flow regimen/ food web structure/ habitat structure/ light quality/ light quantity/ metabolic rate/ mortality rate/ population deterioration/ potential mate discrimination / predation/ reproduction/ riparian zone integrity/ riparian aquatic ecosystem linkages / solar energy transmission/ stream shade/ terrestrial sediments/ thermal energy transfer/ water clarity

Abstract: The relationship between freshwater fish and the integrity of the riparian zone is reviewed with special emphasis on the fauna of northern Australia. Linkages between freshwater fish and riparian zone processes are diverse and important. The riparian zone occurs at the interface between terrestrial and aquatic ecosystems and it may, therefore, regulate the transfer of energy and material between these systems, as well as regulating the transmission of solar energy into the aquatic ecosystem. Riparian influences on light quantity, quality and shade in streams are discussed and predictions are made about the likely impacts associated with changes in light quality. Increased rates of transfer of thermal energy between the atmosphere and the aquatic environment in the absence of an intact riparian zone may potentially disrupt reproduction by desynchronizing the thermal regimen from regional factors, such as the flow regimen, as well as having direct effects on mortality rates, body morphology, disease resistance and metabolic rates. Impacts associated with changes in light quality range from increased egg and larval mortality due to increased ultraviolet (UV) B irradiation and a decreased ability to discriminate between potential mates to increased conspicuousness to predators. Increased insolation and proliferation of exotic pasture grasses, an increasing threat in northern Australia, are shown to have a range of impacts, including changes in habitat structure, food-web structure and the facilitation

of invasion by exotic fish species. The interception of terrestrial sediments and nutrients by the riparian zone has important consequences for stream fish, maintaining habitat structure, water clarity and food-web structure. Coarse organic matter donated to the aquatic environment by the riparian zones has a large range of influences on stream habitat, which, in turn, affect biodiversity and a range of process, such as fish reproduction and predation. Terrestrial matter is also consumed directly by fish and may be a very important source of energy in some Australian systems and under certain circumstances. Attention to the linkages between fish and riparian systems is essential in efforts to rehabilitate degraded stream environments and to prevent further deterioration in freshwater fish populations in northern Australia.
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702. The importance of wetlands in water resource management: A literature review.

Brady, Anne.; Riding, Tim.; and New South Wales. Dept. of Land and Water Conservation.
Sydney: Dept. of Land & Water Conservation; 48 p.: ill. (1996)
Notes: "March 1996"--T.p. verso.
Includes bibliographical references (p. 30-37).
NAL Call #: QH541.5.M3B73--1996;
ISBN: 0731023544
Descriptors: Wetland conservation---Australia---New South Wales/ Wetlands---Australia---New South Wales---Management
This citation is from AGRICOLA.

703. Improved methods of injecting swine manure to agricultural land.

Prairie Agricultural Machinery Institute (Canada) and Saskatchewan. Agriculture Development Fund.
Regina: Agriculture Development Fund, Saskatchewan Agriculture and Food; 19, 40 p.: ill. (1996)
Notes: "Final report" "March, 1996."
NAL Call #: S655-.147-1996
Descriptors: Manures/ Manure handling
This citation is from AGRICOLA.

704. Improved technologies to reduce emission of methyl bromide from fumigated soil.

Gamliel, A; Grinstein, A; and Katan, J
Phytoparasitica 25 ([supplement]): 21S-30S. (1997);
ISSN: 0334-2123

Descriptors: methyl bromide/ emission reduction/ fumigated soil/ improved technologies/ intensive agriculture/ methodology/ methyl bromide/ pesticides/ postharvest quarantine treatments/ soil fumigant/ soil science

Abstract: Methyl bromide (MB) is the chemical most widely used for soil fumigation in intensive agriculture, and for commodity and postharvest quarantine treatments. MB was listed by the Montreal Protocol in 1992 as a controlled ozone-depleting substance, and a phaseout process has been initiated. Several technologies to reduce the fumigation dosage and subsequent emission of MB from the fumigated soil were tested and applied in field trials and commercial application. These include dosage reduction by using impermeable films, improving uniformity of distribution, and preventing possible escape sources such as the edges of the fumigated plot. Combining MB with other pesticides, solarization, or biocontrol agents is another approach to reducing MB emission and dosage. Adapting these technologies may result in a 60-90% reduction of MB emitted from fumigated soil.
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705. Improvement of vegetable quality and water and fertilizer utilization in low-tech greenhouses through a decision support management system.

Passam, H. C.; Sideridis, A. B.; Yialouris, C. P.; and Maliappis, M. T.
Journal of Vegetable Crop Production 7 (1): 69-82. (2001)
NAL Call #: SB320.J68;
ISSN: 1049-6467
Descriptors: lycopersicon esculentum/ cucumis sativus/ cucumis melo/ solanum melongena/ capsicum annum/ lactuca sativa/ greenhouse culture/ decision making/ crop quality/ irrigation water/ nutrient requirements/ fertilizers/ evaporation/ expert systems/ plant pests/ plant diseases/ diagnosis/ symptoms/ nutritional disorders/ databases/ literature reviews
This citation is from AGRICOLA.

706. Improving the Evaluation of Conservation Programs.

Kleiman, G. D.; Reading, P. R.; Miller, J. B.; Clark, W. T.; Scott, M. J.; Robinson, J.; Wallace, L. R.; Cabin, J. R.; and Felleman, F.

Conservation Biology 14 (2): 356-365. (Apr. 2000)

NAL Call #: QH75.A1C5;

ISSN: 0888-8892.

Notes: Publisher:

Blackwell Science Ltd

Descriptors: Conservation/ Reviews/ Government policy

Abstract: The evaluation of conservation programs is rare but increasingly important in improving their effectiveness. Regular evaluations of conservation programs and the implementation of recommendations resulting from such assessments are infrequent because of resistance by participants and lack of funding. Evaluations may be internal or external, depending on the purpose of the review and how broadly it is focused. We strongly recommend external peer review of long-term complex conservation programs every 5 years, supported by more frequent (annual) internal reviews. Criteria for success must encompass both biological and social measures and include learning and the application of new knowledge to management. Evaluations must also go beyond monitoring to assess the value of the program. We emphasize the need to include the organization and function of a conservation program (the process) in any evaluation in addition to substantive criteria for success, which usually involve biological measures (numbers). A dysfunctional program organization and process can as effectively cripple a conservation effort as can a major biological catastrophe. We provide examples of different types of conservation program evaluations, including moderated workshops and case-study analysis, and provide advice on the logistics and organization of the review, emphasizing the importance of the evaluation process itself to a successful outcome. One important aspect of an evaluation is having an individual with leadership ability and considerable expertise to organize the format and oversee the review process itself. Second, it is essential at the outset to ensure agreement among the program participants and the review committee on the goals and objectives of the conservation

program, what is to be evaluated, and the criteria for defining success.

Finally, the best evaluations are inclusive and involve all participants and stakeholders.

© Cambridge Scientific Abstracts (CSA)

707. Improving water use efficiency as part of integrated catchment management.

Batchelor, Charles

Agricultural Water Management

40 (2-3): 249-263. (1999)

NAL Call #: S494.5.W3A3;

ISSN: 0378-3774

Descriptors: water use efficiency: integrated catchment management
Abstract: Sustainable agricultural development requires technologies and practices that make more efficient and productive use of resources and an enabling environment that encourages the adoption of these technologies. Many institutions and international agencies are showing considerable interest in integrated catchment management (ICM) as a practical means of improving the management of water resources, reducing environmental degradation and promoting sustainable agricultural development. This paper outlines some of the main components of ICM and lists some of the prerequisites for establishing collective responsibility for, in particular, groundwater resources. This paper also discusses the extent to which programmes of ICM can be used as a means of conserving water resources and improving water use efficiency and productivity at the farm and catchment scales.

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708. In search of swampland: A wetland sourcebook and field guide.

Tiner, Ralph W.

New Brunswick, N.J.: Rutgers University Press; xviii, 264 p.: ill. (some col.), maps. (1998)

Notes: Includes bibliographical

references (p. [259]-260) and index.

NAL Call #: GB624.T56--1998;

ISBN: 0813525055 (cloth: alk. paper);

0813525063 (pbk.: alk. paper)

Descriptors: Wetlands--Northeastern States

This citation is from AGRICOLA.

709. The incidence and severity of sediment contamination in surface waters of the United States:

National sediment survey: Data summaries for areas of probable concern.

United States. Environmental Protection Agency. Office of Science and Technology.

Washington, DC: U.S. Environmental Protection Agency, Office of Science and Technology; 3 v.: ill., maps. (1997)

Notes: National sediment contaminant point source inventory; "September 1997." Includes bibliographical references.

NAL Call #: TD223.I53-1997

[http://www.epa.gov/cgi-](http://www.epa.gov/cgi-bin/claritgw?op-)

[bin/claritgw?op-](http://www.epa.gov/cgi-bin/claritgw?op-)

[Display&document=clserv:OW:1030:r](http://www.epa.gov/cgi-bin/claritgw?op-)

[ank=1&template=epa](http://www.epa.gov/cgi-bin/claritgw?op-)

Descriptors: Water---Pollution---United States/ Contaminated sediments---United States/ Sedimentation and deposition---Environmental aspects---United States

This citation is from AGRICOLA.

710. Incorporating natural variability, uncertainty, and risk into water quality evaluations using duration curves.

Bonta, J. V. and Cleland, B.

Journal of the American Water Resources Association 39 (6):

1481-1496. (2003)

NAL Call #: GB651.W315;

ISSN: 1093-474X.

Notes: Number of References: 38

Descriptors: Environment/ Ecology/ water quality/ BMP/ best management practice/ derived distribution/ TMDL/ duration curves/ Ohio watersheds/ flow duration/ reclamation/ discharge/ impact

Abstract: Quantifying natural variability, uncertainty, and risk with minimal data is one of the greatest challenges facing those engaged in water quality evaluations, such as development of total maximum daily loads (TMDL), because of regulatory, natural, and analytical constraints. Quantification of uncertainty and variability in natural systems is illustrated using duration curves (DCs), plots that illustrate the percent of time that a particular flow rate (FDC), concentration (CDC), or load rate (LDC; "TMDL") is exceeded, and are constructed using simple derived distributions. Duration curves require different construction methods and

interpretations, depending on whether there is a statistically significant correlation between concentration (C) and flow (Q), and on the sign of the C-Q regression slope (positive or negative). Flow DCs computed from annual runoff data vary compared with an FDC developed using all data. Percent exceedance for DCs can correspond to risk; however, DCs are not composed of independent quantities. Confidence intervals of data about a regression line can be used to develop confidence limits for the CDC and LDC. An alternate expression to a fixed TMDL is suggested as the risk of a load rate being exceeded and lying between confidence limits. Averages over partial ranges of DCs are also suggested as an alternative expression of TMDLs. DCs can be used to quantify watershed response in terms of changes in exceedances, concentrations, and load rates after implementation of best management practices.

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711. Incorporating water goals into forest management decisions at a local level.

Twery, M. J. and Hornbeck, J. W. *Forest Ecology and Management* 143 (1/3): 87-93. (Apr. 2001)
 NAL Call #: SD1.F73;
 ISSN: 0378-1127 [FECMDW].
 Notes: Special issue: The science of managing forests to sustain water resources / edited by R.T. Brooks and N. Lust. Paper presented at a conference held November 8-11, 1998, Sturbridge, Massachusetts. Includes references.
 Descriptors: forest management/ water quality/ water flow/ decision making/ local planning/ silvicultural systems/ wildlife/ water yield/ aesthetic value/ forest ecology/ streams/ wetlands/ riparian vegetation/ fishes/ habitats/ literature reviews
 This citation is from AGRICOLA.

712. Indicators and assessment methods for measuring the ecological integrity of semi-aquatic terrestrial environments.

Innis, S. A.; Naiman, R. J.; and Elliott, S. R.
Hydrobiologia 422/423: 111-131. (2000)

NAL Call #: 410 H992;
 ISSN: 0018-8158
 This citation is provided courtesy of CAB International/CABI Publishing.

713. Indicators of rangeland health and functionality in the Intermountain West.

O'Brien, Renee and Rocky Mountain Research Station
 Fort Collins, Colo.: U.S. Dept. of Agriculture, Rocky Mountain Research Station; Series: General technical report RMRS GTR-104. (2003)
 Notes: Title from web page viewed Oct. 1, 2003. "June 2003." Includes bibliographical references.
 NAL Call #: aSD144.A14-G46-no.-104
<http://www.fs.fed.us/rm/pubs/rmrs%5Fgtr104.pdf>

Descriptors: Rangelands---West---United States/ Range management---West---United States/ Range plants---West---United States/ Invasive plants--West---United States/ Noxious weeds---West---United States/ Ecosystem health West United States
 This citation is from AGRICOLA.

714. Industrialized animal production: A major source of nutrient and microbial pollution to aquatic ecosystems.

Mallin, M. A. and Cahoon, L. B.
Population and Environment 24 (5): 369-385. (May 2003);
 ISSN: 0199-0039.
 Notes: Number of References: 54
 Descriptors: Environmental Studies, Geography & Development/ swine/ poultry/ nutrients/ pathogens/ eutrophication/ column nitrate enrichment/ eelgrass zosteria marina/ Eastern North Carolina/ water quality/ coastal plain/ toxic pfiesteria/ lagoon effluent/ swine manure/ fish kills/ Cape Fear
 Abstract: Livestock production has undergone massive industrialization in recent decades. Nationwide, millions of swine, poultry, and cattle are raised and fed in concentrated animal feeding operations (CAFOs) owned by large, vertically integrated producer corporations. The amount of nutrients (nitrogen and phosphorus) in animal manure produced by CAFOs is enormous. For example, on the North Carolina Coastal Plain alone an estimated 124,000 metric tons of nitrogen and 29,000 metric tons of phosphorus are generated annually by livestock. CAFO wastes are largely

either spread on fields as dry litter or pumped into waste lagoons and sprayed as liquid onto fields. Large amounts of nitrogen and phosphorus enter the environment through runoff, percolation into groundwater, and volatilization of ammonia. Many CAFOs are located in nutrient-sensitive watersheds where the wastes contribute to the eutrophication of streams, rivers, and estuaries. There is as yet no comprehensive Federal policy in place to protect the environment and human health from CAFO generated pollutants.

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715. Influence of abiotic and biotic factors in measuring and modeling soil erosion on rangelands: State of knowledge.

Weltz, M. A.; Kidwell, M. R.; and Fox, H. D.
Journal of Range Management 51 (5): 482-495. (Sept. 1998)
 NAL Call #: 60.18-J82;
 ISSN: 0022-409X [JRMGAQ]
 Descriptors: rangeland soils/ erosion/ simulation models/ rain/ universal soil loss equation/ slope/ canopy/ tillage/ terrain/ topography/ soil texture/ data collection/ rainfall simulators/ interrill erosion/ rill erosion/ literature reviews/ revised universal soil loss equation/ water erosion prediction project model
 Abstract: The first standardized soil erosion prediction equation used on rangelands was the Universal Soil Loss Equation (USLE). The Revised Universal Soil Loss Equation (RUSLE) was developed to address deficiencies in the USLE by accounting for temporal changes in soil erodibility and plant factors which were not originally considered. Improvements were also made to the rainfall, length, slope, and management practice factors of the original USLE model. The Water Erosion Prediction Project (WEPP) model was developed to estimate soil erosion from single events, long-term soil loss from hillslopes, and sediment yield from small watersheds. Temporal changes in biomass, soil erodibility, and land management practices, and to a limited extent, spatial distribution of soil, vegetation, and land use are addressed in the WEPP model. To apply new process-based erosion prediction technology, basic research must be conducted to better model the interactions and feedback mechanisms of plant

communities and landscape ecology. Thresholds at which accelerated soil erosion results in unstable plant communities must be identified. Research is needed to determine the confidence limits for erosion predictions generated by simulation models so that the probability of meeting specified soil loss values (kg ha⁻¹ yr⁻¹) for given management systems can be calculated at specific significance levels. As the technology for modeling soil erosion on rangelands has improved, limitations with the techniques of parameter estimation have been encountered. Improvements in model parameterization techniques and national databases that incorporate vegetation and soil variability are required before existing erosion prediction models can be implemented.

This citation is from AGRICOLA.

716. Influence of agricultural management on soil organic carbon: A compendium and assessment of Canadian studies.

VandenBygaart, A J; Gregorich, E G; and Angers, D A

Canadian Journal of Soil Science 83 (4): 363-380. (2003)

NAL Call #: 56.8 C162;

ISSN: 0008-4271

Descriptors: organic carbon: agricultural management, soil/ Agropyron cristatum (Gramineae): forage crop/ Linum usitatissimum (Linaceae)/ Lolium perenne (Gramineae): forage crop/ Medicago sativa (Leguminosae): forage crop/ Trifolium pratense (Leguminosae): forage crop/ Triticum aestivum [wheat] (Gramineae): grain crop/ Angiosperms/ Dicots/ Monocots/ Plants/ Spermatophytes/ Vascular Plants

Abstract: To fulfill commitments under the Kyoto Protocol, Canada is required to provide verifiable estimates and uncertainties for soil organic carbon (SOC) stocks, and for changes in those stocks over time. Estimates and uncertainties for agricultural soils can be derived from long-term studies that have measured differences in SOC between different management practices. We compiled published data from long-term studies in Canada to assess the effect of agricultural management on SOC. A total of 62 studies were compiled, in which the difference in SOC was determined for conversion from native

land to cropland, and for different tillage, crop rotation and fertilizer management practices. There was a loss of 24+-6% of the SOC after native land was converted to agricultural land. No-till (NT) increased the storage of SOC in western Canada by 2.9+-1.3 Mg ha⁻¹; however, in eastern Canada conversion to NT did not increase SOC. In general, the potential to store SOC when NT was adopted decreased with increasing background levels of SOC. Using no-tillage, reducing summer fallow, including hay in rotation with wheat (*Triticum aestivum* L.), plowing green manures into the soil, and applying N and organic fertilizers were the practices that tended to show the most consistent increases in SOC storage. By relating treatment SOC levels to those in the control treatments, SOC stock change factors and their levels of uncertainty were derived for use in empirical models, such as the United Nations Intergovernmental Panel on Climate Change (IPCC) Guidelines model for C stock changes. However, we must be careful when attempting to extrapolate research plot data to farmers' fields since the history of soil and crop management has a significant influence on existing and future SOC stocks.
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717. The influence of hedge structure, management and landscape context on the value of hedgerows to birds: A review.

Hinsley, S. A. and Bellamy, P. E.

Journal of Environmental Management 60 (1): 33-49. (Sept. 2000)

NAL Call #: HC75.E5J6;

ISSN: 0301-4797 [JEVMAW].

Notes: Special issue: Hedgerows: perspectives on biodiversity and environmental management / edited by D. McCollin. Selected papers from the 'Hedgerow conservation: policy, protection and evaluation' meeting held July 21, 1999, in Northampton, United Kingdom. Includes references.

Descriptors: birds/ hedges/ habitats/ lowland areas/ farming/ landscape/ literature reviews/ UK

This citation is from AGRICOLA.

718. Influence of hydrologic loading rate on phosphorus retention and ecosystem productivity in created wetlands.

Mitsch, William J.; Cronk, Julie K.; and United States. Army. Corps of Engineers. U.S. Army Engineer Waterways Experiment Station. Wetlands Research Program (U.S.). Vicksburg, Miss.: U.S. Army Engineer Waterways Experiment Station; xii, 84 p.: ill., maps; Series: Wetlands Research Program technical report WRP-RE-6. (1995)

Notes: At head of title: Wetlands Research Program. "January 1995." Final report. Includes bibliographical references (p. 73-84).

NAL Call #: QH541.5.M3M57--1995

Descriptors: Wetland conservation/ Constructed wetlands/ Freshwater productivity/ Water---Phosphorus content/ Restoration ecology
This citation is from AGRICOLA.

719. Influence of lime, fertilizer and manure applications on soil organic matter content and soil physical conditions: A review.

Haynes, R. J. and Naidu, R.

Nutrient Cycling in Agroecosystems 51 (2): 123-137. (June 1998)

NAL Call #: S631.F422;

ISSN: 1385-1314 [NCAGFC]

Descriptors: soil organic matter/ soil physical properties/ lime/ manures/ liming/ flocculation/ sustainability/ soil ph/ calcium ions/ ion activity/ aluminum/ soil chemistry/ chemical reactions/ crop yield/ fertilizers/ application rates/ phosphate/ phosphoric acid/ ammonium/ soil water/ water holding capacity/ soil texture/ hydraulic conductivity/ bulk density/ cation exchange capacity/ literature reviews

Abstract: The effects of lime, fertilizer and manure applications on soil organic matter status and soil physical properties are of importance to agricultural sustainability. Their effects are complex and many interactions can occur. In the short-term, liming can result in dispersion of clay colloids and formation of surface crusts. As pH is increased the surface negative charge on clay colloids increases and repulsive forces between particles dominate. However, at higher lime rates, Ca²⁺ concentrations and ionic strength in soil solution increase causing compression of the electrical double layer and renewed flocculation. When present in sufficient quantities, both

lime and hydroxy-A1 polymers formed by precipitation of exchangeable A1, can act as cementing agents bonding soil particles together and improving soil structure. Liming often causes a temporary flush of soil microbial activity but the effect of this on soil aggregation is unclear. It is suggested that, in the long-term, liming will increase crop yields, organic matter returns, soil organic matter content and thus soil aggregation. There is a need to study these relationships on existing long-term liming trials. Fertilizers are applied to soils in order to maintain or improve crop yields. In the long-term, increased crop yields and organic matter returns with regular fertilizer applications result in a higher soil organic matter content and biological activity being attained than where no fertilizers are applied. As a result, long-term fertilizer applications have been reported, in a number of cases, to cause increases in water stable aggregation, porosity, infiltration capacity and hydraulic conductivity and decreases in bulk density. Fertilizer additions can also have physico-chemical effects which influence soil aggregation. Phosphatic fertilizers and phosphoric acid can favour aggregation by the formation of A1 or Ca phosphate binding agents whilst where fertilizer NH₄⁺ accumulates in the soil at high concentrations, dispersion of clay colloids can be favoured. Additions of organic manures result in increased soil organic matter content. Many reports have shown that this results in increased water holding capacity, porosity, infiltration capacity, hydraulic conductivity and water stable aggregation and decreased bulk density and surface crusting. Problems associated with large applications of manure include dispersion caused by accumulated K⁺, Na⁺ and NH₄⁺ in the soil and production of water-repellant substances by decomposer fungi. This citation is from AGRICOLA.

720. The influence of organic nitrogen mineralization on the management of agricultural systems in the UK.

Shepherd, M. A.; Stockdale, E. A.; Powlson, D. S.; and Jarvis, S. C. *Soil Use and Management* 12 (2): 76-85. (June 1996)
 NAL Call #: S590.S68;
 ISSN: 0266-0032 [SUMAEU]
 Descriptors: agricultural soils/ soil

organic matter/ nitrogen/ mineralization/ immobilization/ nutrient sources/ release/ crop management/ fertilizer requirement determination/ crop residues/ animal manures/ grassland soils/ cultivation/ nitrogen cycle/ nitrogen supply/ nitrogen management

Abstract: The understanding of nitrogen mineralization is central to providing good advice to ensure that nitrogen (N), from whatever source, is utilized by crops as efficiently as possible to minimize pollution. We have reviewed how mineralization is accounted for in current advice. It is clear that there is at least a qualitative understanding of the effects of soil and crop management on N mineralization and N supply, which has enabled the development of Codes of Good Agricultural Practice and fertilizer recommendations systems, based on sound scientific principles. However, to refine advice there is a need for a better quantitative understanding. Although soil organic matter (SOM) is a major source of N for crops, we are unable adequately to predict fertilizer requirement as affected by mineralization of SOM. Nitrogen returns from crop residues can vary considerably between fields; the provision of better field specific advice is restricted by our inability accurately to quantify this variability. The qualitative controls on the amount and timing of N release from ploughed grass are known, but better quantification of mineralization/immobilization over both the short- and long-term and better understanding of the relationship with sward age, inputs and management are essential. Much N can also be released from pasture and lost to the environment, especially where long-term leys have been grazed and there is a need to quantify the changing balance of mineralization and immobilization with the age of sward and N input. Whilst the overall principle of cultivation affecting mineralization is well known and appreciated, little is known about the mechanisms and quantification is only possible for a comparison of such extremes as ploughing and direct drilling. This citation is from AGRICOLA.

721. The Influence of Salinity on the Toxicity of Various Classes of Chemicals to Aquatic Biota.

Hall, L. W. and Anderson, R. D. *Critical Reviews in Toxicology* 25 (4): 281-346. (1995);
 ISSN: 1040-8444
 Descriptors: salinity / toxicity/ aquatic environment/ literature review/ organophosphorus pesticides/ heavy metals/ biota/ salinity effects/ lethal effects/ exposure tolerance/ pollution effects / pesticides/ bioaccumulation/ food chains/ reviews/ aquatic organisms/ Effects of pollution / Toxicology and health/ Effects on organisms/ Environmental effects
Abstract: The objective of this study was to review all available aquatic toxicity literature regarding the effects of salinity on the toxicity of various classes of inorganic and organic chemicals. Toxicity data for studies in which toxicity was assessed at various salinities were organized by chemical classes and trophic groups. Seventy percent of the studies were conducted with either crustaceans or fish. The other 30% were with mollusks, annelids, zooplankton, bacteria, phytoplankton, or fungi. Results from 173 data entries showed that negative correlations (toxicity increasing with decreasing salinity) were reported most frequently (55%), followed by no correlations (27%) and positive correlations (18%). The toxicity of most metals such as cadmium, chromium, copper, mercury, nickel, and zinc was reported to increase with decreasing salinity. This finding is likely related to the greater bioavailability of the free metal ion (toxic form) at lower salinity conditions. There was generally no consistent trend for the toxicity of most organic chemicals with salinity. The one exception to this was reported with organophosphate insecticides, the toxicity of which appeared to increase with increasing salinity. Physiological characteristics of the various test species were important in determining the toxicity of the various classes of chemicals at a range of salinities. Results from various studies showed that euryhaline species were more resistant to toxic conditions at isosmotic salinities due to minimization of osmotic stress. Specific examples showed that fish were more resistant to toxic chemicals at middle salinities when compared with either lower or higher extremes. Life history and ecology of test

species were important factors to consider when interpreting salinity/contaminant interaction data.
© Cambridge Scientific Abstracts (CSA)

722. The influence of soil biodiversity on hydrological pathways and the transfer of materials between terrestrial and aquatic ecosystems.

Bardgett, R. D.; Anderson, J. M.; Behan-Pelletier, V.; Brussaard, L.; Coleman, D. C.; Ettema, C.; Moldenke, A.; Schimel, J. P.; and Wall, D. H.

Ecosystems 4 (5): 421-429. (2001)
NAL Call #: QH540.E3645;
ISSN: 1432-9840

This citation is provided courtesy of CAB International/CABI Publishing.

723. The influence of some forest operations on the sustainable management of forest soils: A review.

Worrell, R and Hampson, A
Forestry 70 (1): 61-85. (1997);
ISSN: 0015-752X

Descriptors: erosion rates/ forestry/ forestry method/ nutrient removal/ soil science/ sustainable management/ tree harvesting methods

Abstract: This review paper describes the nature and scale of changes to forest soils brought about by forestry operations. A relatively non-technical approach is adopted with the aim of stimulating debate within as wide an audience as possible. The paper does not aim to be exhaustive but rather a position statement. Areas where further study is required are highlighted. The concept of sustainability is explored in relation to forest soils, and the condition highlighted is that impacts of forest management operations should not, in the long term, exceed the capacity of soil to recover by natural processes (e.g. erosion losses should not exceed soil formation rates, nutrient removals should not exceed nutrient inputs etc.). Soil erosion, nutrient removal, compaction, and changes in organic matter content and soil water status are identified as the most important processes involved in the impacts of management. The impacts of some of the more intensive forest management regimes on soil compaction, nutrient removal and erosion rates appear to be of similar magnitude to the recovery capacity of soils. Where the most intensive forms

of forest operation are used on susceptible sites some degree of long-term soil degradation appears to be likely, and it can be regarded as valid to describe such management practices as unsustainable. However, the scale of occurrence of such management is probably relatively modest, and decreasing. On less susceptible sites, and where less intensive forms of management are employed, impacts on soils are low enough for management to be regarded as sustainable, and are often less than under pre-existing land uses. Compaction caused by heavy harvesting and extraction machinery, nutrient depletion resulting from whole tree harvesting on infertile sites where rotations are short, and erosion following cultivation and harvesting on erodible soils are the greatest causes of concern. Compliance with recent Forestry Commission guidelines should lead to lower impacts than those recorded during recent decades. However, rotation-length audits of the impacts of different forest management regimes on a range of site types are needed before definitive statements about the sustainability of management operations can be made.

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724. Influence of tillage systems on weed population dynamics and management in corn and soybean in the central USA.

Buhler, Douglas D
Crop Science 35 (5): 1247-1258. (1995);
ISSN: 0011-183X

Descriptors: plant (Plantae Unspecified)/ Glycine max (Leguminosae)/ Plantae (Plantae Unspecified)/ Zea mays (Gramineae)/ angiosperms/ dicots/ monocots/ plants/ spermatophytes/ vascular plants/ population density/ species composition/ weed control

Abstract: Species composition and population densities of weed communities of arable land reflect agronomic practices. The trend toward reducing tillage in corn (*Zea mays* L.) and soybean (*Glycine max* (L.) Merr.) production changes the environment where weeds are managed, survive, and reproduce. The shift from tillage systems that include extensive annual soil disturbance to systems that minimize soil disturbance will cause major changes in weed population

dynamics. These changes often reduce the effectiveness of weed control practices. Reduced herbicide efficacy has slowed adoption of conservation tillage because many conservation tillage systems rely heavily on herbicides for weed management. Poor understanding of weed population dynamics and lack of suitable control alternatives often result in increased herbicide use in conservation tillage systems. While results have varied among experiments, some general trends in weed population dynamics have arisen as tillage is reduced. These include increased populations of perennial, summer annual grass, biennial, and winter annual species. Densities of large-seeded dicot species often decrease. The ecological and management aspects of these changes are varied and complex. Effective, economical, and environmentally sound weed management in conservation tillage systems will require integration of new information with established principles of weed management. New management systems and control technologies are needed to develop integrated weed management systems for the altered ecosystems created by conservation tillage production systems.

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725. Inland flood hazards: Human, riparian and aquatic communities.

Wohl, Ellen E.
Cambridge, U.K.; New York: Cambridge University Press; xiv, 498 p., 4 p. of plates: ill. (some col.), maps (some col.). (2000)

NAL Call #: GB1399-.I54-2000;
ISBN: 0521624193 (hb)

Descriptors: Floods/ Flood control
This citation is from AGRICOLA.

726. Innovative management of agricultural phosphorus to protect soil and water resources.

Sharpley, A. N.; Kleinman, P.; and McDowell, R.
Communications in Soil Science and Plant Analysis 32 (7/8): 1071-1100. (2001)

NAL Call #: S590.C63;
ISSN: 0010-3624 [CSOSA2].
Notes: Special issue: Potential use of innovative nutrient management alternatives to increase nutrient use efficiency, reduce losses, and protect soil and water quality/edited by J. Delgado. Proceedings of the Annual

Conference of the Soil and Water Conservation Society held Aug. 8-11, 1999, Biloxi, Mississippi. Includes references.

Descriptors: phosphorus/ phosphorus fertilizers/ nitrogen/ nitrogen fertilizers/ animal manures/ losses from soil/ pollution control/ leaching/ runoff/ transport processes/ crop management/ application rates/ application methods/ soil fertility/ literature reviews/ best management practices

Abstract: Agriculture, particularly livestock agriculture, is receiving increasing public scrutiny due to non-point source phosphorus (P) pollution and eutrophication. Much of today's situation may be attributed to system level trends in specialization and intensification that result in excess P entering livestock farms. Balancing P at the farm gate represents a necessary step for long-term soil and water quality protection. Remedial P management combines source and transport control that confront critical areas of P export in surface and subsurface runoff from agricultural landscapes. Source management seeks to immobilize P in the environment through such strategies as reducing soluble P in manure, targeting P application to soils with high retention capacities, and managing soil P. Transport controls employ an understanding of loss or transfer mechanisms to avoid P application on areas with a high transport potential. Also, the potential for P transport can be reduced by implementation of conservation practices such as reduced tillage, terracing, and stream buffers. However, implementation of agricultural management strategies that minimize P export must consider the cost effectiveness of alternative measures, as low practice adoption may limit or impede water quality benefits.

This citation is from AGRICOLA.

727. Insect pheromone olfaction: New targets for the design of species-selective pest control agents.

Plettner, Erika

Current Medicinal Chemistry 9 (10): 1075-1085. (2002);
ISSN: 0929-8673

Descriptors: pheromone olfaction inhibitors: insecticide/ pheromones: analogs, degradation, recognition, transport/ species selective pest

control agents: pesticide/ insect (Insecta): pest/ Animals/ Arthropods/ Insects/ Invertebrates/ insect chemical communication / mating disruption/ pheromone olfaction/ structure activity relationships

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728. Insect population responses to environmental stress and pollutants.

Pimentel, David

Environmental Reviews 2 (1): 1-15. (1994)

NAL Call #: GE140.E59

Descriptors: Insecta (Insecta Unspecified)/ animals/ arthropods/ insects/ invertebrates/ air pollution/ biosphere/ chemicals/ ecosystem/ fertilizers/ pesticides/ soil pollution/ water pollution

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729. Insect resistance to *Bacillus thuringiensis*: Uniform or diverse?

Tabashnik, Bruce E; Liu, Yong Biao;

Malvar, Thomas; Heckel, David G;

Masson, Luke; and Ferre, Juan

Philosophical Transactions of the Royal Society of London B: Biological Sciences 353 (1376): 1751-1756. (1998)

NAL Call #: 501 L84Pb;

ISSN: 0962-8436

Descriptors: Cry1A toxin/ *Bacillus thuringiensis* (Endospore forming Gram Positives): biocontrol agent, entomopathogen/ *Plutella xylostella* [diamondback moth] (Lepidoptera): agricultural pest/ Animals/ Arthropods/ Bacteria/ Eubacteria/ Insects/ Invertebrates/ Microorganisms/ allelism/ evolution/ genetic variation/ insecticide resistance

Abstract: Resistance to the insecticidal proteins produced by the soil bacterium *Bacillus thuringiensis* (Bt) has been documented in more than a dozen species of insect. Nearly all of these cases have been produced primarily by selection in the laboratory, but one pest, the diamondback moth (*Plutella xylostella*), has evolved resistance in open-field populations. Insect resistance to Bt has immediate and widespread significance because of increasing reliance on Bt toxins in genetically engineered crops and conventional sprays. Furthermore, intense interest in Bt provides an opportunity to examine the extent to which evolutionary pathways to resistance vary among and within

species of insect. One mode of resistance to Bt is characterized by more than 500-fold resistance to at least one CryIA toxin, recessive inheritance, little or no cross-resistance to CryIC, and reduced binding of at least one CryIA toxin. Analysis of resistance to Bt in the diamondback moth and two other species of moths suggests that although this particular mode of resistance may be the most common, it is not the only means by which insects can attain resistance to Bt.
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730. Insect-resistant transgenic plants in a multi-trophic context.

Groot, A. T. and Dicke, M.

Plant Journal 31 (4): 387-406. (Aug. 2002)

NAL Call #: QK710.P68;

ISSN: 0960-7412

Descriptors: transgenic plants/ trophic levels/ pest resistance/ genetic engineering/ genetic resistance/ insecticidal properties/ natural enemies/ arthropods/ plant breeding/ sustainability/ pest management/ nontarget effects/ nontarget organisms/ pollinators/ parasitoids/ predators/ risk assessment/ toxicity/ toxins/ food chains/ ecology/ literature reviews

Abstract: So far, genetic engineering of plants in the context of insect pest control has involved insertion of genes that code for toxins, and may be characterized as the incorporation of biopesticides into classical plant breeding. In the context of pesticide usage in pest control, natural enemies of herbivores have received increasing attention, because carnivorous arthropods are an important component of insect pest control. However, in plant breeding programmes, natural enemies of herbivores have largely been ignored, although there are many examples that show that plant breeding affects the effectiveness of biological control. Negative influences of modified plant characteristics on carnivorous arthropods may induce population growth of new, even more harmful pest species that had no pest status prior to the pesticide treatment. Sustainable pest management will only be possible when negative effects on non-target, beneficial arthropods are minimized. In this review, we summarize the effects of insect-resistant crops and insect-resistant transgenic crops, especially

Bt crops, from a food web perspective. As food web components, we distinguish target herbivores, non-target herbivores, pollinators, parasitoids and predators. Below-ground organisms such as Collembola, nematodes and earthworms should also be included in risk assessment studies, but have received little attention. The toxins produced in Bt plants retain their toxicity when bound to the soil, so accumulation of these toxins is likely to occur. Earthworms ingest the bound toxins but are not affected by them. However, earthworms may function as intermediaries through which the toxins are passed on to other trophic levels. In studies where effects of insect-resistant (Bt) plants on natural enemies were considered, positive, negative and no effects have been found. So far, most studies have concentrated on natural enemies of target herbivores. However, Bt toxins are structurally rearranged when they bind to midgut receptors, so that they are likely to lose their toxicity inside target herbivores. What happens to the toxins in non-target herbivores, and whether these herbivores may act as intermediaries through which the toxins may be passed on to the natural enemies, remains to be studied.
This citation is from AGRICOLA.

731. Insect science in the twenty-first century: Molting or metamorphosis?

Oberlander, Herbert
American Entomologist 42 (3): 140-147. (1996)
NAL Call #: QL461.A52;
ISSN: 1046-2821
Descriptors: Plantae (Plantae Unspecified)/ plants/ Economic Entomology/ Entomologist/ Field Method/ Howard A. Schneiderman/ Insect Science/ Insecticide Resistance Management/ Integrated Pest Management/ Pest Management/ Transgenic Crop Plants/ 21st Century
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732. Insects in biodiversity conservation: Some perspectives and directives.

Samways, M. J.
Biodiversity and Conservation 2 (3): 258-282. (June 1993)
NAL Call #: QH75.A1B562;
ISSN: 0960-3115 [BONSEU].
Notes: Special Issue: Global

Biodiversity and Conservation of Insects. Includes references.
Descriptors: insects/ conservation/ species diversity/ landscape conservation/ biotopes/ literature reviews
This citation is from AGRICOLA.

733. Integrated animal waste management.

Council for Agricultural Science and Technology.
Ames, IA: Council for Agricultural Science and Technology; vii, 87 p.: col. ill., col. maps; Series: Task force report (Council for Agricultural Science and Technology) no. 128. (1996)
Notes: Includes bibliographical references (p. 75-83) and index.
NAL Call #: TD930.2.I54--1996;
ISBN: 1887383085
Descriptors: Animal waste---Management/ Dead animals, Removal and disposal of/ Integrated solid waste management
This citation is from AGRICOLA.

734. Integrated assessment of IPM impacts: An overview.

Antle, J. M.
In: Proceedings of the Third National Integrated Pest Management Symposium and Workshop. (Held February 27-March 1, 1996 at Washington, D.C.)
Washington, D.C.: U.S. Dept. of Agriculture, Economic Research Service; pp. 33-39; 1997.
Notes: Miscellaneous publication (United States. Dept. of Agriculture) no. 1542
NAL Call #: 1-Ag84M-no.1542
Descriptors: integrated pest management/ agricultural research/ economic impact/ environmental impact/ social impact/ public health/ assessment
This citation is from AGRICOLA.

735. Integrated management of greenhouse vegetable crops.

Papadopoulos, A. P.; Pararajasingham, S.; Shipp, J. L.; Jarvis, W. R.; and Jewett, T. J.
Horticultural Reviews 21: 1-39. (1997)
NAL Call #: SB317.5.H6;
ISSN: 0163-7851 [HORED5]
Descriptors: lycopersicon esculentum/ cucumis sativus/ capsicum annuum/ greenhouse crops/ greenhouse culture / crop management/ integrated pest management/ disease control/ relative humidity/ carbon dioxide/

environmental temperature/ light intensity/ growing media/ literature reviews
This citation is from AGRICOLA.

736. Integrated management of sensitive catchment systems.

Burt, T P
Catena 42 (2-4): 275-290. (2001)
NAL Call #: GB400.C3;
ISSN: 0341-8162
Descriptors: nitrate: leaching, pollutant/ nutrients/ pesticides/ catchment systems/ hydrological pathways/ integrated management/ land use/ pollutant transport/ soil erosion/ water quality/ water supply
Abstract: Until recently, 'land use' was regarded as a single function: in rural areas of the UK this simply meant 'farming' or, in the uplands, 'forestry'. However, there is now growing recognition of the multiple use of land, and farming or forestry must compete with other functions, in particular water supply. Links between hydrological pathways and stream water quality are described as a context for understanding the transport of pollutants to the river system. The concept of landscape sensitivity is then described and applied to the topics of soil erosion and nitrate leaching. Based on these analyses, guidelines for integrated management of sensitive catchment systems are proposed.
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737. Integrated pest management.

National Foundation for Integrated Pest Management Education (U.S.) and International Food Information Council (U.S.)
Austin, Tex.; Washington, D.C. National Foundation for Integrated Pest Management Education; International Food Information Council; 1 portfolio: ill. (1994)
Notes: Cover title.
NAL Call #: SB950.2.A1-I57-1994
Descriptors: Pests---Integrated control---United States
This citation is from AGRICOLA.

738. Integrated pest management.

Dent, D.
New York: Chapman and Hall; 356 p. (1995)
Descriptors: integrated control/ pest control/ Insecta
Abstract: This book provides a practical guide to the principles and practice of developing an integrated pest management (IPM) programme.

Integrated Pest Management answers the question "how do you devise, develop and implement a practical IPM system which will fully meet the real needs of farmers?". The term "pest" in this book is used in its broadest sense and includes insects, pathogens, weeds, nematodes, etc. The book commences by outlining the basic principles which underlie pest control (crop husbandry, socio-economics, population ecology and population genetics) and reviews the control measures available and their use in IPM systems. Subsequent chapters cover the techniques and approaches used in defining a pest problem, programme planning and management, systems analysis, experimental paradigms and implementation of IPM systems. The final section of the book contains four chapters giving examples of IPM in different cropping systems, contributed by invited specialists and outlining four different perspectives. Integrated Pest Management will be of use to agricultural and plant scientists, entomologists, acarologists and nematologists and all those studying crop protection, particularly at MSc level and above. It will be particularly useful for, and should find a place on the shelves of all personnel within the agrochemical industry, universities and research establishments working in this subject area and as a reference in libraries for students and professionals alike.
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739. Integrated pest management for cotton in the western region of the United States.

Western Regional IPM Project (U.S.) and University of California Integrated Pest Management Program. Oakland, Calif.: University of Calif., Division of Agriculture and Natural Resources; 164 p.: ill. (chiefly col.); Series: Publication (University of California, Division of Agricultural and Natural Resources) 3305. (1996) Notes: 2nd ed.; Alternative title: IPM for cotton; "Western Regional Integrated Pest Management Project" ... [et al.]--Cover. "Prepared by IPM Education and Publications, an office of the University of California Statewide IPM Project at Davis"--P. 5. Includes bibliographical references (p. 159-160).

NAL Call #: SB608.C8I585--1996;
ISBN: 1879906309
Descriptors: Cotton---Diseases and pests---West---United States/ Cotton--Diseases and pests---Integrated control---West---United States
This citation is from AGRICOLA.

740. Integrated pest management: Historical perspectives and contemporary developments.

Kogan, M.
Annual Review of Entomology 43: 243-270. (1998)
NAL Call #: 421-An72;
ISSN: 0066-4170 [ARENAA]
Descriptors: integrated pest management/ integrated control/ control programs/ history/ reviews/ United States
This citation is from AGRICOLA.

741. Integrated pest management in European apple orchards.

Blommers, L. H. M.
Annual Review of Entomology 39: 213-241. (1994)
NAL Call #: 421-An72;
ISSN: 0066-4170 [ARENAA]
Descriptors: integrated pest management/ apples/ orchards/ malus pumila/ insect pests/ dysaphis plantaginea/ insect control/ mite control/ biological control/ chemical control/ natural enemies/ biological control agents/ typhlodromus pyri/ pesticide resistance/ predators of insect pests/ literature reviews/ Europe
This citation is from AGRICOLA.

742. Integrated pest management in forage alfalfa.

Summers, C. G.
Integrated Pest Management Reviews 3 (3): 127-154. (Sept. 1998)
NAL Call #: SB950.9.I572;
ISSN: 1353-5226 [IPMRF5]
Descriptors: medicago sativa/ pest control/ integrated pest management/ literature reviews
This citation is from AGRICOLA.

743. Integrated pest management in practice: Pathways towards successful application.

Way, M. J. and Van Emden, H. F.
Crop Protection 19 (2): 81-103. (Mar. 2000)
NAL Call #: SB599.C8;
ISSN: 0261-2194 [CRPTD6]
Descriptors: integrated pest management/ research/ genetic

engineering/ semiochemicals/ literature reviews/ bioinsecticides
This citation is from AGRICOLA.

744. Integrated pest management in rice.

Teng, P. S.
Experimental Agriculture 30 (2): 115-137. (Apr. 1994)
NAL Call #: 10-Ex72;
ISSN: 0014-4797 [EXAGAL]
Descriptors: oryza sativa/ integrated pest management/ high yielding varieties/ pest resistance/ pesticides/ biological control/ integrated control/ profitability/ control programs/ literature reviews
This citation is from AGRICOLA.

745. Integrated pest management in tree fruit crops.

Brunner, J. F.
Food Reviews International 10 (2): 135-157. (1994)
NAL Call #: TX341.F662;
ISSN: 8755-9129 [FRINEL].
Notes: Special issue on Integrated pest management. Includes references.
Descriptors: fruit trees/ integrated pest management/ history/ pesticide resistance/ literature reviews
This citation is from AGRICOLA.

746. Integrated pest management in vegetables.

Zehnder, G.
Food Reviews International 10 (2): 119-134. (1994)
NAL Call #: TX341.F662;
ISSN: 8755-9129 [FRINEL].
Notes: Special issue on Integrated pest management. Includes references.
Descriptors: vegetables/ integrated pest management/ food acceptability/ food safety/ literature reviews
This citation is from AGRICOLA.

747. Integrated pest management (IPM) in fruit orchards.

Edland, T.
In: Biological control: Benefits and risks/ Hokkanen, H. M. and Lynch, J. M.; Vol. 4; Series: Plant and microbial biotechnology research series No. 4, 1995; pp. 44-50.
ISBN: 052154405X
NAL Call #: TP248.27.P55P54
Descriptors: orchards / fruit trees/ insect pests/ integrated pest management/ integrated control/ insecticides/ acaricides/ biological control agents / biological control/ introduced species/ natural enemies/

predatory mites/ parasites of insect pests/ predators of insect pests/ literature reviews
This citation is from AGRICOLA.

748. Integrated Pest Management Reviews.

Integrated Pest Management Reviews (1995)

NAL Call #: SB950.9.I572;
ISSN: 1353-5226 [IPMRF5].

Notes: Title from cover.

London; New York, NY: Chapman & Hall, c1995- v.: ill.

Descriptors: Pests Integrated control Periodicals/ Pests Integrated control Research Periodicals

This citation is from AGRICOLA.

749. Integrated weed management and weed species diversity.

Clements, D. R.; Weise, S. F.; and Swanton, C. J.

Phytoprotection 75 (1): 1-18. (1994);
ISSN: 0031-9511

This citation is provided courtesy of CAB International/CABI Publishing.

750. Integrated weed management: Quo vadis.

Zoschke, A. and Quadranti, M.

Weed Biology and Management 2 (1): 1-10. (2002)

NAL Call #: SB610-.W447;
ISSN: 1444-6162

Descriptors: weeds/ integrated pest management/ pest control/ crop management/ plant nutrition/ hygiene/ seed germination/ population dynamics/ weed biology/ literature reviews/ innovation adoption
This citation is from AGRICOLA.

751. Integrating agricultural nutrient management with environmental objectives: Current state and future prospects.

Powlson, D. S. and Fertiliser Society. York: Fertiliser Society; 44 p.: ill.; Series: Proceedings (Fertiliser Society of London) no. 402. (1997)

Notes: "Paper presented to the Fertiliser Society in Cambridge, on the 11th December 1997." Includes bibliographical references (p. 33-42).

NAL Call #: 57.9-F41-no.402;
ISBN: 0853100365

Descriptors: Fertilizer industry---Great Britain---Management/ Soil fertility---Great Britain---Management
This citation is from AGRICOLA.

752. Integrating hydrogeomorphic and index of biotic integrity approaches for environmental assessment of wetlands.

Stevenson, R Jan and Hauer, F Richard

Journal of the North American Benthological Society 21 (3): 502-513. (2002)

NAL Call #: QL141.F7;
ISSN: 0887-3593

Descriptors: environmental assessments/ hydrogeomorphic indexes / index of biotic integrity/ water quality/ wetlands
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753. Integrating management objectives and grazing strategies on semi-arid rangeland.

Reece, Patrick E.

Hasting, Neb.: University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, Agricultural Research Division, Cooperative Extension; 19 p.: col. ill., col. map; Series: E.C. (University of Nebraska--Lincoln. Cooperative Extension) 00-158. (2001)

Notes: Cover title. Includes bibliographical references (p. 19).

NAL Call #: 275.29-N272Ex-no.-2001-158

This citation is from AGRICOLA.

754. Integration in orchard pest and habitat management: A review.

Prokopy, R. J.

Agriculture, Ecosystems and Environment 50 (1): 1-10. (1994)

NAL Call #: S601 .A34;
ISSN: 0167-8809.

Notes: Conference: 19. International Congress of Entomology, Beijing (People's Rep. China), 28 Jun-4 Jul 1992

Descriptors: orchards / biological control/ integrated control/ reviews/ pest control/ Agricultural & general applied entomology/ Control
Abstract: Manipulating the composition of groundcover within orchards and vegetation adjacent to orchards might enhance biological control of orchard arthropod pests. It can also generate effects that may be counter-productive to the overall goals of integrated orchard pest management. Measuring progress toward achieving integration of orchard pest management practices can be viewed as analogous to climbing a step ladder. The first step (equivalent to first-level integrated pest management (IPM) entails the

use of ecologically sound multiple management tactics for a single class of pests (either arthropods, diseases, weeds or vertebrates). The second step (second-level IPM) involves integration of multiple management practices across all classes of pests. The third step (third-level IPM) calls for integration of combined pest management approaches with the entire system of crop production. The fourth and top step of the ladder (fourth-level IPM) envisions blending the concerns of all those having a vital interest in pest management: researchers, extension personnel, private consultants, industry, growers, processors and distributors, consumers, neighbors of growers, environmentalists and government regulatory agencies. The probability is high that manipulating orchard groundcover and surrounding vegetation will affect the outcome of strategies and tactics at each of these four levels of integration of pest management practices. Here, examples are given of potential merits and possible shortcomings of orchard habitat manipulation at each level of integration.

© Cambridge Scientific Abstracts (CSA)

755. Integration of herbicides with arthropod biocontrol agents for weed control.

Ainsworth, Nigel

Biocontrol Science and Technology 13 (6): 547-570. (2003);

ISSN: 0958-3157

Descriptors: herbicide: herbicide/ arthropod (Arthropoda): biological control agent/ plant (Plantae): pest/ Animals/ Arthropods/ Invertebrates/ Plants/ oviposition choice/ parasitism/ predation

Abstract: Classical biological control of weeds using arthropods is being attempted on a large scale in a number of countries, sometimes with spectacularly successful outcomes. However, in many cases biocontrol is not completely effective and use of herbicides on weeds continues to occur, either in the presence of biocontrol agents or as an alternative to them. The ways in which the two techniques may interact are discussed, including direct toxicity of herbicides to biocontrol agents, responses to death of host plants and responses to sublethal changes caused by herbicides with different modes of action. A literature review

for selected weed taxa showed that the great majority of publications relate to either chemical or to biological control techniques separately, with integration of the two seldom addressed. Possible reasons for this situation are discussed and some suggestions for future priorities are made.

© Thomson

756. Intensive animal production and environmental aspects with special reference to phosphorus.

Jongbloed, A. W. and Valk, H. In: Production diseases in farm animals: 10th international conference. (Held 24 Aug 1998-28 Aug 1998 at Utrecht, The Netherlands.) Wensing, T (eds.) Wageningen, The Netherlands: Wageningen Pers; pp. 282-295; 1999.

Notes: A review.

This citation is provided courtesy of CAB International/CABI Publishing.

757. Interactions between forests and herbivores: The role of controlled grazing experiments.

Hester, A. J.; Edenius, L.; Buttenschon, R. M.; and Kuiters, A. T. *Forestry* 73 (4): 381-391. (2000)

NAL Call #: 99.8-F767;

ISSN: 0015-752X [FRSTAH]

Descriptors: forests/ herbivores/ grazing/ grazing trials/ forest management/ browsing/ wild animals/ botanical composition/ grazing intensity/ recruitment/ forest trees/ species differences/ biomass production/ vegetation/ literature reviews

This citation is from AGRICOLA.

758. Interactions between weeds, arthropod pests, and their natural enemies in managed ecosystems.

Norris, R. F. and Kogan, M. *Weed Science* 48 (1): 94-158. (2000)

NAL Call #: 79.8-W41;

ISSN: 0043-1745

This citation is provided courtesy of CAB International/CABI Publishing.

759. Interactions of pesticides and metal ions with soils: Unifying concepts.

Gamble, D. S.; Langford, C. H.; and Barrie Webster, G. R.

Reviews of Environmental Contamination and Toxicology 135: 63-91. (1994)

NAL Call #: TX501.R48;

ISSN: 0179-5953 [RCTOE4]

Descriptors: soil/ pesticides/ metal ions/ interactions/ literature reviews
This citation is from AGRICOLA.

760. Interagency rangeland water erosion project report and state data summaries: NRST's rainfall simulation sites.

Franks, Carol D. and United States. Natural Resources Conservation Service.

Lincoln, NE: U.S. Dept. of Agriculture, Agricultural Research Service, Natural Resources Conservation Service; iii, 121 p.: col. maps; Series: NWRC 98-1. (1998)

Notes: Original title: Interagency rangeland water erosion project report and state data summaries: Interagency Rangeland Water Erosion Team (IRWET) and National Range Study Team (NRST): NRST's rainfall simulation sites; "August 1998"--Cover. Includes bibliographical references (p. 117-121).

NAL Call #: aGB701-.I57-1998

Descriptors: Hydrology, Rangeland---United States---States/ Rain and rainfall---United States---States/ Range ecology---United States---States/ Erosion---United States---States

This citation is from AGRICOLA.

761. Intercropping and Pest Management: A Review of Major Concepts.

Smith, H. A. and McSorley, R. *American Entomologist* 46 (3): 154-161. (2000)

NAL Call #: QL461.A52;

ISSN: 1046-2821

Descriptors: Crop production (intercropping)/ Agricultural practices/ Pest control/ Arthropoda/ Agricultural & general applied entomology
Abstract: The misconception persists that crop diversity in itself reduces pest damage. The key to managing pests through polyculture may lie in the specifics of arthropod behavior and arthropod-plant relations.

© Cambridge Scientific Abstracts (CSA)

762. Intercropping in field vegetable crops: Pest management by agrosystem diversification: An overview.

Theunissen, J. *Pesticide Science* 42 (1): 65-68. (Sept. 1994)

NAL Call #: SB951.P47;

ISSN: 0031-613X [PSSCBG].

Notes: Paper presented at the

symposium, "Farming for the Environment", March 15, 1994, London, England.

Includes references.

Descriptors: intercropping/ vegetables/ pest management/ low input agriculture/ sustainability

Abstract: Intercropping field vegetables with other species such as clovers shows insect pest suppression which may make chemical control unnecessary. Examples are given to illustrate these effects and the underlying mechanisms are discussed. Intercropping fits into environmentally acceptable and sustainable vegetable-producing practices. Both economic and ecological conditions must be fulfilled before intercropping-based commercial production methods can be developed.
This citation is from AGRICOLA.

763. Interior wetlands of the United States: A review of wetland status, general ecology, biodiversity, and management.

Giudice, John H.; Ratti, John T.; United States. Army. Corps of Engineers; U.S. Army Engineer Waterways Experiment Station; and Wetlands Research Program (U.S.). Vicksburg, Miss.: U.S. Army Engineer Waterways Experiment Station; 156 p. in various pagings: ill.; Series: Wetlands Research Program technical report WRP-SM-9. (1995)
Notes: "November 1995." Includes bibliographical references (p. 100-132).

NAL Call #: QH76.G58-1995

Descriptors: Biological diversity conservation---United States/ Ecosystem management---United States/ Wetlands---United States
This citation is from AGRICOLA.

764. Interpretation and analysis of complex environmental data using chemometric methods.

Wenning, Richard J and Erickson, Gerald A. *Trends in Analytical Chemistry* 13 (10): 446-457. (1994)

NAL Call #: QD71.T7;

ISSN: 0165-9936

Descriptors: human (Hominidae)/ Plantae (Plantae Unspecified)/ animals/ chordates/ humans/ mammals/ plants/ primates/ vertebrates/ air pollution/ analytical method/ anthropogenic contaminant distribution/ biological tissue/ contaminated sediment/ forest

productivity/ industrial waste management/ petroleum pollution/ plant productivity/ rainwater/ water quality
© Thomson

765. Interpreting indicators of rangeland health: Version 3.

Pellant, Michael L.; National Science and Technology Center (U.S.), Information and Communications Staff; United States. Bureau of Land Management; United States. Natural Resources Conservation Service; and United States. Agricultural Research Service. Forest and Rangeland Ecosystem Science Center (U.S.). Denver, Colo.: United States Department of the Interior, Bureau of Land Management, National Science and Technology Center, Information and Communications Group, 2000. iv, 118 p.: ill. (some col.), forms. (2000)
Notes: "Nov. 2000"--Report documentation p. "BLM/WO/ST-00/001+1734"--P. [2] of cover. Produced by interagency coordination among "the Bureau of Land Management (BLM), the Natural Resources Conservation Service (NRCS), the Agricultural Research Service (ARS), and the USGS Forest and Rangeland Ecosystem Science Center"--P. i. Also issued as a chapter in: *Defining and assessing soil quality / health on rangelands*. Includes bibliographical references (p. 43-48). SUDOCs: I 53.35:1734-06.
NAL Call #: SF85.3-.I583-2000
<ftp://ftp-fc.sc.egov.usda.gov/GLTI/technical/publications/range-health-indicate.pdf>
Descriptors: Range management---United States/ Rangelands---United States/ Range ecology---United States / Environmental monitoring---United States / Ecological integrity---United States/ Soil stabilization---United States
This citation is from AGRICOLA.

766. Intraguild predation among biological-control agents: Theory and evidence.

Rosenheim, Jay A; Kaya, Harry K; Ehler, Lester E; Marois, James J; and Jaffee, Bruce A
Biological Control 5 (3): 303-335. (1995);
ISSN: 1049-9644
Descriptors: Parasitism/ Pest species/ Plant pathogen/ Population dynamics/ Simulation model/ Trophic interactions/ Weed control/ arthropods (Arthropoda Unspecified)/ nematode

(Nematoda)/ Arthropoda (Arthropoda Unspecified)/ Plantae (Plantae Unspecified)/ animals/ aschelminths/ helminths/ invertebrates/ plants
Abstract: Theoretical and empirical evidence developed in four subdisciplines of biological control (biocontrol of plant pathogens, weeds, nematodes, and arthropods) is brought to bear upon a shared question: the significance of intraguild predation. Intraguild predation ("IGP") occurs when two species that share a host or prey (and therefore may compete) also engage in a trophic interaction with each other (parasitism or predation). We describe the prevalence of IGP and its role in the population dynamics of biological-control agents and target pests. IGP is a widespread interaction within many, but not all, communities of biological-control agents. IGP appears to be pervasive among communities of control agents associated with nematode or arthropod pests. Common forms of IGP include pathogens that infect both herbivores and parasitoids of the herbivore; facultative hyperparasitoids, which can parasitize either an herbivore or a primary parasitoid of the herbivore; predators that attack herbivores that harbor a developing parasitoid; and predators that attack each other. In contrast, IGP appears to be relatively uncommon among biological-control agents of plant pathogens because trophic interactions are less important than competition or antibiosis. Likewise, biological-control agents of weeds interact primarily through competition alone because host ranges are mostly restricted to plant taxa. Empirically based simulation models and general analytical models of interactions involving arthropod pathogens or facultative hyperparasitoids yield variable and often conflicting predictions for the influence of IGP on the success of biological control. Models for predator-predator interactions, however, consistently predict that IGP disrupts biological control. All the field-documented cases of IGP leading to disruption of biological control stem from studies of predators, including mites, insects, and predatory fishes. IGP between two predators or between a predator and an adult parasitoid does not require mortality of the shared prey/host (i.e., the target pest); thus, IGP can be intense, resulting in high levels of mortality for one or both of

the natural enemies, while the total mortality imposed on the target pest population is minimal. For this reason, we hypothesize that IGP by predators is particularly likely to influence the efficacy of biological control. Our ability to develop successful programs of biological control will be enhanced by field studies that address the complexity of trophic interactions occurring in agroecosystems. There is a critical need for additional manipulative experiments conducted in the field that test not only population ecology theory for two-species interactions, but also community ecology theory for multispecies interactions.
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767. An introduction and user's guide to wetland restoration, creation, and enhancement.

Interagency Workgroup on Wetland Restoration.
U.S. Environmental Protection Agency, 2003 (application/pdf)
<http://www.epa.gov/owow/wetlands/restdocfinal.pdf>
Descriptors: wetlands / constructed wetlands/ ecological restoration/ monitoring/ wildlife habitats

768. Introduction: Ecosystem research in a human context.

Finch, D. M. and Tainter, J. A.
In: *Ecology, diversity, and sustainability of the Middle Rio Grande Basin*; Fort Collins, Colo.: U.S. Dept. of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station, 1995. pp. 1-11.
NAL Call #: aSD11.A42-no.268
Descriptors: ecosystems/ rivers/ watersheds/ history/ natural resources/ vegetation/ ecotones/ biodiversity/ land use/ water resources/ resource management/ ecology/ upland areas/ runoff/ social values/ land management/ literature reviews/ New Mexico/ Colorado/ Texas/ Mexico
This citation is from AGRICOLA.

769. Invasive weeds in rangelands: Species, impacts, and management.

DiTomaso, J. M.
Weed Science 48 (2): 255-265. (Mar. 2000-Apr. 2000)
NAL Call #: 79.8-W41;
ISSN: 0043-1745 [WEESA6]
Descriptors: rangelands/ pastures/ bromus tectorum/ centaurea diffusa/

centaurea maculosa/ centaurea solstitialis/ euphorbia esula/ species diversity/ weed control/ integrated pest management/ grasslands/ annuals/ invasion/ economic analysis/ livestock/ forage/ yields/ nutritive value/ grazing/ costs/ land prices/ wildlife/ grassland management/ ecosystems/ weeds/ landscape/ education/ literature reviews/ range management

Abstract: Rangeland and pastures comprise about 42% of the total land area of the United States. About three-quarters of all domestic livestock depend upon grazing lands for survival. Many ranges have had domestic stock grazing for more than 100 years and, as a result, the plant composition has changed greatly from the original ecosystems. Western rangelands previously dominated by perennial bunchgrasses have been converted, primarily through overgrazing, to annual grasslands that are susceptible to invasion by introduced dicots. Today there are more than 300 rangeland weeds in the United States. Some of the most problematic include *Bromus tectorum*, *Euphorbia esula*, *Centaurea solstitialis*, *C. diffusa*, *C. maculosa*, and a number of other *Centaurea* species. In total, weeds in rangeland cause an estimated loss of \$2 billion annually in the United States, which is more than all other pests combined. They impact the livestock industry by lowering yield and quality of forage, interfering with grazing, poisoning animals, increasing costs of managing and producing livestock, and reducing land value. They also impact wildlife habitat and forage, deplete soil and water resources, and reduce plant and animal diversity. Numerous mechanical and cultural control options have been developed to manage noxious rangeland weeds, including mowing, prescribed burning, timely grazing, and perennial grass reseeding or interseeding. In addition, several herbicides are registered for use on rangelands and most biological control programs focus on noxious rangeland weed control. Successful management of noxious weeds on rangeland will require the development of a long-term strategic plan incorporating prevention programs, education materials, and activities, and economical and sustainable multi-year integrated approaches that improve degraded rangeland communities, enhance the utility of the ecosystem, and prevent

reinvansion or encroachment by other noxious weed species. This citation is from AGRICOLA.

770. Invasiveness in Wetland Plants in Temperate North America.

Galatowitsch, S. M.; Anderson, N. O.; and Ascher, P. D. *Wetlands* 19 (4): 733-755. (1999) *NAL Call #:* QH75.A1W47; *ISSN:* 0277-5212. *Notes:* Conference: Temperate Wetlands Restoration Workshop, Barrie, ON (Canada), 27 Nov-1 Dec 1995; Publisher: Society of Wetlands Scientists, Box 1897 Lawrence KS 66044 USA, [[URL:http://www.sws.org/wetlands/journalnalsearch.html](http://www.sws.org/wetlands/journalnalsearch.html)]

Descriptors: North America/ Exotic Species/ Wetlands/ Vegetation/ Literature Review/ Hydrology/ Salinity / Introduced species/ Vegetation patterns/ Growth/ Herbivores/ Hybridization/ Ecosystem disturbance/ Plant populations/ Salinity effects/ Temperate zones/ Phragmites australis/ *Typha glauca*/ *Lythrum salicaria*/ *Myriophyllum spicatum*/ *Phalaris arundinacea*/ North America/ invasive taxa/ Water and plants/ Wetlands/ Habitat community studies/ Mechanical and natural changes/ Geographical distribution

Abstract: The spread of invasive taxa, including *Lythrum salicaria*, *Typha X glauca*, *Myriophyllum spicatum*, *Phalaris arundinacea*, and *Phragmites australis*, has dramatically changed the vegetation of many wetlands of North America. Three theories have been advanced to explain the nature of plant invasiveness. Aggressive growth during geographic expansion could result because 1) growth is more favorable under new environmental conditions than those of resident locales (environmental constraints hypothesis); 2) herbivores may be absent in the new locale, resulting in selection of genotypes with improved competitive ability and reduced allocation to herbivore defenses (evolution of increased competitive ability hypothesis); and 3) interspecific hybridization occurred between a new taxon and one existing in an area, resulting in novel phenotypes with selective advantages in disturbed sites or phenotypes that can grow under conditions not favorable for either parent (introgression/hybrid speciation hypothesis). A review of published literature found few studies

that compare the growth and dynamics of invasive populations in their new range versus those in historic ranges. However, there is evidence that hydrologic alterations could facilitate invasions by *Typha X glauca* and *Phalaris arundinacea* and that increased salinity promoted spread of *Typha angustifolia* (parental taxon) and *Phragmites australis*. The potential for reduced herbivory causing aggressive growth is greatest for *Lythrum salicaria*. Introgressive hybridization is potentially a cause of invasiveness for all five species but has been established only for *Typha X glauca* and *Lythrum salicaria*. © Cambridge Scientific Abstracts (CSA)

771. Inventory of U.S. greenhouse gas emissions and sinks, 1990-1994.

United States. Environmental Protection Agency. Office of Policy, Planning and Evaluation. Washington, D.C.: U.S. Environmental Protection Agency, Office of Policy, Planning, and Evaluation; 1 v. (various pagings): ill. (some col.), map. (1995) *Notes:* Shipping list no.: 96-0202-P. "November 1995." "EPA-230-R-96-006"--Cover. Includes bibliographical references (R-1 - R-12). *SUDOCs:* EP 1.2:G 83/2. *NAL Call #:* QC912.3.I58--1995 *Descriptors:* Greenhouse effect, Atmospheric---United States/ Atmospheric carbon dioxide---United States/ Greenhouse gases---United States This citation is from AGRICOLA.

772. Invertebrates in freshwater wetlands of North America: Ecology and management.

Batzer, Darold P.; Rader, Russell Ben.; and Wissinger, Scott A. New York: J. Wiley; xviii, 1100 p.: ill. (1999) *NAL Call #:* QL365.4.A1I58-1999; *ISBN:* 0471292583 *Descriptors:* Freshwater invertebrates---Ecology---North America/ Wetland ecology---North America/ Wetlands---North America/ Wildlife conservation---North America This citation is from AGRICOLA.

773. Investing in ecosystems and communities.

Luzadis, V. A.; Alkire, C.; Mater, C. M.; Romm, J.; Stewart, W.; Wills, L.; and Vaagen, D. R.

Journal of Sustainable Forestry 12 (3/4): 169-194. (2001)

NAL Call #: SD387.S87J68;
ISSN: 1054-9811.

Notes: In the special issue: Understanding community-based forest ecosystem management, Part I / edited by G.J. Gray, M.J. Enzer, and J. Kusel. Paper presented at a workshop held June 23-38, 1998, Bend, Oregon, USA.

Includes references.

Descriptors: community forestry/ forest management/ forest ecology/ ecosystems/ investment/ communities/ population growth/ international trade/ literature reviews
This citation is from AGRICOLA.

774. IPM: Approaches and prospects.

Parrella, M. P.

NATO ASI Series: Series A, Life Sciences 276: 357-363. (1995)

NAL Call #: QH301.N32;
ISSN: 0258-1213 [NALSDJ].

Notes: In the series analytic: Thrips biology and management / edited by B. L. Parker, M. Skinner and T. Lewis. Proceedings of a NATO Advanced Research Workshop on "Thysanoptera: Towards Understanding Thrips Management" held September 28-30, 1993, Burlington, Vermont.

Includes references.

Descriptors: thysanoptera/ integrated pest management/ insect control/ frankliniella occidentalis/ ornamental plants/ floriculture/ greenhouse crops/ literature reviews
This citation is from AGRICOLA.

775. IPM handbook for golf courses.

Schumann, Gail L.

Chelsea, Mich.: Ann Arbor Press; vii, 264 p.: ill. (some col.). (1998)

NAL Call #: GV975.5.175-1998;
ISBN: 1575040654

Descriptors: Golf courses---United States---Management---Handbooks, manuals, etc/ Pests Control---United States---Handbooks, manuals, etc
This citation is from AGRICOLA.

776. IPM: What has it delivered?

Harris, M. K.

Plant Disease 85 (2): 112-121. (2001)
NAL Call #: 1.9-P69P;

ISSN: 0191-2917 [PLDIDE]

Descriptors: gossypium hirsutum/ integrated pest management/ history/ costs/ application rates/ phenology/ crop yield/ natural enemies/ pest resistance/ economic analysis/ coevolution/ crop management/ insecticides/ literature reviews / Texas
This citation is from AGRICOLA.

777. Irrigated agriculture and the environment.

Shortle, J. S. and Griffin, Ronald C. Cheltenham, UK; Northampton, MA: Edward Elgar; xix, 272 p.: ill., maps;

Series: Management of water resources 1 (An Elgar reference collection). (2001)

NAL Call #: S613-.I66-2001;
ISBN: 1840645032

Descriptors: Irrigation farming/ Irrigation farming---Environmental aspects/ Water quality management/ Irrigation farming---United States/ Irrigation farming---Environmental aspects---United States/ Water quality management---United States
This citation is from AGRICOLA.

778. Irrigation and drainage reference manual.

Mulcahy, Sue.; Schroen, James.; and Target 10 Water On Water Off Working Group.

Victoria, Australia: Target 10 Water On Water Off Working Group; 1 v. (various pagings): ill. (1993)

Notes: Cover title. At head of title: Target 10. "September 1993."

NAL Call #: S616.A8176--1993

Descriptors: Irrigation---Australia---Victoria---Handbooks, manuals, etc/ Drainage---Australia---Victoria---Handbooks, manuals, etc
This citation is from AGRICOLA.

779. Irrigation drainage: International and national perspectives.

Hooja, Rakesh.; Mundra, S. N.; Ram, Sewa.; and Rajasthan Agricultural Drainage Research Project, National Seminar on Subsurface Drainage Udaipur, India: Agro Tech Pub. Academy; 424 p.: maps. (2000)

Notes: Papers presented in the National Seminar on Subsurface Drainage organized by Rajasthan Agricultural Drainage Research Project at Jaipur, India in May 1995; also includes papers from other seminars and publications.

NAL Call #: TC803-.I77-2000;
ISBN: 818568037X

Descriptors: Irrigation---Congresses/ Drainage---Congresses

This citation is from AGRICOLA.

780. Irrigation-induced contamination of water, sediment, and biota in the Western United States: Synthesis of data from the National Irrigation Water Quality Program.

Seiler, R. L.

Denver, CO: U.S. Dept. of the Interior, U.S. Geological Survey; vi, 123 p.: ill., maps (some col.); 28 cm. (2003)

Notes: U.S. Geological Survey professional paper 1655

NAL Call #: 407 G29Pr no. 1655
http://water.usgs.gov/pubs/pp/pp1655/pp1655_v1.1.pdf

Descriptors: Selenium---Environmental aspects---West (United States)/ Irrigation---Environmental aspects---West (United States)/ Geographic information systems---West (United States)

This citation is from AGRICOLA.

781. Irrigation management under water scarcity.

Pereira, Luis Santos; Oweis, Theib; and Zairi, Abdelaziz

Agricultural Water Management 57 (3): 175-206. (2002)

NAL Call #: S494.5.W3A3;
ISSN: 0378-3774

Descriptors: agricultural production/ aridity/ desertification/ drought/ irrigation performances/ saline water usage/ wastewater usage/ water scarcity: environmental impact, health impact/ water shortage

Abstract: The use of water for agricultural production in water scarcity regions requires innovative and sustainable research, and an appropriate transfer of technologies. This paper discusses some of these aspects, mainly relative to on-farm irrigation management including the use of treated wastewater and saline waters. First, the paper proposes some concepts relative to water scarcity, concerning aridity, drought, desertification and water shortage, as well as policies to cope with these water stressed regimes. Conceptual approaches on irrigation performances, water use and water savings are reviewed in a wide perspective. This is followed by a discussion of supply management to cope with water scarcity, giving particular attention to the use of wastewater and low-quality waters, including the respective impacts on

health and the environment as water scarcity is requiring that waters of inferior quality be increasingly used for irrigation. The paper then focuses on demand management, starting with aspects relating to the improvement of irrigation methods and the respective performances, mainly the distribution uniformity (DU) as a fundamental tool to reduce the demand for water at the farm level, and to control the negative environmental impacts of over-irrigation, including salt stressed areas. Discussions are supported by recent research results. The suitability of irrigation methods for using treated wastewaters and saline waters is analysed. Supplemental irrigation (SI) and deficit irrigation strategies are also discussed, including limitations on the applicability of related practices. The paper also identifies the need to adopt emerging technologies for water management as well as to develop appropriate methodologies for the analysis of social, economic, and environmental benefits of improved irrigation management.

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782. Irrigation performance indicators based on remotely sensed data: A review of literature.

Bastiaanssen, W. G. M. and Bos, M. G.

Irrigation and Drainage Systems 13 (4): 291-311. (1999)

NAL Call #: TC801.I66;

ISSN: 0168-6291 [IRDSEG]

Descriptors: irrigation/ performance/ irrigation water/ water flow/ irrigation channels/ remote sensing/ crops/ irrigated soils/ evapotranspiration/ satellite surveys/ irrigated sites/ irrigated farming/ evaporation/ transpiration/ vegetation/ literature reviews

Abstract: The earlier generation of irrigation performance indicators was based on canal flow data. Commonly, they quantify performance in a command area downstream of a discharge measurement device. Remote sensing determinants, such as actual evapo-transpiration, soil water content and crop growth reflect the overall water utilization at a range of scales, up to field level. Crop evapo-transpiration includes water originating from irrigation supply, water from precipitation, groundwater and water withdrawn from the unsaturated zone. Hence, this is a

refinement in spatial scale as compared to the classically collected flow measurements, and describes moreover depletion from all water resources. If these possibilities are well implemented, we expect that a new generation of irrigation performance indicators can be quantified in a cost-effective manner. Especially, because satellite measurements pave a way to standardize data collection between different irrigation schemes and among different countries at costs which are currently decreasing. These challenges can only turn into a success if irrigation managers are involved in pilot projects and demonstration studies exploring satellite data.

This citation is from AGRICOLA.

783. Irrigation with sewage effluents: The Israeli experience.

Avnimelech, Yoram

Environmental Science and Technology 27 (7): 1278-1281. (1993)

NAL Call #: TD420.A1E5;

ISSN: 0013-936X

Descriptors: plant (Plantae Unspecified)/ Hominidae (Hominidae)/ Plantae (Plantae Unspecified)/ animals/ chordates/ humans/ mammals/ plants/ primates/ vertebrates/ activated sludge/ agriculture/ heavy metals/ human consumption/ organic pollution/ wastewater recycling

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784. Is an enhanced soil biological community, relative to conventional neighbours, a consistent feature of alternative (organic and biodynamic) agricultural systems.

Ryan, M.

Biological Agriculture and Horticulture 17 (2): 131-144. (1999)

NAL Call #: S605.5.B5;

ISSN: 0144-8765 [BIAHDP]

Descriptors: farms/ soil fertility/ alternative farming/ farming systems/ soil biology/ communities/ fertilizers/ composts/ manures/ minerals/ growth/ green manures/ legumes/ soil flora/ microbial flora/ soil fauna/ plant pathogenic fungi/ symbionts/ nutrient uptake/ case studies/ data analysis/ literature reviews/ Australia

This citation is from AGRICOLA.

785. Is the productivity of organic farms restricted by the supply of available nitrogen?

Berry, P M; Sylvester, Bradley R; Philipps, L; Hatch, D J; Cuttle, S P; Rayns, F W; and Gosling, P

Soil Use and Management 65 ([supplement]): 181-192. (2002)

NAL Call #: S590.S68;

ISSN: 0266-0032

Descriptors: carbon/ nitrogen: availability dynamics, available supply, mineralization, nutrient/ crop (Angiospermae): major growth phases/ Angiosperms/ Plants/ Spermatophytes/ Vascular Plants / carbon:nitrogen ratio/ case study data/ cash crop residues: application timing, mineralization rates, nitrogen content, soil incorporation/ leys: application timing, soil incorporation/ literature data/ organic farms: productivity limitations/ sustainability/ uncomposted manure: application timing, soil incorporation

Abstract: This paper reviews information from the literature and case studies to investigate whether productivity in organic systems is restricted by the supply of available N during the major phases of crop growth. Organic systems have the potential to supply adequate amounts of available N to meet crop demand through the incorporation of leys, N rich cash crop residues and uncomposted manures. However, this is seldom achieved because leys are only incorporated once every few years and organically produced crop residues and manures tend to have low N contents and slow mineralization rates. N availability could be improved by delaying ley incorporation until spring, applying uncomposted manures at the start of spring growth, transferring some manure applications from the ley phase to arable crops, preventing cover crops from reaching a wide C:N ratio and better matching crop type with the dynamics of N availability.

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786. Issues in the economics of pesticide use in agriculture: A review of the empirical evidence.

Fernandez Cornejo, J.; Jans, S.; and Smith, M.

Review of Agricultural Economics 20 (2): 462-488. (Fall 1998-Winter 1998)

NAL Call #: HD1773.A3N6;

ISSN: 1058-7195

Descriptors: pesticides/ use value/ application rates/ economic impact/

regulations/ pest management/
productivity/ crop yield/ losses/ cost
benefit analysis/ elasticities/
integrated pest management/ maize/
soybeans/ wheat/ cotton/ rice/
peanuts/ sorghum/ United States/
pesticide productivity
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787. Keeping science in environmental regulations: The role of the animal scientist.

Powers, W. J.

Journal of Dairy Science 86 (4):
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NAL Call #: 44.8 J822;

ISSN: 0022-0302

This citation is provided courtesy of
CAB International/CABI Publishing.

788. Killing cover crops mechanically: Review of recent literature and assessment of new research results.

Creamer, N. G. and Dabney, S. M.

*American Journal of Alternative
Agriculture* 17 (1): 32-40. (2002)

NAL Call #: S605.5.A43;

ISSN: 0889-1893

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789. Kinetic constraints on the loss of organic chemicals from contaminated soils: Implications for soil-quality limits.

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Science and Technology*

25 (1): 1-43. (1995)

NAL Call #: QH545.A1C7;

ISSN: 1064-3389

Descriptors: biphenyls/ Hominidae
(Hominidae)/ Plantae (Plantae
Unspecified)/ animals/ chordates/
humans/ mammals/ plants/ primates/
vertebrates/ diffusion/ human
exposure/ pesticides/ phytotoxicity/
polychlorinated biphenyls/ polynuclear
aromatic hydrocarbons/ remediation/
solvents/ sorption/ volatile aromatic
compounds

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Power, J. F.

Madison, Wis.: Soil Science Society
of America; 653 p. (2000)

Notes: Contents note: Chemical,
physical, and biological characteristics
of agricultural and forest by-products
for land application / J.H. Edwards

and Arun V. Someshwar --

Description of food processing by-
products / Allen V. Barker, Tara A.

O'Brien, and Margie L. Stratton --

Characterization of industrial by-
products / D.M. Miller ... [et al.] --

Quantities, characteristics, barriers,
and incentives for use of organic

municipal by-products / Richard M.

Kashmanian ... [et al.] -- Soil and by-
product characteristics that impact the

beneficial use of by-products / Allen

V. Barker, Margie L. Stratton, and

Jack E. Rechcigl -- Sustainable use of

by-products in land management /

Leslie R. Cooperband -- Assessing

the impacts of agricultural, municipal,

and industrial by-products on soil

quality / J. Thomas Sims and Gary M.

Pierzynski -- Potential impact of land

application of by-products on ground

and surface water quality / William F.

Ritter -- Odor and other air quality

issues associated with organic and

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by-product materials / Harold M.

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objectives / S. Brown and R.L.

Chaney -- Estimating the benefits of

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Descriptors: Fertilizers---

Environmental aspects/ Factory and

trade waste as fertilizer/ Waste

products as fertilizer/ Agricultural

wastes---Recycling---Environmental

aspects

This citation is from AGRICOLA.

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Risse, L. M.; Cabrera, M. L.;

Franzluebber, A. K.; Gaskin, J. W.;

Gilley, J. E.; Killorn, R.; Radcliffe, D.

E.; Tollner, W. E.; and Zhang, H

In: White papers on animal agriculture

and the environment/ National Center

for Manure & Animal Waste

Management; Midwest Plan Service;

and U.S. Department of Agriculture;

Raleigh, NC: National Center for

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NAL Call #: TD930.2-W45-2002

Descriptors: Agricultural wastes---

Environmental aspects---United

States

792. Land quality indicators: Research plan.

Dumanski, J. and Pieri, C.

Agriculture, Ecosystems and

Environment 81 (2): 93-102.

(Oct. 2000)

NAL Call #: S601.A34;

ISSN: 0167-8809 [AEENDO].

Notes: Special issue: Indicators of

land quality and sustainable land

management / edited by J. Dumanski.

Paper presented at a symposium held

August 1998, Montpellier, France.

Includes references.

Descriptors: land management/

quality/ environmental degradation/

monitoring/ land use/ indicators/

decision making/ economic indicators/

social indicators/ air quality/ water

quality/ environment/ crop yield/

environmental management/ literature

reviews

Abstract: Indicators of land quality

(LQIs) are being developed as a

means to better coordinate actions on

land related issues, such as land

degradation. Economic and social

indicators are already in regular use

to support decision making at global,

national and sub-national levels and

in some cases for air and water

quality, but few such indicators are

available to assess, monitor and

evaluate changes in the quality of

land resources. Land refers not just to

soil but to the combined resources of

terrain, water, soil and biotic

resources that provide the basis for

land use. Land quality refers to the

condition of land relative to the

requirements of land use, including

agricultural production, forestry,

conservation, and environmental

management. The LQI program

addresses the dual objectives of

environmental monitoring as well as

sector performance monitoring for