Implementing Agricultural Conservation Practices: Barriers and Incentives

1. **The 1990 Farm Bill and water quality in Corn Belt watersheds: Conserving remaining wetlands and restoring farmed wetlands.**
Lant, C. L.; Kraft, S. E.; and Gillman, K. R.
Journal of Soil and Water Conservation 50 (2): 201-204. (1995)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
Descriptors: surveys/ water quality/ United States, Midwest/ wetlands/ cropland/ conservation/ easements/ groundwater pollution/ groundwater recharge/ farms/ property rights/ legislation/ agriculture/ environmental impact/ ecosystem disturbance/ inland water environment/ Conservation Reserve Program/ Wetland Reserve Program/ Watershed protection/ Environmental action/ Mechanical and natural changes
Abstract: Two contingent valuation surveys including 770 mail surveys and 157 personal interviews were conducted in ten Corn Belt counties to estimate potential enrollment of farmed wetlands in the Conservation Reserve Program (CRP) and in the Wetland Reserve Program (WRP) and to elicit farmers' and farmland owners' attitudes toward Swampbuster. Weighted, piecewise-linear regression was used to obtain estimated enrollments from the mail survey data. Results from the two surveys indicate that enrollment of farmed wetlands in the CRP climbs from 2-8% of eligible acreage at an annual rental rate of $90/ac/yr to 52-64% at $140/ac/yr. Enrollment reaches 81-83% at rental rates of $400/ac/yr. For the WRP, the two surveys are in less agreement. According to the mail survey, enrollments climb from 4% of eligible acreage at $500/ac for a 30-year easement to 26% at $2,500/ac. Enrollments climb more rapidly at higher easement rates reaching 78% enrollment at $4,000/ac. Results from personal interviews, however, indicate much lower enrollment rates of less than 2% of eligible acreage at $1,700/ac climbing to 20% at $2,500/ac. Beyond financial considerations, dealing with problems of altering drainage facilities is a primary barrier to enrollment of farmed wetlands in the WRP. Attitudes toward Swampbuster clearly indicate the unpopularity of the program. About half of farmland owners with wetlands would put them to some agricultural use in the absence of Swampbuster. Only 30% feel that Swampbuster is necessary and fair, while 68% feel it is a violation of their property rights and 56% feel that the public should have to purchase wetlands if they wish to protect them. Swampbuster could be made less unpopular by addressing property taxes or by allowing some limited economic use of wetlands.

2. **The 2002 Farm Bill: U.S. Producer Preferences for Agricultural, Food, and Public Policy.**
Lubben, B. D.; Simons, C. J.; Bills, N. L.; Meyer, N. L.; and Novak, J. L.
Oak Brook, Illinois: Farm Foundation; Publication No.2001-02, 2001.
Notes: Author Affiliation: National Public Policy Education Committee
Abstract: National survey of over 14,000 producers on agricultural policy, which includes sections on conservation and environmental programs.

3. **The acceptability of forest management practices: An analysis of ethical accounting and the ethical matrix.**
Gamborg, Christian
Forest Policy and Economics 4 (3): 175-186. (2002)
NAL Call #: SD1 .F6747; *ISSN:* 1389-9341
Descriptors: ethical accounting/ ethical matrix/ forest management practice acceptability
Abstract: In this paper, the feasibility of using stakeholder approaches to assess forest management practices is examined. The paper focuses on two such approaches: the idea of ethical accounting developed for livestock farming, and the so-called ethical matrix. More extensive accounting is needed in forestry. The public is increasingly sensitive to, and aware of, the broader impact of forest management, not only on human welfare but also on environmental values such as nature conservation and biodiversity. Green accounting is being used to assess the environmental effects of forestry. In a broader approach such as ethical accounting as developed for livestock farming, both the purpose and the type of use that is being made of the forest must be examined. It is also necessary to ask which visible or invisible stakeholders are to be included. However, it is important to note that the adoption of stakeholder approaches does not remove the need to reflect on one's fundamental ethical position. In fact, one must critically consider one's basic values before applying these approaches to forestry.

4. **Adaptive management: Potential and limitations for ecological governance.**
Jiggins, J. and Roling, N.
International Journal of Agricultural Resources, Governance and Ecology 1 (1): 28-42. (2000)
NAL Call #: S604.5-.I57; *ISSN:* 1462-4605
Descriptors: environmental management/ learning/ institutions/ ecosystems/ integrated pest management/ literature reviews/ social learning
This citation is from AGRICOLA.

5. **Adaptive participation in watershed management.**
Chess, C.; Hance, B. J.; and Gibson, G.
Journal of Soil and Water Conservation 55 (3): 248-252. (2000)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561 [JSWCA3]
Descriptors: watersheds/ watershed management/ decision making/ public opinion/ community involvement/ demography/ geographical variation/ research/ literature reviews
This citation is from AGRICOLA.

6. **Adoption and adaptation of scientific irrigation scheduling: Trends from Washington, USA as of 1998.**
Leib, Brian G; Hattendorf, Mary; Elliott, Todd; and Matthews, Gary
Agricultural Water Management 55 (2): 105-120. (2002)
NAL Call #: S494.5.W3A3; *ISSN:* 0378-3774
Descriptors: agricultural water management
Abstract: Scientific irrigation scheduling (SIS) is defined as the use of crop evapotranspiration data and soil moisture sensors to accurately determine when and how much to irrigate. Three surveys were conducted during 1997 and 1998 to determine the status of and direction for SIS in Washington. According to the survey results, nine private consultants were contracted to perform irrigation scheduling on nearly 120,000 ha per year. Conservation districts, county extension, and the national resource conservation service assisted producers in scheduling irrigation on an additional 6000 ha in a year. Two-hundred and four producers reported scheduling 26,750 ha of irrigation on their own and 6000 ha with consultants. At a minimum, the combined acreage reported in these surveys indicates an 18% adoption rate of SIS. However, the actual adoption rate is much greater if the self-implementation rate for the 200 producers is representative of the entire state. Survey results also indicated that potatoes and tree fruit account for more than half of the acreage being scheduled. The main reason producers were willing to pay for irrigation scheduling is to insure the quality of high-value crops. Energy savings became important when water needed to be lifted a considerable distance; however, water conservation, high yield, fertilizer savings, and non-point pollution reduction were considered secondary benefits. Center-pivots were the most likely irrigation systems to be scheduled and a considerable proportion of drip and solid-set sprinklers were scheduled, but a very small proportion of furrow systems and set-move sprinklers were scheduled. Over 75% of the survey respondents have personal computers and 50% have modems but less than 5% are using their computers to schedule irrigation. However, when examining the group producers who irrigate more than 405 ha, 33% are using their computers to schedule irrigation. Since computers and communication technology are available "on-farm", and producers are showing a willingness to implement SIS on their own, Washington State University (WSU) has developed the Washington Irrigation Scheduling Expert (WISE) software and a web-based information system. Self-implemented SIS also requires increased producer knowledge along with training for potential vendors. Therefore, WSU is continuing traditional SIS educational efforts such as on-farm testing of soil moisture sensors, workshops, field days, publications and newsletters. Conversely, WSU has stopped providing full-service SIS demonstrations that compete with existing services, require intensive labor, and affect a limited number of producers. Agri-business is employing a similar strategy as self-service SIS providers have increased by seven companies since the 1998 survey.

7. **The adoption and diffusion of level fields and basins.**
Anderson, D. P.; Wilson, P. N.; and Thompson, G. D.
Journal of Agricultural and Resource Economics 24 (1): 186-203. (July 1999)
NAL Call #: HD1750.W4; *ISSN:* 1068-5502
Descriptors: cotton/ farm management/ irrigated farming/ technical progress/ water conservation/ water costs/ innovation adoption/ legislation/ state government/ regression analysis/ Arizona/ 1980 Groundwater Management Act/ laser leveling
This citation is from AGRICOLA.

8. **Adoption and economic impact of site-specific technologies in U.S. agriculture.**
El Osta, H. and Mishra, A.
Selected papers from the annual meeting of the American Agricultural Economics Association (2001)
NAL Call #: HD1405-.A44.
Notes: Supplemental online access through http://agecon.lib.umn.edu. Meeting held August 5-8, 2001, in Chicago, Illinois. Includes references.
Descriptors: site specific crop management/ variable rate application/ innovation adoption/ economic impact/ farmers' attitudes/ decision making/ production costs/ savings/ United States
This citation is from AGRICOLA.

9. **Adoption of Agricultural Production Practices: Lessons Learned from the U.S. Department of Agriculture Area Studies Project.**
Caswell, M.; Fuglie, K.; Ingram, C.; Jans, S.; and Kascak, C.
U.S. Department of Agriculture [Also available as: ERS Agricultural Economic Report No. 792], 2001 (application/pdf)

http://www.ers.usda.gov/publications/aer792/
Descriptors: natural resource management/ nutrient management/ soil management/ pest management/ water management/ conservation practices/ agrochemicals/ crop yield/ innovation adoption/ participation/ econometric models/ regional economics/ policy analysis/ economic analysis/ watersheds/ surveys/ United States/ farmer surveys/ USDA Area Studies Project
Abstract: The U.S. Department of Agriculture Area Studies Project was designed to characterize the extent of adoption of nutrient, pest, soil, and water management practices and to assess the factors that affect adoption for a wide range of management strategies across different natural resource regions. The project entailed the administration of a detailed field-level survey to farmers in 12 watersheds in the Nation to gather data on agricultural practices, input use, and natural resource characteristics associated with farming activities. The data were analyzed by the Economic Research Service using a consistent methodological approach with the full set of data to study the constraints associated with the adoption of micronutrients, N-testing, split nitrogen applications, green manure, biological pest controls, pest-resistant varieties, crop rotations, pheromones, scouting, conservation tillage, contour farming, strip cropping, grassed waterways, and irrigation. In addition to the combined-areas analyses, selected areas were chosen for analysis to illustrate the difference in results between aggregate and area-specific models. The unique sample design for the survey was used to explore the importance of field-level natural resource data for evaluating adoption at both the aggregate and watershed levels. Further analyses of the data illustrated how the adoption of specific management practices affects chemical use and crop yields.

10. **Adoption of conservation production systems in three Midwest watersheds.**
Napier T.L.; Tucker M.; and McCarter S.
Journal of Soil and Water Conservation 55 (2): 123-134. (2000)
NAL Call #: 56.8-J822
This citation is provided courtesy of CAB International/CABI Publishing.

11. **Adoption of conservation production systems in two Ohio watersheds: A comparative study.**
Napier TL and Bridges T
Journal of Soil and Water Conservation 57 (4): 229-235; 8 ref. (2002)
NAL Call #: 56.8 J822
This citation is provided courtesy of CAB International/CABI Publishing.

12. **Adoption of conservation production systems within the north central region of the United States.**
Napier T.L.; Ascough J.C.; and Flanagan D.C.
In: Soil erosion research for the 21st century: Proceedings of the International Symposium. (Held 3 Jan 2001-5 Jan 2001 at Honolulu, Hawaii.)
St Joseph, Mo.: American Society of Agricultural Engineers; pp. 256-259; 2001.
This citation is provided courtesy of CAB International/CABI Publishing.

13. **Adoption of environmental protection practices in the Scioto River watershed: Implications for MODSS.**
Napier, T. L. and Camboni, S. M.
In: Multiple objective decision making for land, water, and environmental management: Proceedings of the First International Conference on Multiple Objective Decision Support Systems (MODSS) for Land, Water and Environmental Management: Concepts, Approaches, and Applications.
Boca Raton, Fla.: Lewis Publishers; pp. 337-347; 1998.
Notes: Meeting held September 1996 in Honolulu, Hawaii. Edited by S.A. El-Swaify and D.S. Yakowitz. Includes references.
NAL Call #: HC13.I544-1996; *ISBN:* 1574440918
Descriptors: farm management/ innovation adoption/ decision making/ farm surveys/ farmers' attitudes/ Ohio/ multiple objective decision support system
This citation is from AGRICOLA.

14. **Adoption of integrated pest management in U.S. agriculture.**
Vandeman, Ann M. and United States. Dept. of Agriculture. Economic Research Service.
Washington, DC: U.S. Dept. of Agriculture, Economic Research Service; iii, 26 p.: ill.; Series: Agriculture information bulletin no. 707. (1994)
Notes: Cover title. Running title: Adoption of IPM in U.S. agriculture. "September 1994"--P. [i]. Includes bibliographical references (p. 25-26).
NAL Call #: 1--Ag84Ab-no.707
Descriptors: Agricultural pests---Integrated control---United States/ Pests---Integrated control---United States
This citation is from AGRICOLA.

15. **Adoption of nutrient management techniques to reduce hypoxia in the Gulf of Mexico.**
Robinson, J. R. and Napier, T. L.
Agricultural Systems 72 (3): 197-213. (June 2002)
NAL Call #: HD1.A3; *ISSN:* 0308-521X [AGSYDS]
Descriptors: hypoxia/ watershed management/ water conservation/ farm management/ nutrients/ innovation adoption/ water quality/ socioeconomics/

farm surveys/ models/ data collection/ regression analysis/ Ohio/ Iowa/ Minnesota/ Gulf of Mexico
Abstract: Data were collected from 1011 land owner-operators within three watersheds located in the North Central Region of the USA to examine use of selected water protection practices. A theoretical model developed from selected components of the traditional diffusion paradigm and the farm structure model was used to predict adoption and use of conservation practices at the farm level within the study watersheds. Study findings revealed that factors commonly purported to be highly correlated with adoption of conservation production systems were not useful for predicting use of conservation production practices assessed. The production practices examined in the study were percent of cultivated fields surrounded by grass filter strips, percent of waterways in cultivated fields protected by grass, use of banded fertilizer, use of side dressing of fertilizer, and use of nitrification inhibitor. Study findings revealed that the theoretical model developed to guide the study was relatively ineffective for predicting adoption of the conservation practices assessed in the study. None of the statistical models developed from analysis of study data explained more than nine percent of the variance in any of the conservation practices assessed. Research findings suggest that existing conservation programs are no longer useful policy instruments for motivating land owner-operators to adopt and use production systems designed to reduce agricultural pollution of waterways.
This citation is from AGRICOLA.

16. **Adoption of nutrient management technologies for rice production: Economic and institutional constraints and opportunities.**
Pandey, S.
Nutrient Cycling in Agroecosystems 53 (1): 103-111. (Jan. 1999)
NAL Call #: S631.F422; *ISSN:* 1385-1314 [NCAGFC].
Notes: In the special issue: Resource management in rice systems: nutrients / edited by V. Balasubramanian, J.K. Ladha, and G.L. Denning. Includes references.
Descriptors: oryza sativa/ cropping systems/ green revolution/ crop management/ soil management/ soil fertility/ technology transfer/ innovation adoption/ cultivars/ dwarf cultivars/ high yielding varieties/ fertilizers/ simulation models/ crop yield/ farm income/ use efficiency/ farm inputs/ literature reviews
This citation is from AGRICOLA.

17. **Adoption of pest management strategies under varying environmental conditions.**
Caswell, Margriet F.; Shoemaker, Robbin; and United States. Dept. of Agriculture. Economic Research Service.
Washington, DC: U.S. Dept. of Agriculture, Economic Research Service; iii, 16 p.: ill.; Series: Technical bulletin (United States. Dept. of Agriculture) no. 1827. (1993)
Notes: Cover title. "December 1993"--P. i. Includes bibliographical references (p. 11).
NAL Call #: 1-Ag84Te-no.1827
Descriptors: Agricultural pests---Integrated control---United States---Technological innovations/ Pests---Integrated control---United States---Technological innovations/ Pests Control---United States
This citation is from AGRICOLA.

18. **Adoption of precision farming within three Midwest watersheds.**
Napier, T. L.; Robinson, J.; and Tucker, M.
Journal of Soil and Water Conservation 55 (2): 135-141. (2000)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561 [JSWCA3]
Descriptors: farmers/ site specific crop management/ watersheds/ innovation adoption/ landowners/ prediction/ farmers' attitudes/ age/ education/ nature conservation/ erosion/ risk assessment/ water quality
This citation is from AGRICOLA.

19. **Adoption of Soil Conservation Practices: A Revealed Preference Approach.**
Lichtenberg, E.
College Park, MD: Department of Agricultural and Resource Economics, University of Maryland; Working Paper No. 01-12, 2001.
Notes: Supercedes: Joint adoption of multiple technologies: A dual, latent demand approach (WP 00/14), by Lichtenberg, E. and Strand, I.E. [Cited, 20 April 2004: http://www.arec.umd.edu/Publications/papers/2000-working-papers.htm]
http://www.arec.umd.edu/elichtenberg/Revealed%20Preference%20BMP%20Adoption.pdf
Descriptors: Supporting Science
Abstract: A revealed preference survey was used to understand the adoption of 11 conservation practices, the responsiveness of adoption to cost sharing, and complementarity of the practices.

20. **Adoption of sustainable agriculture.**
Hoiberg, Eric O. and Bultena, Gordon L.
In: Planting the future: Developing an agriculture that sustains land and community/ Bird, E. A.; Bultena, G. L.; and Gardner, J. C., 1995; pp. 155-171.
Notes: ISBN: 0813820723
Descriptors: continuous replacement/ controversial

practice adoption/ new practices/ optimum productivity goal/ policy making/ Agronomy (Agriculture)/ Conservation/ Government and Law

21. **Agglomeration bonus: An incentive mechanism to reunite fragmented habitat for biodiversity conservation.**
Parkhurst, G. M.; Shogren, J. F.; Bastian, C.; Kivi, P.; Donner, J.; and Smith, R. B. W.
Ecological Economics 41 (2): 305-328. (2002)
NAL Call #: QH540.E26; *ISSN:* 0921-8009
This citation is provided courtesy of CAB International/CABI Publishing.

22. **Agricultural and water-quality conflicts: Economic dimensions of the problem.**
Crutchfield, Stephen R.; Hansen, LeRoy T.; Ribaudo, Marc.; and United States. Dept. of Agriculture. Economic Research Service.
Washington, DC: U.S. Dept. of Agriculture, Economic Research Service; 18 p.: ill., maps. (1993)
Notes: Caption title. "July 1993." "Water quality." Includes bibliographical references (p. 18).
NAL Call #: 1-Ag84Ab-no.676
Descriptors: Water quality---Economic aspects---United States/ Groundwater---Pollution---Economic aspects---United States/ Agricultural chemicals---Environmental aspects---United States/ Agriculture and state---United States
This citation is from AGRICOLA.

23. **Agricultural producers' perceptions of sandhill cranes in the San Luis Valley of Colorado.**
Laubhan, Murray K and Gammonley, James H
Wildlife Society Bulletin 29 (2): 639-645 (2001)
NAL Call #: SK357.A1W5; *ISSN:* 0091-7648
Descriptors: Grus canadensis tabida [greater sandhill crane] (Gruiformes)/ human (Hominidae): farmer/ Animals/ Birds/ Chordates/ Humans/ Mammals/ Nonhuman Vertebrates/ Primates/ Vertebrates/ agricultural production/ croplands/ economic attitudes/ human wildlife conflicts/ natural resources/ perceptions/ private land use/ social attitudes
Abstract: Management for migratory birds at an ecosystem scale requires forming cooperative partnerships with the private sector. To be effective, however, wildlife managers must understand the economic and social attitudes of private landowners to ensure that strategies involving stakeholders are viable and can be implemented. We documented attitudes of farmers in the San Luis Valley (SLV) of Colorado toward Rocky Mountain Population greater sandhill cranes (Grus canadensis tabida) using a self-administered, mail-back survey. Overall response rate was 46.7%. Viewing sandhill cranes in the SLV was considered somewhat important or important by 78.6% of respondents. In contrast, only 62.1% of respondents indicated that viewing sandhill cranes was somewhat important or important on their own land. Farmers' attitudes toward viewing sandhill cranes on their own property were related (P=0.02) to perceived conflicts with crop production. The extent of crane use (P=0.04) was the only variable we tested that predicted whether conflicts were reported. Our results suggest that partnerships between farmers and natural resource agencies concerned with management of sandhill cranes may be viable. However, the role of farmers in any proposed management strategy must be examined carefully because there may be an upper limit of crane use on private land that farmers will tolerate.

24. **Agriculture and the Environment: Information on and Characteristics of Selected Watershed Projects: Report to the Committee on Agriculture, Nutrition, and Forestry, U.S. Senate.**
United States General Accounting Office, Resources Community and Economic Development Division. United States General Accounting Office [Also available as: GAO/RCED-95-218], 1995 (text/html)
NAL Call #: TD428 A37A57 1995
http://www.gao.gov/archive/1995/rc95218.pdf
Descriptors: program evaluation/ governmental programs and projects/ government agencies/ USDA/ Environmental Protection Agency/ water pollution/ watershed management/ nonpoint source pollution/ agricultural runoff/ environmental policy/ public finance/ local government/ citizen participation/ case studies / decision support systems/ United States/ EPA/ USGS/ United States Geological Survey/ Fish and Wildlife Service/ National Oceanic and Atmospheric Administration/ NO AA/ National Marine Fisheries Service/ United States Army Corps of Engineers/ USACE
This citation is from AGRICOLA.

25. **Agriculture and the environment: Listening to the grassroots: A report based on a series of regional forums and urban focus groups.**
Ankeny, Iowa: Soil and Water Conservation Society; 48 p.: ill.; 28 cm. (1995)
NAL Call #: S589.755 .S64 1995
Descriptors: Agriculture---Environmental aspects---United States/ Agriculture and state---United States/ Agricultural subsidies---United States/ Soil erosion---United States/ Water quality---United States
This citation is from AGRICOLA.

26. **Alternative and conventional agricultural paradigms: Evidence from farming in southwest Saskatchewan.**
Abaidoo, S. and Dickinson, H.
Rural Sociology 67 (1): 114-131. (Mar. 2002)
NAL Call #: 281.28-R88; *ISSN:* 0036-0112
[RUSCA]
Descriptors: farmers' attitudes/ agricultural policy/ environmental protection/ technology/ innovation adoption/ farm management/ farming systems/ agricultural households/ farm surveys/ household surveys/ statistical analysis/ Saskatchewan
Abstract: Agricultural analysts have suggested that the emergence of an alternative agriculture system represents more than changes in practices; it is also thought to represent a shift in environmental beliefs, values, attitudes, and norms. This means that conventional and alternative systems of agriculture represent distinct paradigms which are informed by two contradictory worldviews. Insofar as this claim is correct, it is possible to delineate, target, and promote one paradigm, depending on the system of agriculture that policy makers wish to encourage. In this paper we seek to clarify the practical application of the two agricultural paradigms by examining the practices, beliefs, values, norms, and attitudes of farmers in southwest Saskatchewan, part of the semi-arid section of the North American Great Plains. Findings support the view that different farming systems correspond to different worldviews. Strong confidence in the market, however, is not limited to conventional farmers, as suggested by the literature.
This citation is from AGRICOLA.

27. **Anaerobic digester survey of California dairy producers.**
Morse D; Guthrie JC; and Mutters R
Journal of Dairy Science 79 (1): 149-153; 11 ref. (1996)
NAL Call #: 44.8 J822
This citation is provided courtesy of CAB International/CABI Publishing.

28. **An analysis of farmer participation in conservation oriented management on set-aside land in England.**
Neve, P; Mortimer, A M; and Putwain, P D.
In: 1997 Brighton crop protection [international] conference: Weeds. (Held 17 Nov 1997-20 Nov 1997 at Brighton, England, UK.); Vol. 1-3. Farnham, England, UK: British Crop Protection Council (BCPC); pp. 681-682; 1997.
Descriptors: human (Hominidae): farmer/ Animals/ Chordates/ Humans/ Mammals/ Primates/ Vertebrates/ set aside land: conservation based management, farmer participation/ survey method/ data collection method

29. **An Analysis of Farmers' Incentives to Conserve or Degrade the Land.**
Milham, N.
Journal of Environmental Management 40 (1): 51-64. (1994)
NAL Call #: HC75.E5J6; *ISSN:* 0301-4797
Descriptors: soil erosion/ soil conservation/ agriculture/ erosion control/ resources management/ environmental perception/ Watershed protection/ Environmental perception
Abstract: In this paper, it is argued that an increased understanding of the linkages between farmers' economic incentives to control soil degradation, degradation-induced productivity decline and future farmland productivity is essential for the formulation of effective land degradation and soil management policies. As a basis for the argument, a comprehensive farm-level economic model for the optimum private and social utilization of soil over time is developed. Complexities in the decision process due to environmental conditions and other uncertainties are considered. It is shown that, if farmers are well informed, they will tolerate soil degradation only to the point where the marginal net returns from depleting soil depth, fertility or structure equal the marginal profits foregone from conserving these productive aspects of the soil. Efficiency-related technical progress is found to provide incentives for reduced rates of soil degradation. It is also found that the optimum private rate of soil degradation is not likely to mimic the socially optimal rate unless capital markets and farm input and output markets operate efficiently and competitively. The potential for monetary and fiscal policy to impact on private rates of soil utilization is highlighted as a topic for further detailed investigation. Finally, it is argued that external costs and benefits from farming activity, which have not as yet been comprehensively quantified, may be the single most important cause of any differential between the optimum private and social rates of soil degradation.

30. **Analysis of potential conservation effort of CRP participants in the state of Missouri: A latent variable approach.**
Kalaitzandonakes, N. G. and Monson, M.
Journal of Agricultural and Applied Economics 26 (1): 200-208. (July 1994)
NAL Call #: HD101.S6; *ISSN:* 1074-0708
Descriptors: land diversion/ soil conservation/ federal programs/ program participants/ farmers' attitudes/ decision making/ mathematical models/ Missouri/ Conservation Reserve Program/ multiple indicator multiple cause model mimic
Abstract: This study investigated the influence of economic, personal, and attitudinal factors on the intended conservation effort of a sample of

Conservation Reserve Program (CRP) contract holders after their contracts have expired. Economic factors were found to dominate the decision about future conservation effort. Attitudes towards conservation were found to have no significant influence on the decision. This fact may relate to the recent changes in the regulatory environment brought about by the 1985 Food Security Act which changed conservation from a voluntary to regulated nature.
This citation is from AGRICOLA.

31. **Analyzing Agricultural Landowners' Willingness to Install Streamside Buffers.**
Lynch, L.; Hardie, I.; and Parker, D.
College Park, MD: Department of Agricultural and Resource Economics, University of Maryland; Working Paper 02-01, 2002.
http://www.arec.umd.edu/publications/papers/Working-Papers-PDF-files/02-01.pdf
Descriptors: Conservation Reserve Enhancement Program/ Maryland
Abstract: A survey of Maryland land owners examined what level of financial incentives is needed to interest owners in installing buffers.

32. **Applicability of Montreal Process Criterion 7: Legal, institutional and economic framework: To rangeland sustainability.**
Mitchell, J E and Woodmansee, R G
International Journal of Sustainable Development and World Ecology 9 (2): 121-134. (2002);
ISSN: 1350-4509
Descriptors: human (Hominidae): rangeland managers, rangeland scientists/ Animals/ Chordates/ Humans/ Mammals/ Primates/ Vertebrates/ Montreal Process Criterion 7/ best management practices / economic framework/ education/ enforcement capabilities/ institutional framework/ land use policy/ legal framework/ monitoring capacity/ monitoring programs/ outreach/ property rights/ public participation/ rangeland sustainability/ reporting programs/ research/ values
Abstract: Criterion 7 - legal, institutional and economic framework for rangeland conservation and sustainable management - contains 19 of the 67 indicators incorporating the Montreal Process. These indicators are aggregated into five sub-criteria; those dealing with the legal, institutional, and economic frameworks for supporting the sustainable management of rangelands, and sub-criteria concerning the capacity to monitor and conduct and apply research. Capacity for sustainability can be tied to property rights (Indicator 48), land-use policy (Indicators 49, 50), and use of best management practices (Indicator 51). Public participation in planning is an effective measure of sustainable management, but with public interaction in planning, science is no longer seen as being value-free (Indicators 52, 53, 54). Concerns exist that the numbers of trained rangeland managers and scientists, along with those in related disciplines, are inadequate to meet existing and future needs (Indicator 55). Enforcement capabilities, an institutional measure, rely upon the legal framework to be effective (Indicator 57). Access to capital can be important to graziers if they are to retain flexibility to manage sustainably (Indicator 58). Monitoring and reporting programmes are difficult and expensive, yet they remain critical for assessing sustainable management (Indicators 60, 61, 62). Education, research and outreach are equally meaningful as indicators of sustainability for forests and rangelands (Indicators 63, 64).

33. **Appropriation and Water Rights Issues in the High Plains Ogallala Region.**
White, S. E. and Kromm, D. E.
Social Science Journal 33 (4): 437-450. (1996);
ISSN: 0362-3319
Descriptors: United States, High Plains, Ogallala Region/ water rights/ groundwater management/ attitudes/ irrigation/ water use efficiency/ appropriation/ surveys/ beneficial use/ water conservation/ Water law and institutions
Abstract: This research assesses the effectiveness of groundwater doctrine in eastern Colorado and western Kansas within the context of 330 irrigators' preferences for perceived changes in groundwater appropriations and variances in existing rules to best achieve the public interest. A survey of irrigators in six groundwater management districts reveals that attitudes conflict with several aspects of current appropriation doctrine. There is significant support for broad-based, uniform reductions in appropriations when groundwater becomes scarce rather than the "first in time, first in right" requirement in the prior appropriation doctrine. Many irrigators believe that past water-use efficiency should be a criteria factored into appropriation reduction polices. Most oppose the "use it or lose it" concept that requires specified levels of beneficial use to protect a water right, and irrigators oppose special exemptions to permit new wells to benefit the public interest in fully appropriated areas. Importantly, if irrigators' preferences were codified in the groundwater appropriations doctrines, more groundwater could be conserved.

34. **Are 'Other Gainful Activities' on farms good for the environment?**
McNally, Sandra
Journal of environmental management 66 (1): 57-65. (2002)
NAL Call #: HC75.E5J6; *ISSN:* 0301-4797
Descriptors: human (Hominidae): farm household members/ Animals / Chordates/ Humans/ Mammals/ Primates/ Vertebrates/ ESA Management Agreement [Environmentally Sensitive Area Management Agreement]/ Environmentally Sensitive Area/ agricultural intensity/ conservation attitudes/ diversification activities/ environmental performance measures/ farm environmental improvement/ farm size/ land use type/ low agricultural income: effects mitigation/ off farm employment/ other gainful activities [OGAs]/ stated environmental intentions
Abstract: There has been a lot of academic interest in the pursuit of diversification activities and off-farm employment by farm household members. This is regarded as an important strategy for mitigating the effects of low agricultural income. One aspect of the debate about these so-called 'Other Gainful Activities' (OGAs) is whether they are associated with any environmental improvement on farms. In this paper, we use three approaches to analyse this issue. We examine whether measures of agricultural intensity are associated with the pursuit of OGAs by farmers and their spouses. We examine whether OGAs are more likely on farms where there is an ESA Management Agreement. Finally, we examine whether OGAs are associated with the farmer's stated environmental intentions. Although we tentatively conclude that there is a relationship between OGA involvement and these measures of environmental performance or concern by farmers, the magnitude of the association is small relative to other variables such as farm size, the type of land use, the form of business and recent agricultural training.

35. **Assessing sustainable land management (SLM).**
Hurni, H.
Agriculture, Ecosystems and Environment 81 (2): 83-92. (Oct. 2000)
NAL Call #: S601.A34; *ISSN:* 0167-8809 [AEENDO].
Notes: In the 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/ sustainability/ environmental degradation/ indicators/ evaluation/ measurement/ monitoring/ interdisciplinary research/ environmental impact/ natural resources/ information systems/ literature reviews
Abstract: The term 'sustainable development' and its component 'sustainable land management (SLM)' have been receiving increasing attention in development co-operation and at the global level. However, practical tools which can help local users and multi-disciplinary teams to work together and apply these general concepts at the local to regional levels have emerged only very recently. Some of these tools, as well as programme support services are presented in this paper. The author argues that only a comprehensive, participatory approach involving stakeholders at all levels will have the potential to develop locally useful solutions within a favourable, i.e. 'enabling' institutional environment. Assessment tools will require transdisciplinary methods that involve natural, social, and political sciences as well as local knowledge systems. Support services for SLM activities will have to include monitoring and impact assessment, experimentation with innovative ideas, resource assessment, information, and training. Examples from different parts of the globe have shown that the proposed tools are now receiving greater attention and may fulfill the requirements set forth by the concept of SLM.
This citation is from AGRICOLA.

36. **Assessing the retention potential of Conservation Reserve Program practices in Alabama.**
Onianwa, O. O.; Wheelock, G. C.; Dubois, M. R.; and Warren, S. T.
Southern Journal of Applied Forestry 23 (2): 83-87. (May 1999)
NAL Call #: SD1.S63; *ISSN:* 0148-4419 [SJAFD9]
Descriptors: nature conservation/ nature reserves/ land use/ agricultural land/ land banks/ surveys/ forests/ grasslands/ ethnicity/ erosion/ Alabama
Abstract: Conservation reserve program (CRP) participants in Alabama were surveyed to determine the probable utilization of CRP acres should the contracts expire without opportunity for renewal. From over 9000 contracts established between 1986 and 1995, 594 contracts were randomly selected and surveyed for the study. Two hundred and fourteen surveys were completed and returned. Of these, 204 (34%) were usable. Result indicate that 90% of CRP tree acres would be retained in trees while nearly 60% of CRP grass acres would be converted to row crop production. In addition, there are no significant differences in the response between the minority and white participants with regard to the intended use of CRP acres. Therefore, for sustained mitigation of soil loss and reduction of excess production capacity, tree planting as a conservation practice choice should be advocated and encouraged.
This citation is from AGRICOLA.

37. **Assessment of farmer attitudes and behavioral intentions toward bird conservation on organic and conventional Florida farms.**
Jacobson, Susan K; Sieving, Kathryn E; Jones, Gregory A; and Van Doorn, Annamamria
Conservation Biology 17 (2): 595-606. (2003)
NAL Call #: QH75.A1C5; *ISSN:* 0888-8892
Descriptors: bird (Aves)/ Animals/ Birds/ Chordates/ Nonhuman Vertebrates/ Vertebrates/ bird conservation: behavioral intentions, farmer attitudes
Abstract: To enhance efforts to conserve birds, especially insectivorous species, we examined the social dimensions of conventional and organic farming in northern Florida (U.S.A.). Using a framework for the adoption of agricultural innovations, we developed a 44-item survey instrument to measure farmers' socio-demographic background, farm characteristics, participation in social organizations, communication and information networks, and perceived barriers and incentives to adopting bird-friendly practices. Seventy-six surveys were completed, with a response rate of 84%for organic farmers and 60% for conventional farmers. The population of conventional farmer was composed of more males who were older, less educated, and earned a greater income than organic farmers. Conventional farms were on average 20 times larger than organic farms and grew less than half the varieties of crops. These two factors correlated with higher agreement with statements that a considerable amount of money is spent on pest management and that leaf-eating insects cause considerable damage. Fewer conventional than organic farmers scouted for pests daily, an important component of integrated pest management. Almost all farmers (95%) reported recognizing most of the bird species on their farms. More organic farmers (31%) than conventional farmers (12%) reported more than 30 bird species on their farms. Farmers' overall willingness to attract birds to their farms was not correlated with economic or noneconomic incentives and barriers to adopting bird-friendly practices, such as current costs of pest management, experience with bird damage to crops, and farmers' knowledge of insectivorous birds and birds on their farms. Innovations in current farming practices that could enhance bird populations should be disseminated through existing social networks and media channels identified in this paper.

38. **Assessment of the adoption of sustainable agriculture practices: Implications for agricultural education.**
Alonge, A. J. and Martin, R. A.
Journal of Agricultural Education 36 (3): 34-42. (1995)
NAL Call #: S530.A4; *ISSN:* 1042-0541
Descriptors: sustainability/ farmers' attitudes/ innovation adoption/ demography/ regression analysis/ farming systems/ profitability/ Iowa
This citation is from AGRICOLA.

39. **Attitudes toward joint forest planning among private landowners.**
Jacobson, M. G.; Abt, R. C.; and Carter, D. R.
Journal of Sustainable Forestry 11 (3): 95-112. (2000); *ISSN:* 1054-9811
This citation is provided courtesy of CAB International/CABI Publishing.

40. **Awareness of operation future among landowner-operators in the Darby Creek watershed of Ohio.**
Napier, T. L. and Johnson, E. J.
Journal of Soil and Water Conservation 53 (4): 353-357. (1998)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561 [JSWCA3]
Descriptors: soil conservation/ water conservation/ watersheds/ agricultural land/ voluntary services/ programs/ program effectiveness/ diffusion of information/ social participation/ farmers' attitudes/ regional surveys/ Ohio
This citation is from AGRICOLA.

41. **Biological integrity versus biological diversity as policy directives.**
Angermeier, P. L. and Karr, J. R.
Bioscience 44: 690-697. (1994)
NAL Call #: 500 Am322A
Descriptors: Supporting Science
Abstract: Examined the ideas of biological integrity and diversity as they pertained to human-generated landscapes, such as agriculture, and discussed the need for effective policy to create a complete conservation protection plan.

42. **Blending "hard" and "soft" science: The "follow-the-technology" approach to catalyzing and evaluating technology change.**
Douthwaite, Boru; de, Haan Nicoline C; Manyong, Victor; and Keatinge, Dyno
Conservation Ecology 5 (2): 13. (2002)
NAL Call #: QH75.A1C67; *ISSN:* 1195-5449
Descriptors: plant (Plantae): crop/ Plants/ Darwinian evolution/ conceptual models/ follow the technology approach [FTT approach]/ hard science/ integrated natural resource management [INRM]/ learning selection/ natural resource management technologies [NRM technologies]/ natural selection/ novelty generation/ plant breeding/ plausible promise/ promulgation/ rural technology/ social adaptation / social negotiation/ soft science/ stakeholders/ technology change: catalyzation, evaluation
Abstract: The types of technology change catalyzed by research interventions in integrated natural resource management (INRM) are likely to require

much more social negotiation and adaptation than are changes related to plant breeding, the dominant discipline within the system of the Consultative Group on International Agricultural Research (CGIAR). Conceptual models for developing and delivering high-yielding varieties have proven inadequate for delivering natural resource management (NRM) technologies that are adopted in farmers' fields. Successful INRM requires tools and approaches that can blend the technical with the social, so that people from different disciplines and social backgrounds can effectively work and communicate with each other. This paper develops the "follow-the-technology" (FTT) approach to catalyzing, managing, and evaluating rural technology change as a framework that both "hard" and "soft" scientists can work with. To deal with complexity, INRM needs ways of working that are adaptive and flexible. The FTT approach uses technology as the entry point into a complex situation to determine what is important. In this way, it narrows the research arena to achievable boundaries. The methodology can also be used to catalyze technology change, both within and outside agriculture. The FTT approach can make it possible to channel the innovative potential of local people that is necessary in INRM to "scale up" from the pilot site to the landscape. The FTT approach is built on an analogy between technology change and Darwinian evolution, specifically between "learning selection" and natural selection. In learning selection, stakeholders experiment with a new technology and carry out the evolutionary roles of novelty generation, selection, and promulgation. The motivation to participate is a "plausible promise" made by the R&D team to solve a real farming problem. Case studies are presented from a spectrum of technologies to show that repeated learning selection cycles can result in an improvement in the performance of the plausible promise through adaptation and a sense of ownership by the stakeholders.

43. **Bridging the gap between private landowners and conservationists.**
James, S. M.
Conservation Biology 16 (1): 269-271. (2002)
NAL Call #: QH75.A1C5; *ISSN:* 0888-8892

44. **Broadening the basis for enhancing biodiversity: A farmer's perspective.**
Milne, Bruce
In: People and nature conservation: Perspectives on private land use and endangered species recovery/ Bennett, A.; Backhouse, G.; and Clark, T. Mosman, New South Wales, Australia: Royal Zoological Society of New South Wales, 1995; pp. 204-208.
Notes: ISBN: 0646245074; Conference: Australasian Wildlife Management Society Annual Meeting, Melbourne, Victoria, Australia, December 1993
Descriptors: human (Hominidae)/ animals/ chordates/ humans/ mammals/ primates/ vertebrates/ attitude/ biodiversity decline/ education/ ethics/ land degradation/ soil erosion/ water pollution/ Behavior / Conservation / Education / Human Ecology (Anthropology)/ Philosophy and Ethics/ Pollution Assessment Control and Management/ Soil Science

45. **Building forest wealth: Incentives for biodiversity, landowner profitability, and value added manufacturing.**
Johnson, Kirk. and University of Washington. Northwest Policy Center. Washington Forestry Working Group.
Seattle, Wash.: The Center; 44 p.: ill. (1995)
Notes: "January 1995." Includes bibliographical references (p. 42-43).
NAL Call #: SD413.W2J64--1995
Descriptors: Forest conservation---Economic aspects---Washington State/ Forest landowners---Washington State/ Forest policy---Washington State

46. **A case study for adopting the nitrate chloride technique to improve irrigation and nitrogen practices in farmers' fields.**
Al Jamal, M. S.; Sammis, T. W.; and Ball, S. T.
Applied Engineering in Agriculture 17 (5): 601-610. (Sept. 2001)
NAL Call #: S671.A66; *ISSN:* 0883-8542
Descriptors: chloride/ tracers/ irrigation water/ infiltration/ furrow irrigation/ irrigation/ water use efficiency/ nitrate nitrogen/ leaching/ pollution control/ groundwater pollution/ innovation adoption/ resistance to change/ technology transfer/ crop management/ crop yield/ lactuca sativa/ capsicum annuum/ field crops/ horticultural crops/ farmers' attitudes/ New Mexico/ best management practices/ irrigation efficiency/ deficit irrigation
Abstract: Groundwater contamination caused by nitrate-nitrogen (NO3(-)-N) leaching through soils is becoming a serious problem in the irrigated Mesilla Valley of southern New Mexico. The greatest groundwater contamination probably results from large amounts of nitrogen fertilizer being applied to shallow-rooted, high-value vegetable crops (i.e., onion, lettuce, and chile). The main objective of the study was to demonstrate to farmers that a chloride tracer could be used to determine the irrigation and nitrogen-use efficiency of their management system and how decreasing nitrogen (N) inputs will affect

profitability. Five farmers (representing 60% of the farmers that are the technology diffusion leaders in the county) were chosen as innovative farmers who would transfer the technology to others. The average estimated irrigation efficiencies obtained from the farmers' fields were high, ranging from 87 to 97%. These unexpectedly high irrigation efficiencies under furrow irrigation were a result of the farmers practicing deficit irrigation due to limited water resources. However, deficit irrigation resulted in yields below maximum yield (considered to be near the average county yield). The amount of NO3(-)-N leached ranged from 9 kg/ha under fall lettuce to 152 kg/ha under chile. The 152 kg/ha obtained from the chile fields had a calculated average N application efficiency of 57%, resulting in an average NO3(-)-N concentration greater than the maximum contamination level allowed for drinking water of 10 mg/L. Although the NO3(-)-N leached below farmers' fields was high, the farmers did not think it was their responsibility to change management practices unless their profits would increase. Farmers rejected the adoption of the technology because they felt the costs outweighed the benefits. Consequently, transfer of this technology to the farmers failed. The farmers indicated that they would adopt the technology only if forced to by a regulatory agency.
This citation is from AGRICOLA.

47. **A Case Study of Changing Land Use Practices in the Northern Great Plains, U.S.A.: An Uncertain Future for Waterbird Conservation.**
Higgins, K. F.; Naugle, D. E.; and Forman, K. J.
Waterbirds 25 (2 [supplement]): 42-50. (2002); *ISSN:* 1524-4695.
Notes: Managing Wetlands for Waterbirds: Integrated Approaches.
Descriptors: Land use / Habitat changes/ Agricultural practices/ Conservation/ Wildlife management/ Aquatic birds/ Habitat/ Breeding sites/ Wetlands/ Agriculture/ Nature conservation/ Ecosystem management/ Environmental protection/ Aves/ United States, Great Plains/ Birds/ mixed grass prairies/ Conservation/ Conservation, wildlife management and recreation/ Reproduction and development
Abstract: Wetland and grassland habitats of the northern Great Plains are a primary breeding ground for waterbirds in North America. Native mixed grass prairies that were historically used for cattle grazing have met with changing social and economic pressures that put the remaining 40% of this resource at high risk of tillage. In this paper, we describe the current state of our waning rural societies, characterize impacts of land use change on waterbird habitats, and discuss conservation actions to benefit waterbirds. Recent population statistics indicate that a record number of farmers facing low commodity prices are selling their farms and moving to urban centers for employment. Other farmers are shifting from diversified agriculture to monoculture grain farming to take advantage of farm programs that provide incentives to bring marginal land into production. Additional data indicate that concurrent changes in crop types have decreased quality of farmland wildlife habitat while bigger and faster farm equipment and genetically modified crops continue to make farming marginal land less risky. Legislators and administrators should be advised that waterbird habitat loss continues to expand westward. The last chance to sustain the unique grassland-wetland character of the northern Great Plains is to accelerate grassland conservation with short- and long-term stewardship programs and incentives to family ranchers. This philosophy is of vital importance because it also protects wetland habitats that otherwise are vulnerable to drainage when native prairie is converted to cropland. Lastly, and perhaps most importantly, this would conserve our prairie heritage for future generations while preserving the private property rights of landowners.

48. **The Central Valley Water Project Improvement Act and water markets: Water markets, individual incentives, and environmental goals.**
Howitt, R.
Choices 9 (1): 10-13. (1994)
NAL Call #: HD1751.C45; *ISSN:* 0886-5558.
Notes: Comment by B.D. Gardner and J.E. Warner, p. 4-9. Includes references.
Descriptors: water policy/ environmental legislation/ trade/ externalities/ incentives/ water costs/ marketing/ objectives/ California
This citation is from AGRICOLA.

49. **The change to conservation: Moving farmers toward new production practices.**
Caswell, M.
Agricultural Outlook (AO) (No. 281): 32-34. (2001)
NAL Call #: aHD1751.A422
This citation is provided courtesy of CAB International/CABI Publishing.

50. **The choice of tillage, rotation, and soil testing practices: Economic and environmental implications.**
Wu, J. J. and Babcock, B. A.
American Journal of Agricultural Economics 80 (3): 494-511. (Aug. 1998)
NAL Call #: 280.8-J822; *ISSN:* 0002-9092 [AJAEBA]
Descriptors: farm management/ innovation adoption/ decision making/ agricultural land/ environmental impact/ economic impact/ nitrogen fertilizers/ application rates/ conservation/ erosion/

tillage/ rotations/ agricultural regions/ crop management/ soil testing/ probabilistic models/ Nebraska/ polychotomous choice selectivity model
Abstract: Farmers' management practices can have a significant effect on agricultural pollution. Past research has analyzed factors influencing adoption of a single management practice. But often adoption decisions about many practices are made simultaneously, which suggests use of a polychotomous-choice model to analyze decisions. Such a model is applied to the choice of alternative management practices on cropland in the Central Nebraska Basin and controlled for self-selection and the interaction between alternative practices. The results of the choice model are used to estimate the economic and environmental effects of adopting alternative combinations of management practices. This citation is from AGRICOLA.

51. **Combining actual and contingent behavior data to model farmer adoption of water quality protection practices.**
Cooper, J. C.
Journal of Agricultural and Resource Economics 22 (1): 30-43. (1997)
NAL Call #: HD1750.W4; *ISSN:* 0162-1912
This citation is provided courtesy of CAB International/CABI Publishing.

52. **Combining spatial and survey data to explain participation in agricultural land preservation programs.**
Lynch, L. and Lovell, S. J.
Land Economics 79 (2): 259-276. (2003)
NAL Call #: 282.8-J82; *ISSN:* 0023-7639
This citation is provided courtesy of CAB International/CABI Publishing.

53. **A common vision: Evaluating the farming industry's progress toward sustainability.**
Forney, D. R.
Reviews in Toxicology 2 (1-4): 303-314. (1998); *ISSN:* 1382-6980.
Notes: Conference: Pesticides and the Future: Minimizing Exposure of Humans and the Environment, Kisarazu (Japan), 26-30 May 1997; Publisher: IOS Press, Van Diemenstraat 94 Amsterdam 1013 CN The Netherlands
Descriptors: Environmental protection/ Environmental impact/ Agricultural pollution/ Agriculture/ Nature conservation/ Pollution control/ Resource conservation/ Sociological aspects/ Economics/ Sustainable agriculture/ Agrochemicals/ Agricultural practices/ Pollution/ Sustainable development/ Resource management/ Research programs/ Environment management/ United States, Maryland/ United States, Maryland, Chestertown, Chesapeake Farms/ sustainable farming/ Chesapeake Farms/ Prevention and control/ Environmental impact/ Environmental action/ Protective measures and control
Abstract: The Sustainable Agriculture Project at Chesapeake Farms is a study of what is working in farming today - technologies and practices born on both industrial and sustainable farms to help ensure the industry's success. Many were created in response to the negative impacts of industrial agriculture, paving the way for social pressure and regulation to reshape the way farming is done. There is an increased demand for the protection of natural resources, safe food and water, and a commitment to social issues. Sustainable agriculture addresses these demands by considering its impact in the context of human, ecological, and economic parameters. While sustainable agriculture is not yet mainstream, a common vision for sustainability is moving the industry as a whole in the right direction. This paper illustrates how the Sustainable Agriculture Project at Chesapeake Farms contributes to our knowledge and understanding of sustainability so that we can effectively evaluate the industry's progress.

54. **Communication and adoption evaluation of USDA water quality demonstration projects: Evaluation report.**
Nowak, Peter J. and United States. Cooperative State Research, Education and Extension Service. Washiington, D.C.: Plant and Animal Science Production, Protection, and Processing, CSREES/USDA; iv, 43 p.: ill. (1 col.), col. map. (1997)
Notes: Cover title. "Both funding and technical support were provided by USDA's Cooperative State Research, Education, and Extension Service" ... [et al.]--P. ii. "October 22, 1997"--T.p. Includes bibliographical references (p. 42-43).
NAL Call #: aTD223.C662--1997
Descriptors: Water quality management---United States/ Farmers---United States---Attitudes
This citation is from AGRICOLA.

55. **Communication and adoption evaluation of USDA water quality demonstration projects: Executive summary.**
Nowak, Peter J.; United States. Extension Service; United States. Natural Resources Conservation Service; and United States. Farm Service Agency. Washington, D.C.: Plant and Animal Science Production, Protection, and Processing, CSREES/USDA; 5 p. (1997)
Notes: Cover title. "The projects have been jointly conducted by Cooperative Extension, the Natural Resources Conservation Service, and the Farm Service Agency"--P. 2. "October 22, 1997"--P. [1].
NAL Call #: aTD223.C66--1997
http://www.nal.usda.gov/wqic/wgwq/demoeval1.html

Descriptors: Water quality management---United States/ Farmers---United States Attitudes
This citation is from AGRICOLA.

56. **Comparative differences in Ontario farmers' environmental attitudes.**
Filson, Glen C
*Journal of Agricultural and Environmental Ethics 6 (2): 165-184. (*1993)
NAL Call #: BJ52.5 .J68
Descriptors: agricultural sustainability/ conservation/ education/ statistics

57. **Comparison of perceptions and implementation of Integrated Pest Management (IPM) between IPM and conventional farmers of greenhouse vegetables in northern Greece.**
Papadaki, Klavdianou Afroditi; Tsakiridou, Efthimi; and Giasemi, Evangeli
Environmental Conservation 27 (1): 36-42. (2000)
NAL Call #: QH540.E55; *ISSN:* 0376-8929
Descriptors: human (Hominidae): farmer/ vegetable crops (Angiospermae)/ Angiosperms/ Animals/ Chordates/ Humans/ Mammals/ Plants/ Primates/ Spermatophytes/ Vascular Plants/ Vertebrates/ Common Agricultural Policy [CAP]/ advisory support/ environmental attitudes/ greenhouses/ integrated pest management [IPM]: implementation, perceptions/ technical support
Abstract: Reform of the European Union's Common Agricultural Policy (CAP), especially through Regulation 2078/92, provided a dual role for farmers as food producers and stewards of the environment and the countryside. Implementation of integrated pest management (IPM) in greenhouse enterprises in Greece is a part of this effort. In this study, the effectiveness of the adoption and implementation of IPM practices in greenhouse vegetable cultivation in Central Macedonia (Greece) was assessed. Eighty-six farmers enrolled in an IPM programme and 28 conventional greenhouse farmers were selected and interviewed in 1997, using a questionnaire designed to assess their behaviour in the greenhouse and examine their attitudes towards the environment. Wide adoption of IPM was found still to face many hindrances, mainly due to the lack of appropriate technical and advisory support by the agricultural local services, and farmers' low level of knowledge of IPM. Comparisons between IPM and conventional farmers revealed that: (1) the two groups' behaviour did not differ significantly in greenhouse production practices, but (2) IPM farmers were more aware of the new environmental dimension of the CAP, and (3) they expressed more concern about the negative effects of modern agriculture on nature, than conventional farmers.

58. **Conservation Reserve Program: Cost-effectiveness is uncertain: Report to the Chairman, Subcommittee on Agriculture, Rural Development, Food and Drug Administration, and Related Agencies, Committee on Appropriations, House of Representatives.**
United States, General Accounting Office and United States, Congress House Committee on Appropriations Subcommittee on Agriculture Rural Development Food and Drug Administration and Related Agencies
Washington, D.C.: General Accounting Office; 14 p. (1993)
Notes: Cover title. "March 1993." "GAO/RCED-93-132." "B-252621"--P. 1. Includes bibliographical references. SUDOCS: GA 1.13:RCED-93-132.
NAL Call #: S604.6.U55--1993
http://archive.gao.gov/d44t15/148906.pdf
Descriptors: Conservation Reserve Program---United States/ Cost effectiveness/ Agricultural conservation---United States
This citation is from AGRICOLA.

59. **Conservation tillage and input use.**
Uri, N D
Environmental Geology 29 (3-4): 188-201. (1997)
NAL Call #: QE1.E5; *ISSN:* 0943-0105
Descriptors: agriculture/ conservation/ mathematical model/ pesticide use/ soil science/ tillage
Abstract: There continues to be a question as to the overall effectiveness of conservation tillage practices in reducing the impact of agricultural production on the environment. While it is generally recognized that water runoff and soil erosion will decline further, as tillage and mulch tillage systems are not used more extensively on cropland, what will happen to pesticide and fertilizer use remains uncertain. To gain some insight into this, the conservation tillage adoption decision is modelled. On the assumption that the decision to adopt conservation tillage is a two-step procedure, the first decision is whether or not to adopt a conservation tillage production system and the second concerns the extent to which conservation tillage should be used - appropriate models of the Cragg and Heckman (dominance) type are estimated. Based on farm-level data on corn production in the United States for 1987, the profile of a farm on which conservation tillage was adopted is that the cropland had above-average slope and experienced above-average rainfall, the farm was a cash grain enterprise, and it had an above-average expenditure on pesticides and a below-average expenditure on fuel and custom pesticide applications. Additionally, for a farm adopting a no-tillage production practice, an above-average expenditure was made on fertilizer.

60. **Conservation tillage in US agriculture.**
Uri, N D
Environmental Technology 19 (10): 1017-1027. (1998)
NAL Call #: TD1.E59; *ISSN:* 0959-3330
Descriptors: agricultural production/ climate/ conservation tillage/ environmental impact/ policy factors/ resource management/ soil erosion/ soil type
Abstract: Conservation tillage was used on nearly 36% of planted hectares in 1996 in the United States. This level has remained relatively unchanged since 1993. The use of conservation tillage varies by crop and is dependent on site-specific factors including soil type, topsoil depth and local climatic conditions. A number of economic, demographic, geographic and policy factors have affected the adoption of conservation tillage. While it is not possible to quantify exactly the impact of these factors, it is clear that management complexities and profitability are key factors impeding the further adoption of conservation tillage.
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61. **Conservation tillage research and extension education in California.**
Mitchell, J P; Miyao, E M; McGiffen, M; and Cahn, M D
HortScience 36 (3): 472. (2001)
NAL Call #: SB1.H6; *ISSN:* 0018-5345.
Notes: Conference: 98th Annual International Conference of the American Society for Horticultural Science, Sacramento, California, USA, July 21-25, 2001
Descriptors: Education/ Soil Science/ California/ United States / North America/ Nearctic region/ conservation tillage/ research/ tillage method
Abstract: Despite a 300% increase in conservation tillage (CT) acreage in the Midwest during the last decade, less than 0.5% of row crop acreage in California is currently farmed with CT practices (CT Information Center, 2000). Primary reasons why CT approaches have not been more widely adopted in California include lack of experience and information related to CT, limited locally-available CT equipment, concerns about irrigation management in surface residues, and the fact that planting bed dimensions typically change from one rotation crop to the next. Despite these concerns, however, there has been a well-documented increase not only in interest in CT, but also in terms of CT research and demonstration activities during the last five years throughout California. Whereas in 1996 there was one CT research/demonstration site in the state, there were upwards of twenty in 2000. The Univ. of California's Division of Agriculture and Natural Resources Conservation Tillage Workgroup has been involved in many of these research and extension education efforts and during the last five years has increased the number of its members and affiliates from three to over 60 in 2000. Primary incentives for evaluating CT options in California include cutting production costs, improving soil quality, managing weed with surface residues, and minimizing soil compaction. The extent to which these goals might be realized in California's highly productive and intensive row crop production valleys is the subject of considerable ongoing research and innovation.
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62. **Constraints to the adoption of innovations in agricultural research and environmental management: A review.**
Guerin, L J and Guerin, T F
*Australian Journal of Experimental Agriculture 34 (4): 549-571. (*1994)
NAL Call #: 23-Au792; *ISSN:* 0816-1089
Descriptors: agriculture/ cost/ technology
Abstract: There are several constraints to the adoption of technologies and innovations by Australian farmers. Here an attempt has been made to define the major constraints to adoption. These are identified as: the extent to which the farmer finds the new technology complex and difficult to comprehend; how readily observable the outcomes of an adoption are; its financial cost; the farmer's beliefs and opinions towards the technology; the farmees level of motivation; the farmer's perception of the relevance of the new technology; and the farmer's attitudes towards risk and change. The classical adoption-diffusion model and subsequent modifications are discussed. In particular, issues relating to the participatory action research (PAR) approach are raised and discussed. In addition, methodologies in extension research are briefly discussed and the roles of extension personnel and agricultural scientists in the technology adoption process are examined. The adoption of innovations in natural resource management is discussed and the findings indicate that this is an area of agriculture in which extension practice and research will play an increasingly important role in the future. Recommendations for further research into adoption of technological innovations in resource management and agriculture are made.
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63. **Constructing a nitrogen fertilizer recommendation system using a dynamic model: What do farmers want?**
Smith, J. U.; Dailey, A. G.; Glendining, M. J.; Bradbury, N. J.; Addiscott, T. M.; Smith, P.; Bide, A.; Boothroyd, D.; Brown, E.; Cartwright, R.; Chorley, R.; Cook, S.; Cousins, S.; Draper, S.; Dunn, M.; Fisher, A.; Griffith, P.; Hayes, C.; Lock, A.; Lord, S.; Mackay, J.; Malone, C.; Mitchell, D.; Nettleton, D.; Nicholls, D.; and Overman, H.
Soil Use and Management 13 (4): 225-228. (1997)

NAL Call #: S590.S68; *ISSN:* 0266-0032
This citation is provided courtesy of CAB International/CABI Publishing.

64. **Contract holders' preferences for the 1995 Food Security Act.**
Fox, L.; Meyer, N.; and Greear, J.
Bulletin - Idaho Agricultural Experiment Station 773: 39. (1995)
NAL Call #: 100-Id14; *ISSN:* 0441-9855.
Notes: In the subseries: Idaho Conservation Reserve Program. Includes references.
Descriptors: conservation areas/ federal programs/ program participants/ landowners/ demography/ regional surveys/ attitudes/ land use/ statistical data/ microeconomics/ Idaho/ United States
This citation is from AGRICOLA.

65. **The contribution of scenic beauty indicators in estimating environmental welfare measures: A case study.**
Fanariotu, I. and Skuras, D.
Social Indicators Research 65 (2): 145-165. (2004); *ISSN:* 0303-8300.
Notes: Number of References: 40
Publisher: Kluwer Academic Publ
Descriptors: Sociology & Anthropology/ contingent valuation/ forest fires/ forest landscape/ landscape conservation/ scenic beauty estimates/ choice contingent valuation/ confidence intervals/ information/ preferences/ landscape/ impacts/ stands/ tests
Abstract: Aesthetic indicators of landscapes, expressed as individual scenic beauty estimates, may be used as proxies of individuals' specific aesthetic values, and improve the properties of welfare estimates produced by contingent valuation models. This work presents results from an interdisciplinary study where forest scenic beauty indicators are utilized in an economic valuation study approximating welfare estimates from increased forest fire protection. The omission of scenic beauty indicators from the economic valuation of environmental resources produces biased and overestimated welfare measures. Combining economic and environmental indicators significantly improves the explanatory power of economic valuation models and of the produced welfare measures. Such a combination, however, is only possible when carried out by interdisciplinary research teams. The results of such research are significant to environmental and natural resource policy makers and planners.

66. **Control of Nonpoint Source Pollution Through Voluntary Incentive-Based Policies: An Application to Nitrate Contamination in New York.**
Peterson, J. M. and Boisvert, R. N.
Agricultural and Resource Economics Review 30 (2): 127-138. (2001)
NAL Call #: HD1773.A2N6; *ISSN:* 1068-2805
Descriptors: Government policies/ Environmental economics/ Agricultural runoff/ Land use/ Pollution control/ Environmental quality/ Nonpoint pollution/ Nitrates/ Environmental Policy/ Nonpoint Pollution Sources/ Water Pollution Control/ Corn/ Farms/ United States, New York/ Environmental action/ Water quality control
Abstract: A voluntary program is developed to achieve environmental goals through the self-interested choices of farmers under environmental risk and asymmetric information. Farmers behave to maximize expected net returns, and environmental quality standards are formulated through chance constraints. Because the government may not know each farmer's soil type, policy options must be self-selecting. The model is applied empirically to nitrate leaching and runoff from corn production in three New York regions. Asymmetric information between producers and the government would impose additional cost burdens on society, but these costs are modest in the context of other farm programs.

67. **Controversy over CRP in Montana: Implications for the future.**
Saltiel, J.
Journal of Soil and Water Conservation 49 (3): 284-288. (May 1994-June 1994)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561 [JSWCA3]
Descriptors: soil conservation/ federal programs/ participation/ farmers' attitudes/ opinions/ regional surveys/ Montana/ Conservation Reserve Program
This citation is from AGRICOLA.

68. **Correlates of plant nutrient use among Ohio farmers: Implications for water quality initiatives.**
Napier TL and Sommers DG
Journal of Rural Studies 10 (2): 159-171; 34 ref. (1994)
NAL Call #: HT401.J68
This citation is provided courtesy of CAB International/CABI Publishing.

69. **Cost-effectiveness of conservation and nutrient management practices in Pennsylvania.**
Epp, D. J. and Hamlett, J. M.
Journal of Soil and Water Conservation 51 (6): 486-494. (1996)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
Descriptors: River basins/ agricultural practices/ cost analysis/ nutrients/ agricultural runoff/ sediment

erosion/ conservation/ environmental policy/ water pollution control/ economics/ pollution control/ Pennsylvania/ Susquehanna River/ Water quality control/ Freshwater pollution/ Prevention and control/ Management/ United States
Abstract: We evaluated changes in field costs and revenues with each of seven conservation best management practices (BMP) and two nutrient management programs (NMP) for three sites in the Susquehanna River Basin in Pennsylvania. Field layouts, rotation selection, BMP design, and CREAMS modeling of sediment and nutrient losses are reported elsewhere. BMP implementation costs, field operation costs, and crop revenues were calculated with each BMP as well as the baseline condition representing present practices. The present value of net field revenue over a 10-year period for each BMP/NMP combination is compared to that of the baseline. The BMP/NMP combinations are compared for cost-effectiveness in reducing sediment, nitrogen, and phosphorus losses. Nonstructural BMPs (no-till, contour, contour with waterways, strip crop with waterways, filter strips) produced less reduction in net field income than did structural BMPs (terraces with waterways, parallel tile outlet terraces, sediment basins). In some instances nonstructural BMPs increased net field income relative to the baseline even without including cost sharing. When combined with the improved NMP (improved manure storage and nutrient application matched to crop needs), nonstructural BMPs produced higher net field incomes than did structural BMPs. The most cost-effective BMP /NMP combinations were no-till, filter strip, and strip crop with waterways. At one of the sites, the most cost-effective combination included the improved NMP. At the other two sites, a BMP without improved NMP was more cost-effective.

70. **Cost-share incentives and best management practices in a pilot water quality program.**
Houston, J. E. and Sun, H.
Journal of Agricultural and Resource Economics 24 (1): 239-252. (July 1999)
NAL Call #: HD1750.W4; *ISSN:* 1068-5502
Descriptors: farm management/ simulation/ incentives/ pollution/ crop yield/ returns/ uncertainty/ weather/ markets/ water quality/ program evaluation/ crop production/ innovation adoption/ watersheds/ coastal plains/ nitrogen fertilizers/ risk/ equations/ Georgia/ Gum Creek Watershed
This citation is from AGRICOLA.

71. **Cover-cropping practices of vegetable producers in western New York.**
Stivers Young, L. J. and Tucker, F. A.
HortTechnology 9 (3): 459-465. (July 1999-Sept. 1999)
NAL Call #: SB317.5.H68; *ISSN:* 1063-0198
Descriptors: vegetables/ farms/ cover crops/ surveys/ farmers' attitudes/ information needs/ extension/ technology transfer/ farm size/ erosion control/ soil organic matter/ harvesting/ tillage/ New York
Abstract: Surveys of vegetable growers in a six-county region in western New York were conducted in 1997 to determine which cover cropping practices were being used on commercial vegetable operations; to identify producers' needs for further research and information, and to assess the impact of cooperative extension programs in this area. In a broad survey, 118 responses were returned out of 315 surveys sent (37%). Respondents represented > 37,000 acres (14974 ha) of vegetable production, or approximately equal to 53% of the vegetable acreage in the region. Vegetable acreage per operation ranged from 1 to 4000 acres (0.4 to 1619 ha). Sixty-nine percent responded that they grew cover crops on a total of 15,426 acres (6243 ha). Oats (Avena sativa L.), rye (Secale cereale), clover (Trifolium pratense), and wheat (Triticum vulgare) were the most commonly used cover crops. Seventy-six percent of the reported cover-cropped acres were planted to small grains, and 19% to legumes, almost entirely clovers. In open ended questions, the most important benefits of cover cropping identified by respondents were erosion control (46% of respondents) and organic matter additions (42%). The most important problems associated with cover crops were that they interfere with spring field work or fall harvest (26%), and that they are difficult to incorporate or plow under (24%). A targeted survey of nineteen onion (Allium cepa L.) producers in the same region measured the recent adoption of sudangrass (Sorghum sudanense Piper) and sorghum-sudan hybrid (Sorghum bicolor L. x S. sudanense) cover crops, the focus of the several years of extension research and educational programs. Nine of the onion producers had adopted the practice, and six of these had done so since the beginning of these extension programs. The implications of these results for research and extension are discussed.
This citation is from AGRICOLA.

72. **The CRP Decision Process.**
Amosson, S. H.; Smith, J.; Outlaw, J.; and Smith, E. G.
College Station, TX: Texas Agricultural Extension Service, 1997.
http://agecoext.tamu.edu/commodity/crp/three/crpsteva.pdf
Descriptors: Conservation Reserve Program/ State conservation programs/ Texas
Abstract: Outlined the decision process a landowner must making in deciding to enroll or re-enroll land in CRP.

73. **Cultural evolution and water management in the Salinas River Valley.**
Thompson, J. G. and Reynolds, R.
Journal of the American Water Resources Association 38 (6): 1661-1677. (2002)
NAL Call #: GB651.W315; *ISSN:* 1093-474X
Descriptors: United States, California, Salinas River/ Water Management/ Case Studies/ Planning/ Social Change/ Groundwater Irrigation/ Saline Water Intrusion/ Institutional Constraints/ Groundwater/ Irrigation/ Case study/ River valleys/ River basin management/ Water resources/ Resource management/ Water use/ Agriculture/ Irrigation water/ Water supply/ Environmental effects/ Saline intrusion/ Sociological aspects/ Regional planning/ Policies/ Environmental legislation/ River basins / Irrigation/ Economics/ Historical account/ Sociology/ environmental policy/ United States, California, Salinas River/ United States, California, Salinas River Valley/ Groundwater management/ Water Resources and Supplies/ Conservation, wildlife management and recreation/ Environmental action/ Water & Wastewater Treatment/ Evaluation process
Abstract: This article reports the findings of a case study of a major California water management district's effort to change its management approach. The following key findings and factors have influenced the Salinas basin management plan (BMP) and its progress: (1) the Salinas Valley is an economy dominated by highly sophisticated irrigated agriculture dependent on ground water; (2) a persistent pattern of agricultural overdraft of ground water has hurt growers primarily in the north end of the valley via induced saline intrusion of irrigation wells; (3) a complex set of water institutions, property and water rights, and land lease practices offer little incentive for good stewardship of land and water; and (4) the BMP approach initially may have intensified tension among growers and between growers and other water user groups. Water rules and practices in the Salinas Valley and Monterey County have evolved through a long historical process of adaptations. Therefore, any significant changes in local water use practices need to be understood in terms of cultural change, that is, changes in deeply held values, beliefs, and assumptions. We believe the BMP and the MCWRA are succeeding when evaluated from this evolutionary perspective. The fact that both still exist relatively intact testifies that they are working, albeit slowly.

74. **The dairy dilemma: A decision case for water quality.**
Miller, B. E.; Farrell Poe, K. L.; and Egelund, J.
Journal of Natural Resources and Life Sciences Education 27: 42-48. (1998)
NAL Call #: S530.J6; *ISSN:* 1059-9053 [JRLEEJ]
Descriptors: cattle/ water pollution/ farm management/ waste disposal/ dairy farming/ case studies/ water quality/ regulations/ decision making/ animals/ Utah/ bacterial pollution/ waste management
Abstract: This decision case study involves a dairy (Box taurus) operation that contributed bacterial pollution to a nearby water-way in northern Utah. Students must use whole-farm management and waste management design criteria in the decision process. A solution requires balancing the current crop and livestock management philosophies of the owners with water quality standards mandated by the state. The method has been used successfully in three courses. Chet and Todd Benson are currently operating a dairy in Wellsville, UT, which has been found to be a major contributor of water pollution in the Little Bear River. The state of Utah and the USEPA have hoped that an educational effort will allow for voluntary measures to mitigate the pollutants leaving the dairy. To date, the Utah Department of Environmental Quality (DEQ) has issued few citations in the state and are hoping to continue on a voluntary compliance basis. The primary operator of the dairy, Todd, must decide what course of action to take related to their family dairy operation. It is a delicate issue because his father, Chet, feels that the state is meddling into their business. Todd must also take into account the future of the dairy because the voluntary compliance program has some attractive incentives to encourage participation, namely, cost-sharing for improvements. If they choose not to participate, it is likely that they will be ineligible for future USDA cost-sharing arrangements. The Key issues in the case involve voluntary vs. involuntary participation in government programs, water quality, and implications to agricultural operations, dairy waste management, and Western water rights.
This citation is from AGRICOLA.

75. **Dairy manure and plant nutrient management issues affecting water quality and the dairy industry.**
Lanyon, L. E.
Journal of Dairy Science 77 (7): 1999-2007. (July 1994)
NAL Call #: 44.8-J822; *ISSN:* 0022-0302 [JDSCAE]
Descriptors: cattle manure/ water pollution/ pollution control/ dairy farms/ cattle feeding/ production costs/ environmental policy/ United States
Abstract: Specific requirements for dairy manure management to protect water quality from nutrient pollution depend on the organization of individual farms. Further, the management requirements and options are different for point (farmstead) and nonpoint (field-applied) sources of pollution from farms. A formal management process can guide decisions about existing crop nutrient utilization

potential, provide a framework for tracking nutrients supplied to crops, and identify future requirements for dairy manure management to protect water quality. Farm managers can use the process to plan daily activities, to assess annual nutrient management performance, and to chart future requirements as herd size increases. Agronomic measures of nutrient balance and tracking of inputs and outputs for various farm management units can provide the quantitative basis for management to allocate better manure to fields, to modify dairy rations, or to develop alternatives to on-farm manure application. Changes in agricultural production since World War II have contributed to a shift from land-based dairy production to a reliance on capital factors of production supplied by the dairy industry. Meanwhile, management of dairy manure to meet increasingly stringent water quality protection requirements is still a land-based activity. Involving the dairy industry and off-farm stakeholders as participants in the management process for field, farm, and regional dairy production can be the basis for decision-making to reconcile the sometimes conflicting demands of production and water quality protection.
This citation is from AGRICOLA.

76. **Data and Information About Natural Resources on Agricultural Land: No Rules, Just Rights.**
Zinn, J. A.; Congressional Research Service (CRS). National Arbor Day Foundation (NADF) [Also available as: Privacy and Natural Resources Workshop White Paper; 1998], 2000 (text/html) http://www.arborday.org/programs/papers/PrivacyWpaper.html
Descriptors: databases/ data collection/ information technology/ legal rights/ natural resource policy / agricultural policy/ landowners/ private lands/ laws and regulations
Abstract: The National Arbor Day Foundation (NADF), supported by the Natural Resources Conservation Service (NRCS), convened a diverse group of about 60 invited participants - landowners as well as representatives of agribusiness, interest groups, and government agencies - to discuss evolving relationships between the rapidly increasing volume of valuable natural resource data and information in agriculture and growing concerns about confidentiality. Farmers, ranchers, and other landowners often characterize these relationships as a debate between public access to data and information that could be used to regulate their production activities and the protection of personal privacy, but the relationships are far more complicated, as this workshop demonstrated. Participants shared their knowledge about the laws and rules that govern disclosure and confidentiality, about recent changes in data collection and information technology, and about their expectations regarding the rate and nature of change in the future. They identified possible responses and solutions during discussion periods. Some of the themes that emerged during the workshop had to do with the growing value of data, the increased interest by private industry in this value, the need to create a climate of trust among agricultural producers, the need for better communication and new partnerships, and the growing importance of information in distinguishing more successful producers from less successful ones. The workshop did not reach closure on these themes for agriculture generally or for natural resource conservation. This group left development of recommendations for future gatherings.

77. **Decomposing the size effect on the adoption of innovations: Agrobiotechnology and precision agriculture.**
Fernandez Cornejo, J.; Daberkow, S.; and McBride, W. D.
Agbioforum 4 (2) (2001)
NAL Call #: HD9999.B442A33; *ISSN:* 1522-936X.
Notes: Publisher: Curators of the University of Missouri
Descriptors: zea mays / glycine max/ biotechnology/ genetic engineering/ site specific crop management/ innovation adoption/ crop production/ farm size/ decision making/ farm surveys/ probabilistic models/ comparisons/ two limit Tobit model
Abstract: This paper examines the factors that influence the adoption of two emerging agricultural technologies, genetically engineered crops and precision agriculture in corn and soybean production, and contrasts the relative influence of various factors on the adoption decision for these two technologies, with special emphasis on the role of farm size.
This citation is from AGRICOLA.

78. **The delicate balance: Decision-making, rights, and nature.**
Schulkin, Jay.
Lanham, Md.: University Press of America; xvii, 174 p. (1996)
Notes: Includes bibliographical references (p. [141]-171) and index.
NAL Call #: HD30.23.S378--1996; *ISBN:* 0761804323 (alk. paper); 0761804331 (pbk.: alk. paper)
Descriptors: Decision making---Moral and ethical aspects/ Natural resources---Management---Decision making/ Uncertainty
This citation is from AGRICOLA.

79. **Desert riparian areas: Landscape perceptions and attitudes.**
Zube, Ervin H and Sheehan, Michele R
Environmental Management 18 (3): 413-421. (1994)
NAL Call #: HC79.E5E5; *ISSN:* 0364-152X
Descriptors: human (Hominidae)/ animals/ chordates/ humans/ mammals/ primates/ vertebrates/ agriculture/ farmers/ land use/ local decision makers/ management/ natural area preservation/ realtors/ resource managers/ Safford/ socioeconomics/ Upper Gila River/ wildlife preservation
Abstract: The perceptions and attitudes of residents and special interest groups along the Upper Gila River in the vicinity of the town of Safford, Arizona, USA, were studied with a primary focus on descriptions of the riparian landscape and attitudes towards planning and management in and around the riparian area. Special interest groups included farmers, resource managers, realtors, and local decision makers. Attention was directed to differences between resource managers and other groups. Findings from this study are compared with those from a previous study along the Upper San Pedro River. Notable differences between the two areas included perceptions of appropriate land uses, with a greater emphasis on agriculture and related activities in the Upper Gila River area and on wildlife and natural area preservation in the Upper San Pedro area. Relationships of perceptions and attitudes with the socioeconomic contexts of the two study areas are explored.

80. **Desert riparian landscapes: Values and change, 1981-96.**
Zube, Ervin H; Simcox, David; and Friedman, Steven
Landscape and Urban Planning 42 (2-4): 81-89. (1998)
NAL Call #: QH75.A1L32; *ISSN:* 0169-2046
Descriptors: desert riparian landscapes: change, values/ landscape architecture: education, research
Abstract: This paper presents first, a brief overview of research activities in the Landscape Architecture Program at the University of Arizona. Included is both the pedagogical foundation for the research emphasis and a brief summary of research topics pursued by faculty and graduate students during the past 15 years. The second and major part of the paper summarizes selected components of a long-term research project in which graduate students in Landscape Architecture and Renewable Natural Resources Studies played significant roles. Primary emphasis is on riparian landscapes located in southeastern Arizona. The research was developed in three phases. First was an exploration of people-landscape relationships via open-ended interviews; second, was survey research to explore perceptions of landscape values and attitudes about appropriate uses for these landscapes; and third, was the assessment of landscape change, both perceived and physical, in the same landscapes. Together, the three phases span 15 years, from 1981 to 1996. Case studies of two riparian areas that represent diverse contextual settings are discussed.

81. **Determinants of Farmer Behavior: Adoption of and Compliance with Best Management Practices for Nonpoint Source Pollution in the Skaneateles Lake Watershed.**
Welch, E. W. and Marc-Aurele, F. J.
Lake and Reservoir Management 17 (3): 233-245. (2001)
NAL Call #: TC401.L3; *ISSN:* 0743-8141
Descriptors: United States, New York, Skaneateles Lake/ Lakes/ Water Pollution Prevention/ Nonpoint Pollution Sources/ Agriculture/ Watershed Management / Case Studies/ Best Management Practices/ Public Participation/ Compliance/ Attitudes/ Communication/ Watersheds/ Catchment area/ Environmental protection/ Water quality control/ Sociological aspects/ Agricultural pollution/ Water management/ Water supply/ Pollution control/ Nonpoint pollution/ Communications/ United States, New York, Skaneateles Lake/ best management practices / Water quality control/ Prevention and control/ Environmental action/ Lakes
Abstract: Policy makers and public managers have recently implemented a wide range of watershed management programs designed to reduce nonpoint pollution from agriculture. This paper focuses on the progress of one such program. Skaneateles Lake, New York is the drinking water supply of Syracuse City. Granted "filtration avoidance" under the Surface Water Treatment Rules-allowance of unfiltered water supply conditional upon heightened source protection activities - the City, in cooperation with other agencies, established the Skaneateles Lake Watershed Agricultural Program (SLWAP) in 1994 as one element of a broader watershed protection plan. The SLWAP is a 5-10 member interagency pollution prevention program designed to work cooperatively and independently with watershed farmers to develop Whole Farm Plans that incorporate pollution minimizing best management practices. The program is voluntary and not all farmers have agreed to opt in. Using a modified behavioral model, this paper examines adoption and compliance behavior of farmers in the Skaneateles Lake Watershed in New York State. Findings indicate two stages of adoption. Early adopters have lower incomes, indicate that farming is their primary source of income, perceive fairer and more equitable treatment by regulators, believe the Best Management Practices (BMP) will have the desired effect, and are more fearful of regulatory

consequences if the Whole Farm Planning effort fails. We call this first stage "regulatory push." Late adopters are more environmentalist and more influenced by other farmers and the community. We call this second stage "community pull." In addition, findings regarding compliance indicate that farmers and the management team diverge in their assessments of progress toward implementation of Best Management Practices, indicating some potentially significant communication problems. Concluded recommendations for management of voluntary programs for farmers include: (1) initial implementation efforts should seek out those community leaders are more likely to be cooperative, (2) regulatory threat may be useful during the initial implementation period, and (3) evaluation criteria must be developed cooperatively with and clearly communicated to farmers.

82. **Determinants of perceived agricultural chemical risk in three watersheds in the Midwestern United States.**
Tucker, M. and Napier, T. L.
Journal of Rural Studies 17 (2): 219-233. (Apr. 2001)
NAL Call #: HT401.J68; *ISSN:* 0743-0167
Descriptors: watersheds/ agricultural chemicals/ risk/ health hazards/ farmers' attitudes/ decision making/ farm surveys/ regression analysis/ multivariate analysis/ Ohio/ Iowa/ Minnesota
Abstract: Recent epidemiologic research on the relationship between agricultural chemical use and human health has focused on possible risks to both farmers and nonfarm publics through such avenues as airborne chemical drift and contamination of drinking water. While agricultural chemical use has been defined as a public health issue, decisions about applying chemicals are made primarily by individual farmers who consider not only highly publicized health and environmental risks but also potentially severe economic risks of not using chemicals for production of food and fiber. The critical decision-making role played by farmers relative to agricultural chemical use creates a need for accurate information on their perceptions of various chemical-related hazards and the factors that may influence such judgments. Understanding farmers' perceptions toward agricultural chemical risk is essential to formulate effective risk-mitigation programs and policies and to target educational and technical assistance programs that encourage sound chemical practices at the farm level. This paper reports findings from a study of 1011 farm operators in three Midwestern watersheds in Ohio, Iowa, and Minnesota to assess their perceptions of risk associated with use of agricultural chemicals. A theoretical model developed from components of social learning, risk perception, and farm structure theories is used to identify predictors of agricultural chemical risk. Findings show that farmers in the three watersheds do not view agricultural chemical use as a serious health or environmental hazard. Regression findings provide partial support for the theoretical model. The statistical models explained from 30 to 37%. of the variance in farmers' risk perceptions in the three study watersheds. Findings are discussed in the context of developing future education/information programs in the three watersheds.
This citation is from AGRICOLA.

83. **Developing monitoring programs for livestock producers.**
Rasmussen, G Allen
Arid Land Research and Management 17 (4): 479-483. (2003)
NAL Call #: S592.17.A73 A74; *ISSN:* 1532-4982
Descriptors: ecosystem management/ livestock production
Abstract: Many official monitoring programs have been developed, but few have been adopted by livestock producers. While these programs have relatively strong support from professionally trained managers, even their implementation is not consistent. New programs must address several important factors if they are going to be used. They must be used to help producers and managers make current decisions relating to their objectives and those broader resource objectives of society. Producers must understand how these broader objectives relate to their specific livestock objectives. These monitoring programs must help make proactive decisions, and be cost effective. Finally attempts must be made to make them flexible to deal with changing objectives that happen over time.

84. **Development of information intensive agrichemical management services in Wisconsin.**
Wolf Steven A and Nowak Peter J
Environmental Management 19 (3): 371-382. (1995)
NAL Call #: HC79.E5E5; *ISSN:* 0364-152X
Abstract: This paper examines opportunities to improve the environmental and economic performance of cropping systems through intensified application of information in agrichemical management. Through intensified application of information, both net farm income and environmental quality may increase through more closely matching the specific needs of the crop with the type, timing, and volume of chemical inputs used in crop production. This study examines the current status and future prospect of agrichemical dealers offering information intensive agrichemical management services to producers. Agrichemical dealers are the focus of this study because: (1) farmers are perceived as ill-prepared to substantially

upgrade the sophistication of their agrichemical management without off-farm support, and (2) dealers enjoy a close relationship with farmers, which potentially could be expanded to include a variety of information-based services. A mail survey was conducted of all agrichemical suppliers/applicators in Wisconsin. The response rate was 76% (172 of 225). Substantial numbers of services were found to be offered by many dealers. The majority of these services were related to traditional yield-enhancement functions. Services that have a greater potential to mitigate the negative environmental impacts of inefficient agrichemical use and have higher on-farm data requirements were found to be less widely offered by dealers. Analysis of constraints to further development of information-intensive services indicates that dealers offering significant numbers of services are concerned with constraints external to the dealership, while dealers offering relatively few services perceive internal constraints as most limiting. This relationship indicates that efforts to accelerate dealerships development of information-intensive agrichemical management services should focus on specific constraints operating on targeted dealerships.

85. **Development of more effective conservation farming systems through participatory on-farm research.**
Wuest, S. B.; McCool, D. K.; Miller, B. C.; and Veseth, R. J.
American Journal of Alternative Agriculture 14 (3): 98-102. (1999)
NAL Call #: S605.5.A43; *ISSN:* 0889-1893

86. **Differences between farmer and agency attitudes regarding policies to reduce phosphorus pollution in the Minnesota River basin.**
McCann, L. M. J. and Easter, K. W.
Review of Agricultural Economics 21 (1): 189-207. (1999)
NAL Call #: HD1773.A3N6; *ISSN:* 0191-9016

87. **Do agricultural preservation programs and preferential property tax programs affect farmland conservation?**
Lynch, L.
American Agricultural Economics Association, 2003.
Notes: In: Selected papers from the annual meeting of the American Agricultural Economics Association; July 27-30, 2003; Montreal, Canada (application/pdf)
NAL Call #: HD1405 .A44
http://agecon.lib.umn.edu/cgi-bin/pdf%5Fview.pl?paperid=9200
Descriptors: farmland preservation/ agricultural land/ agricultural programs and projects/ conservation programs/ governmental programs and projects/ property tax/ econometric models/ Delaware/ Maryland/ New York/ New Jersey/ Pennsylvania/ Virginia/ farmland loss

88. **Do Farmers Understand Their Soils? A Non-Pastoral Look at a Fundamental Challenge to Conservation.**
McCallister, B.; Nowak, P.; and Leitner, J.
In: Proceedings of the 50th Annual Meeting of the Soil and Water Conservation Society. (Held 6 Aug 1995-9 Aug 1995 at Des Moines, IA.)
Ankeny, IA: Soil and Water Conservation Society; 1995.
Descriptors: Wisconsin/ education/ agricultural practices/ soil properties/ surveys/ soil profiles/ soil conservation/ farm management/ best management practices/ Education extramural/ Conservation in agricultural use/ United States
Abstract: Soil knowledge that is strictly results-oriented hides potential soil capabilities and may hinder the long-term quality of the soil resource. Can BMP programs about tillage and nutrients have long-term success if farmers are unclear about their soils' textures? How well are farmers prepared to follow the growing number of soil-based regulations about chemical use? Is soil knowledge one more information component that the farm-supply industry will capture through its sale of site-specific technologies? The 700+ farmers in this Wisconsin study completed a site-specific mail survey with accompanying airphoto. Results show that many farmers do not have a solid understanding of the soil at familiar airphoto locations on their farms. Most commonly, their most important source of soils knowledge is working the soil with implements. Thereby, farmers do notice changes in soil surfaces. Yet, when compared to county soil survey data for that site, farmer soil knowledge drops off significantly with depth into the soil profile. Responses to basic questions about soil texture, soil depth, and other factors reveal that many farmers did not answer within a generous range of reasonable responses. The pragmatic way farmers understand their soils suggests that public agencies and private consultants need to convey ideas about soils and conservation in a manner more attainable to them. Soil information for farmers needs reinterpretation so that basic soil concepts from soil science are not abandoned, but explained in relation to the jobs of crop management.

89. **Documenting the status of dairy manure**

management in New York: Current practices and willingness to participate in voluntary programs.
Poe, Gregory L. and New York State College of Agriculture and Life Sciences. Dept. of Agricultural, Resource and Managerial Economics.
Ithaca, N.Y.: Dept. of Agricultural, Resource, and Managerial Economics, Cornell University; 24 p.: ill.; Series: Staff paper (New York State College of Agriculture and Life Sciences. Dept. of Agricultural, Resource, and Managerial Economics)
SP 99-03. (1999)
Notes: "September 1999." Includes bibliographical references (p. 23-24). Funding for this project was provided by Cornell University's Statewide Program Committee grants, the Cornell University Water Resources Institute, and Hatch Project # 121-416, and USDA Regional Project W-133.
NAL Call #: HD1407-.C6-no.-99-03
Descriptors: Dairy cattle---Manure---Handling---New York State
This citation is from AGRICOLA.

90. **A dynamic analysis of the impact of water quality policies on irrigation investment and crop choice decisions.**
Wu, J. J.; Mapp, H. P.; and Bernardo, D. J.
Journal of Agricultural and Applied Economics 26 (2): 506-525. (Dec. 1994)
NAL Call #: HD101.S6; *ISSN:* 1074-0708
Descriptors: maize/ sorghum/ wheat/ irrigation water/ irrigated farming/ investment/ water quality/ farm management/ decision making/ crop enterprises/ dynamic models/ cost analysis/ soil types/ innovation adoption/ economic impact/ irrigation technology
Abstract: A dynamic model is developed to analyze farmers irrigation investment and crop choice decisions under alternative water quality protection policies. The model is applied to an empirical example in the Oklahoma High Plains. The choices of crops and irrigation systems and the resulting levels of irrigation, income, and nitrogen runoff and percolation are simulated over a ten-year period. An effluent tax on nitrogen runoff and percolation is shown to be effective in reducing nitrate pollution. The efficacy of cost sharing in adopting modern irrigation technologies and restrictions on irrigation water use depends on soil type. A tax on nitrogen use is shown to be the least effective policy.
This citation is from AGRICOLA.

91. **Dynamic economic management of soil erosion, nutrient depletion, and productivity in the north central USA.**
Hopkins, J W; Lal, R; Wiebe, K D; and Tweeten, L G
Land Degradation and Development 12 (4): 305-318. (2001)
NAL Call #: S622.L26; *ISSN:* 1085-3278
Descriptors: nutrients/ fertilizer application/ initial soil properties: alternative management practice yield response, susceptibility to degradation, yield sensitivity/ nutrient depletion/ overall farm management implications/ soil degradation: optimal management response/ soil erosion/ soil productivity/ soil profile depth depletion
Abstract: Physical scientists have presented a wealth of evidence regarding the effects of cropland soil degradation. Because soil degradation has both on-site and off-site effects, public policies have often tried to increase rates of conservation over privately optimal rates. Where private incentives leave off and public incentives start up is somewhat controversial, however. Physical evidence, while necessary, is not sufficient to predict conservation actions by farmers in response to the threat of degradation. This paper provides a partial explanation for why farmers may adopt differing conservation strategies, even though they share similar preferences. A model is constructed that divides soil degradation into reversible and irreversible components. We portray nutrient depletion as a reversible facet of soil degradation and soil profile depth depletion as an irreversible facet of soil degradation. Predictions of optimal management response to soil degradation are accomplished using a closed-loop model of fertilizer applications and residue management to control future stocks of soil nutrients and soil profile depth. Our model is applied to degradation data from nine soils in the north central United States. Three principal findings result: First, due to differences in initial soil properties, susceptibility to degradation, sensitivity of yield to soil depth, and yield response to alternative management practices, dynamically optimal economic strategies cannot be inferred directly from physical results but are inferred from the associated economic implications. Second, optimal residue management is more variable with respect to soil type than to the erosion phase of the soil, implying that substantial gains to targeting are possible. Third, nutrient depletion is a more compelling motivator for adopting residue management than soil profile depth depletion. This implies that motivating residue management requires programs that pay even greater attention to reversible degradation, and therefore the overall farm management implications, rather than strictly to protect topsoil from irreversible degradation.

92. **The dynamics of soil erosion in U.S. agriculture.**
Uri, Noel D and Lewis, James A
Science of the Total Environment 218 (1): 45-58. (1998)
NAL Call #: RA565.S365; *ISSN:* 0048-9697
Descriptors: land productivity/ sediment transport: estuary degradation, lake degradation, stream degradation/ soil conservation policies/ soil depth/

soil erosion dynamics: off farm impacts, on farm impacts/ Federal Agriculture Improvement and Reform Act of 1996 [FAIR of 1996]/ United States
Abstract: Soil erosion has both on-farm and off-farm impacts. Reduction of soil depth can impair the land's productivity, and the transport of sediments can degrade streams, lakes, and estuaries. To address this problem, soil conservation policies have existed in the United States for over 60 years. Initially, these policies focused on the on-farm benefits of keeping soil on the land and increasing net farm income. Beginning in the 1980s, however, policy goals increasingly included reductions in off-site impacts of erosion. The Food Security Act of 1985 was the first major legislation explicitly to tie eligibility to receive agricultural program payments to conservation performance. The Federal Agriculture Improvement and Reform Act (FAIR) of 1996 modifies the conservation compliance provisions by providing farmers with greater flexibility in developing and implementing conservation plans. As a consequence of conservation efforts, total soil erosion between 1982 and 1997 was reduced by 42% and the erosion rate fell from 8.0 tons per acre in 1982 to 5.2 tons per acre in 1997. Still, soil erosion is imposing substantial social costs. In 1997 these costs are estimated to have been approx. $29.7 billion. To further reduce soil erosion and thereby mitigate its social costs, there are a number of policy options available to induce farmers to adopt conservation practices including, education and technical assistance, financial assistance, research and development, land retirement, and regulation and taxes.

93. **An Economic Analysis of Riparian Landowners' Willingness to Participate in Oregon's Conservation Reserve Enhancement Program.**
Kingsbury, L. and Boggess, W.
In: Annual Meeting of the American Agricultural Economics Association. (Held 8 Aug 1999-11 Aug 1999 at Nashville, Tennessee.)
Ames, IA: American Agricultural Economics Association; 1999.
http://agecon.lib.umn.edu/cgi-bin/pdf_view.pl?paperid=1312&ftype=.pdf
Descriptors: State conservation programs/ Conservation Reserve Enhancement Program/ Oregon
Abstract: A survey was used to model the probability of participation in Oregon's CREP as a function of the economic incentives and expectations, environmental regulation and preferences, personal characteristics; and prior knowledge about USDA programs.

94. **Economic analysis of soil carbon in afforestation and forest management decisions.**
Sohngen, B.; Alig, R.; and Choi, S.
In: The potential of U.S. forest soils to sequester carbon and mitigate the greenhouse effect/ Kimble, J. M.
Boca Raton, Fla.: CRC Press, 2003; pp. 395-407.
Notes: ISBN: 1-56670-583-5
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95. **An economic analysis of vegetative buffer strip implementation: Case study: Elkhorn Slough, Monterey Bay, California.**
Rein, F. A.
Coastal Management 27 (4): 377-390. (1999);
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Descriptors: Coastal zone management/ Water quality control/ Marine pollution/ Pollution control/ Erosion control/ Agricultural runoff/ Buffers/ Vegetation cover/ Cost analysis/ United States, California/ INE, USA, California, Elkhorn Slough/ Models/ Coastal zone management/ Prevention and control/ Pollution Control and Prevention
Abstract: Vegetative buffer strips (VBS) are being proposed as a tool to protect water quality from nonpoint pollution nationwide, yet no studies have investigated the economics of implementing VBS. This study evaluates environmental costs and benefits of implementing VBS, both to the grower and to society as a whole, as a means of capturing nonmarket ecosystem values and informing decision-making. Results indicate a net economic benefit to the grower for installing VBS within the first year, if the economic costs of erosion are considered. The installation of VBS also has extensive economic benefits to society, including in areas such as tourism, commercial fisheries, long-term road maintenance, and harbor protection. These results support installing VBS as a management strategy in an erosion-prone watershed to protect water quality and preserve soil fertility, as well as to protect economic interests. A number of policy tools to encourage VBS implementation are discussed, including tax incentives and legislative policies. Government intervention through incentive-based programs is advocated due to the clear economic and ecologic benefits to society.

96. **Economic and Conservation Tradeoffs of Regulatory vs. Incentive-Based Water Policy in the Pacific Northwest.**
Schaible, G. D.
International Journal of Water Resources Development 16 (2): 221-238. (2000)
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