Implementing Agricultural Conservation Practices: Barriers and Incentives

A Conservation Effects Assessment Bibliography

Special Reference Briefs Series no. SRB 2004-02

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Abstract

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This bibliography is one in a multi-volume set developed by the Water Quality Information Center at the National Agricultural Library in support of the U.S. Department of Agriculture's Conservation Effects Assessment Project (CEAP). The bibliography is a guide to recent literature examining agricultural producers' views of conservation programs and practices. It provides people working in the area of agriculture and the environment with a guide to information resources that focus on the psychological and socioeconomic factors that influence agricultural producers' behavior with regard to environmental issues.

Keywords: conservation practices, farmers' attitudes, psychosocial factors, production economics, sociodemographic characteristics, conservation programs, Farm Bill

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Preface

This is one in a series of bibliographies developed by the Water Quality Information Center at the National Agricultural Library in support of the U.S. Department of Agriculture's Conservation Effects Assessment Project (CEAP).

The purpose of CEAP is to study the environmental effects of conservation practices implemented through various U.S. Department of Agriculture conservation programs. CEAP will evaluate conservation practices and management systems related to nutrient, manure, and pest management; buffer systems; tillage; irrigation and drainage practices; wetland protection and restoration; and wildlife habitat establishment. More information about CEAP is available at www.nrcs.usda.gov/technical/nri/ceap/.

The current titles in this series are

- Environmental Effects of U.S. Department of Agriculture Conservation Programs
  Special Reference Brief 2004-01
- Implementing Agricultural Conservation Practices: Barriers and Incentives
  Special Reference Brief 2004-02
- Data and Modeling for Environmental Credit Trading
  Special Reference Brief 2004-03
- Agricultural Conservation Practices and Related Issues: Reviews of the State of the Art and Research Needs
  Special Reference Brief 2004-04

Each of the documents, as well as bibliographies on similar topics, is accessible online from the Water Quality Information Center at www.nal.usda.gov/wqic/.

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  www.csa.com
- The H. W. Wilson Company
  www.hwwilson.com
- Midwest Plan Service
  www.mwpshq.org
- National Information Services Corporation (NISC)
  www.nisc.com
- Natural Resource, Agriculture and Engineering Service (NRAES)
  www.nraes.org
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- Thomson ISI
  www.isinet.com
- Thomson Zoological, LTD
  www.biosis.com

In addition, support from the Natural Resources Conservation Service for the development of these bibliographies is greatly appreciated.

Joseph R. Makuch, Ph.D.
Coordinator
Water Quality Information Center

About This Bibliography

This bibliography is a guide to recent literature examining agricultural producers' views of conservation programs and practices. The purpose is to provide people working in the area of agriculture and the environment with a guide to information resources that focus on the psychological and socioeconomic factors that influence agricultural producers' behavior with regard to environmental issues. An understanding of barriers to, and incentives for, conservation practices can help foster development of conservation programs and practices that fit the needs of agricultural producers.

There are 375 citations with abstracts (when available) in this bibliography. Citations were found through literature searches of the AGRICOLA database, produced by the National Agricultural Library, and several commercial bibliographic databases. In addition, Water Quality Information Center staff created citations for documents that were located by other means. Documents cited were published from 1993 through 2003 (with a few included from early 2004). URLs are provided for online documents that are freely available. The inclusion or omission of a particular citation does not imply endorsement or disapproval.

Citations are arranged alphabetically by title. To locate information on a specific topic, for example, conservation tillage, use the subject index beginning on page 85. To ensure that you see all the relevant citations for a particular topic, be sure to also look up related terms in the subject index, for example, no till, ridge till, etc., from the example above. An author index is also available beginning on page 101.

To obtain a specific document, please contact your local library. Information on how to obtain documents from the National Agricultural Library can be found at www.nal.usda.gov/ddsb/.

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.
© Cambridge Scientific Abstracts (CSA)

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.
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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.
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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
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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.
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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
© Thomson

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.
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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).
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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.
© Cambridge Scientific Abstracts (CSA)

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

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
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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
This citation is from AGRICOLA.

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.
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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.
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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
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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.
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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.
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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.
© Thomson ISI

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

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

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
This citation is from AGRICOLA.

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

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); *ISSN:* 0892-0753
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.
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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)
NAL Call #: TD201.I56; *ISSN:* 0790-0627.
Notes: Special issue: Water and agriculture in the American West; DOI: 10.1080/07900620050003134

Descriptors: United States, Pacific Northwest/ Economic Aspects / Water Rights/ Water Conservation/ Agriculture/ Irrigation Water/ Water Policy/ Treaties/ Economic analysis/ Water use/ Water quality/ Economics/ Rights/ United States, Pacific Northwest/ Pacific Northwest/ Evaluation process/ Applied economics/ Water Resources and Supplies
Abstract: In this paper, onfarm water conservation and agricultural economic tradeoffs between selected regulatory and conservation-incentive water-policy choices are evaluated for the Pacific Northwest. Five broad water-policy perspectives are analysed using a total of 37 alternative policy scenarios. Policy analyses use a primal/dual-based, multi-product, normalized restricted-equilibrium model of Pacific Northwest field-crop agriculture. Results demonstrate that conservation-incentive water policy, when integrated within balanced policy reform, can produce upwards of 1.7 million acre-feet of onfarm conserved water for the region, while also significantly increasing economic returns to farmers. Producer willingness to accept water-policy change is lowest for regulatory policy (US$4-$18 per acre-foot of conserved water), but highest for conservation-incentive policy that increases both irrigation efficiency and crop productivity ($67-$208 per acre-foot of conserved water). Conservation-incentive water policy also enhances decision-maker flexibility in meeting multiple regional policy goals (i.e. water for endangered aquatic species, water quality, Native American treaty obligations, and sustainable rural agricultural economies).
© Cambridge Scientific Abstracts (CSA)

97. **Economic and environmental effects of nitrogen testing for fertilizer management.**
Bosch, D. J.; Fuglie, K. O.; and Keim, R. W.
Economic Research Service, United States Department of Agriculture; Staff Report - AGES No. 9413, 1994. iv, 37 pp.
This citation is provided courtesy of CAB International/CABI Publishing.

98. **An economic approach to improving water management in waterlogged and saline areas.**
Wichelns, D.
In: Challenges facing irrigation and drainage in the new millennium: Proceedings. (Held Jun 2000 at Fort Collins, Colorado: U.S. Committee on Irrigation and Drainage; pp. 503-522; 2000.
ISBN: 1-887903-09-7
This citation is provided courtesy of CAB International/CABI Publishing.

99. **Economic Benefits with Environmental Protection: No-till and Conservation Buffers in the Midwest.**
Conservation Technology Information Center.
Conservation Technology Information Center, 2002 (application/pdf)
http://www.ctic.purdue.edu/ctic/FINAL.pdf
Abstract: This 32-page publication from the CTIC examines the adoption of no-till and conservation buffers in the Midwest. Farmers and the environment in the Great Lakes watershed and North Central region, which includes Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin, and the western portions of New York and Pennsylvania, stand to benefit from increases in no-till practices and conservation buffers. The region, although very productive, has millions of highly erodible acres. The document explores many of the challenges, opportunities, management strategies, and successful marketing efforts for promoting conservation here. Soil quality benefits derived from no-till practices are explained, along with techniques to overcome transitional challenges producers face when converting from conventional systems.

100. **An economic evaluation of adoption of the conservation compliance program: A stochastic dominance approach.**
Govindasamy, R. and Cochran, M. J.
Journal of Agribusiness 15 (1): 121-133. (Spring 1997)
NAL Call #: HD1401.J68; *ISSN:* 0738-8950
Descriptors: erosion/ soil conservation/ innovation adoption/ rotation/ stochastic processes/ risk/ soil types/ farmers/ farmers' attitudes/ returns/ profits/ Iowa
This citation is from AGRICOLA.

101. **Economic evaluation of on-farm conservation practices in the Great Lakes region of North America.**
Stonehouse, D. P.
Environmetrics 10 (4): 505-520. (1999);
ISSN: 1180-4009.
Notes: Conference: Environmental Statistics: Proceedings of the Conference on Environmetrics, Innsbruck (Austria), 4-8 Aug 1997
Descriptors: North America, Great Lakes/ Soil Conservation/ Farms/ Cost benefit Analysis/ Benefits/ Economic Aspects/ Water Quality/ Agricultural Practices/ Degradation/ Wildlife Habitats/ Social Aspects/ Agriculture/ Nature conservation/ Economics/ Costs/ Riparian vegetation/ Pollution control/ Conservation/ Soil erosion/ Water quality control/ Environmental protection/ Socioeconomics/ North America, Great Lakes/ Conservation in agricultural use/ Law, policy, economics and social sciences/ Environmental action
Abstract: Agriculture has long been regarded as a major contributor to wildlife habitat despoliation, soil

degradation, and downstream watercourse pollution. It would be possible to largely eliminate natural resource degeneration through judicious application of on-farm conservation practices. Farmers have little economic incentive to conserve because, according to previous research, most conservation techniques have been demonstrated to be unprofitable. The empirical research into three alternative types of conservation practices for this study confirms that two (conservation crops and riparian buffer strips) provide for net costs to farmers, and that the third (conservation soil tillage) is not profitable under all circumstances. At the same time, the research shows that two out of the three sets of practices, namely riparian buffer strips and conservation tillage, can be economically beneficial to society as a whole. This raises the question of whether and to what extent society, as economic gainers, should offer compensation to farmers as economic losers. This study furthermore establishes that not all conservation practices that result in reduced soil erosion will lead to decreased sediment and phosphorus loadings into watercourses; that not all reduced sediment and phosphorus loadings lead to improved water quality; and that, even where an improvement to water quality in chemical, physical, biological and aesthetic terms can be obtained, the costs to society of achieving improvement may exceed the economic benefits. Such outcomes can readily promote disagreements between environmentalists and ecologists on the one hand and socio-economists on the other.
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102. **Economic factors contributing to the adoption of reduced tillage technologies in central Saskatchewan.**
Gray, R S; Taylor, J S; and Brown, W J
Canadian Journal of Plant Science 76 (4)*:* 661-668*. (*1996)
NAL Call #: 450-C16; *ISSN:* 0008-4220
Descriptors: crop (Angiospermae)/ plant (Plantae Unspecified)/ weeds (Tracheophyta)/ Plantae (Plantae Unspecified)/ angiosperms/ plants/ spermatophytes/ vascular plants/ agriculture/ biobusiness/ crop yield/ economic factors/ herbicide/ pest/ pest management/ prices/ reduced tillage technology/ soil science
Abstract: The zero-tillage and minimum-tillage technologies, which are now being rapidly adopted in many areas of western Canada, have made a significant contribution to the sustainability of the soil resource. As a measure of economic viability of these practices this study uses the Top Management Model to simulate the 5-yr ending equity given stochastic prices and yields for a consensus farm in central Saskatchewan. Simulations are used to compare a minimum disturbance, zero-tillage system to a more conventional direct-seeding system. At 1994 crop and input prices, and a 10% yield advantage, zero-tillage systems compared favourably with conventional direct-seeding system. The relative crop yield and glyphosate price are key determinants to the short-run profitability of adopting zero-tillage technologies with fuel price having a smaller influence. When the switch to zero tillage allows a net reduction in machinery stock, this simultaneously increases the profitability, and reduces the financial risk for the producer. We conclude that in areas of Saskatchewan where zero-tillage systems provide a yield advantage, producers will continue to adopt these systems as an economically viable means of sustaining their soil resource.
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103. **Economic incentives for coordinated management of forest land: A case study of southern New England.**
Klosowski, R.; Stevens, T.; Kittredge, D.; and Dennis, D.
Forest Policy and Economics 2 (1): 29-38. (2001)
NAL Call #: SD1 .F6747; *ISSN:* 1389-9341
This citation is provided courtesy of CAB International/CABI Publishing.

104. **Economic incentives reduce irrigation deliveries and drain water volume.**
Wichelns, D.; Houston, L.; and Cone, D.
Irrigation and Drainage Systems 10 (2): 131-141. (May 1996)
NAL Call #: TC801.I66; *ISSN:* 0168-6291 [IRDSEG]
Descriptors: irrigated farming/ irrigation scheduling/ irrigation requirements/ water costs/ incentives/ drainage water/ volume/ water quality/ water allocation/ irrigation equipment/ prices/ price policy/ loans/ field crops/ vegetables/ California/ low interest loans/ irrigation depth/ tiered water pricing
This citation is from AGRICOLA.

105. **Economic indicators to assess the sustainability of conservation farming projects: An evaluation.**
Tisdell, Clem
Agriculture Ecosystems and Environment 57 (2-3): 117-131. (1996)
NAL Call #: S601 .A34; *ISSN:* 0167-8809
Descriptors: plant (Plantae Unspecified)/ Plantae (Plantae Unspecified)/ plants/ agriculture/ framework for the evaluation of sustainable land management/ international board for soil research and management/ natural resources/ Philippines
Abstract: Multiple criteria for sustainability, such as the five pillars in the FAO/IBSRAM (International Board for Soil Research and Management) Framework for the Evaluation of Sustainable Land

Management (FESLM), raise difficult assessment and evaluation problems. Economic viability is included as one of the pillars in this FELSM and is essential for the sustained adoption of conservation farming projects. However, even specifying economic viability and obtaining operational and predictive indicators for it is difficult because, for one thing, the economic viability of a farming system depends upon a variety of attributes. These include the level of economic returns, the instability and uncertainty of returns, and in monetary economies, the associated financial requirements for the farming system, the availability of finance and its implications for the financial liquidity of the farm. In all economies, the amount of investment required to adopt a sustainable conservation farming project will be a major consideration. As a rule, economic viability is also related to the sustainability of the natural productivity of soils and other natural resources on which economic production partially depends, so economic indicators depend in part on noneconomic factors, and a holistic approach is needed. Taking such factors into account, as well as the difficulty of predicting the future economic sustainability of conservation projects, this paper critically reviews suggestions made in the literature for developing appropriate indicators of sustainability, such as those of Lynam and Herdt (1989), as well as break-even analyses and the scope for applying various forms of cost-benefit analysis. Illustrations are drawn from the IBSRAM/ACIAR project investigating land management on vertisols and on sloping lands, e.g. in Australia and The Philippines.
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106. **Economic methods for comparing alternative crop production systems: A review of the literature.**
Roberts, W. S. and Swinton, S. M.
American Journal of Alternative Agriculture 11 (1): 10-17. (1996)
NAL Call #: S605.5.A43; *ISSN:* 0889-1893 [AJAAEZ]
Descriptors: alternative farming/ cropping systems/ comparisons/ evaluation/ economic analysis/ environmental impact/ stability/ profitability/ risk/ sustainability/ North America/ alternative versus conventional cropping systems
Abstract: New crop production technologies developed in response to growing concern over environmental contamination from agriculture may be neither more profitable nor higher yielding than the systems they replace, but they often reduce environmental contamination or improve soil and water quality. Systems designed with environmental objectives cannot be evaluated fairly just by productivity, which is what often is done in economic studies of alternative systems. We review 58 recent studies comparing alternative crop production systems to identify the key criteria for system comparisons, the system characteristics important in designing the analysis, and the methods most suited for comparing alternative systems. The four key criteria we looked for in system comparisons are expected profit, stability of profits, expected environmental impacts, and stability of environmental impacts. Most economic studies of crop production focus exclusively on profitability, and incorporate neither environmental criteria nor the dynamic characteristics inherent in alternative systems. We identify promising new approaches that take account of specific environmental characteristics and attempt to balance the objectives of profitability and environmental risk management. Balanced environmental-economic analysis is most likely to be achieved by integrating biophysical simulation models with economic optimization methods to model the trade-offs among profitability, environmental impact, and system stability (both financial and environmental).
This citation is from AGRICOLA.

107. **Economic risk and water quality protection in agriculture.**
Bosch, D. J. and Pease, J. W.
Review of Agricultural Economics 22 (2): 438-463. (2000)
NAL Call #: HD1773.A3N6; *ISSN:* 1058-7195
This citation is provided courtesy of CAB International/CABI Publishing.

108. **Economic risk, returns and input use under ridge and conventional tillage in the northern Corn Belt, USA.**
Archer, David W; Pikul, Joseph L Jr; and Riedell, Walter E
Soil and Tillage Research 67 (1): 1-8. (2002)
NAL Call #: S590.S48; *ISSN:* 0167-1987
Descriptors: Glycine max [soybean] (Leguminosae): oil crop/ Zea mays [corn] (Gramineae): grain crop/ Angiosperms/ Dicots/ Monocots/ Plants/ Spermatophytes/ Vascular Plants
Abstract: Ridge tillage (RT) has been proposed as an economically viable conservation tillage alternative for row crop production; however the long-term economic viability of RT in the northern Corn Belt of the USA is largely unknown. Economic returns, risk and input use were compared for RT and conventional tillage (CT) in a corn (Zea mays L.) and soybean (Glycine max (L.) Merr.) rotation with high, medium and low nitrogen treatments. The analysis was based on 10 years of experimental data from Brookings, SD on a Barnes clay loam (US soil taxonomy: fine-loamy, mixed, superactive, frigid Calcic Hapludoll; FAO classification: Chernozem). Economic returns were significantly higher at the highest nitrogen treatment levels. Highest average

net returns to land and management were $78 per hectare for RT at the high nitrogen treatment level (RT-H) followed by $59 per hectare for CT at the high nitrogen treatment level (CT-H). Risk, measured as the standard deviation of net returns, was the lowest for CT at the medium nitrogen treatment level (CT-M) followed by RT-H and CT-H. However, net returns were substantially lower under CT-M at $32 per hectare. Average yields and average operating costs were not significantly different for RT-H and CT-H. Reduced equipment operating costs for CT-H were offset by increased herbicide costs for RT-H. Equipment ownership costs were significantly lower for RT-H than CT-H. There were no significant differences in fertilizer use for RT and CT. Pesticide use was significantly higher for RT-H than CT-H. Fuel use was 18-22% lower and labor use was 24-27% lower for RT-H than CT-H. Despite continued low adoption rates for RT in the northern Corn Belt, our analysis shows that RT is an economically viable alternative to CT.
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109. **Economically efficient watershed management with environmental impact and income distribution goals.**
Oenal, H.; Algozin, K. A.; Iik, M.; and Hornbaker, R. H.
Journal of environmental management 53 (3): 241-253. (1998)
NAL Call #: HC75.E5J6; *ISSN:* 0301-4797
Descriptors: Watersheds/ Catchment area/ Water management/ Environmental impact/ Economic analysis/ Pollution control/ Agricultural pollution/ Erosion control/ Costs/ Environment management/ Agriculture/ United States, Illinois/ Watershed Management/ Environmental Effects/ Soil Erosion/ Agricultural Watersheds/ Farms/ Economic Aspects/ United States, Illinois/ Prevention and control/ Watershed protection
Abstract: This paper presents a methodology for incorporating environmental impacts and income distribution goals in economic analysis of watershed management policies. Empirical results on a small Illinois, USA, watershed indicate that farm costs are increased notably by restricting agricultural pollution and soil erosion. The income distribution constraint also reduces economic efficiency, but the efficiency loss due to implementing this constraint is less than 10% of the costs resulting from environmental regulations. An ex post comparison of these results with the actual payments offered to farmers under the incentive program currently in place in the watershed reveals that these payments are approximately equal to the losses estimated by the analysis when the burden of environmental control is shared equally among the farmers.
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110. **Economics of conservation tillage in the semiarid prairie.**
Zentner, R P; McConkey, B G; Campbell, C A; Dyck, F B; and Selles, F
Canadian Journal of Plant Science 76 (4): 697-705. (1996)
NAL Call #: 450-C16; *ISSN:* 0008-4220
Descriptors: crop (Angiospermae)/ durum wheat (Gramineae)/ plant (Plantae Unspecified)/ wheat (Gramineae)/ Plantae (Plantae Unspecified)/ Triticum aestivum (Gramineae)/ Triticum turgidum (Gramineae)/ angiosperms/ monocots/ plants/ spermatophytes/ vascular plants/ agronomy/ biobusiness/ conservation tillage/ economics/ hard red spring/ production costs/ semiarid prairie/ soil science/ soil texture/ yield
Abstract: Concerns about environmental sustainability and economic survival have changed tillage practices significantly in western Canada. This study examined the effects of conventional (CT), minimum (MT), and no-tillage (NT) management on the economic performance of hard red spring wheat (Triticum aestivum L.) or durum wheat (Triticum turgidum L.) production when grown in fallow-wheat (F-W) and continuous wheat (Cont W) rotations, over a period of up to 12 yr (1982-1993) on three soil textures in southwestern Saskatchewan. Our results show little short-term economic incentive for producers to adopt NT management practices. Production costs were similar on the three soil textures, averaging 141 ha-1 for F-W and 224 ha-1 for Cont W. Total costs for Cont W systems averaged 10 to 13% higher for NT compared to CT. For F-W systems, total costs for NT averaged 29% higher than for CT on the silt loam, and 14% higher on the heavy clay. Also for F-W systems, costs for NT averaged 23, 12, and 17% higher than for MT on silt loam, sandy loam, and heavy clay soils, respectively. Although conservation tillage (MT and NT) provided savings in labor, fuel and oil, machine repair, and machine overhead (compared to CT), these savings were more than offset by greater expenditures for herbicides. On the silt loam, net returns were highest for Cont W (CT) and lowest for F-W (NT) at wheat prices greater than 147 t-1; at lower wheat prices, F-W (CT) and Cont W (CT) provided the highest and about equal net returns. On the sandy loam, F-W (MT) consistently earned the highest net return; F-W (NT) ranked second highest, while Cont W systems ranked lowest. On the heavy clay, F-W (MT) and Cont W (CT) provided the highest net return at wheat prices greater than 147 t-1, while at lower wheat prices F-W (MT) ranked highest. In our study, the relatively poor economic performance of conservation tillage, particularly NT, for monoculture wheat production

was due to a combination of higher input costs and the lack of significant yield advantages with MT and NT management.
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111. **Economics of residue management in agricultural tillage systems.**
Harman, W. L.
In: Managing agricultural residues/ Unger, P. W.
Boca Raton, Fla.: Lewis Publishers, 1994;
pp. 377-423.
Notes: ISBN: 0-87371-730-9
This citation is provided courtesy of CAB International/CABI Publishing.

112. **The economics of risk, uncertainty and learning in the adoption of new agricultural technologies: Where are we on the learning curve?**
Marra, M.; Pannell, D. J.; and Ghadim, A. A.
Agricultural Systems 75 (2/3): 215-234. (2003)
NAL Call #: HD1.A3; *ISSN:* 0308-521X
This citation is provided courtesy of CAB International/CABI Publishing.

113. **Economics of water quality protection from nonpoint sources: Theory and practice.**
Ribaudo, Marc.; Horan, Richard D.; Smith, Mark Eugene; and United States. Dept. of Agriculture. Economic Research Service.
Washington, DC: U.S. Dept. of Agriculture, Economic Research Service; iii, 106 p.: ill., col. maps. (1999)
Notes: Cover title. "November 1999"--P. [i]. Includes bibliographical references (p. 96-106).
SUDOCS: A 1.107:782.
NAL Call #: A281.9-Ag8A-no.-782
http://www.ers.usda.gov/publications/aer782/
Descriptors: Water quality---United States/ Nonpoint source pollution---United States/ Agricultural pollution---United States/ Water Pollution---Economic aspects---United States
This citation is from AGRICOLA.

114. **The effect of farming practices on reducing excess nitrogen fertilizer use.**
Huang, Wen Yuan and Uri, Noel D
Environment International 19 (2): 179-191. (1993)
NAL Call #: TD169.E54; *ISSN:* 0160-4120
Descriptors: nitrogen/ corn (Gramineae)/ soybean (Leguminosae)/ angiosperms/ dicots/ monocots/ plants/ spermatophytes/ vascular plants/ cropland/ ground water leaching
Abstract: This paper studies the effects of crop rotation and a limitation on the application of nitrogen fertilizer on the reduction of excess nitrogen available for potential leaching into the ground water. For a farmer initially planting corn continuously, the adoption of a soybean-corn rotation will have a smaller compliance cost, but it will not eliminate the excess application of nitrogen fertilizer under a relatively low nitrogen fertilizer to corn price ratio. An explicit limitation on nitrogen fertilizer use would be needed to achieve this objective. Limiting nitrogen fertilizer use on cropland susceptible to a high potential for leaching will have a smaller compliance cost than on cropland with a moderate potential for leaching.
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115. **Effect of risk perspective on fertilizer choice by sharecroppers.**
Paudel, K. P.; Lohr, L.; and Martin, N. R.
Agricultural Systems 66 (2): 115-128. (2000)
This citation is provided courtesy of CAB International/CABI Publishing.

116. **Efficacy of standards vs. incentives for managing the environmental impacts of agriculture.**
Weaver, R. D.; Harper, J. K.; and Gillmeister, W. J.
Journal of Environmental Management 46 (2): 173-188. (Feb. 1996)
NAL Call #: HC75.E5J6; *ISSN:* 0301-4797 [JEVMAW]
Descriptors: water quality/ field crops/ farming systems/ agricultural production/ environmental impact/ taxes/ regulations/ farm management/ incentives/ standards/ simulation models/ Pennsylvania/ biophysical models/ economic incentives
This citation is from AGRICOLA.

117. **An efficiency approach to managing Mississippi's marginal land based on the Conservation Reserve Program (CRP).**
Hamdar, B.
Resources, Conservation and Recycling 26 (1): 15-24. (1999)
NAL Call #: TP156.R38R47; *ISSN:* 0921-3449
This citation is provided courtesy of CAB International/CABI Publishing.

118. **Emerging agricultural water conservation price incentives.**
Michelsen, A. M.; Taylor, R. G.; Huffaker, R. G.; and McGuckin, J. T.
Journal of Agricultural and Resource Economics 24 (1): 222-238. (July 1999)
NAL Call #: HD1750.W4; *ISSN:* 1068-5502
Descriptors: irrigation/ water costs/ water policy/ water conservation/ prices/ incentives/ water use/ federal government/ government organizations/ water allocation/ United States/ U.S. Bureau of Reclamation
This citation is from AGRICOLA.

119. **An empirical analysis of Louisiana small farmers' involvement in the Conservation Reserve Program.**
McLean Meyinsse, P. E.
Journal of Agricultural and Applied Economics 26 (2): 379-385. (Dec. 1994)
NAL Call #: HD101.S6; *ISSN:* 1074-0708
Descriptors: land diversion/ federal programs/ program participants/ small farms/ farm income/ returns/ tenants/ probabilistic models/ willingness to participate/ Franklin Parish, Louisiana/ Richland Parish, Louisiana/ West Carroll, Louisiana
Abstract: The study examines Louisiana small farmers' reasons for not participating in the Conservation Reserve Program (CRP), their awareness of the program, and their willingness to participate in the program. The results suggest that: farmers do not participate in the CRP if revenues from cropland are an important source of income, or if they are tenants; awareness is significantly related to education, income, race, and average return per acre; willingness is positively influenced by payment per acre, age, and farm status. Participation depends on whether payments per acre are comparable to the opportunity costs of removing cropland from production.
This citation is from AGRICOLA.

120. **An empirical analysis of the relative efficiency of policy instruments to reduce nitrate water pollution in the U.S. Southern High Plains.**
Wu, J.; Teague, M. L.; Mapp, H. P.; and Bernardo, D. J.
Canadian Journal of Agricultural Economics / Revue Canadienne d'Economie Rurale 43 (6): 403-420. (Nov. 1995)
NAL Call #: 281.8-C16; *ISSN:* 0008-3976
Descriptors: nitrate/ water pollution/ water quality/ water policy/ environmental protection/ nitrogen fertilizers/ application rates/ regulations/ taxes/ water use/ irrigation water/ incentives/ irrigation systems/ mathematical models/ simulation/ southern plains states of USA/ epic pst crop growth/ chemical transport model/ mathematical programming model
This citation is from AGRICOLA.

121. **Encouraging farmers to produce environmental benefits from agriculture.**
Westra, J.; Zimmerman, J.; and Vondracek, B.
Selected papers from the annual meeting of the American Agricultural Economics Association (May 2002)
NAL Call #: HD1405 .A44.
Notes: Supplemental online access through http://agecon.lib.umn.edu.
Descriptors: farm management/ environmental protection/ social benefits/ externalities/ water quality/ fisheries/ farm income/ streams/ watersheds/ simulation models/ computer simulation/ land use/ land diversion/ Minnesota/ agricultural drainage and pesticide transport model/ coolwater stream/ warmwater stream/ Wells Creek Watershed/ Chippewa River Watershed/ Minnesota
This citation is from AGRICOLA.

122. **Enrolling conservation buffers in the CRP.**
Loftus TT and Kraft SE
Land Use Policy 20 (1): 73-84; many ref. (2003)
NAL Call #: HD101.L35
This citation is provided courtesy of CAB International/CABI Publishing.

123. **Enrollment of filter strips and recharge areas in the CRP and USDA easement programs.**
Lant, C. L.; Kraft, S. E.; and Gillman, K.
Journal of Soil and Water Conservation 50 (2): 193-200. (1995)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
Descriptors: United States, Midwest/ easements/ groundwater recharge/ soil conservation/ economic aspects/ farms/ cropland/ wetlands/ governmental interrelations/ conservation/ property rights/ Conservation Reserve Program/ Wetland Reserve Program/ Watershed protection
Abstract: Two related contingent valuation surveys were conducted in ten Cornbelt counties to estimate the potential enrollment in the Conservation Reserve Program (CRP) and a 30-year easement program of filter strips and cropland in areas vulnerable to groundwater contamination. It was found that potential CRP enrollment climbs dramatically in the range $90-140/acre/year. Filter strip enrollments are greater than recharge area enrollments at any given rental rate. Thirty-year easements receive substantially less enrollment than CRP when a lump sum of 10 times the CRP rate is offered. Tree planting is a low percentage of CRP enrollments, but is a higher percentage of 30-year easement enrollments. Allowing enrollments to be used for set-aside requirements improves enrollments in the CRP by 32% for filter strips and by 6% for recharge areas; these differences are most marked at lower annual rental rates. Farmland owners who indicated they would not enroll gave primarily financial reasons for making that decision, further indicating that enrollment is very responsive to rental rates for the CRP and lump sums for easements. However, allowing variable time periods for contracts, adjusting rental rates for inflation or local cropland rental rates, publicizing maximum annual rental rates (MARRs), and simplifying the enrollment process could increase enrollments.
© Cambridge Scientific Abstracts (CSA)

124. **Environmental and economic tradeoffs of alternative cropping systems.**
Koo SeungMo; Williams, J. R.; Schurle, B. W.; and Langemeier, M. R.
Journal of Sustainable Agriculture 15 (4): 35-58. (2000)
NAL Call #: S494.5.S86S8; *ISSN:* 1044-0046
This citation is provided courtesy of CAB International/CABI Publishing.

125. **The environmental consequences of the conservation tillage adoption decision in agriculture in the United States.**
Uri, Noel D
Water, Air and Soil Pollution 103 (1-4): 9-33. (1998)
NAL Call #: TD172.W36; *ISSN:* 0049-6979
Descriptors: agricultural production/ conservation tillage/ corn production/ environmental impact/ fertilization/ pesticide applications/ soil erosion/ water runoff
Abstract: The environmental consequences of conservation tillage practices are an important issue concerning the impact of agricultural production on the environment. While it is generally recognized that water runoff and soil erosion will decline as no tillage and mulch tillage systems are 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. Starting with the assumption that this decision is a two step procedure - the first is the decision whether or not adopt a conservation tillage production system and the second is the decision on 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 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 a below average expenditure on custom pesticide applications. Additionally, for a farm adopting a no tillage production practice, an above average expenditure was made on fertilizer.
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126. **Environmental dilemmas: Ethics and decisions.**
Berry, R. J.
London; New York: Chapman & Hall; xxii, 271 p.: ill., maps. (1993)
Notes: 1st ed.; Includes bibliographical references and index.
NAL Call #: GF80.E58-1983; *ISBN:* 0412398001
Descriptors: Human ecology---Moral and ethical aspects/ Environmental engineering/ Decision making---Environmental aspects/ Decision making---Ethics
This citation is from AGRICOLA.

127. **Environmental Education and Outreach: Experiences of a Federal Agency.**
Newton, B. J.
Bioscience 51 (4): 297-299. (2001)
NAL Call #: 500 Am322A; *ISSN:* 0006-3568
Descriptors: Government policy/ Education/ United States/ Aquatic environment/ Governments/ Policies/ Resource management/ Natural resources/ United States/ aquatic ecosystems/ Education/ Environmental Advocacy, Education and Awareness/ Protective measures and control/ General Environmental Engineering
Abstract: Conservation of natural resources is inextricably bound to public attitudes and opinions. Other articles in this issue of BioScience argue for greater involvement by the scientific community in public education and outreach. This one addresses the effectiveness of various outreach and education techniques, based on the experiences of the Natural Resources Conservation Service (NRCS), a US Department of Agriculture nonregulatory agency that is responsible for helping farmers, ranchers, and landowners conserve natural resources on private lands.
© Cambridge Scientific Abstracts (CSA)

128. **Environmental farm planning in Ontario: Exploring participation and the endurance of change.**
Smithers, J. and Furman, M.
Land Use Policy 20 (4): 343-356. (2003)
NAL Call #: HD101.L35; *ISSN:* 0264-8377
This citation is provided courtesy of CAB International/CABI Publishing.

129. **The environmental implications of soil erosion in the United States.**
Uri, Noel D
Environmental Monitoring and Assessment 66 (3): 293-312. (2001)
NAL Call #: TD194.E5; *ISSN:* 0167-6369
Descriptors: agriculture/ conservation policies/ conservation tillage/ economic losses/ ecotoxicology/ education/ environmental degradation/ environmental implications/ environmental legislation/ financial assistance/ land productivity/ land retirement/ research and development/ sediment transport/ social costs/ soil depth: reduction/ soil erosion/ taxes/ technical assistance
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. Since

1933, soil conservation policies have existed in the United States. Originally they 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. As a consequence of conservation efforts associated with explicit U.S. government policies, total soil erosion between 1982 and 1992 was reduced by 32% and the sheet and rill erosion rate fell from an average of 4.1 tons per acre per year in 1982 to 3.1 tons per acre in 1992 while the wind erosion rate fell from an average of 3.3 tons per acre per year to 2.4 tons per acre per year over the same period. Still, soil erosion is imposing substantial social costs. These costs are estimated to be about $37.6 billion annually. 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.
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130. **Environmental payments to farmers: Issues of program design.**
Claassen, R. and Horan, R. D.
Agricultural Outlook (AO) (No. 272): 15-18. (2000)
NAL Call #: aHD1751.A422
This citation is provided courtesy of CAB International/CABI Publishing.

131. **Environmental policy and swine manure management: Waste not or want not?**
Hoag, D. L. and Roka, F. M.
American Journal of Alternative Agriculture 10 (4): 163-166. (1995)
NAL Call #: S605.5.A43; *ISSN:* 0889-1893
This citation is provided courtesy of CAB International/CABI Publishing.

132. **Environmental protection: Federal incentives could help promote land use that protects air and water quality.**
United States. General Accounting Office.
Washington, D.C.: GAO. (2001)
Notes: Report to Congressional Requesters; Title from web page. "October 2001." "GAO-02-12." Description based on content viewed April 14, 2003. Includes bibliographical references.
NAL Call #: TD171-.E68-2001
http://www.gao.gov/new.items/d0212.pdf
Descriptors: Environmental protection---United States/ Environmental protection---United States---Management/ Land use---Planning---Environmental aspects---United States/ Water quality management---United States/ Urban runoff---United States/ Urban runoff---United States---Management/ Automobiles---Motors---Exhaust gas---Environmental aspects---United States
This citation is from AGRICOLA.

133. **Equilibrium effects of agricultural technology adoption: The case of induced output price changes.**
Caswell, Margriet F.; Shoemaker, Robbin; and United States. Dept. of Agriculture. Economic Research Service.
Washington, DC: U.S. Dept. of Agriculture, Economic Research Service; viii, 15 p.: ill.; Series: Technical bulletin (United States. Dept. of Agriculture) no. 1823. (1993)
Notes: Cover title. "September 1993"--P. [iii]. Includes bibliographical references (p. 13).
NAL Call #: 1-Ag84Te-no.1823
Descriptors: Agricultural innovations---Economic aspects---United States/ Agricultural innovations---Government policy---United States/ Agricultural pollution---Economic aspects---United States/ Agricultural pollution---Government policy---United States/ Equilibrium---Economics
This citation is from AGRICOLA.

134. **Estimating transaction costs of alternative policies to reduce phosphorus pollution in the Minnesota River.**
McCann, L. and Easter, K. W.
Staff Paper - Department of Applied Economics, University of Minnesota (No. P98-7): 30 pp. (1998)
This citation is provided courtesy of CAB International/CABI Publishing.

135. **Ethnic diversity and the patterned adoption of soil conservation in the strawberry hills of Monterey, California.**
Mountjoy, D. C.
Society and Natural Resources 9 (4): 339-357. (July 1996-Aug. 1996)
NAL Call #: HC10.S63; *ISSN:* 0894-1920 [SNREEI].
Notes: Special Section: Cultural Diversity in Natural Resource Use. Includes references.
Descriptors: farmers/ ethnic groups/ soil conservation/ erosion control/ innovation adoption/ land management/ ethnicity/ farmers' attitudes/ California
This citation is from AGRICOLA.

136. **Evaluating barriers to participation by fertilizer and agricultural chemical dealers in a federal water quality project.**
Lanyon, L. E.; Kiernan, N. E.; and Stoltzfus, J. H.
Journal of Natural Resources and Life Sciences Education 25 (2): 160-165. (1996)
NAL Call #: S530 .J6; *ISSN:* 1059-9053
This citation is provided courtesy of CAB International/CABI Publishing.

137. **Evaluation of a stream-bank fencing program in Pennsylvania.**
Hafner, Christine L and Brittingham, Margaret C
Wildlife Society Bulletin 21 (3): 307-315. (1993)
NAL Call #: SK357.A1W5; *ISSN:* 0091-7648
Descriptors: Aves (Aves Unspecified)/ Hominidae (Hominidae)/ Plantae (Plantae Unspecified)/ animals/ birds/ chordates/ humans/ mammals/ nonhuman vertebrates/ plants/ primates/ vertebrates/ farmers attitudes/ summer resident birds/ vegetation
Abstract: Sixty summer resident bird species were recorded on 3 fenced and 3 unfenced riparian areas located in grazed pastures in Lancaster County, Pennsylvania. The greatest impact of fencing was on nest density and nest success. Nest density was higher on fenced than control sites, but nest success was lower on fenced compared to control sites. Although nest success was lower, overall productivity (no. of successful nests/ha) did not differ between fenced and control sites. Reducing stream-bank erosion, improving water quality, and the belief that fencing would become mandatory in the future were the primary reasons landowners gave for participating in the fencing program. After joining the program, the major concerns or complaints landowners had about fencing involved weeds, fence maintenance, and loss of pasture. These issues will need to be addressed to maintain high levels of voluntary participation in fencing programs.
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138. **Evaluation of farmers' perceptions of soil quality indicators.**
Liebig, M. A. and Doran, J. W.
American Journal of Alternative Agriculture 14 (1): 11-21. *(*1999)
NAL Call #: S605.5.A43; *ISSN:* 0889-1893 [AJAAEZ]
Descriptors: farmers/ soil fertility/ soil texture/ knowledge/ technology transfer/ monitoring/ evaluation/ techniques/ organic farming/ questionnaires/ nitrogen/ phosphorus/ nutrient availability/ soil color/ soil compaction/ infiltration/ farmers' attitudes/ Nebraska
Abstract: Understanding farmers' knowledge of soil quality and health is essential to ensure transfer of appropriate technology for on-farm assessments. The objective of this study was to evaluate farmers' knowledge of soil quality by comparing their perceptions of soil conditions for "good" and "problem" soils on their farms with values of soil quality indicators as determined by established assessment protocol. Twenty-four conventional and organic farmers throughout eastern Nebraska were paired within regions of similar climate, topography, and soil type and their perceptions of soil quality indicators were queried using a written questionnaire. Questionnaire data were compared directly to values of soil quality indicators and perception accuracy indices were calculated. Overall, perception accuracy of soil quality indicators did not differ between conventional and organic farmers. Farmers' perceptions of soil quality indicators tended to be more accurate for "good" soils as compared to "problem" soils. Indicators that were incorrectly estimated at a frequency greater than 33% included available nitrogen and phosphorus, soil color, degree of compaction, and infiltration rate. Despite this, farmers' perceptions were correct or nearly-correct over 75% of the time for the majority of indicators evaluated in the study. Evaluation of social and managerial factors indicated that perception accuracy of soil quality indicators declined as the time of on-farm tenure increased. Results from this study indicate that agriculturists should seek out farmers' knowledge of soil characteristics as a first iteration to point-scale evaluation of soil quality.
This citation is from AGRICOLA.

139. **Evaluation of policy tools to establish forests and protect water quality in cornbelt watersheds.**
Lant, C. and Kraft, S. E.
Urbana, Ill.: Water Resources Center, University of Illinois at Urbana-Champaign; Rept No: UILUWRC93217, USGSG201706, 1993. 27 p.
Notes: "Research report."; "May 1993." "... supported in part by funds provided by the United States Department of the Interior as authorized under the Water Resources Act of 1984." "Project no. G-2017-06." "UILU-WRC-93-217."--Cover. Includes bibliographical references (p. 19-20).
NAL Call #: TC424.I3I4--no.217
Descriptors: Soil conservation projects---Illinois---Central Region/ Water resources development---Illinois---Central Region/ Watershed management---Illinois---Central Region/ Water quality management---Illinois---Central Region/ Groundwater---Illinois---Central Region---Quality
Abstract: The 1990 Farm Bill provides a number of incentives to farmers and farmland owners to improve water quality by retiring critical croplands through the Conservation Reserve Program (CRP) and the Agricultural Wetland Reserve Program (AWR), and by controlling chemical use through the Water Quality Incentives Program (WQIP). The

study utilizes two contingent valuation methodologies on 770 mail surveys and 157 personal interviews in 10 cornbelt counties to estimate potential participation in these programs as a function of financial incentives offered. It also identifies possible barriers to increased enrollment and presents farmers' attitudes toward these programs as well as toward Swampbuster. The results show that potential enrollments in the WQIP are low; only 17.5 percent of respondents indicated an interest in participating. In contrast, potential enrollments of filter strips, recharge areas, and farmed wetlands in the CRP respond strongly to annual rental rates, particularly in the range $90 -140/acre.
This citation is from AGRICOLA.

140. **Evaluation of the experimental Rural Clean Water Program: Barriers and Incentives.**
Gale, Judith A. and United States. Environmental Protection Agency. Office of Wetlands, Oceans and Watersheds
Washington, D.C.: United States Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, Nonpoint Source Control Branch, 1993. 559 p.
Notes: "May 1993." "National Water Quality Evaluation Project." "EPA-841-R-93-005"--Cover. Includes bibliographical references. Sponsor: Rural Nonpoint Source Control Water Quality Evaluation and Technical Assistance (Project).
NAL Call #: TD370.E92--1993
http://h2osparc.wq.ncsu.edu/info/rcwp/index.html
Descriptors: Rural Nonpoint Source Control Water Quality Evaluation and Technical Assistance Project/ Water quality---United States/ Water quality management---United States
This citation is from AGRICOLA.

141. **Explaining farmers' conservation behaviour: Why do farmers behave the way they do?**
Beedell, J D C and Rehman, T
Journal of environmental management 57 (3): 165-176. (1999)
NAL Call #: HC75.E5J6; *ISSN:* 0301-4797
Descriptors: human (Hominidae): farmer/ Animals/ Chordates/ Humans/ Mammals/ Primates/ Vertebrates/ Theory of Planned Behavior/ attitudes/ conservation behavior/ decision making processes / hedges/ landscape management/ social pressure/ social psychology/ wildlife management
Abstract: This paper attempts to illustrate the use of a structured social psychology methodology, the Theory of Planned Behaviour, in explaining how and more crucially why farmers manage the existing wildlife and landscape features on their holdings. The hedge management behaviour of Bedfordshire farmers is studied to illustrate the theory and it was found that the more 'conservation minded' ones regarded the conservation benefits of hedge management more likely to be true and value them more highly than other farmers do. Such farmers also felt under greater social pressure to manage their hedges. This use of the Theory of Planned Behaviour suggests that it can provide a useful insight into farmers' decision-making processes and their conservation behaviour.
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142. **Explaining irrigation technology choices: A microparameter approach.**
Green, G.; Sunding, D.; Zilberman, D.; and Parker, D.
American Journal of Agricultural Economics 78 (4): 1064-1072. (Nov. 1996)
NAL Call #: 280.8-J822; *ISSN:* 0002-9092 [AJAEBA]
Descriptors: irrigation water/ water costs/ technology/ soil properties/ innovation adoption/ irrigation systems/ decision making/ probability/ probabilistic models/ multivariate analysis/ California/ San Joaquin Valley/ California
Abstract: Water price reforms are increasingly being used to encourage improvements in irrigation efficiency through technology adoption. A microparameter approach based on field-level data is used to assess the effect of economic variables, environmental characteristics, end institutional variables on irrigation technology choices. The results show that water price is not the most important factor governing irrigation technology adoption; physical and agronomic characteristics appear to matter more. The results demonstrate the importance of using micro-level data to determine the effects of asset heterogeneity and crop type on technology adoption.
This citation is from AGRICOLA.

143. **Facilitating User Participation in Irrigation Management.**
Kolavalli, S. and Brewer, J. D.
Irrigation and Drainage Systems 3: 249-273. (1999)
NAL Call #: TC801 .I66; *ISSN:* 0168-6291.
Notes: DOI: 10.1023/A:1006211725291
Descriptors: Water Users/ Cost benefit Analysis/ Irrigation Systems/ Organizations/ Cost effectiveness / Irrigation water/ Cost allocation, cost sharing, pricing/ Underground Services and Water Use
Abstract: This paper examines various factors which contribute to performance of water user associations. The capability of collective organizations such as WUAs to develop appropriate rules and to enforce them while keeping the level of conflict low is considered to be the core of organizational performance. We focus on the processes in collective organizations with greater

attention to costs of working together. Four factors representing benefits and costs, the rights held by the WUAs, magnitude of expected benefits, external assistance received and leadership explain most of the differences in performance. The prospect of benefits is a necessary condition for individuals to act collectively. But it is not sufficient. Expected organizational costs need to be low. The prospect of costs being low or being absorbed by one or more individuals - either external agents or internal leaders - provides an encouraging environment. Effective internal leadership appears to be essential as it can lead to greater congruence in interests and greater possibility of mutual assurances which are critical for collective action.
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144. **Factor-input demand subject to economic and environmental risk: Nitrogen fertilizer in Kansas dryland corn production.**
Carriker, G. L.
Review of Agricultural Economics 17 (1): 77-89. (Jan. 1995)
NAL Call #: HD1773.A3N6; *ISSN:* 1058-7195
Descriptors: zea mays/ nitrogen fertilizers/ crop production/ dry farming/ cost analysis/ farm inputs/ risk/ environmental impact/ farm management/ decision making/ demand/ returns/ equations/ Kansas/ external costs
Abstract: Factor-input demand should be affected when a producer considers environmental risks in the decision-making process; this is a straight forward application of the LeChatelier Principle. The two-fold purpose of this study is to develop a model to estimate environmental costs arising from excess factor inputs and to examine how firm-level factor-input demand is affected by economic and environmental risk. Nitrogen fertilizer use in northeast Kansas dryland corn production is used as an example. Weather and corn growth simulation models were used to generate 50-year distributions of dryland corn yields and potential environmental damage (surplus nitrogen). A model for approximating external environmental costs of surplus factor inputs was developed. Private (environmental costs not included) and social (environmental costs included) net returns distributions were generated for 1991 Farm Bill program participation and non-participation. Stochastic dominance analysis with respect to a function was used to identify the risk-efficient fertilizer strategies from among the 24 private and 24 social net returns distributions. Constrained (private) and unconstrained (social) nitrogen fertilizer demand schedules were then approximated on a per-pound of fertilizer basis as measures of the incremental value of nitrogen fertilizer. As expected, the results suggest that: (1) in the absence of environmental risk, nitrogen demand is more elastic as a producer becomes more risk averse; and (2) when environmental risk is introduced into the decision-making process, nitrogen demand is more elastic than when environmental risk is excluded. The findings support the hypothesis that producers when provided with information regarding the potential environmental effects of production strategies, may choose those that are more environmentally benign.
This citation is from AGRICOLA.

145. **Factors affecting attitudes toward groundwater pollution among Ohio farmers.**
Napier, T. L. and Brown, D. E.
Journal of Soil and Water Conservation 48 (5): 432-438. (1993)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
This citation is provided courtesy of CAB International/CABI Publishing.

146. **Factors affecting conservation practice behavior of CRP participants in Alabama.**
Onianwa, O.; Wheelock, G.; and Hendrix, S.
Journal of Agribusiness 17 (2): 149-160. (1999); *ISSN:* 0738-8950
This citation is provided courtesy of CAB International/CABI Publishing.

147. **Factors affecting environmental impacts: The effect of technology on long-term trends in cropland, air pollution and water-related diseases.**
Goklany, Indur M
Ambio 25 (8): 497-503. (1996)
NAL Call #: QH540.A52; *ISSN:* 0044-7447
Descriptors: agriculture/ conservation/ environmental impact assessment/ global food demand/ pollution/ water related diseases
Abstract: Long-term trends for cropland harvested, air emissions and deaths due to water-related diseases (selected as indicators of land, air and water pollution, respectively) are analyzed primarily for the US from the early 1900s onward. Due to technological change, the increases in these indicators are generally less than those for population (P), affluence (A) or their product (PA) - sometimes by an order of magnitude. Technological change resulted from secular improvements in technologies which were adopted voluntarily - owing to greater affluence and other economic factors - or because of national environmental laws. While environmental impacts had diminished substantially even before their enactment, these laws, whose very stringency may depend on affluence, consolidated and extended those gains. The analysis suggests that fostering economic growth and technological

change will help reduce adverse environmental impacts, including further losses of habitat and biodiversity, as new cropland is created to meet future global food demand.
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148. **Factors affecting farmers' use and rejection of banded pesticide applications.**
Rikoon, J. S.; Constance, D. H.; and Geletta, S.
Journal of Soil and Water Conservation 51 (4): 322-329. (July 1996-Aug. 1996)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561 [JSWCA3]
Descriptors: water quality/ water resources/ environmental protection/ farm management/ herbicides/ band placement/ innovation adoption/ decision making/ change/ farmers' attitudes/ constraints/ assessment/ surveys/ methodology/ best management practices
This citation is from AGRICOLA.

149. **Factors affecting initial use and decision to abandon banded pesticide applications.**
Rikoon, J. S.; Vickers, R.; and Constance, D.
In: Agricultural research to protect water quality: Proceedings of the conference. (Held 21 Feb 1993-24 Feb 1993 at Minneapolis, Minnesota.)
Ankeny, IA: Soil and Water Conservation Society; pp. 335-337; 1993.
NAL Call #: TD427.A35A49-1993
Descriptors: pesticides/ band placement/ farmers/ United States/ innovation adoption/ decision making/ regional surveys/ water pollution/ water quality/ low input agriculture
This citation is from AGRICOLA.

150. **Factors affecting NIPF landowner participation in management programs: A Massachusetts case study.**
Stevens, T. H.; White, S.; Kittredge, D. B.; and Dennis, D.
Journal of Forest Economics 8 (3): 169-184. (2002); *ISSN:* 1104-6899
This citation is provided courtesy of CAB International/CABI Publishing.

151. **Factors affecting nutrient application rates within three Midwestern watersheds.**
Napier, T. L. and Tucker, M.
Journal of Soil and Water Conservation 56 (3): 220-228. (2001)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
This citation is provided courtesy of CAB International/CABI Publishing.

152. **Factors affecting the adoption of conservation tillage on clay soils in southwestern Ontario, Canada.**
Wandel, J. and Smithers, J.
American Journal of Alternative Agriculture 15 (4): 181-188. (2000)
NAL Call #: S605.5.A43; *ISSN:* 0889-1893
This citation is provided courtesy of CAB International/CABI Publishing.

153. **Factors affecting the adoption of productive pastures by participants in a paired-paddock extension program.**
Trompf, J. P.; Sale, P. W. G.; and Graetz, B.
Australian Journal of Experimental Agriculture 40 (8): 1089-1099. (2000)
NAL Call #: 23-Au792; *ISSN:* 0816-1089
Descriptors: pastures / extension/ innovation adoption/ grasslands/ surveys/ farmers' attitudes/ stocking rate/ phosphorus fertilizers/ application rates/ farm management/ rain/ South Australia/ New South Wales/ Victoria/ Tasmania
This citation is from AGRICOLA.

154. **Factors affecting use of conservation farming practices in east central Ohio.**
Camboni SM and Napier TL
Agriculture, Ecosystems and Environment 45 (1-2): 79-94; 26 ref. (1993)
NAL Call #: S601 .A34
This citation is provided courtesy of CAB International/CABI Publishing.

155. **Factors influencing best management practice implementation in Virginia's Chesapeake Bay drainage basin.**
Lowery, James B.
Blacksburg, Va.: Virginia Polytechnic Institute and State University, 1996.
Notes: Report (M.S.); Bibliography: leaves 207-208.
NAL Call #: ViBlbV LD5655.V851-1996.L694
Descriptors: agriculture/ best management practices/ cost share/ nonpoint source pollution/ survey
This citation is from AGRICOLA.

156. **Factors influencing farmer participation in the environmentally sensitive areas scheme.**
Wilson, Geoff A
Journal of Environmental Management 50 (1): 67-93. (1997)
NAL Call #: HC75.E5J6; *ISSN:* 0301-4797
Descriptors: agri-environmental schemes/ conservation/ decision making behavior/ environmentally sensitive areas scheme/ ESA scheme/ farmer participation/ remnant wildlife habitat
Abstract: This study investigates factors influencing farmers' motivations for participation in the Cambrian Mountains ESA scheme (Wales, U.K.). Emphasis is

placed on analysing whether significant correlations exist between ESA participation and specific factors. A behavioural approach is used for analysis, largely based on Brotherton's classification into 'scheme factors' (e.g. payments) and 'farmer factors' (e.g. age of farmer), but which expands this classification by including the 'information environment' of a farmer and 'dynamics within the farm district' - variables which this study shares with some actor-network approaches. While size and existence of remnant wildlife habitats were strongly correlated with overall participation, payments offered by the scheme, information provided by ADAS, scheme flexibility, the 'successors factor' and dynamics within the district were of particular importance for participation on farms of marginal ESA eligibility (i.e. small farms lacking substantial semi-natural habitats). Age, education and length of residency were important for explaining differential entering of specific habitats (especially broadleaved woodlands) into the ESA scheme, while scheme duration, dependence on the farm for income, tenure and the general information environment of the farmer did not influence overall participation. The paper concludes by arguing that a behavioural approach offers a valuable insight into farmers' decision-making behaviour with regard to participation in agri-environmental schemes, and that this study may be seen as a starting point that could be expanded through the use of related methodologies.
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157. **Factors influencing farmer's participation in agri-environmental measures: A Belgian case study.**
Vanslembrouck, Isabel; Van Huylenbroeck, Guido; and Verbeke, Wim
Mededelingen Faculteit Landbouwkundige en Toegepaste Biologische Wetenschappen Universiteit Gent 65 (4): 99-104. (2000)
Descriptors: Belgian agri environmental management/ agricultural policy/ environmental quality/ farmer participation/ farmer's participation associated influences/ non market service reward development/ resource management
© Thomson

158. **Factors to Consider when Bringing Conservation Reserve Program (CRP) Land or Idle Land Back into Production.**
Murdock, L.; Herbek, J.; Townsend, L.; Hershman, D.; Martin, J.; Rasnake, M.; Hill, D. B.; Clark, B.; and Trimble, R. L. University of Kentucky, College of Agriculture, Cooperative Extension Service; ID-124, 1997.
http://www.ca.uky.edu/agc/pubs/id/id124/id124.htm
Descriptors: Conservation Reserve Program/ United States
Abstract: Looked at factors to consider, such as which cropping system to use, pests that will be encountered, fertility status of the field, other nontraditional options, and the economics of bringing land back into production after CRP contract expiration.

159. **Family Factors Affecting Adoption of Sustainable Farming Systems.**
Salamon, S.; Farnsworth, R. L.; Bullock, D. G.; and Yusuf, R.
Journal of Soil and Water Conservation 52 (4): 265-271. (Aug. 1997)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
Descriptors: United States, Illinois/ comparison studies/ farming/ attitudes/ decision making/ social aspects/ education/ agricultural practices/ family factors/ Evaluation process
Abstract: A paired comparison of 60 Illinois farm families was employed, 30 using sustainable systems and 30 using conventional systems, to determine factors affecting adoption of sustainable farming systems. The groups do not diverge significantly along dimensions typically accounting for farming contrasts, but are distinctive socially. Families using sustainable systems have traditions of environmentalism, systematically do on-farm experimentation, and are prudent about resources. Rather than making a paradigm shift to environmentally sensitive farming, families who adopt have a predisposition toward sustainable practices in all aspects of their lives. Adoption of sustainable systems is therefore as much for efficiency or financial motives as it is for environmental reasons. Families farming conventionally but sharing many characteristics identified with sustainable families, potentially are those best targeted for educational programs.
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160. **Farm*a*Syst/Home*a*Syst: A Framework for Voluntary Action That Is Both Effective and Replicable.**
Castelnuovo, R.
Water Science and Technology 39 (12): 315-322. (1999)
NAL Call #: TD420.A1P7; *ISSN:* 0273-1223.
Notes: Conference: IAWQ 3, International Conference on Diffuse Pollution, Edinburgh (UK), 21 Aug-4 Sep 1998
Descriptors: Canada/ Australia/ United States/ North America/ Education/ Risk/ Behavior/ Interagency Cooperation/ Evolution/ Water Pollution Prevention/ Water Pollution Control/ Public Participation/ Nonpoint pollution/ Pollution prevention/ Agriculture/ Environment management/ Farm*A*Syst/ Home*A*Syst/ Water quality control/ Environmental action
Abstract: Farm*A*Syst/Home*A*Syst has developed an applied approach to education that results in

voluntary actions effective in preventing pollution. Easy-to-use assessment worksheets are a key innovation that enable landowners to identify pollution risks on their property and develop plans to correct problems. This active learning process produces high levels of awareness that translate into changes in behavior. Farm*A*Syst/Home*A*Syst supports voluntary action by landowners with a unique structure that emphasizes interagency cooperation and local program delivery. The program's capacity for replication is demonstrated by its evolution in the United States as well as its adoption in North America and beyond. Examples of international use include the Environmental Farm Plan developed in Canada and a cotton- specific adaptation in Australia. As a result of the ongoing expansion of this common sense approach to pollution prevention, Farm*A*Syst/Home*A*Syst offers many options to involve and motivate farmers and other non-industrial audiences whose voluntary participation is needed to reduce diffuse pollution.
© Cambridge Scientific Abstracts (CSA)

161. **Farm Economics to Support the Design of Cost-Effective Best Management Practice (BMP) Programs to Improve Water Quality: Nitrogen Control in the Neuse River Basin, North Carolina.**
Wossink, G. A. A. and Osmond, D. L.
Journal of Soil and Water Conservation 57 (4): 213-220. (2002)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
Descriptors: United States, North Carolina, Neuse River/ Watershed Management/ Nonpoint Pollution Sources/ Water Pollution Control/ Nitrogen/ Best Management Practices/ Public Participation/ Economic Aspects/ Cost Analysis/ Cost Sharing/ Water quality control/ Water Pollution: Monitoring, Control & Remediation
Abstract: This paper shows how farm economics information that is widely available can be used to help guide local resource managers and watershed groups in their efforts to design cost-effective programs to improve water quality. The focus is on the economic elements driving farmer and landowner decisions and how those compare with incentive payments to alter these decisions. The approach is illustrated for the case of Best Management Practices (BMPs) mandated for nitrogen control in the Neuse River Basin in North Carolina. The empirical research shows that the economics of the BMPs are very different for the three regions in the basin as distinguished by physiographic conditions. Economic differences in implementing BMPs should be taken into account by state and federal authorities when they are determining cost-share programs. The research also shows that the cost-share payments offered for grass buffers might not be in line with the relative reduction in nitrogen emission offered by this BMP.
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162. **Farm management and protection of natural resources: Analysis of adaptation process and dependence relationships.**
Gafsi, M. and Brossier, J.
Agricultural Systems 55 (1): 71-97. (Sept. 1997)
NAL Call #: HD1.A3; *ISSN:* 0308-521X [AGSYDS]
Descriptors: mineral waters/ farm management/ natural resources/ environmental protection/ adaptation/ contracts/ farming systems/ innovation adoption/ resource management/ case studies
Abstract: In the new farming context, farms are under considerable pressure from their socio-economic and administrative environment to adhere to service or management contracts, which create new constraints regarding production systems, leading farmers to modify their farming practices with a highly limiting effect on their manoeuvring power. Using the example of protection of a mineral water perimeter, we analyse in this paper: (i) the techno-economic results of the adaptation process on the farms; and (ii) the question of dependence of farms with regard to the other party involved in the contract. The methodological approach used is crucial to the reliability of this analysis. We have used the physical and monetary flow method to carry out detailed studies of the farms based on the case-study method. Results after the changes show a trend to specialise and extensify production systems, and also positive economic results with a new source of farm revenue (bonuses). The analysis shows that pressure to change leads to several types of external control on farms, and also that farmers are able to react in a number of ways. The success of such programmes can be put down to a certain number of factors which are examined here. This citation is from AGRICOLA.

163. **Farm Operators' Preferences for Soil Conservation Service Information: Results From Three Tennessee Watersheds.**
Pompelli, G.; Morfaw, C.; English, B. C.; Bowling, R. G.; Bullen, G. S.; and Tegegne, F.
Journal of Production Agriculture 10 (3): 472-476. (1997)
NAL Call #: S539.5.J68; *ISSN:* 0890-8524
Descriptors: United States, Tennessee/ Soil Conservation/ Watersheds/ Attitudes/ Farms/ Regional Analysis/ Information Systems/ Prediction/ Legislation/ Water quality/ Agriculture/ Environmental information/ Human factors/ Information exchange/ Watershed protection/ Environmental action/ Conservation in agricultural use
Abstract: Recent water quality legislation requires

that the Soil Conservation Service (SCS) reach a more diverse range of farm operators, especially small farm operators. With few, if any, additional resources, the effectiveness of the SCS's efforts to communicate soil conservation information to new audiences is critical. Thus, a better understanding about farm operators' predispositions toward SCS information may help SCS personnel reach these new audiences more efficiently. This study examines the extent to which farm and farm operator characteristics can be used to predict farm operators' attitudes about the usefulness of soil conservation information supplied by the SCS. The results of this study indicate that farm operators contacted by SCS and extension personnel, who also participate in government commodity programs have an increased likelihood of considering SCS information useful. Although regional influences negatively affect the likelihood that farm operators will consider the SCS soil conservation information useful, farm size, gross sales, years of education, and other farm and farm operator characteristics were not found to be significant factors.
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164. **Farm organization and resource use.**
Campbell, M. B. and Dinar, A.
Agribusiness 9 (5): 465-480. (Sept. 1993)
NAL Call #: HD1401.A56; *ISSN:* 0742-4477
Descriptors: farm management/ decision making/ resource utilization/ farm inputs/ labor/ irrigated farming/ drainage/ innovation adoption/ classification/ organization of work/ farm comparisons/ California/ San Joaquin Valley, California
This citation is from AGRICOLA.

165. **Farm production systems of Mennonite and non-Mennonite land owner-operators in Ohio.**
Napier, T. L. and Sommers, D. G.
Journal of Soil and Water Conservation 51 (1): 71-76. (Jan. 1996-Feb. 1996)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561 [JSWCA3]
Descriptors: farming systems/ farm structure/ comparisons/ social differentiation/ religion/ ethnicity/ farmers/ cultural behavior/ farmers' attitudes/ innovation adoption/ technical progress/ environmental protection/ resource conservation/ educational programs/ technology transfer/ diffusion of information/ rural sociology/ Ohio
This citation is from AGRICOLA.

166. **Farmer adoption of improved nitrogen management technologies in rice farming: Technical constraints and opportunities for improvement.**
Balasubramanian, V.
Nutrient Cycling in Agroecosystems 53 (1): 93-101. (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/ crop management/ farmers' attitudes/ innovation adoption/ soil management/ climatic factors/ nitrogen/ use efficiency/ irrigation/ weeds/ agricultural research/ spatial variation/ temporal variation/ soil fertility/ nutrient balance/ drainage/ soil degradation/ soil compaction/ flooding/ rain/ drought/ solar radiation/ stress/ tolerance/ farming systems/ technology transfer/ literature reviews
This citation is from AGRICOLA.

167. **Farmer evaluation of precision farming technologies.**
Batte, M. T. and Arnholt, M. W.
Journal of the American Society of Farm Managers and Rural Appraisers: 78-89. (2002)
NAL Call #: 281.8-Am32; *ISSN:* 0003-116X
Descriptors: site specific crop management/ farmers' attitudes/ perception/ innovation adoption/ probit analysis/ farm surveys/ cost benefit analysis/ Ohio
This citation is from AGRICOLA.

168. **Farmer irrigation scheduling: A case study in Arizona.**
Lamacq, S.; Gal, P. Y. le; Bautista, E.; and Clemmens, A. J.
In: Evapotranspiration and irrigation scheduling: Proceedings of the International Conference. (Held 3 Nov 1996-6 Nov 1996 at San Antonio, Texas.) Camp, C. R.; Sadler, E. J.; and Yoder, R. E. (eds.); pp. 97-102; 1996. *ISBN:* 0-929355-82-2
This citation is provided courtesy of CAB International/CABI Publishing.

169. **Farmer participation in irrigation: 20 years of experience and lessons for the future.**
Meinzen Dick, R.
Irrigation and Drainage Systems 11 (2): 103-118. (May 1997)
NAL Call #: TC801.I66; *ISSN:* 0168-6291 [IRDSEG]
Descriptors: irrigated farming/ irrigation/ farmers/ organizations/ farmers' associations/ irrigation water/ irrigation scheduling/ farmers' attitudes/ participation/ water policy/ water allocation/ Philippines/ Sri Lanka/ Pakistan/ Senegal/ Mexico/ western states of USA/ water users' associations/ Columbia Basin area of USA
This citation is from AGRICOLA.

170. **Farmer perspectives on the Wetlands Reserve Program: A series of focus groups conducted by the Soil and Water Conservation Society, October 1993-February 1994.**
Soil and Water Conservation Society (U.S.).
Ankeny, Iowa: Soil and Water Conservation Society. (1994)
Descriptors: Wetlands Reserve Program U.S/ Wetlands---Law and legislation---United States/ Wetland conservation---Law and legislation---United States
This citation is from AGRICOLA.

171. **Farmer rationality and the adoption of environmentally sound practices; a critique of the assumptions of traditional agricultural extension.**
Vanclay, F. and Lawrence, G.
European Journal of Agricultural Education and Extension 1 (1): 59-90. (Apr. 1994)
NAL Call #: S530.E97; *ISSN:* 1381-2335
Descriptors: extension/ sustainability/ low input agriculture/ farmers' attitudes/ innovation adoption/ environmental protection/ social benefits/ economic impact/ Australia/ United States/ Europe/ barriers to innovation adoption
This citation is from AGRICOLA.

172. **Farmer's willingness to pay for groundwater protection.**
Lichtenberg, E. and Zimmerman, R.
Water Resources Research 35 (3): 833-841. (1999)
NAL Call #: 292.8 W295; *ISSN:* 0043-1397
This citation is provided courtesy of CAB International/CABI Publishing.

173. **Farmers' and experts' opinion on no-tillage in Western Europe and Nebraska (USA).**
Tebrügge, F. and Böhrnsen, A.
In: Conservation agriculture: Environment, farmers experiences, innovations, socio-economy, policy/ García-Torres, L.; Benites, J.; Martínez-Vilela, A.; and Holgado-Cabrera, A.
Dordrecht, The Netherlands: Kluwer Academic, 2003; pp. 69-78.
Notes: ISBN: 1-4020-1106-7
NAL Call #: S604.5 .C64 2003
This citation is provided courtesy of CAB International/CABI Publishing.

174. **Farmers and the custody of the countryside: Trends in loss and conservation of non-productive habitats 1981-1998.**
Macdonald, D W and Johnson, P J
Biological Conservation 94 (2): 221-234. (2000)
NAL Call #: S900.B5; *ISSN:* 0006-3207
Descriptors: human (Hominidae): farmers/ Animals/ Chordates/ Humans/ Mammals/ Primates/ Vertebrates/ conservation policy/ cultivation type/ farmland management/ habitat destruction/ habitat restoration/ hedgerow/ non productive habitats
Abstract: Using questionnaires circulated in 1981 and 1998, we assess the extent to which wildlife habitats were lost from English farms during the 1970s and 1990s, and attempt to identify the forces which motivated farmers to act as they did. We investigate how farmers' professed interest in wildlife and involvement with different leisure activities, particularly field sports, was related to their actions, and how these patterns had changed between the two surveys. These patterns are of some interest in assessing how the availability of subsidies, and changes in the legal framework surrounding farmland management, may effect the behaviour of farmers. There were large regional differences between farmers in their reported strategies with respect to unproductive land in both surveys, which could be at least partially related to regional variation in cultivation types. While economic reasons were predominant in motivating farmers to remove hedgerows and other habitats in the 1970s, a large proportion of farmers then also professed positive attitudes to wildlife and stated that they would be willing to co-operate with schemes for habitat restoration if subsidies were available. In the 1990s subsidies have become available, and many of the 1990s respondents had made use of the various schemes recently in place to encourage habitat restoration and preservation. There was some evidence that fieldsport involvement was influential; hunting farmers reported least hedgerow destruction in both decades and shooting farmers reported creating more new woodland in the 1990s than did other farmers.
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175. **Farmers' attitudes about farming and the environment: A survey of conventional and organic farmers.**
Sullivan, Shannon; McCann, Elizabeth; De Young, Raymond; and Erickson, Donna
Journal of Agricultural and Environmental Ethics 9 (2): 123-143. (1996)
NAL Call #: BJ52.5 .J68; *ISSN:* 1187-7863
Descriptors: human (Hominidae)/ animals/ chordates/ humans/ mammals/ primates/ vertebrates/ agriculture/ conservation/ conventional farming/ environmental attitudes/ farmer/ farming attitudes/ human ecology/ organic farming
Abstract: Farmers have been characterized as people whose ties to the land have given them a deep awareness of natural cycles, appreciation for natural beauty and sense of responsibility as stewards. At the same time, their relationship to the land has been characterized as more utilitarian than that of others who are less directly dependent on its bounty. This paper explores this tension by comparing the attitudes and beliefs of a group of

conventional farmers to those of a group of organic farmers. It was found that while both groups reject the idea that a farmer's role is to conquer nature, organic farmers were significantly more supportive of the notion that humans should live in harmony with nature. Organic farmers also reported a greater awareness of and appreciation for nature in their relationship with the land. Both groups view independence as a main benefit of farming and a lack of financial reward as its main drawback. Overall, conventional farmers report more stress in their lives although they also view themselves in a caretaker role for the land more than do the organic farmers. In contrast, organic farmers report more satisfaction with their lives, a greater concern for living ethically, and a stronger perception of community. Finally, both groups are willing to have their rights limited (organic farmers somewhat more so) but they do not trust the government to do so.
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176. **Farmers' attitudes to the benefits and barriers of adopting automation for surface irrigation on dairy farms in Australia.**
Maskey, R.; Roberts, G.; and Graetz, B.
Irrigation and Drainage Systems 15 (1): 39-51. (2001)
NAL Call #: TC801.I66; *ISSN:* 0168-6291 [IRDSEG]
Descriptors: dairy farms/ farmers' attitudes/ surface irrigation/ automation/ automatic irrigation systems/ factor analysis/ irrigated pastures/ innovation adoption/ Victoria
Abstract: The study reports farmers' attitudes and perceptions towards the "barriers" and "benefits" of automatic irrigation systems. Factor analysis was used to identify perceived "barriers" and "benefits" and the impact of these on farmers' priority to adopt automation was examined. Results suggest that farmers' attitudes, particularly with respect to "cost" and "lifestyle" influenced the priority given to adopting automatic irrigation systems. The area under pasture cultivation was also an important determinant in the farmers' priority for adopting automatic irrigation systems.
This citation is from AGRICOLA.

177. **Farmers' attitudes toward the carrying out of wildlife habitat improvement actions (WHIA) in intensive agricultural areas of Northern Italy.**
Genghini, M; Spalatro, Fiorenza; and Gellini, S
Zeitschrift fuer Jagdwissenschaft 48 ([supplement]): 309-319. (2002); *ISSN:* 0044-2887
Descriptors: human (Hominidae): farmer, hunter, manager, public functionary/ livestock (Mammalia): commercial species/ plant (Plantae): fruit crop, game crop/ wildlife (Animalia)/ Animals/ Chordates/ Humans/ Mammals/ Nonhuman Mammals/ Nonhuman Vertebrates/ Plants/ Primates/ Vertebrates/ abandoned fields: reclamation / age effects/ agri environmental management/ attitudes/ community participation/ crop residues maintenance/ economic compensation/ farm structures/ financial subsidies/ hunting permits/ intensive agricultural areas/ livestock breeding/ outsourcing/ payment levels/ set aside lands/ socio economics/ wildlife damage/ wildlife habitat improvement actions [WHIAs]
Abstract: The research aims at estimating farmers' willingness to carry out selected measures for creating or improving wildlife habitat on their farms. We have surveyed almost all farmers of one agricultural province (Ravenna) in Northern Italy, by sending 9,500 questionnaires enclosed in three major farm publications. The questionnaire was elaborated on the basis of the results of previous interviews with several farmers, hunters, public functionaries and managers of agri-environmental and wildlife sectors. The questionnaire was organised by dividing it into two main sections: the first covers socio-economic information about farmers and farm structures, while the second asks respondents about their willingness to carry out some selected wildlife habitat improvement actions (WHIA). Four main measures were proposed, involving: game crops, crops residues maintenance, management of set-aside land for wildlife and management and reclamation of abandoned fields. Different payment levels were proposed for each measure. A telephone survey of 100 farmers revealed that only 10% of them were aware of the questionnaires. We collected a total of 303 valid questionnaires (3.2% of the total, and 31.9% of the examined questionnaires); they arrived partly by mail and partly through agricultural extension agents. 128 of such farmers (42%) expressed a general willingness to carry out actions in favour of wildlife in the case of economic compensation; only 36 (12%) were willing to carry out the proposed intervention if a low level of subsidy were involved (the level actually proposed in agri-environmental and/or wildlife habitat measures in the Ravenna province). Variables correlating positively with participation in the WHIA program are: farm size, certain types of farm (mixed, with prevalence of arable crops, and with pasture, woodland and set-aside fields), previous participation in agri-environmental programmes, presence of hunting permits in the family, absence of wildlife damage experience, farmers' age (in upland areas), etc. Variables correlating negatively with participation in the WHIA program are: fruit crops, livestock breeding, absence of outsourcing, farmers' age (on the plain), etc.
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178. **Farmers' Choices: Management Practices to Reduce Nutrient Leakage Within a Swedish Catchment.**
Bratt, A.
Journal of Environmental Planning and Management 45 (5): 673-689. (2002); *ISSN:* 0964-0568.
Notes: DOI: 10.1080/0964056022000013066
Descriptors: decision making/ Agriculture/ Catchments/ Water quality control/ Eutrophication/ Nutrients/ Sweden/ Water Quality Management/ Nonpoint Pollution Sources/ Catchment Areas/ Agricultural Practices/ Best Management Practices/ Public Participation/ Attitudes/ Pollution (Nonpoint sources)/ Decision theory/ Sweden/ Freshwater pollution/ Water Pollution: Monitoring, Control & Remediation/ Water quality control/ Water Quality
Abstract: This paper analyses farmers' strategies on management practices for the reduction of nutrient releases, within a Swedish catchment. The main objective of the European Union water framework directive is to obtain good ecological water quality, and the approach is specifically stipulated to be catchment-based. Eutrophication is generally stated as the main environmental problem in water management and agricultural production is the major cause of nutrient leakage. The analysis concentrates on current agricultural management practices to reduce nutrient leakage. Farmers are beginning to experience a new awareness about nutrient use and see manure as a resource instead of a waste product. Further, those factors that are decisive for decision making are investigated, including information sources. The farm economy, the level of ecological knowledge and regulations illustrate the main obstacles linked to decision making. Professional magazines and informal discussions are considered the most esteemed information sources. Farmers' disposition to change, and co-operation, are also discussed, both of which are of vital importance for the development of new official administrative procedures.
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179. **Farmers' commitment to continued use of the late spring soil nitrogen test.**
Contant, C. K. and Korsching, P. F.
American Journal of Alternative Agriculture 12 (1): 20-27. (1997)
NAL Call #: S605.5.A43; *ISSN:* 0889-1893 [AJAAEZ]
Descriptors: soil testing/ nitrogen/ nutrient availability/ determination/ spring/ tests/ technical progress/ new products/ utilization/ farmers' attitudes/ opinions/ innovation adoption/ decision making/ crop management/ nutrient management
Abstract: Within the past decade, low cost and convenient soil tests have been developed and marketed to permit better matching of soil nitrogen levels with crop needs. We explore the factors related to farmers' initial adoption and their commitment to continued use of one such kit, marketed in Iowa as N-Trak. Early adopters of the N-Trak had many of the same personal and farm operation characteristics as farmers who have been early adopters of other farming innovations. Further, the principal factors in differentiating between various levels of commitment to continued use of the kit were perceptions of technological attributes of the kit and, to a much lesser extent, farmer attitudinal factors and personal characteristics. These results suggest that perceived attributes of the technology, especially its returns to time, effort, and financial investment, were critical in the decision to adopt and continue to use the N-Trak kit. Early adopters' decisions to continue using it focused primarily on cost, profitability, and technological issues, to the exclusion of water quality concerns measured by attitudinal items. These findings suggest that providing information that shows the kit's ease, compatibility, and advantages, would be more persuasive than marketing it as a tool to enhance water quality.
This citation is from AGRICOLA.

180. **Farmers' decision processes and adoption of conservation tillage.**
Westra, John.; Olson, Kent D.; and University of Minnesota. Dept. of Applied Economics.
St. Paul, MN: Dept. of Applied Economics, University of Minnesota; 35 p.; Series: Staff paper (University of Minnesota. Dept. of Applied Economics) P97-9. (1997)
Notes: "June 1997." "Research sponsored by the Twin Cities Water Quality Initiative of the Metropolitan Council." Includes bibliographical references (p. 23).
NAL Call #: HD1761.A1M5-no.97-9
http://agecon.lib.umn.edu/mn/p97-09.pdf
This citation is from AGRICOLA.

181. **Farmers' incentives to conserve soil resources: A dynamic model applied to the North-Central United States.**
Hopkins, J. W.; Schnitkey, G. D.; Miranda, M. J.; Sohngen, B. G.; and Tweeten, L. G.
In: Land quality, agricultural productivity, and food security: Biophysical processes and economic choices at local, regional, and global levels/ Wiebe, K., 2003; pp. 305-318.
Notes: ISBN: 1-84064-752-3
This citation is provided courtesy of CAB International/CABI Publishing.

182. **Farmers' information sources, problem recognition and the adoption of water quality-related management practices.**
O'Keefe, G.; Rursch, J.; Anderson, S.; and Nowak, P.
In: Agricultural research to protect water quality: Proceedings of the conference. (Held 21 Feb 1993-24 Feb 1993 at Minneapolis, Minnesota.)
Ankeny, IA: Soil and Water Conseravation Society; pp. 252-253; 1993.
NAL Call #: TD427.A35A49-1993
Descriptors: farmers/ decision making/ farm management/ water quality/ diffusion of information
This citation is from AGRICOLA.

183. **Farmers' landscape decisions: Relationships between farmers' values and landscape practices.**
Busck, A. G.
Sociologia Ruralis 42 (3): 233-249. (2002); *ISSN:* 0038-0199
This citation is provided courtesy of CAB International/CABI Publishing.

184. **Farmers' motivations for adopting conservation practices along riparian zones in a mid-western agricultural watershed.**
Ryan, R. L.; Erickson, D. L.; and de Young, R.
Journal of Environmental Planning and Management 46 (1): 19-37. (2003); *ISSN:* 0964-0568
This citation is provided courtesy of CAB International/CABI Publishing.

185. **Farmers' needs for nature conservation education in Greece.**
Pyrovetsi, M and Daoutopoulos, G
Journal of environmental management 56 (2): 147-157. (1999)
NAL Call #: HC75.E5J6; *ISSN:* 0301-4797
Descriptors: herbicides: herbicide/ pesticides: pesticide/ human (Hominidae): farmer/ Animals/ Chordates/ Humans/ Mammals/ Primates/ Vertebrates/ environmental awareness/ farming practices: environmental impact/ landscape/ nature conservation education/ soil/ sustainable agriculture/ water quality/ wetlands: conservation
Abstract: Impact of farming practices on the environment and on wetlands is determined, to a great extent, by the level of farmers' environmental awareness. Effective conservation of wetlands cannot depend merely on prohibitions but instead it is necessary to investigate users' knowledge and attitudes towards these vulnerable resources and then inform and encourage sustainable use. In the present study we examine: (1) farmers' knowledge of the environmental impact of modern agriculture practised adjacent to two Ramsar wetlands, Lakes Kerkini and Prespa, and on the Plain of the Serres Basin, (2) absence of knowledge associated with characteristics of farming operations and their managers; and (3) which groups are in greater need of environmental awareness and knowledge. Data analysis revealed that the majority of farmers ignored the environmental impact of modern agriculture. Wetland farmers were more ignorant and practised a more intensive form of agriculture than those on the Plain. Prespa farmers were the most intensive farmers and were also the most ignorant with regards to water quality, soil and landscape and the use of pesticides and herbicides. This is particularly important since Prespa is a National Park. Kerkini farmers showed less environmental awareness and farmed more intensively, compared to their adjacent counterparts on the Plain. Those more 'knowledgeable' concerning environmental impacts of high input agriculture are those younger crop farmers with higher formal education and training. The findings of the study call for immediate action to implement specifically designed training programmes for wetland farmers, primarily of Prespa, so that they become more environmentally aware and eventually change their behaviour in a pro-environmental direction. This study highlights the necessity to build a conservation consensus among farmers in environmentally sensitive areas by educating them to conserve natural resources, training them to practise sustainable agriculture and rewarding the most environmentally friendly agriculture.
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186. **Farms adaptation to changes in flood risk: A management approach.**
Pivot, J. M.; Josien, E.; and Martin, P.
Journal of Hydrology 267 (1/2): 12-25. (2002)
NAL Call #: 292.8 J82; *ISSN:* 0022-1694
This citation is provided courtesy of CAB International/CABI Publishing.

187. **Flexible incentives and water quality control technologies for the Everglades Agricultural Area.**
Lee, Donna J. and Milton, J. Walter.
Gainesville: University of Florida, Institute of Food and Agricultural Sciences, Food and Resource Economics Dept.; 26 p.: ill.; Series: Staff paper (University of Florida. Food and Resource Economics Dept.) SP98-11. (1998)
Notes: Includes bibliographical references (p. 25-26).
NAL Call #: FU S49.S7-SP98-11; HD1751.A1S73-no.98-11
Descriptors: Water quality---Florida---Everglades/ Agriculture---Florida---Everglades/ Water quality management---Florida---Everglades
This citation is from AGRICOLA.

188. **Forest owner incentives to protect riparian habitat.**
Kline, J. D.; Alig, R. J.; and Johnson, R. L.
Ecological Economics (Amsterdam) 33 (1): 29-43. (2000)
NAL Call #: QH540.E26; *ISSN:* 0921-8009
This citation is provided courtesy of CAB International/CABI Publishing.

189. **A framework for evaluating the economic benefits, costs, and trade- offs associated with riparian-area management practices and strategies.**
Obermiller, F. W.
Natural Resources and Environmental Issues 1: 53-64. (1994); *ISSN:* 1069-5370
This citation is provided courtesy of CAB International/CABI Publishing.

190. **From researcher to farmer: The use of extension programs to transfer biological control technology in developed countries.**
Mahr, D L
*Entomophaga 41 (3-4): 387-404. (*1996)
NAL Call #: 421 EN835M; *ISSN:* 0013-8959
Descriptors: arthropod (Arthropoda Unspecified)/ insect (Insecta Unspecified)/ invertebrate (Invertebrata Unspecified)/ Arthropoda (Arthropoda Unspecified)/ Insecta (Insecta Unspecified) / animals/ arthropods/ insects/ invertebrates/ biobusiness/ biological control/ biological control agent/ education/ extension programs/ integrated pest management/ pest/ pest control method/ pest management/ technology transfer
Abstract: Effective use of biological control by the pest manager requires knowledge of the biologies of the pests and natural enemies, and their interactions with their environment and agronomic practices. Manufacturers provide information for products such as microbial pesticides and entomophagous arthropods used in augmentative biological control. However, information about process-oriented methods such as classical importation biological control and conservation of natural enemies is not often available to the farmer. Governmental extension programs are one method for providing practical biological control information, but availability in developed countries varies considerably. Examples of transfer of biological control information are provided for New Zealand, Canada, and Australia. In the United States, the Extension Service, a branch of the U.S. Department of Agriculture, provides partial funding and coordination for pest management educational programs conducted at the national, regional, state and local levels. In a twelve-state region of the North Central United States, university extension and research entomologists have developed a coordinated program to educate county extension personnel, farmers, and private consultants about the use of biological controls in pest management. The details of this model program are discussed. The paper concludes with a discussion of the educational constraints that must be overcome to successfully increase the adoption of biological control.
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191. **From science to technology adoption: The role of policy research in improving natural resource management.**
Hazell, Peter and Wood, Stanley
Agriculture, Ecosystems and Environment 82 (1-3): 385-393. (2000)
NAL Call #: S601 .A34; *ISSN:* 0167-8809
Descriptors: food production/ global climate change/ natural resource management: policy research/ technology adoption
Abstract: GCTE3 science seeks to predict the effects of global change on agriculture, forestry and soils. Better understanding the response of these ecological systems, it is argued, will enable society to better ameliorate, adapt to, and even benefit from, the forces of global change. The argument presented in this paper, however, is that the response of managed ecosystems can only be understood by treating likely human response to global change as an integral part of the research agenda. Linking science and policy research matters because the adoption of technologies for improved natural resource management, or of other interventions that scientific research may help design, is conditioned by socio-economic factors that policy research is better equipped to articulate. The paper first discusses how natural resource management and technology adoption are influenced by policy factors. It then explores why science - including GCTE - research needs to be linked to policy research. The reasons include: (a) that understanding biophysical processes is necessary but insufficient to understanding the socio-economic consequences of global change; (b) that the design of interventions to ameliorate negative and foster positive change at a global scale depends on gauging the likely human behavioral responses to change; (c) that although global impacts arise from an accumulation of local changes, interventions are often best coordinated in an international forum where the interests of potential "winners" and "losers" can best be matched. Different (winner and loser) nations have different policy stances on the underlying promoters of change, e.g., population growth, carbon emissions, biodiversity loss, etc. Failure to understand the (often economic) incentives underlying the "business-as-usual" position of many countries can hamper progress, even if the scientific arguments are compelling. The paper also assesses

how best to link GCTE science research and policy research. Researchers need to be: (a) concerned at many scales, from local to global; (b) able to predict and allow for the influences of technical change; (c) able to model biophysical processes and behavioral norms and responses in an integrated way. Interactive models in which biophysical processes impact on human behavioral response and vice versa are increasingly required. Even where land use and socio-economic models are not formally linked, significant gains may be made from multidisciplinary approaches and information exchange that develop common scenarios under which biophysical and economic analyses are made separately, but at least in complementary ways.
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192. **Future land use decisions of North Dakota Conservation Reserve Program participants.**
Gustafson, Cole. and Hill, Chester Lewis.
Fargo, ND: Dept. of Agricultural Economics, Agricultural Experiment Station, North Dakota State University; v, 43 p.: map. (1993)
Notes: Cover title. "August 1993." Includes bibliographical references (p. 29-31).
NAL Call #: 281.9-N814A-no.302
Descriptors: Conservation Reserve Program--- United States/ Agricultural Conservation Program--- North Dakota/ Soil conservation projects--- North Dakota
This citation is from AGRICOLA.

193. **Goal-oriented agricultural water quality legislation.**
Gannon, R. W.; Osmond, D. L.; Humenik, F. J.; Gale, J. A.; and Spooner, J.
Water Resources Bulletin 32 (3): 437-450. (June 1996)
NAL Call #: 292.9-Am34; *ISSN:* 0043-1370 [WARBAQ]
Descriptors: agriculture/ water quality/ water pollution/ pollution control/ legislation/ nonpoint source pollution/ 1995 Farm Bill/ Clean Water Act/ Coastal Zone Management Act
Abstract: While significant nonpoint source (NPS) pollution control progress has been made since passage of Section 319 in the 1987 Water Quality Act, existing federal legislation does not provide for the most timely and cost-effective NPS pollution reduction. In this paper, we use findings from the Rural Clean Water Program and other nationwide agricultural NPS pollution control programs, building on legislative history, to recommend a coordinated and efficient direction for agricultural water quality legislation. A collaborative framework should be established to accomplish the goals of the Clean Water Act (CWA), Coastal Zone Management Act (CZMA), and the Conservation Title of the Farm Bill. Valuable elements of the 1990 CZMA amendments that created a coastal NPS program should be subsumed into the CWA. The CWA should reemphasize use of receiving water quality criteria and standards and should allow states flexibility to tailor basin-scale NPS program implementation to local needs. Implementation should involve targeting of NPS pollution control efforts to critical land treatment areas and use of systems of best management practices to address these targeted water quality problems. The 1995 Farm Bill should reorient production incentives toward water quality to support the collaborative framework, implementing ecologically sound source reduction principles. The Farm Bill and the CWA should contain interrelated provisions for voluntary, incentive-assisted producer participation and fallback regulatory measures. Such coordinated national water quality and Farm Bill legislation that recognizes the need for flexibility in state implementation is supported as the most rational and cost-effective means of attaining water quality goals.
This citation is from AGRICOLA.

194. **A group incentive program for farmer adoption of best management practices: An application to the nitrate pollution problem in central Illinois.**
Ipe, V. C. and DeVuyst, E. A.
Selected papers from the annual meeting of the American Agricultural Economics Association (1999)
NAL Call #: HD1405-.A44.
Notes: Supplemental online access through http://agecon.lib.umn.edu. Meeting held August 8-11, 1999 in Nashville, Tennessee.
Includes references.
Descriptors: farm management/ pollution control/ nitrate/ farmers' attitudes/ innovation adoption/ incentives/ program participants/ Illinois/ best management practices
This citation is from AGRICOLA.

195. **Growers' perceptions and acceptance of soil quality indices.**
Andrews, S. S.; Flora, C. B.; Mitchell, J. P.; and Karlen, D. L.
Geoderma 114 (3/4): 187-213. (2003)
NAL Call #: S590.G4; *ISSN:* 0016-7061
This citation is provided courtesy of CAB International/CABI Publishing.

196. **A hedonic analysis of herbicides: Do user safety and water quality matter?**
Beach, E. D. and Carlson, G. A.
American Journal of Agricultural Economics 75 (3): 612-623. (1993)
NAL Call #: 280.8 J822; *ISSN:* 0002-9092
This citation is provided courtesy of CAB International/CABI Publishing.

197. **How do growers deal with regulatory induced change?**
Matthews, Charles H Jr and Botts, Daniel A
Soil and Crop Science Society of Florida: Proceedings 55: 74-76. (1996)
NAL Call #: 56.9 So32; *ISSN:* 0096-4522
Descriptors: agriculture/ best management practices/ hazardous analysis and critical control points techniques/ regulatory induced change/ silviculture/ water disposal
Abstract: Florida fruit and vegetable growers continue to face a myriad of regulatory challenges. These challenges result in constant changes for growers. This paper discusses how growers deal with regulatory induced changes, including examples of 1) the adoption of silviculture BMPs for surface-water protection during forest-related operations, 2) the development of BMPs dealing with water disposal from tomato packinghouse dump tanks, and 3) the application of Hazardous Analysis and Critical Control Points (HACCP) techniques to minimize microbiological contamination of food products. Florida-based scientists (i.e., academia) are encouraged to avoid the adoption of far-reaching conclusions based solely on basic research and/or preliminary results, and to become more heavily involved in the extension or implementation of research findings to the point of grower-ready techniques.
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198. **How does water price affect irrigation technology adoption.**
Green, G.; Parker, D.; Sunding, D.; Trotter, C.; Ziberman, D.; and Collup, S.
California Agriculture (California Agricultural Experiment Station) 50 (2): 36-40. (Mar. 1996-Apr. 1996)
NAL Call #: 100-C12Cag; *ISSN:* 0008-0845 [CAGRA3]
Descriptors: irrigation systems/ innovation adoption/ decision making/ irrigation water/ water costs/ crops/ agricultural soils/ permeability/ slope/ field size/ probabilistic models/ California/ low volume irrigation
This citation is from AGRICOLA.

199. **How economic incentives for growers can benefit biological diversity.**
Howitt, R. E.
California Agriculture (California Agricultural Experiment Station) 49 (6): 28-33. (Nov. 1995-Dec. 1995)
NAL Call #: 100-C12Cag; *ISSN:* 0008-0845 [CAGRA3]
Descriptors: wetlands/ species diversity/ irrigated farming/ environmental impact/ economic policy/ agricultural policy/ California/ biodiversity management
This citation is from AGRICOLA.

200. **How to organise nature production by farmers.**
Slangen, L. H. G.
European Review of Agricultural Economics 24 (3/4): 508-529. (1997); *ISSN:* 0165-1587
This citation is provided courtesy of CAB International/CABI Publishing.

201. **Identification of farmer characteristics and farm strategies explaining changes in environmental management and environmental and economic performance of dairy farms.**
Ondersteijn, CJM.; Giesen, GWJ.; and Huirne, RBM.
Agricultural Systems 78 (1): 31-55. (2003)
NAL Call #: HD1.A3; *ISSN:* 0308-521X.
Notes: Number of References: 49; Publisher: Elsevier Sci Ltd
Descriptors: Agriculture/ Agronomy/ strategic management/ environmental management change/ environmental performance change/ farmer characteristics/ farm strategies/ dairy farming/ LISREL analysis/ conservation practices/ efficiency/ diversification/ behavior/ decision/ models/ goals
Abstract: In 1998, the Mineral Accounting System (MINAS) was introduced in The Netherlands. MINAS penalises farms with a levy if the farm nutrient surpluses exceed a certain threshold. The threshold is strict, meaning that most farmers need to change their environmental management and performance to avoid high levies. Since MINAS is designed to leave ample room for farmers to follow the course of change of their choice, it is crucial to know whether or not different farmers and different farm strategies lead to different environmental results. A strategic management framework is used to model changes in implementation and performance on specialised dairy farms. Financial and nutrient bookkeeping data of 114 farms, collected over the period 1997-1999 are combined with survey data on farmer characteristics and farm strategies. Results of Linear Structural Equation Analysis (LISREL) showed that the main farmer characteristic explaining change in environmental management was education. Better-educated farmers chose to increase the intensity of the farming system, and cope with the corresponding increase in environmental pressure by improving the production capacity of the herd and improving operational management. Farm strategies explain the differences in the changes in nutrient management. A strategy of process control focuses on optimising tactical management, whereas a growth strategy and a diversification strategy are strongly related to changes in farm structure. Changes in technical and environmental performance in addition to changes resulting from implementation changes are positively affected by education, but show no strong relationship with any strategy, indicating that environmental improvements can be achieved regardless of the

way a farmer chooses to develop his farm. Finally, an improvement of financial performance was shown to be significantly related to an improvement of environmental performance. (C) 2003 Elsevier Ltd. All rights reserved.
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202. **Impact of irrigation water use on water quality in the central Colorado water conservancy district.**
Emond, H.; Loftis, J. C.; and Podmore, T.
Fort Collins, CO: Colorado Water Resources Research Institute, Colorado State University, 1993.
Notes: COMPLETION REPORT: 179
Descriptors: irrigation water/ water quality/ environmental effects/ water management/ surface runoff/ percolation/ nitrates/ water quality standards/ groundwater pollution/ fertilizers/ water conservation/ United States, Colorado, Greeley/ irrigation/ runoff/ agriculture/ environmental impact/ groundwater contamination/ agricultural pollution/ Sources and fate of pollution/ Use of water of impaired quality/ Freshwater pollution/ Prevention and control
Abstract: This paper presents the results of a two year study sponsored by the Colorado Water Resources Research Institute, the United States Geological Survey, and the United States Environmental Protection Agency on the impact of irrigation water use on water quality in the agricultural area near Greeley, Colorado. Data on water management techniques, consumptive use, irrigation application efficiency, deep percolation, surface runoff and nitrate levels were collected. Results indicated a wide range of application efficiencies and deep percolation percentages. Nitrate levels in the pumped ground water often exceeded EPA drinking water standards, while nitrate levels of water from the South Platte River were generally below the drinking water standards. There are opportunities for improving irrigation application efficiency in this area, but there may be repercussions for downstream water users. Decreasing the quantity of nitrate going into the ground water can occur through increased water conservation and through reducing the actual amount of nitrates applied in the irrigation water or fertilizers. There is currently little incentive for farmers to implement these measures.
© Cambridge Scientific Abstracts (CSA)

203. **Impact of participation in government programs on tenant and landlord risk-returns for crop shared rice.**
Parsch, L. D.; Cao, G.; and Rhoades, S. R.
Research Series - Arkansas Agricultural Experiment Station (No. 456): 198-205. (1997)
This citation is provided courtesy of CAB International/CABI Publishing.

204. **Impact of Spring 2000 Drought Forecasts on Midwestern Water Management.**
Changnon, S. A. and Vonnahme, D. R.
Journal of Water Resources Planning and Management 129 (1): 18-25. (2003)
NAL Call #: TC401.A45; *ISSN:* 0733-9496
Descriptors: United States, midwest/ Water Management/ Weather Forecasting/ Drought/ Case Studies/ Management Planning/ Social Impact/ Economic Impact/ Surveys/ Attitudes/ Case study/ Sociology/ Economics/ Survey/ Water resources/ Droughts / Sociological aspects/ United States, Midwest/ Evaluation process/ Water Resources and Supplies
Abstract: In March 2000, the National Oceanic and Atmospheric Administration issued forecasts of spring and summer droughts for five Midwestern states. Summer brought heavy rains across the Midwest, ending the drought and revealing the forecast's failure. The uses of forecasts and the resulting impacts were assessed by interviewing 45 state agency water managers in the drought region plus managers of 31 community water systems facing serious shortages. All state water managers had received the forecasts and most believed the forecast was accurate. As a result of the forecast, 70% of them initiated various activities, primarily by warning managers of water short communities and initiating meetings of state drought response groups. Many managers of water-short local systems reported that the forecast led them to impose water use restrictions or to seek new sources of water. Most state water officials and local managers felt the forecast-based actions were beneficial and created few problems. State climatologists handled many complaints, primarily from agricultural interests who claimed large losses resulting from use of the forecast. The forecast failure led to a loss of credibility over future use of climate forecasts by water managers. Long-range weather forecasts issued without expressing levels of uncertainty are misleading.
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205. **Impacts of Voluntary Conservation Initiatives in the Darby Creek Watershed of Ohio.**
Napier, T. L. and Johnson, E. J.
Journal of Soil and Water Conservation 53 (1): 78-84. (1998)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
Descriptors: Ohio/ Darby Creek/ Watersheds/ Soil Conservation/ Water Conservation/ Public Participation/ forming / Assessments/ Agricultural Practices/ volunteers/ Conservation in agricultural use/ Conservation/ United States
Abstract: Land owner-operators in the Darby Creek watershed located in central Ohio were provided the opportunity to participate in a comprehensive soil and water conservation program sponsored by

several public and private conservation organizations. Extensive human and economic resources were appropriated by the cooperating organizations to implement a conservation effort that emphasized information, education, and cost-sharing to motivate land owner-operators to adopt soil and water protection practices at the farm level. Data were collected in 1991 prior to the implementation of the conservation program and again in 1994 after conservation efforts had been in operation for approximately 3 years. Analysis of longitudinal data revealed that conservation efforts were not very successful in motivating land owner-operators to change production practices. While significant modifications in production practices were observed over time, the changes were not uniformly desirable from the perspective of soil and water conservation. The findings also revealed that land owner-operators within the study area become more polarized in terms of the types of farm production systems employed. Such findings suggest that it may become more difficult to motivate land owner-operators who have resisted using conservation production systems in the past to adopt conservation production systems in the future. Study findings bring into serious question the utility of continuing to implement soil and water conservation practices using traditional voluntary approaches such as those used in the Darby Creek watershed.
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206. **Implementation of landscape planning and nature conservation in the agricultural landscape: A case study from Saxony.**
Luetz, M and Bastian, O
Agriculture, Ecosystems and Environment 92 (2-3): 159-170. (2002)
NAL Call #: S601 .A34; *ISSN:* 0167-8809
Descriptors: agri-environmental measures: farm income, subsidies/ agroecosystems: agriculture society interface
Abstract: The interface between environment, agriculture and society needs more attention to improve nature conservation in rural landscapes. The present paper attempts to identify the conditions on which ecological landscape plans can be implemented in agricultural practice, considering the prevailing conditions of agricultural policy. The case study was carried out in a local authority area in Saxony (Germany). Calculation of variable margins indicated that most of the measures proposed by the landscape plan (such as planting hedgerows, reduction of land use intensity, establishment of field margins rich in arable weeds) can be realised without loss of farmers' income. That is 6% of the agricultural area can be withdrawn from cultivation without any negative financial effect for the farmers. In addition, a certain proportion of arable fields and grassland can be managed less intensively. Nevertheless, the attitude of farmers towards nature conservation was an obstacle in the realisation of ecological measures, even with generous economic incentives. The method applied was adequate to show that agriculture in this area is dependent on payments from agri-environmental programmes. It is proposed to strengthen the link between such subsidies and more effective agri-environmental measures.
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207. **Implementing irrigation efficiency: The energy savings incentive.**
Pinkham, R.
In: Basin planning and management: Water quantity and quality/ Mueller, D. K.; Fort Collins, CO: Colorado Water Resour. Res. Inst., Colorado State Univ. (Series: Information Series of the Colorado Water Resources Institute 73), 1993. pp. 39-42
Notes: Conference: 1993 Basin Planning and Management Symp., Thornton, CO (USA), 5 Mar 1993
Descriptors: irrigation efficiency/ energy/ water demand/ technology/ cost analysis/ environmental effects/ water quality/ water resources management/ water conservation/ irrigation water/ water use/ United States/ water resources/ water management/ Conservation in agricultural use/ Protective measures and control
Abstract: Efficient use of water in irrigation is increasingly important throughout the western United States. Desired crop yields can be obtained using less water, and saved water can be applied to additional fields, sold to other users, or devoted to environmental needs and enhancement. Irrigation efficiency may reduce groundwater overdraft, helping perpetuate the agricultural future of some regions. Reduced water applications can also reduce leaching of salts and agricultural chemicals, thereby maintaining or enhancing surface and groundwater quality. These benefits of efficient irrigation are well-known. So too are the many technologies and practices that can increase on-farm water efficiency. As with any good idea, the critical question in irrigation efficiency is how to implement it. How can farmers be motivated to change equipment and management techniques? Wherever water is pumped, rather than moved by gravity, cutting the cost of energy use can be an important motivation for implementing water-efficient irrigation technologies and practices. Even where water itself has a zero or low price, irrigation efficiency may provide economic payoffs by reducing the pumping costs to move water to farms, to distribute water to fields, and to pressurize water application systems. These energy savings can be significant for individual farmers and for water

providers. They have also become important to energy utilities, many of which, as this paper will show, are developing innovative programs to work with farmers and water districts.
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208. **Improving farmers' access to advice on land management: Lessons from case studies in developed countries.**
Garforth, C.; Angell, B.; Archer, J.; and Green, K.; Network Paper - Agricultural Research and Extension Network No.125, 2003. iv, 19 p.
This citation is provided courtesy of CAB International/CABI Publishing.

209. **Incentive payments to encourage farmer adoption of water quality protection practices.**
Cooper, J. C. and Keim, R. W.
American Journal of Agricultural Economics 78 (1): 54-64. (Feb. 1996)
NAL Call #: 280.8-J822; *ISSN:* 0002-9092 [AJAEBA]
Descriptors: water quality/ farm management/ incentives/ innovation adoption/ probit analysis/ integrated pest management/ legumes/ manures/ soil water/ nitrogen fertilizers/ application rates/ profits/ costs/ legislation/ federal programs/ USDA/ farmers' attitudes/ mathematical models/ legume crediting/ manure testing/ willingness to accept
Abstract: Farmers can be encouraged to voluntarily adopt environmentally sound management practices through the use of incentive payments. This paper uses both a bivariate probit with sample selection model and a double hurdle model on data from a survey of farmers to predict farmer adoption of the practices as a function of the pay merit offer. The five management practices addressed here are integrated pest management, legume crediting, manure testing, split applications of nitrogen, and soil moisture testing. Also estimated are models that predict the acreage on which these practices would be applied given the decision to accept the incentive payments estimated.
This citation is from AGRICOLA.

210. **Incentives for avoiding the tragedy of the commons.**
Uphoff, Norman and Langholz, Jeff
Environmental Conservation 25 (3): 251-261. (1998)
NAL Call #: QH540.E55; *ISSN:* 0376-8929
Descriptors: biodiversity/ common property/ environmental protection/ incentives/ natural resources/ Tragedy of the Commons
Abstract: Efforts to protect vulnerable environmental resources have focused largely on legal prohibitions and sanctions or on economic rewards or penalties. The role and importance of social and cultural factors have been much less considered. While theoretical arguments have addressed whether state institutions must be involved in resource protection, or whether private incentives can be manipulated to achieve desired outcomes, this preoccupation with either public sector or private sector solutions to the problems of environmental conservation has caused a neglect of social values and community consensus. The analysis offered here seeks to enlarge the debate from being two-sided to three-cornered. By bringing in a third set of considerations, the sociocultural, the analysis underscores that individual decisions are embedded in community and local contexts. All three kinds of incentives are considered to be potentially of equal importance for resource-conserving behaviour (RCB) vis-a-vis resource-degrading behaviour (RDB). The analysis is concerned first with the strength of different incentives in favour of RCB compared to RDB, comparing legal and economic with sociocultural considerations affecting RCB and RDB. Efforts to protect vulnerable resources can seek to alter in an RCB direction the attitudes and incentives of people along any or all of these three dimensions of motivation, or they can seek to make a particular domain of motivation more salient if it is supportive of environmental conservation. This analysis is proposed in part to get the sociocultural domain taken more seriously alongside the legal and economic domains, as well as to prompt more systematic consideration of different kinds of policies, investments, actions or pronouncements that could shift the net balance of incentives in favour of RCB. While the analysis is admittedly simplified, there is utility in encouraging focused comparisons and evaluations of conservation alternatives. Examples of efforts to promote RCB in Madagascar and Costa Rica are given to illustrate this.
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211. **Incentives for countryside management: The case of environmentally sensitive areas.**
Whitby, Martin and C.A.B. International.
Wallingford: CAB International; ix, 286 p.: ill., maps. (1994)
Notes: Includes bibliographical references (p. 273-280) and index.
NAL Call #: QH77.G7I53--1994;
ISBN: 0851988970 (pbk)
Descriptors: Landscape protection---Great Britain/ Agricultural conservation---Great Britain
This citation is from AGRICOLA.

212. **Incentives in soil conservation: From theory to practice.**
Sanders, David W. and World Association of Soil and Water Conservation.
Enfield, N.H.: Science Publishers; xvii, 384 p.: ill., maps. (1999)
Notes: "World Association of Soil and Water

Conservation." Includes bibliographical references and index.
NAL Call #: S627.I54-I53-1999; *ISBN:* 1578080614
Descriptors: Incentives in soil conservation
This citation is from AGRICOLA.

213. **Information and Farmers' Attitudes About Pesticides, Water Quality, and Related Environmental Effects.**
Lichtenberg, E. and Zimmerman, R.
Agriculture, Ecosystems and Environment 3: 227-236. (1999)
NAL Call #: S601 .A34; *ISSN:* 0167-8809.
Notes: DOI: 10.1016/S0167-8809(99)00053-5
Descriptors: United States, Mid Atlantic states/ Attitudes/ Surveys/ Agricultural Chemicals/ Pesticides/ Environmental Quality/ Wildlife/ Drinking Water/ Information Systems/ Farms/ Agricultural pollution/ Sociological aspects/ Water quality/ Environmental protection/ Ecosystem disturbance/ Agriculture/ Agrochemicals/ Perception/ Public concern/ Occupational safety/ Environmental impact/ Information exchange/ United States/ farmers' attitudes/ Evaluation process/ Behavior and fate characteristics/ Environmental action
Abstract: This paper investigates the effects of information from different sources on farmers' attitudes regarding the effects of pesticides and other agricultural chemicals on environmental quality using a survey of 2700 farmers in three mid-Atlantic states. Farmers' beliefs are similar to those of the general public on average, but are distributed more uniformly, suggesting that the farm community may be more polarized on environmental issues than the general public. Farmers regard first-hand sources of information such as direct field observation and pesticide labels as being the most important. Chemical dealers and extension rank next in importance. Farmers who attached greater importance to information from news media and extension expressed greater environmental concern. Farmers who found information from chemical dealers more important expressed greater concern about injury to wildlife and pesticides in drinking water but less concern about general environmental quality problems associated with agricultural chemicals.
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214. **Information and the adoption of precision farming.**
Daberkow, S. G. and McBride, W. D.
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/ information services/ innovation adoption/ decision making/ farming systems
This citation is from AGRICOLA.

215. **Information for policy design: Modelling participation in a farm woodland incentive scheme.**
Crabtree, B.; Chalmers, N.; and Barron, N. J.
Journal of Agricultural Economics 49 (3): 306-320. (1998); *ISSN:* 0021-857X
This citation is provided courtesy of CAB International/CABI Publishing.

216. **Innovating conservation agriculture: The case of no-till cropping.**
Coughenour, C. M.
Rural Sociology 68 (2): 278-304. (2003); *ISSN:* 0036-0112
This citation is provided courtesy of CAB International/CABI Publishing.

217. **Integrated Land and Water Management in the United Kingdom: Narrowing the Implementation Gap.**
Ducros, C. and Watson, N. M.
Journal of Environmental Planning and Management 45 (3): 403-423. (2002); *ISSN:* 0964-0568.
Notes: DOI: 10.1080/09640560220133423
Descriptors: British Isles/ Watershed Management/ Riparian Land/ Environmental Policy/ Policy Making/ Social Participation/ Farms/ Decision Making/ Surveys/ Case Studies/ Statistical Analysis/ Water management/ Farms and farming/ Decision theory/ Survey/ Case study/ British Isles/ riparian buffer zones/ Water quality control/ Water Resources and Supplies/ General Environmental Engineering
Abstract: Riparian buffer zones have been incorporated in land and water management policy for England since 1994, when the Ministry of Agriculture, Fisheries and Food introduced a Water Fringe Option (WFO) as part of a broader habitat conservation scheme. Whilst natural scientists have examined the functioning of riparian buffer zones, understanding of farmers' decision making regarding the adoption or non-adoption of voluntary buffer zone policies is very limited. This paper examines the factors influencing the decision making of farmers who were eligible to join the WFO in three river catchments. Quantitative and qualitative information was collected from farmers using semi-structured interviews and was supplemented with in-depth interviews with representatives of public agencies, agricultural groups and independent experts. Data analysis was completed using the 'Framework' analytical approach and the Statistical Package for the Social Sciences 8.0 computer software. The research revealed that decisions to participate in the WFO were influenced by a mix of

situational, psychological and sociological characteristics, which suggests that policy makers must attach greater importance to implementation conditions and farmers decision making if riparian buffer zones are to play a more prominent role in the management of land and water in rural catchments. Tightly structured schemes will only appeal to a narrow segment of the farming population and will not lead to widespread re-creation of riparian habitats. A more flexible and collaborative style of policy development is needed in order for riparian buffer zone policies to meet the circumstances and needs of the diverse UK farming community.
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218. **Integrated pest management systems: Back to basics to overcome adoption obstacles.**
Herbert, D. A.
Journal of Agricultural Entomology 12 (4): 203-210. (1995)
NAL Call #: SB599.J69; *ISSN:* 0735-939X.
Notes: Conference: Symposium: The Crisis in IPM: Is There a Solution to the Gap Between Theory and Practice?, at Annual Meeting of the Entomological Society of America, Indianapolis, IN (USA), Dec 1993
Descriptors: integrated control/ agricultural practices/ Agricultural & general applied entomology
Abstract: Adoption of Integrated Pest Management (IPM) practices into agricultural programs and the constraints affecting adoption are topics that have been addressed since the mid-1970s when the implementation of agricultural IPM programs began. Adoption has never occurred at the levels hoped for and the constraints slowing this process have been well reviewed by many authors. The purpose of this work is to highlight the primary obstacles to IPM adoption and discuss solutions that could bring about positive change. As the title implies, these solutions are not new, but basic to implementation of any innovative system or change. With a new focus on these basic solutions, it is hoped that those involved with IPM may be reminded of their importance and reemphasize them in the planning, development, and implementation phases of programs.
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219. **Integrating crop and livestock production in Inland Northwest farming systems.**
Hardesty, L. H. and Tiedeman, J. A.
American Journal of Alternative Agriculture 11 (2/3): 121-126. (1996)
NAL Call #: S605.5.A43; *ISSN:* 0889-1893 [AJAAEZ].
Notes: Paper presented at the U.S.-Middle East Conference and Workshop on "Dryland Farming Systems and Technologies for a more Sustainable Agriculture" held October 18-23, 1993, Moscow, Idaho. Includes references.
Descriptors: crop production/ animal production/ dry farming/ farming systems/ integrated systems/ integration/ sustainability/ Pacific Northwest states of USA/ ecological integration/ economic integration
Abstract: The demand for more ecologically and economically sustainable agriculture arises because we currently integrate products economically in a fashion that distorts ecological relationships. Early farms were ecologically integrated through feeding of forage crops and crop residues to livestock, with livestock contributing draft power and manure for crops. Today we have almost entirely uncoupled plant and animal production, eliminating the contribution that each can make to the productivity of the other. Barriers to integrating farming systems include the large volume of information needed for sophisticated production systems and the lack of infrastructure. Also, many chemicals used on crops have not been evaluated for their safety in food animals. Winter feeding and calving may conflict with crop production cycles; balancing year-round forage supplies is another obstacle. Opportunities include using the Conservation Reserve Program to shift land to livestock production. Domestic demand for meat is changing, and range livestock production is seen by some people as more humane than confinement. Animals fed less grain may be more acceptable in some markets. As agriculture responds to changes in society, ecological integration may become more compatible with economic integration.
This citation is from AGRICOLA.

220. **An interactive and participative approach to water quality management in agro-rural watersheds.**
Mtetwa, S and Schutte, C F
Water SA (Pretoria) 28 (3): 337-344. (2002); *ISSN:* 0378-4738
Descriptors: agro rural watershed/ environmental degradation / farming/ land use practices/ river/ rural community/ stakeholder participation/ water pollution/ water quality
Abstract: An interactive and participative approach to involve and mobilise rural communities in water quality control programmes was investigated. Agro-rural watersheds are experiencing serious environmental degradation mainly because of inappropriate land use practices due to various competing and opposing priorities in the community. The communities tend to concentrate on availability of land and water for their activities regardless of the state of that resource. The methodology is designed to bring awareness to the rural farmers of the amounts of pollutants they contribute to a river system and the benefits of adhering to good land-use and farming practices both in terms of production and environmental protection. It is based

on a pilot project, dealing with an argo-rural watershed in a semi-arid developing area. A strong emphasis was put on stakeholder participation, an area neglected by many researchers. It became clear that pollutant flushes from the catchments are influenced by many factors, of which agricultural practices is only one.
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221. **An interdisciplinary approach to integrate a range of agro-landscape values as proposed by representatives of various disciplines.**
Van Mansvelt, J D
Agriculture Ecosystems and Environment 63 (2-3): 233-250. (1997)
NAL Call #: S601 .A34; *ISSN:* 0167-8809
Descriptors: aesthetics/ agriculture/ agro landscape values/ biobusiness/ biotope diversity/ conservation/ eco coherence/ ethics/ humane development/ interdisciplinary approach/ landscape development/ philosophy and ethics/ resource efficiency/ rural conditions/ system integration
Abstract: A Concerted Action has been initiated to discuss the assessment of sustainable agro-landscape values in the EU. The objective is to find out how criteria and parameters can be defined that would help farmers, authorities and politicians to manage the agro-landscape towards sustainability and socio/cultural appreciation. Such parameters should most probably consist of a general mainframe with compatible regional specifications. They could eventually be a base for income support/cross-compliance type of payments that farmers receive for their landscape management performance. Referring to the papers presented in this special issue, an effort is made to integrate the values proposed by the wide range of participating disciplines into a consistent and knowledgeable system. This is done by linking the different values as mentioned by the participants to the human motivations, phrased according to Maslow, that they are meant to serve. The disciplines present have been provisionally clustered into three areas with two main issues: (1) environment (resource conditions) and ecology (biological relations); (2) economy (flows of finances and services) and sociology (participative procedures); (3) psychology (appreciation and aesthetics) and anthropology (history and ethics). In these three realms, they are perceived as representing a double hierarchy of priorities: from the environment onward they represent the evolutionary option of basic human needs, evolving from sheer survival to the development of the individual potentials (food first, then ethics). From the cultural aspect of ethics to the environmental conditions they represent a more humanistic (humane), immaterial priority of ethical values, leading social and economic priorities to their environmental impacts. From this effort, indications are derived pointing at options for a coherent system of agro-landscape values, especially when seen in the perspective of sustainable land use. A table showing the various agro-landscape quality aspects is presented. Throughout this paper, the agro-landscape is perceived as an integrated product of human actions, of agro-technical, political and mental (ethical) character.
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222. **Interrelationship between conservation tillage and energy and other input use in U.S. agriculture.**
Uri, Noel D
Energy Sources 18 (8): 917-940. (1996); *ISSN:* 0090-8312
Descriptors: agronomy/ conservation/ conservation tillage adoption decision/ corn production/ pesticide application/ rainfall/ tillage practices
Abstract: An important issue with regard to the overall effectiveness of conservation tillage practices in reducing the impact of agricultural production on the environment concerns what happens to energy, pesticide, and fertilizer use as these practices are more extensively adopted To gain some insight into this, the conservation tillage adoption decision is modeled. Starting with the assumption that the conservation tillage adoption decision is a two-step procedure-the first is the decision whether or not to adopt a conservation tillage production system and the second is the decision on 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, a below average expenditure on energy, and a below average expenditure on custom pesticide applications. Additionally, for a farm adopting a no-tillage production practice, an above average expenditure was made on fertilizer.
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223. **Iowa prairie: Original extent and loss, preservation and recovery attempts.**
Smith, Daryl D
Journal of the Iowa Academy of Science 105 (3): 94-108. (1998)
NAL Call #: Q11.J68; *ISSN:* 0896-8381
Descriptors: ecosystem recovery/ grassland/ history/ natural resources/ original land surveys/ prairie demise/ prairie reconstruction/ prairie restoration/ savanna/ settlement
Abstract: Iowa's prairie has to be assessed in the

context of the pre- and post-agriculturally dominated ecosystem in which it now exists. This requires an understanding of prairies and of society's perspective of prairies. Therefore, the attitudes of people through time have to be considered; (1) those who were involved in the demise of the prairie, (2) those who helped saved the pieces of the prairie and (3) those who may be called upon to recover the prairie ecosystem. of Iowa prairie to agriculture was rapid and extensive. Most of the Iowa prairie was settled and much of it converted to agriculture Prairie preservation was recommended in the Twenty-Five Year Conservation Plan 14 years after it was first suggested by Hayden in 1919. A committee chaired by Shimek proposed a 5000 acre preserve in NW Iowa as a part of a continental plan to conserve the North American prairie. During the 1940s, Hayden emerged as a leader of a major effort of the Iowa Academy of Science to identify and preserve prairies. These preservation efforts culminated in the dedication of Iowa's first prairie preserve in 1947. Hayden's information also was valuable in subsequent preservation of prairies by conservation organizations and governmental agencies. In the past two decades, interest in locating and protecting prairie remnants has increased. Remaining prairie is best represented in western Iowa's Loess Hills and in the northwestern pan of the state. Many prairie remnants have survived because they were used as hay fields. In spite of increased efforts to preserve prairie, remnants are still being degraded or lost to agriculture and urban sprawl. Within the past decade there has been increased recognition of the importance of ecosystem recovery. Iowa's roadsides are now acknowledged as a valuable natural resource for establishment and restoration of prairie. This recognition has led to the development of a program of integrated roadside vegetation management chat utilizes native prairie as a means of controlling weeds, reducing soil erosion, improving aesthetics and reducing costs. The 580,000 acres of primary and secondary roadsides in the state have the potential of becoming a statewide network of prairie corridors. Furthermore, three large-scale prairie recovery projects are in various stages of development (1) Walnut Creek National Wildlife Refuge by the U. S. Fish and Wildlife Service, (2) Waterman Creek Project by the Iowa Department of Natural Resources and (3) the Loess Hills Landscape Conservation Plan by the Nature Conservancy. All prairie recovery projects face numerous challenges, but such attempts are essential if we hope to recover a vanishing ecosystem.

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224. **IPM implementation and acceptance by cucurbit growers over a 5 year period in the Lower Rio Grande Valley, Texas.**

Anciso, Juan R; Trevino, Gloria E; and Torres, Norma

Subtropical Plant Science 53: 40-43. (2001)

Descriptors: cucurbit (Cucurbitaceae): vegetable crop/ whitefly (Homoptera): pest/ Angiosperms/ Animals/ Arthropods/ Dicots/ Insects/ Invertebrates/ Plants/ Spermatophytes/ Vascular Plants/ alternative techniques implementation/ cucurbit growers/ current practices/ economic/ action thresholds/ educational meetings/ perceptions/ spring crop

Abstract: Questionnaires mailed to cucurbit growers in two Texas counties (Cameron and Hidalgo) in 1995 and 1999 were used to assess perceptions and current practices regarding integrated pest management (IPM). A total of 32 of the 79 surveys (41%) solicited from potential cucurbit growers in the two county area were returned in 1995. However, IPM concepts in general were not widely accepted in 1995 since only 44% were willing to participate or practice IPM strategies even if improved recommendations were proven with sound field or grower experience. In 1999, a post-questionnaire was mailed to 78 cucurbit producers in the two county area to determine whether the adoption of IPM practices had increased due to the response effort of educational meetings and implementation of alternative techniques through the various grower demonstrations. This questionnaire was conducted during the fall of 1999 after the spring crop of cucurbits to determine any changes in attitudes, knowledge, or practices as compared to 1995. A total of 45 of the 78 surveys (58%) mailed and solicited from potential cucurbit growers in the two county area were returned in 1999. Of the 45 that responded, 96% answered that IPM strategies were important in their cucurbit production system in 1999. The use of economic/action thresholds and monitoring is fundamental to the practice of IPM. Respondent's attitudes about the use of action thresholds and monitoring were assessed in 1995 and the majority used them (77%) but this did not increase in 1999 since 77% still practiced them. The results indicated that the growers perceptions have not changed on the use of action thresholds and monitoring mainly because some distrust them but the majority use these practices. However, a dramatic increase occurred in practicing or participating in IPM strategies from 44% in 1995 to 96% in 1999. The IPM strategies identified as important did not solely depend on monitoring and action thresholds but were quite varied from planting earlier, spraying earlier for the whitefly, awareness/conservation of beneficials and increasing fertility.

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225. **IPM: Overcoming conflicts in adoption.**
Trumble, J. T.
Integrated Pest Management Reviews 3 (4): 195-207. (Dec. 1998)
NAL Call #: SB950.9.I572; *ISSN:* 1353-5226 [IPMRF5]
Descriptors: integrated pest management/ innovation adoption/ economics/ literature reviews
This citation is from AGRICOLA.

226. **Irrigation scheduling revisited: Historical evaluation and reformulation of the concept.**
Clyma, W.
In: Evapotranspiration and irrigation scheduling: Proceedings of the International Conference. (Held 3 Nov 1996-6 Nov 1996 at San Antonio, Texas.) Camp, C. R.; Sadler, E. J.; and Yoder, R. E. (eds.); pp. 626-631; 1996. *ISBN:* 0-929355-82-2
This citation is provided courtesy of CAB International/CABI Publishing.

227. **Joint adoption of multiple technologies: A dual, latent demand approach.**
Lichtenberg, E. and Strand, I. E.
College Park, MD: Department of Agricultural and Resource Economics, University of Maryland; 00/14, 2000 . 28 p. Working Papers: Department of Agricultural and Resource Economics, University of Maryland.
This citation is provided courtesy of CAB International/CABI Publishing.

228. **A joint framework for analysis of agri-environmental payment programs.**
Cooper, J. C.
American Journal of Agricultural Economics 85 (4): 976-987. (2003)
NAL Call #: 280.8 J822; *ISSN:* 0002-9092.
Notes: Number of References: 23
Descriptors: Agriculture/ Agronomy/ Economics/ best management practices/ EQIP/ incentive payments/ multinomial probit/ simulated maximum likelihood estimation/ simulated multivariate normal / WTA/ quality protection practices/ contingent valuation/ water quality/ farmer adoption/ simulation/ choice
Abstract: This article presents an approach for simultaneously estimating farmers' decisions to accept incentive payments in return for adopting a bundle of environmentally benign best management practices. Using the results of a multinomial probit analysis of surveys of over 1,000 farmers facing five adoption decisions in a voluntary program, we show how the farmers' perceptions of the desirability of various bundles change with the offer amounts and with which practices are offered in the bundle. We also demonstrate an estimator for the mean minimum willingness to accept for the adoption of a practice conditional on the cost share offers for other practices.
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229. **Knowledges in action: An actor network analysis of a wetland agri-environment scheme.**
Burgess, J.; Clark, J.; and Harrison, C. M.
Ecological Economics 35 (1): 119-132. (2000)
NAL Call #: QH540.E26
This citation is provided courtesy of CAB International/CABI Publishing.

230. **Land allocation, soil quality, and the demand for irrigation technology.**
Green, G. P. and Sunding, D. L.
Journal of Agricultural and Resource Economics 22 (2): 367-375. (Dec. 1997)
NAL Call #: HD1750.W4; *ISSN:* 1068-5502
Descriptors: citrus/ vineyards/ crop production/ irrigation systems/ water use/ innovation adoption/ land resources/ resource allocation/ land evaluation/ water costs/ decision making/ mathematical models/ probability/ elasticities/ California/ discrete choice models/ low pressure technology adoption
This citation is from AGRICOLA.

231. **Land application of sewage sludge: Perceptions of New Jersey vegetable farmers.**
Krogmann, U.; Gibson, V.; and Chess, C.
Waste Management and Research 19 (2): 115-125. (2001)
NAL Call #: TD896.W37; *ISSN:* 0734-242X
This citation is provided courtesy of CAB International/CABI Publishing.

232. **Land tenure and the adoption of conservation practices in the United States.**
Soule, M. J. and Tegene, A.
In: Land quality, agricultural productivity, and food security: Biophysical processes and economic choices at local, regional, and global levels/ Wiebe, K., 2003; pp. 319-336.
Notes: ISBN: 1-84064-752-3
This citation is provided courtesy of CAB International/CABI Publishing.

233. **Land Use Characteristics and Water Quality: A Methodology for Valuing of Forested Buffers.**
Basnyat, P.; Teeter, L.; Lockaby, B. G.; and Flynn, K. M.
Springer-Verlag [Also available as: Environmental Management Vol. 26, No. 2, pp. 153-161; DOI: 10.1007/s002670010078], 2000 (application/pdf)
http://web6.duc.auburn.edu/academic/forestry_wildlife/forest_policy_ctr/teeter/env-mgt-value.pdf
Descriptors: water quality/ economics/ models

234. **Land-Use Dynamics in a Southern Illinois (USA) Watershed.**
Lant, C.; Loftus, T.; Kraft, S.; and Bennett, D.
Environmental Management 28 (3): 325-340. (2001)
NAL Call #: HC79.E5E5; *ISSN:* 0364-152X
Descriptors: Watersheds/ Land use/ Agriculture/ Environmental economics/ Hydrology/ decision making/ environmental policy/ Resource management/ Environment management/ Agricultural land/ Crop production/ Government policy/ United States, Illinois/ Crops/ Farms/ Cultivated Lands/ Sediment Load/ Nonpoint Pollution Sources/ Agricultural Runoff/ Watershed Management/ United States, Illinois, Cache River/ United States, Illinois/ Environmental action/ Planning and development/ Ecological impact of water development
Abstract: The Cache River of southernmost Illinois is used as a case study for developing and demonstrating an approach to quantitatively link (1) national agricultural policy and global agricultural markets, (2) landowner's decisions on land use, (3) spatial patterns of land use at a watershed scale, and (4) hydrologic impacts, thus providing a basis to predict, under a certain set of circumstances, the environmental consequences of economic and political decisions made at larger spatial scales. The heart of the analysis is an estimation, using logistic regression, of the affect of crop prices and Conservation Reserve Program (CRP) rental rates on farmland owner's decisions whether to reenroll in the CRP or return to crop production. This analysis shows that reasonable ranges for crop prices (80%-150% of 1985-1995 values) and CRP rental rates (0-125% of 1985-1995 rates) result in a range of 3%-92% of CRP lands being returned to crop production, with crop prices having a slightly greater effect than CRP rental rates. Four crop price/CRP rental rate scenarios are used to display resulting land-use patterns, and their effect on sediment loads, a critical environmental quality parameter in this case, using the agricultural non point source (AGNPS) model. These scenarios demonstrate the importance of spatial pattern of land uses on hydrological and ecological processes within watersheds. The approach developed can be adapted for use by local governments and watershed associations whose goals are to improve watershed resources and environmental quality.
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235. **Landlord involvement in environmental decision-making on rented Missouri cropland: Pesticide use and water quality issues.**
Constance, D. H.; Rikoon, J. S.; and Ma, J. C.
Rural Sociology 61 (4): 577-605. (Winter 1996)
NAL Call #: 281.28-R88; *ISSN:* 0036-0112
[RUSCA]
Descriptors: landowners/ farmland/ rent/ farm management/ decision making/ participation/ pesticides/ United States/ water quality/ tenure systems/ trends/ sociology/ Missouri
Abstract: The need to better understand landlord involvement in decision-making related to pesticide use and water quality issues is evidenced by several trends. These trends include the increasing documentation of water pollution by farm pesticides, the changing characteristics of farm ownership and operator tenure, and evolutions in resource policy and protection planning. This paper utilizes a theoretical approach to the sociology of land tenure to interpret results from an investigation of landlord involvement in environmental decision making regarding pesticide selection on rented land. Eight counties with high susceptibility of water contamination by pesticides were selected for study. Structured, in-person interviews were administered to in-county landlords, and a mail survey was used to poll out-of-county landlords. Results indicate that participation is generally low with very little difference between landlord groups. Renters make most of the organizational and operational decisions on rented farmland. Landlord participation is predominantly based on economic, rather than on social or environmental, factors. Furthermore, while economic variables are important predictors of participation for both groups, gender and social ties to the renter tend to increase local landlord involvement, but not absentee involvement. These results have important implications for both federal programs and further research on land tenure and environmental stewardship.
This citation is from AGRICOLA.

236. **Landowner decision making about riparian buffers.**
Lynch, L. and Brown, C.
Journal of Agricultural and Applied Economics 32 (3): 585-596. (Dec. 2000)
NAL Call #: HD101.S6; *ISSN:* 1074-0708
Descriptors: land types/ landowners/ decision making/ agricultural land/ land use/ land diversion/ environmental policy/ federal programs/ simulation/ mathematical models/ riparian buffers / Conservation Reserve Enhancement Program
This citation is from AGRICOLA.

237. **Landowner perceptions and the adoption of agroforestry practices in southern Ontario, Canada.**
Matthews, S.; Pease, S. M.; Gordon, A. M.; and Williams, P. A.
Agroforestry Systems 21 (2): 159-168. (1993)
NAL Call #: SD387.M8A3; *ISSN:* 0167-4366
This citation is provided courtesy of CAB International/CABI Publishing.

238. **Legal, institutional and economic indicators of forest conservation and sustainable management: Review and evaluation of available information in the United States.**
Ellefson, Paul V.
St. Paul Minn,: College of Natural Resources and Minnesota Agricultural Experiment Station, University of Minnesota; xi, 64 p. (2002)
Notes: "September 2002."
Includes bibliographical references.
NAL Call #: SD144.M6-S72-no.-163
http://www.cnr.umn.edu/FR/publications/staffpapers/Staffpaper163.pdf
This citation is from AGRICOLA.

239. **The link between local participation and improved conservation: A review of issues and experiences.**
Little, Peter D.
Airlie, Va.: Liz Claiborne Art Ortenberg Foundation; 34 p. (1993)
Notes: Cover title. "Prepared for the Liz Claiborne Art Ortenbreg Foundation Community Based Conservation Workshop, Airlie, Virginia, 18-22 October 1993." Includes bibliographical references (p. 28-32).
NAL Call #: S944.5.C57-L57-1993
Descriptors: Conservation of natural resources---Citizen participation
This citation is from AGRICOLA.

240. **Linking land quality, agricultural productivity, and food security.**
Wiebe, K. Economic Research Service, US Department of Agriculture; Agricultural Economic Report No.823, 2003. iii, 60 p.
http://www.ers.usda.gov/publications/aer823/
This citation is provided courtesy of CAB International/CABI Publishing.

241. **A literature review on the adoption and diffusion of management practices in agriculture.**
Hill, W. Lee.; Mezzatesta, R.; Long, G.; New South Wales. Dept. of Land and Water Conservation. Technical Services Directorate; and New South Wales. Dept. of Land and Water Conservation. Water Quality Services Unit.
Parramatta, N.S.W.: Dept. of Land & Water Conservation, Technical Services Directorate; iv, 43 p. (1995)
Notes: "October 1995" "TS 95.152" "Public document" Includes bibliographical references (p. 34-39).
NAL Call #: S562.A8-H56-1995; *ISBN:* 0731023404
Descriptors: Farm management---Australia---New South Wales/ Agricultural conservation---Australia---New South Wales
This citation is from AGRICOLA.

242. **Livestock and poultry producers' waste management practices and attitudes in North Carolina.**
Hoban, T. J. and Clifford, W. B.
In: Animal waste and the land-water interface. Boca Raton, Fla.: Lewis Publishers, 1995; pp. 441-448.
Notes: ISBN: 1566701899
NAL Call #: TD930.A55-1995
Descriptors: animal wastes/ management/ attitudes/ pollution control/ North Carolina/ best management practices
This citation is from AGRICOLA.

243. **Livestock waste management: Watershed approach in Italy, Florida and Texas.**
Frarey L; Mennella V; Abbozzo P; and Macellari E
Rivista di Ingegneria Agraria 29 (3): 180-191; 25 ref. (1998)
This citation is provided courtesy of CAB International/CABI Publishing.

244. **Local groundwater management effectiveness in the Colorado and Kansas Ogallala region.**
White, S. E. and Kromm, D. E.
Natural Resources Journal 35 (2): 275-307. (1995)
NAL Call #: HC79.E5N3
This citation is provided courtesy of CAB International/CABI Publishing.

245. **Local perceptions and values for a Midwestern river corridor.**
Ryan, Robert L
Landscape and Urban Planning 42 (2-4): 225-237. (1998)
NAL Call #: QH75.A1L32; *ISSN:* 0169-2046
Descriptors: landscape architecture: education, research/ river corridor: local perceptions, values/ rural landscape planning
Abstract: Rivers are vital natural corridors under increasing environmental pressure from rural development. This study addressed rural resident's perceptions and values, including their preferences for and attitudes toward riparian landscapes. Study participants were 120 rural property owners living in two communities near the River Raisin of southeastern Michigan. They completed a mailed survey which included a schematic diagram to determine their perceptions of those landscapes which form the river corridor, a photo-questionnaire to measure preference for scenes typical of the river corridor, and written questions to assess perceptions of both positive and negative characteristics of riverfront land. The results showed that local residents see the river corridor as four inter-connected zones: the river, woods, farms and built areas. New residents showed significantly higher

preference for more natural areas, such as woods and river zone, than did long-time residents. Farmers, by contrast, had a higher preference for less natural landscapes such as farms and built areas. Residents' landscape preference related more to their surrounding landscape-type than to the actual distance between their home and the river, although water quality problems were felt more strongly by those living near the river. The results point to the need to consider the riparian corridor as a series of inter-connected landscapes in planning efforts. Decisions about protection and development in these zones require not only an ecological understanding of these resources but an appreciation of the residents' values as well.
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246. **Making conservation tillage conventional: Building a future on 25 years of research -- Research and extension perspective.**
Derpsch, R.
In: Making conservation tillage conventional: Building a future on 25 years of research -- Proceedings of 25th Annual Southern Conservation Tillage Conference for Sustainable Agriculture. (Held 24 Jun 2002-26 Jun 2002 at Auburn, AL.)
Santen, E. van (eds.); pp. 25-29; 2002.
This citation is provided courtesy of CAB International/CABI Publishing.

247. **Making soil and water conservation sustainable: From coercion and control to partnerships and participation.**
Pretty, J N and Shah, P
*Land Degradation and Development 8 (1): 39-58. (*1997)
NAL Call #: S622.L26; *ISSN:* 1085-3278
Descriptors: conservation/ conservation program/ erosion/ rural development policy/ soil conservation/ sustainable agriculture/ sustainable conservation/ water conservation
Abstract: For close to a century, rural development policies and practice have taken the view that farmers are mismanagers of soil and water. This paper reviews the history of farmers being advised, paid and forced to adopt new soil and water conservation measures and practices. Many have done so, and environments and economies have benefitted in the short term, but ill-conceived policies and badly designed programmes and projects have undermined these efforts in the name of conservation. Most efforts have been remarkably unsuccessful, often resulting in more erosion. They have undermined the credibility of conservation and wasted huge sums of money. For a new era of soil and water conservation, new initiatives are showing how to make conservation sustainable. Farmers are now considered the potential solution rather than the problem, and so the value of local knowledge and skills is being put at the core of new programmes. This involves a major focus on building farmers' capacity to innovate and develop technologies appropriate to their own conditions. Local organizations are strengthened through participatory processes, this participation being interactive and empowering. Recent evidence is indicating that these new interactions between professionals and farmers are producing considerable productive and sustainable benefits. For widespread impact, enabling policy frameworks are still needed to encourage the spread of more sustainable practices for agriculture.
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248. **Making Watershed Partnerships Work: A Review of the Empirical Literature.**
Leach, W. D. and Pelkey, N. W.
Journal of Water Resources Planning and Management 127 (6): 378-385. (2001)
NAL Call #: TC401.A45; *ISSN:* 0733-9496
Descriptors: Water Resources Management/ Watershed Management/ Organizations/ Literature Review/ Public Policy/ Theoretical Analysis/ Institutional Constraints/ Remedies/ Factor Analysis/ Water management/ Catchment areas/ Public opinion/ Water policy/ Economics/ Water law and institutions/ Water Resources and Supplies
Abstract: Two main goals are achieved in this review of the empirical literature on factors affecting conflict resolution in watershed partnerships. The first is an assessment of two public policy theories relevant to partnership structure and function. The second is a set of practical suggestions for designing successful partnerships. The 37 available studies collectively identified 210 "lessons learned," which were grouped into 28 thematic categories. The most frequently recurring themes are the necessity of adequate funding (62% of the studies), effective leadership and management (59%), interpersonal trust (43%), and committed participants (43%). Exploratory factor analysis was used to search for patterns in the lessons. Four factors were identified, which together explain 95% of the variance in the 28 themes. The first two factors emphasize the importance of (1) balancing the partnership's resources with its scope of activities; and (2) employing a flexible and informal partnership structure. The third and fourth factors offer modest support for two theoretical perspectives on collaborative resource management--the alternate dispute resolution framework and the institutional analysis and development framework.
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249. **Managing agricultural resources at the urban-rural interface: A case study of the Old Mission Peninsula.**
Westphal, Joanne M
Landscape and Urban Planning 57 (1): 13-24. (2001)
NAL Call #: QH75.A1L32; *ISSN:* 0169-2046
Descriptors: agricultural resource management/ land use/ landscape planning/ urban rural interface
Abstract: Despite the vast landmass of the United States, resource managers, landscape architects, and planners are becoming increasingly aware of the difficulty in protecting natural resources at the urban-rural interface. Because of the legal framework of the United States, individual states retain the rights to regulate and manage the affairs of land use within their jurisdictions. Each state, in turn, has transferred portions of this right to county and local bodies of government through "enabling legislation". Because each of these layers of government has different agenda, oftentimes, a coordinated, effective land use planning effort that could protect natural resources, especially at the urban-rural interface, is impossible to develop. This paper examines one local community's effort to preserve farmland and open space at the urban-rural interface. As a case study, it presents some of the historic land use management tools in Michigan that have been used to protect farmland. It also discusses the political and economic factors that determine the success or failure of these tools. Because of the inadequacies of some of the tools to protect open space and farmland, the township adopted an alternative land use planning strategy. It appears that this strategy has successfully integrated the best of the old planning tools with some of the newer alternatives to curb urban sprawl in a rapidly growing area in Michigan, USA.
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250. **Managing material transfer and nutrient flow in an agricultural watershed.**
Nord, E. A. and Lanyon, L. E.
Journal of Environmental Quality 32 (2): 562-570. (2003)
NAL Call #: QH540.J6; *ISSN:* 0047-2425
This citation is provided courtesy of CAB International/CABI Publishing.

251. **Manure Management for Water Quality: Costs to Animal Feeding Operations of Applying Manure Nutrients to Land.**
Ribaudo, Marc; Gollehon, Noel; Aillery, Marcel; Kaplan, Jonathan; Johansson, Robert; Agapoff, Jean; Christensen, Lee; Breneman, Vince; and Peters, Mark; Economic Research Service.
U. S. Department of Agriculture [Also available as: Agricultural Economic Report No. 824; AER824], 2003 (application/pdf)
http://www.ers.usda.gov/publications/aer824/aer824.pdf
Descriptors: agricultural economics/ animal manure management/ animal manures/ nutrients/ nitrogen/ phosphorus/ water quality/ concentrated animal feeding operations/ animal feeding operations / Chesapeake Bay/ land application/ Clean Water Act/ manure management/ livestock waste/ CAFOs/ AFOs/ manure hauling/ ERS
Abstract: Nutrients from livestock and poultry manure are key sources of water pollution. Ever-growing numbers of animals per farm and per acre have increased the risk of water pollution. New Clean Water Act regulations compel the largest confined animal producers to meet nutrient application standards when applying manure to the land. The additional costs for managing manure have implications for feedgrain producers and consumers as well. This report's farm-level analysis examines onfarm technical choice and producer costs across major U.S. production areas. A regional analysis focuses on off-farm competition for land to spread surplus manure, using the Chesapeake Bay region as a case study. Finally, a sectorwide analysis addresses potential long-term structural adjustments at the national level and ultimate costs to consumers and producers.

252. **Market-based incentives for addressing non-point water quality problems: A residual nitrogen tax approach.**
Huang, W. and LeBlanc, M.
Review of Agricultural Economics 16 (3): 427-440. (Sept. 1994)
NAL Call #: HD1773.A3N6; *ISSN:* 1058-7195
Descriptors: zea mays/ nitrogen fertilizers/ water quality/ taxes/ groundwater/ economic impact/ farm income/ incentives/ profits/ case studies/ Corn Belt States of USA
Abstract: This study analyzes the implications of a nitrogen tax for agricultural producers. A tax scheme is examined that penalizes farmers for applying nitrogen in excess of a crop's nitrogen uptake. Farmers are taxed for the potential leaching of residual nitrogen into groundwater and are rewarded for growing crops that capture and utilize residual soil nitrogen. Corn production is used to illustrate the differential impacts of a residual nitrogen tax on farm income in Corn Belt States.
This citation is from AGRICOLA.

253. **Maxims for the Third Resource Conservation Act Appraisal.**
Shogren, J. F. and Johnson, S. R.
Ecological Economics 10 (2): 113-123. (1994)
NAL Call #: QH540.E26; *ISSN:* 0921-8009
Descriptors: conservation/ agricultural practices/ government policy/ United States/ economics/ Legislation/ Conservation

Abstract: The paper explores three issues in the development of an ecological economics approach to the USDA's Third Resource Conservation Act (RCA) Appraisal. First, profit-maximizing farmers respond to incentives provided by both the USDA and the EPA, implying that explicit interagency policy strategies are critical. Second, evaluating sustainable agriculture options with the Appraisal can improve our understanding of the attractiveness of widespread adoption, but only if systematic operational systems are developed to evaluate the economic and environmental trade-offs. Third, the Appraisal policy options should be evaluated in light of the argument that preferred policies often only resolve a problem by transferring the problem to another time or location. The Appraisal offers a unique opportunity to address these and other issues.
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254. **Microcatchment water harvesting for agricultural production: Socio-economic considerations.**
Renner, H. F. and Frasier, G.
Rangelands 17 (3): 79-82. (June 1995)
NAL Call #: SF85.A1R32; *ISSN:* 0190-0528.
Notes: Subtitle: [Part] II.
Descriptors: water harvesting/ cost benefit analysis/ semiarid zones/ sustainability/ innovation adoption
This citation is from AGRICOLA.

255. **Midwestern Farmers' Perceptions of Monitoring for Conservation Compliance.**
Esseks, J. D. and Kraft, S. E.
Journal of Soil and Water Conservation 48 (5): 458-465. (1993)
NAL Call #: 56.8 J822 [JSWCA3]
Descriptors: Erosion control/ Soil conservation/ Compliance/ Monitoring/ Rural areas/ Attitudes/ Agricultural runoff/ Agricultural watersheds/ Midwest/ Regulations/ Public opinion/ Watershed protection/ Evaluation process
Abstract: By 1995, more that 1.2 million producers are supposed to have fully implemented approved conservation plans that collectively have the potential for substantially reducing soil erosion in the U.S. Studies of other regulatory programs suggest that implementation of these plans will depend on various conditions: (1) an assessment of the legitimacy of the regulations; (2) the perception of the net benefits of compliance; (3) the likelihood of noncompliance being detected; and (4) the penalties for not complying. In six diverse Midwestern sites, operators of farms with highly erodible land were interviewed about conservation compliance. In all sites the majority of the respondents believed in at least a medium probability (50-50 chance) of noncompliance being detected. The majority also believed that a 50-50 chance was sufficient to encourage compliance. The results of a logistic regression analysis suggest that farmers are more likely to expect at least a 50-50 probability of detection if they have relatively frequent contact with local U.S. Department of Agriculture offices and also if they believe that monitoring makes use of aerial photography. (Author's abstract)
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256. **The Missouri MSEA Project: A model for "the partnership approach" to water quality concerns.**
Smith, M.
In: Proceedings National Watershed Water Quality Project Symposium / National Watershed Water Quality Project Symposium. (Held 22 Sep 1997-26 Sep 1997 at Washington, D.C.)
Washington, D.C.: Environmental Protection Agency, Office of Research and Development, Office of Water; pp. 9-14; 1997.
NAL Call #: TD223.N386-1997
Descriptors: low input agriculture/ pollution control/ water pollution/ atrazine/ herbicide residues/ management systems evaluation area/ best management practices
This citation is from AGRICOLA.

257. **Mitigating climate change by planting trees: The transaction costs trap.**
Kooten, G. C. van; Shaikh, S. L.; and Suchánek, P.
Land Economics 78 (4): 559-572. (2002)
NAL Call #: 282.8-J82; *ISSN:* 0023-7639
This citation is provided courtesy of CAB International/CABI Publishing.

258. **Mitigation options for diffuse phosphorus loss to water.**
Withers, P J A and Jarvis, S C
Soil Use and Management 14 (supplement): 186-192. (1998)
NAL Call #: S590.S68; *ISSN:* 0266-0032
Descriptors: phosphorus: loss mitigation/ eutrophication/ land management/ surface water pollution
Abstract: Agriculture contributes significant loads of P to surface waters. The reductions in these diffuse P inputs necessary to help prevent eutrophication problems and/or assist in the restoration of water quality will require controls over both nutrient inputs and their subsequent transport in land runoff. Specific mitigation options include nutrient budgeting, input management, soil conservation, land use management and the establishment of riparian, and other buffer zones. The variable nature of diffuse P loss suggests that the best approach to control is through integrated management at a range of scales. Critical control concepts at the farm level include targeting source areas adequately, maintaining P input loading rates within

recommended limits and avoiding high-risk management actions. Since eutrophication is a natural phenomenon and with potential conflicts with the need to meet production targets and/or minimize loss of other nutrients (N), some assessment of acceptable levels of P loss, of cost effectiveness of options and some prioritization of goals are necessary to find optimal solutions. As the requirements of individual waterbodies differ, these solutions need to be site specific and their successful adoption requires an appreciation by farmers of the importance of minimizing agricultural P loss both as individuals and collectively within a catchment.
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259. **A model of investment under uncertainty: Modern irrigation technology and emerging markets in water.**
Carey, J. M. and Zilberman, D.
American Journal of Agricultural Economics 84 (1): 171-183. (Feb. 2002)
NAL Call #: 280.8-J822; *ISSN:* 0002-9092
[AJAEBA]
Descriptors: irrigation water/ irrigated farming/ technology/ innovation adoption/ investment/ uncertainty/ dynamic models/ farm management/ profit functions/ decision making
Abstract: This article develops a stochastic dynamic model of irrigation technology adoption. It predicts that farms will not invest in modern technologies unless the expected present value of investment exceeds the cost by a potentially large hurdle rate. The article also demonstrates that, contrary to common belief, water markets can delay adoption. The introduction of a market should induce farms with abundant (scarce) water supplies to adopt earlier (later) than they would otherwise. This article was motivated by evidence that, contrary to NPV predictions, farms wait until random events such as drought drive returns significantly above costs before investing in modern irrigation technologies.
This citation is from AGRICOLA.

260. **Modeling multiple adoption decisions in a joint framework.**
Dorfman, J. H.
American Journal of Agricultural Economics 78 (3): 547-557. (Aug. 1996)
NAL Call #: 280.8-J822; *ISSN:* 0002-9092
[AJAEBA]
Descriptors: apples/ innovation adoption/ farm management/ irrigation/ integrated pest management/ technology/ decision making/ Bayesian theory/ multivariate analysis/ probabilistic models/ probit analysis/ California/ Michigan/ New York/ North Carolina/ Oregon/ Pennsylvania/ Virginia/ Washington/ multinomial probit model/ technology bundles
Abstract: A multinomial probit (MNP) model is applied to the modeling of adoption decisions by farmers facing multiple technologies which can be adopted in various combinations. This model allows for full investigation of the interactions between decisions to adopt or not adopt several technologies. Estimation is carried out in a Bayesian framework employing Gibbs sampling to circumvent past difficulties encountered in maximum likelihood estimation of the MNP model. The model is estimated for a sample of U.S. apple growers with four possible sustainable production technology bundles. The results show that adoption decisions are most significantly influenced by off-farm labor supply.
This citation is from AGRICOLA.

261. **Modifying the neo-classical approach to technology adoption with behavioral science models.**
Lynne, G. D.
Journal of Agricultural and Applied Economics 27 (1): 67-85. (July 1995)
NAL Call #: HD101.S6; *ISSN:* 1074-0708.
Notes: Paper presented at the meeting of the Southern Agricultural Economics Association, January 30, 1995, New Orleans, Louisiana.
Includes references.
Descriptors: water conservation/ technology/ innovation adoption/ neoclassical economics/ mathematical models/ Florida/ behavioral economics
Abstract: The dualistic nature of humans has been recognized for centuries. The intriguing question is the extent to which the human being with her/his display of concern for others can simultaneously act as an egoist, the latter being descriptive of the homo oeconomicus rendition of the human. Multiple utility theory suggests a way to approach research on such issues. A test case of water conserving technology adoption behavior by Florida growers is examined. Empirical evidence supports moving toward an expanded version of the mono-utility or I-utility model to include a We-utility.
This citation is from AGRICOLA.

262. **Money talks: But to whom? Financial versus nonmonetary motivations in land use decisions.**
Koontz, T. M.
Society and Natural Resources 14 (1): 51-65. (2001)
NAL Call #: HC10.S63; *ISSN:* 0894-1920
This citation is provided courtesy of CAB International/CABI Publishing.

263. **Moral hazard, risk aversion and compliance monitoring in agri-environmental policy.**
Ozanne, A.; Hogan, T.; and Colman, D.
European Review of Agricultural Economics 28 (3): 329-347. (Sept. 2001)
NAL Call #: HD1401.E92; *ISSN:* 0165-1587 [ERAEDA]
Descriptors: environmental policy/ innovation adoption/ efficiency/ costs/ farmers' attitudes/ risk/ social welfare/ simulation models/ monitoring/ United States
This citation is from AGRICOLA.

264. **A multiple utility approach to understanding conservation technology adoption: Application to the Florida tomato industry.**
Casey, C. Franklin University of Florida, 1996.
Notes: Thesis (Ph. D.); Includes bibliographical references (leaves 140-147).
NAL Call #: FU LD1780-1996.C338
Descriptors: Conservation of natural resources---Florida/ Tomato industry---Florida/ Tomatoes---Irrigation/ Water conservation---Economic aspects
This citation is from AGRICOLA.

265. **National Perspectives on Management Options for Lands Concluding Their Tenure in the Conservation Reserve Program (CRP).**
Schumacher, T. E.; Lindstrom, M. J.; Blecha, M. L.; and Langdale, G. W.
In: Crop Residue Management To Reduce Erosion and Improve Soil Quality: Southeast, Conservation Research Report Number 39 United States Department of Agriculture, Agricultural Research Service, 1995.
Descriptors: Conservation Reserve Program/ Regional conservation programs/ Southeastern United States
Abstract: Addressed the options for post-CRP land related to ground cover, grass types, long-tern soil improvement, and management strategies in the Southeast portion of the U.S.

266. **National Watershed Water Quality Project Symposium: Proceedings.**
U. S. Environmental Protection Agency, Office of Water and U. S. Environmental Protection Agency, Office of Research and Development; U. S. Department of Agriculture.
U. S. Environmental Protection Agency [Also available as: EPA625-R-97-008], 1997 (image/tiff)
NAL Call #: TD223 N386 1997
http://www.epa.gov/cgi-bin/claritgw?op-Display&document=clserv:ORD:2084;&rank=4&template=epa
Descriptors: watershed management/ water quality/ nonpoint source pollution/ governmental programs and projects/ pollution control/ innovation adoption/ best management practices/ environmental monitoring/ group process/ Management Systems Evaluation Areas/ United States/ Hydrologic Unit Area/ HUA/ MSEAs/ 319 National Monitoring Program/ BMPs
Abstract: The lessons learned from watershed projects addressing nonpoint source problems are recorded in these proceedings of the National Watershed Water Quality Project Symposium, held September 22-26, 1997, in Washington, D.C. The symposium featured accomplishments of local projects funded under EPA's Section 319 (Clean Water Act) National Monitoring Program and USDA's Demonstration, Hydrologic Unit Area Programs, and Management Systems Evaluation Areas.
This citation is from AGRICOLA.

267. **Nature provision by farmers and the principal agent framework: How to achieve environmental improvements in agriculture through improved payment schemes.**
Nuppenau, E. A. and Slangen, L. H. G.; Forum, Reports on Current Research in Agricultural Economics and Agribusiness Management No. 24, 1998. 49 p.
Notes: ISBN: 3-8175-0284-2
This citation is provided courtesy of CAB International/CABI Publishing.

268. **New federal support for priority watershed management needs.**
Ogg CW and Keith GA
Journal of the American Water Resources Association 38 (2): 577-586; many ref. (2002)
NAL Call #: GB651.W315
This citation is provided courtesy of CAB International/CABI Publishing.

269. **Nonchemical pest and nutrient management practices: Limitations to adoption and policy options.**
Ferguson, W.; Yee, J.; and Fitzner, M.
Journal of Sustainable Agriculture 7 (4): 45-56. (1996)
NAL Call #: S494.5.S86S8; *ISSN:* 1044-0046
This citation is provided courtesy of CAB International/CABI Publishing.

270. **North Carolina producers' adoption of waste management practices.**
Hoban, T. J.; Clifford, W. B.; Futreal, M.; and McMillan, M.
Journal of Soil and Water Conservation 52 (5): 332-339. (Sept. 1997-Oct. 1997)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561 [JSWCA3]
Descriptors: intensive livestock farming/ animal wastes/ management/ farm management/ decision making/ innovation adoption/ resistance to change/ waste utilization/ application to land/ environmental

protection/ water quality/ farmers' attitudes/ opinions/ surveys/ North Carolina
This citation is from AGRICOLA.

271. **Nutrient management planning: Justification, theory, practice.**
Beegle, D. B.; Carton, O. T.; and Bailey, J. S.
Journal of Environmental Quality 29 (1): 72-79. (2000)
NAL Call #: QH540.J6; *ISSN:* 0047-2425
This citation is provided courtesy of CAB International/CABI Publishing.

272. **On-farm adaptation of knowledge-intensive nitrogen management technologies for rice systems.**
Balasubramanian, V.; Morales, A. C.; Cruz, R. T.; and Abdulrachman, S.
Nutrient Cycling in Agroecosystems 53 (1): 59-69. (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/ nitrogen/ crop management/ leaves/ use efficiency/ chlorophyll/ color/ application rates/ technology transfer/ nitrogen content/ nutrient availability/ meters/ decision making/ cultivars/ diagnostic techniques/ literature reviews/ fertilizer requirement determination/ chlorophyll meter
This citation is from AGRICOLA.

273. **On-farm adoption of conservation practices: The role of farm and farmer characteristics, perceptions, and health hazards.**
Traoré, N.; Landry, R.; and Amara, N.
Land Economics 74 (1): 114-27. (1998)
NAL Call #: 282.8-J82; *ISSN:* 0023-7639
This citation is provided courtesy of CAB International/CABI Publishing.

274. **On-farm system performance in the Maricopa-Stanfield Irrigation and Drainage District area.**
Clemmens, A. J.; Dedrick, A. R.; Clyma, W.; and Ware, R. E.
Irrigation and Drainage Systems 14 (1/2): 93-120. (2000)
NAL Call #: TC801 .I66; *ISSN:* 0168-6291
This citation is provided courtesy of CAB International/CABI Publishing.

275. **On-farm water conservation practices in southern Alberta.**
Johnston, T. R. R.; Kromm, D. E.; and Byrne, J. M.
Journal of the American Water Resources Association 37 (3): 737-750. (June 2001)
NAL Call #: GB651.W315; *ISSN:* 1093-474X [JWRAF5]
Descriptors: water conservation/ on farm conservation/ irrigated farming/ irrigation/ innovation adoption/ diffusion of information/ farm surveys/ Alberta
Abstract: In southern Alberta, as elsewhere, pressures on limited water supplies are increasing. Not surprisingly, a great deal of attention has been focused on irrigated agriculture, which accounts for the largest share of water consumed in the region. In order to meet broadly accepted water conservation goals, some commentators have suggested that irrigation water use should be metered and that irrigators should be charged based on the amount of water used. An alternative proposal would have water management authorities rely upon the perceived adaptability of irrigators. This paper offers a perspective on the willingness of irrigators to conserve water. Based on a survey of 183 irrigation farmers conducted over the summer and early fall of 1998, we found that irrigators are generally aware of the need to conserve water and soil moisture, and that a variety of water conserving strategies were being employed. Water saving technologies specific to irrigation agriculture were less widely adopted. The findings suggest that there is considerable potential to reduce the amount of water consumed by the irrigation sector through increased efficiency, but that change will be limited if current economic circumstances and institutional arrangements persist.
This citation is from AGRICOLA.

276. **Optimal adoption strategies for no-till technology in Michigan.**
Krause, M. A. and Black, J. R.
Review of Agricultural Economics 17 (3): 299-310. (Sept. 1995)
NAL Call #: HD1773.A3N6; *ISSN:* 1058-7195
Descriptors: maize/ soybeans/ no-tillage/ farm machinery/ replacement/ decision making/ learning ability/ farmers' attitudes/ risk/ innovation adoption/ dynamic models/ profits/ Michigan/ learning curves
Abstract: Adjustment costs and risk aversion are hypothesized to delay adoption of no-till technology on representative corn and soybean farms in Michigan. The relevant adjustment costs include: (1) the cost of replacing the conventional planter already in use; and (2) the cost of learning how to obtain high crop yields with no till technology. Previous economic analyses of no-till adoption have not considered adjustment costs and risk aversion together. This analysis uses dynamic programming

models to evaluate the effects of machinery replacement, risk aversion, a learning curve, and crop yield expectations on adoption strategies by representative profit-maximizing and risk-averse, expected utility-maximizing farmers in Michigan. Mean net revenues for the no-till technology are higher than net revenues for conventional tillage when mean crop yields are assumed to be equal for the two technologies. The estimated mean corn and soybean yields are higher for the no-till system than for conventional tillage, but the differences are not statistically significant. The representative risk-averse farmer waits until both the conventional planter and the current tractor have aged many years before adopting the no-till technology when equal mean yields and a learning curve are assumed. The representative profit-maximizing farmer replaces this machinery and adopts the no-till technology more quickly, especially when no learning curve is considered. Both representative farmers adopt the no-till technology much more quickly when the estimated mean crop yields are assumed than when equal mean crop yields are assumed. Crop price expectations also exert a large influence on the optimal adoption strategy for the risk-averse farmer. The results support efforts to promote no-till technology by demonstrating superior to yields and lowering learning costs.
This citation is from AGRICOLA.

277. **Oregon's Conservation Reserve Enhancement Program: Likely Participation and Recommendations for Implementation.**
Kingsbury, L.
Corvallis, OR: Oregon State University, 1999.
Notes: M.S. Thesis
Descriptors: State conservation programs/ Conservation Reserve Enhancement Program/ Oregon
Abstract: Assessed the willingness of private riparian landowners to participate in Oregon's CREP under various contract provisions.

278. **Participatory assistance: An alternative to transfer of technology for promoting change on farms.**
Lanyon, L. E.
American Journal of Alternative Agriculture 9 (3): 136-142. (1994)
NAL Call #: S605.5.A43; *ISSN:* 0889-1893 [AJAAEZ]
Descriptors: farming systems/ change/ farm management/ decision making/ innovation adoption/ farmers/ participation/ technology transfer/ comparisons
Abstract: Participatory assistance (PA) is a proposed approach for promoting change that involves both the biophysical processes of farms and the management processes of farmers. It integrates external expertise, inputs, and expectations with the unique character of a particular farming system. It focuses on improving the processes of the farm and farmer rather than on the traditional interests of "outsiders" such as disciplinary researchers, industry sales people, government regulators, consumers, or environmental interest groups. As an alternative to transfer of technology, it promotes learning both by the farmer and by specialists from academia, industry, government, and the public. Participatory assistance can promote innovations in the operation of farms, in the conduct of research and education, in the development of products and services, in the formulation of policy, and in the involvement of the public in agriculture. The outcome is not assumed to be the adoption of the "best" technology, but may be found in the emerging properties that result from innovations. Assessing the improvement that follows each innovation will require clear specification of the relevant performance criteria, provision of appropriate technical support, and reinforcement by the appropriate incentives. Reconciling today's farming with water quality protection illustrates the potential of the PA approach.
This citation is from AGRICOLA.

279. **Participatory landscape ecology: A basis for acceptance and implementation.**
Luz, Frieder
Landscape and Urban Planning 50 (1-3): 157-166. (2000)
NAL Call #: QH75.A1L32; *ISSN:* 0169-2046
Descriptors: participatory landscape ecology: acceptance, implementation
Abstract: Until recently, participation by local actors (decision-makers, lobbyists, farmers or representatives of various interest groups) played little or no role in landscape ecology and planning in Germany. Research in southern Germany between 1990 and 1996 and other more recent studies demonstrate how a lack of communication between scientists, planners, administrators and local stakeholders hinder acceptance and implementation of landscape planning projects. As part of practically-oriented research project, measures to improve communication were applied in several communities and the effects measured over several years. Participatory and communicative methods such as round tables, workshops, marketing of regional products and information campaigns caused significant acceleration of the implementation, suggesting that landscape ecology can be holistic only if public awareness and participation play an equal role with the expert views of natural scientists and planners.
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280. **Past investments in conservation research.**
Napier, T. L.
Journal of Soil and Water Conservation 52 (1): 32-33. (Jan. 1997-Feb. 1997)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561 [JSWCA3].
Notes: Commentary.
Descriptors: soil conservation/ water conservation/ programs/ farmers' attitudes/ participation/ resistance to change/ innovation adoption/ incentives/ disincentives/ decision making/ social sciences/ research
This citation is from AGRICOLA.

281. **Perceptions of risk associated with use of farm chemicals: Implications for conservation initiatives.**
Tucker, M. and Napier, T. L.
Environmental Management 22 (4): 575-587. (1998)
NAL Call #: HC79.E5E5; *ISSN:* 0364-152X
This citation is provided courtesy of CAB International/CABI Publishing.

282. **Pesticide free production of field crops: Results of an on-farm pilot project.**
Nazarko, Orla M; Acker, Rene C van; Entz, Martin H; Schoofs, Allison; and Martens, Gary
Agronomy Journal 95 (5): 1262-1273. (2003)
NAL Call #: 4-AM34P; *ISSN:* 0002-1962
Descriptors: Avena sativa [oat] (Gramineae): grain crop/ Hordeum vulgare [barley] (Gramineae): grain crop/ Linum usitatissimum [flax] (Linaceae): fiber crop/ Triticum aestivum [wheat] (Gramineae): grain crop/ Angiosperms/ Dicots / Monocots/ Plants/ Spermatophytes/ Vascular Plants/ on farm pilot project/ pesticide free crop production: organic production transition, weeds, yield
Abstract: Existing strategies for pesticide use reduction in the northern Great Plains have suffered from limited adoption. A novel approach, Pesticide Free Production (PFP), was recently developed in Manitoba, Canada. A participatory, on-farm study was conducted to assess the potential of PFP to be implemented on typical farms and the level of success farmers experienced with PFP. Pesticide Free Production prohibits the use of in-crop pesticide and seed treatments during one crop year as well as prior use of residual pesticides. Synthetic fertilizer use is permitted, as are pre-emergent applications of nonresidual pesticides. A total of 71 farmers, representing 120 fields and 11 crops, participated in the study. Fields and farmers were grouped based on whether or not fields (i) achieved PFP certification and (ii) were in transition to organic production. Certification was achieved for 83% of the participating area. Spring cereals were the most likely crops to achieve PFP certification. Yields in all groups were slightly lower than conventional averages in Manitoba but were not significantly different among groups. Weed densities were higher (P=0.065) in noncertifiable fields than in certifiable fields. Most farmers reported manageable weed densities in the year following PFP. Soil conservation practices were used on a high proportion of PFP fields. Management practices associated with PFP included the use of delayed seeding, forages in rotation, and increased seeding rates. Agronomic and demographic characteristics of participating fields and farmers were typical for Manitoba. Pesticide Free Production demonstrates considerable potential to be successfully adopted by mainstream farmers.
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283. **Policy prospects for brush control to increase off-site water yield.**
Thurow, T. L.; Thurow, A. P.; and Garriga, M. D.
Journal of Range Management 53 (1): 23-31. (Jan. 2000)
NAL Call #: 60.18-J82; *ISSN:* 0022-409X [JRMGAQ]
Descriptors: watershed management/ brush control/ water yield/ cost analysis/ ranching/ farm surveys/ wildlife management/ game animals/ decision making/ hunting/ leases/ farm income/ range management/ Texas
Abstract: Water yield from rangeland on the Edwards Plateau, Texas is significantly greater if a site is dominated by grass instead of brush. Brush control programs are being considered by policy-makers as a way to relieve water shortages in the region. This research analyzed ranchers' willingness to participate in a publicly-funded brush control cost-sharing program that would be ranch-revenue neutral. A survey instrument was mailed to 226 ranchers, 119 were completed and returned (53%). The cost sharing program required that brush on enrolled land be cleared and maintained at 3% cover for a 10-year period. Respondents estimated that current brush cover on their land averaged 41%, which contrasted with their preference that brush cover average 27%. This expression of preferred brush cover was similar to an independent estimate by a panel of experts in the region which indicated ranch livestock and deer-hunting lease value would be maximized at 30% brush cover. These estimates indicate that a program designed to increase water yield by reducing brush cover to 3% would likely require a financial incentive to offset the cost of brush control that exceeded the preference of the owner. Sixty-six percent of respondents indicated a willingness to enroll some portion of their land in the cost-sharing program described in the survey instrument. Ranch size, the percentage of ranch income earned from deer-hunting leases and livestock, and whether or not ranchers indicated that expense limited past brush control efforts were the variables measured by the survey instrument which

best explained the probability of participation and the amount of land the owner was willing to enroll.
This citation is from AGRICOLA.

284. **A policy simulation of the Wetlands Reserve Program.**
Parks, P. J. and Kramer, R. A.
Journal of Environmental Economics and Management 28 (2): 223-240. (1995);
ISSN: 0095-0696
Descriptors: agricultural practices/ government policy/ wetlands/ environmental restoration/ costs/ models/ United States/ agriculture/ government policies/ economics/ ecosystem disturbance / land use/ environmental protection/ urbanization/ cost analysis/ land reclamation/ Modeling/ mathematics/ computer applications/ Reclamation/ Environmental action/ Protective measures and control/ Evaluation process/ Freshwater/ United States
Abstract: Farmer participation in wetlands restoration practices is explained using land benefits, land attributes, and owner attributes. The probability of participation is estimated using county-level data, and used to calculate the expected acreage restored. National restored wetlands reserves are simulated by sorting counties on government cost and enrolling acreage into the reserve until the acreage target is reached. Total government cost for a million-acre reserve ranges from $1736 million to $1869 million, depending on the administrative strategy used. Using estimated participation rates in place of hypothetical rates suggests that achieving acreage targets may be more expensive than previously thought.
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285. **The potential of the 1990 Farm Bill to conserve and restore wetlands in cornbelt watersheds.**
Lant CL; Kraft SE; and Campbell KL.
In: Versatility of wetlands in the agricultural landscape: Hyatt Regency, Tampa, Florida, USA, 17-20 September, 1995.; pp. 295-303; 1995.
This citation is provided courtesy of CAB International/CABI Publishing.

286. **Practical considerations in assessing barriers to IPM adoption.**
Nowak, P.; Padgett, S.; and Hoban, T. J.
In: Proceedings of the Third National IPM Symposium and Workshop: Broadening support for 21st century IPM. (Held 27 Feb 1996-1 Mar 1996 at Washington, D.C.)
Washington, D.C.: U.S. Dept. of Agriculture, Economic Research Service; pp. 93-114; 1997.
Notes: Miscellaneous publication (United States. Dept. of Agriculture) no. 1542
NAL Call #: 1-Ag84M-no.1542
Descriptors: integrated pest management/ crop management/ decision making/ innovation adoption/ resistance to change/ sociological analysis
This citation is from AGRICOLA.

287. **Precision farming adoption and use in Ohio: Case studies of six leading-edge adopters.**
Batte, M. T. and Arnholt, M. W.
Computers and Electronics in Agriculture 38 (2): 125-139. (Feb. 2003)
NAL Call #: S494.5.D3C652; *ISSN:* 0168-1699 [CEAGE6]
Descriptors: site specific crop management/ variable rate application/ data collection/ innovation adoption/ farmers' attitudes/ information technology/ case studies/ interviews/ farm management/ evaluation/ geographical information systems/ diffusion of information/ technology transfer/ Ohio
Abstract: Precision farming (PF) has the potential to help farmers improve input allocation decisions, thereby lowering production costs or increasing outputs, and, potentially, increasing profits. However, little is known about how farmers use PF technologies to support managerial decision-making, or about the relative magnitude of benefits and costs of PF technologies on individual farms. An embedded, multiple-case study approach was used to collect information about PF from six farms. The objective was to collect information about adoption and use of PF from early adopters to glean information that would be useful to those considering adoption of this farming system. Results suggest that farmers credit benefits to PF for a wide variety of decision types. The case study farmers appear to derive more value from information gathering technologies (e.g. yield monitors and mapping) than from variable rate application technologies.
This citation is from AGRICOLA.

288. **Predicting Drip Irrigation Use and Adoption in a Desert Region.**
Skaggs, R. K.
Agricultural Water Management 51 (2): 125-142. (2001)
NAL Call #: S494.5.W3A3; *ISSN:* 0378-3774
Descriptors: United States, New Mexico/ Irrigation Practices/ Drip Irrigation/ Crop Production/ Farms/ Surveys/ Attitudes/ Regression Analysis/ Model Studies/ Conservation in agricultural use
Abstract: The possibility that drip irrigation technology could increase yields, reduce the incidence of crop diseases, and improve fruit quality has been identified as a critical research issue for the New Mexico chile pepper industry. Numerous hypotheses have been expressed regarding the low incidence of drip irrigation usage among New Mexico farmers. A survey of farmers was conducted in 1999 to assess commercial chile pepper producers' attitudes toward and knowledge of drip irrigation technology. The survey data were used in

logistic regression models that predict current high-tech irrigation system usage, drip irrigation usage, and plans for future drip irrigation adoption by chile pepper producers. The results of this research provide information useful to extension personnel, other researchers, and chile industry members. Results also raise questions about the impact of widespread drip irrigation adoption on multi-user irrigation systems, such as those found in New Mexico.
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289. **Preferred sources and channels of soil and water conservation information among farmers in three Midwestern US watersheds.**
Tucker, M. and Napier, T. L.
Agriculture, Ecosystems and Environment 92 (2/3): 297-313. (Nov. 2002)
NAL Call #: S601-.A34; *ISSN:* 0167-8809
[AEENDO]
Descriptors: farmers/ farmers' attitudes/ soil conservation/ water conservation/ information services/ information needs/ diffusion of information/ watersheds/ decision making/ prediction/ data analysis/ Iowa/ Ohio/ Minnesota
Abstract: This research examines farmers' use of various sources and channels of conservation information in three Midwestern US watersheds. A primary objective was to determine perceptual and farm structure factors influencing the use of particular information sources for farm-level decision-making. Data were collected from 1011 farm operators, the Maquoketa River watershed in east-central Iowa, the Lower Minnesota River watershed in southeast Minnesota, and the Darby Creek watershed in central Ohio. Respondents were asked to indicate frequency of use for 22 sources of conservation information identified from the literature and to rank the perceived importance of 11 of the most common communication channels for accessing agricultural information. Factor analysis was used to reduce the number of information sources to a smaller set of variables that explained much of the variance of the original data set. Selected elements of diffusion, risk communication, and farm structure theories were used to interpret the factor loadings and to identify predictors of information use. Regression analysis was used to test the communication source models developed for the overall data set and for each state. Descriptive findings revealed that farmers use multiple sources and channels when accessing soil and water conservation information. Substantial differences in information-use patterns were noted among the study watersheds. The results of the factor analysis showed that the 22 information sources could be categorized into six overarching groups based on their intercorrelation. The regression models were shown to vary widely in their predictive capacity, explaining from 1 to 29% of the total variance in source use. The variability noted among farmers' information-use patterns and perceptions across the three study areas casts doubt on the value of broad-based or "shotgun" approaches for delivering agricultural information. The use of factor analysis has promise in future studies as a valuable tool for developing empirical measures of information use and improving measurement of key theoretical constructs in agricultural communication.
This citation is from AGRICOLA.

290. **A Preliminary Analysis of Texas Ranchers' Willingness to Participate in a Brush Control Cost-Sharing Program to Improve Off-Site Water Yields.**
Thurow, A. P.; Conner, J. R.; Thurow, T. L.; and Garriga, M. D.
Ecological Economics 37 (1): 139-152. (2001)
NAL Call #: QH540.E26; *ISSN:* 0921-8009
Descriptors: Environmental economics/ Public concern/ Cost benefit analysis/ Agriculture/ Perception/ Regional planning/ Water resources/ Ecology/ United States, Texas/ Water Yield/ Water Supply/ Farming/ Economic Aspects/ Water Management/ Arid environments/ Environment management/ Socioeconomic aspects/ United States, Texas, Edwards Plateau/ brush control/ Environmental action/ Water yield improvement/ General Environmental Engineering/ Freshwater
Abstract: Brush cover of 30% is estimated to be economically optimal for ranches on the Edwards Plateau, Texas. This contrasts with a regional objective to increase off-site water yield, which is maximized if brush cover is removed. Survey research was conducted to assess ranchers' willingness to enter a 10-year easement contract to clear brush to 3%, for a fixed cost-share payment to offset their opportunity costs of participation. Sixty-six percent of the 119 ranchers surveyed were willing to enroll. Ranch size, income from livestock and deer-hunting enterprises, and perceptions about brush control costs were important explanatory variables in statistical analysis using probit and Cragg models.
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291. **Private farmer's attitudes to land, work and landscape: Interpretation of a case study in landscape ecological framework.**
Lapka, Miloslav and Cudlinova, Eva
Ekologia Bratislava 18 (4): 401-412. (1999); *ISSN:* 1335-342X
Descriptors: human (Hominidae): farmer/ Animals/ Chordates/ Humans/ Mammals/ Primates/ Vertebrates/ rural landscapes: ecological framework
Abstract: This paper looks at the private farmer's attitudes to their land, their own work and

surrounding landscape. We employed a data coming from the socio-ecological research of family farmers in the South Bohemian landscape of the Czech Republic. Using farmer's attitudes to land, work and to landscape, the paper charts the ecological consequences of our cases in context with sustainable agriculture as so as in more theoretical context of landscape ecology. Farmer's attitudes mentioned above contains the potential to be a positive (from an ecological point of view) driving force for landscape preservation and land use. However, the application of these ecological positive attitudes is not a task only the farmer's internal factors. There are playing also great role external factors like agriculture policy, subsidies and last, but not least understanding of co-existence of natural and social patterns in rural landscape.
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292. **Program participation behavior of non-industrial forest landowners: A probit analysis.**
Nagubadi, V.; McNamara, K. T.; Hoover, W. L.; and Mills, W. L. Jr.
Journal of Agricultural and Applied Economics 28 (2): 323-336. (1996); *ISSN:* 0081-3052
This citation is provided courtesy of CAB International/CABI Publishing.

293. **Property tax distortions and participation in federal easement programs: An exploratory analysis of the Wetlands Reserve Program.**
Poe, G. L.
Agricultural and Resource Economics Review 27 (1): 117-124; 40 ref. (1998)
NAL Call #: HD1773.A2N6
This citation is provided courtesy of CAB International/CABI Publishing.

294. **Property taxation and participation in Federal easement programs: Evidence from the 1992 Pilot Wetlands Reserve Program.**
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; 15 p.; Series: Working paper (New York State College of Agriculture and Life Sciences. Dept. of Agricultural, Resource, and Managerial Economics) WP 96-06. (1996)
Notes: "May 1996"--Cover. Includes bibliographical references (p. 15).
NAL Call #: HD1751.W67--no.96-06
Descriptors: Conservation easements---United States/ Real property and taxation---United States/ Wetland conservation---Economic aspects---United States
This citation is from AGRICOLA.

295. **Public marginal willingness to trade off among water quality programs: Estimates of statewide and watershed-specific budget values.**
Blomquist GC; Newsome MA; and Stone DB
Water Resources Research 36 (5): 1301-1313; 12 ref. (2000)
NAL Call #: 292.8 W295
This citation is provided courtesy of CAB International/CABI Publishing.

296. **Public policies and private decisions: Their impacts on Lake Erie water quality and farm economy.**
Forster, D. L.
Journal of Soil and Water Conservation 55 (3): 309-322. (2000)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
This citation is provided courtesy of CAB International/CABI Publishing.

297. **Publicly-provided information in environmental management: Incorporating groundwater quality goals into herbicide treatment recommendations.**
Liu, W; Moffitt, L J; Lee, L K; and Bhowmik, P C
Journal of environmental management 55 (4): 239-248. (1999)
NAL Call #: HC75.E5J6; *ISSN:* 0301-4797
Descriptors: herbicide: treatment recommendations/ environmental management/ groundwater quality goals / publicly provided information
Abstract: Use of publicly-provided information to promote environmental quality has received somewhat less attention in the environmental management literature than use of other environmental policy tools based on economic incentives such as emissions taxes, subsidies and marketable permits. Yet publicly-provided information may have potential as an environmental policy tool, especially in managing problems of agricultural pollution, due in large part to the existing capability of public information agencies associated with the agricultural research community. Information provided by these agencies is known to be an important factor in decision making in agriculture and may have potential for influencing decisions that relate directly to preserving the integrity of environmental resources. Moreover, this potential may have particular relevance for protecting groundwater quality from agricultural production since the results of contamination are often at least partially internal to the farm decision maker. This paper develops an empirical model to formulate publicly-provided herbicide treatment recommendations designed to protect both the quality of groundwater and the income of farmers. An economic and statistical model of a crop-pest system is used in conjunction with a groundwater loading model to derive the trade-off relationship

between producer income and movement of herbicide material through the root zone. The trade-off relationship can provide the basis for formulating herbicide treatment recommendations and can also shed light on appropriate groundwater quality goals.
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298. **The pursuit of efficiency and its unintended consequences: Contract withdrawals in the environmental quality incentives program.**
Cattaneo, A.
Review of Agricultural Economics 25 (2): 449-469. (2003)
NAL Call #: HD1773.A3N6; *ISSN:* 1058-7195.
Notes: Number of References: 11; Publisher: Amer Agricultural Economics Assoc
Descriptors: Agriculture/ Agronomy/ Economics/ water quality/ moral hazard
Abstract: This article analyzes why the USDA's Environmental Quality Incentives Program (EQIP) experiences contract withdrawals. Among approved contracts, 17% withdrew one or more conservation practices. After presenting a model of producers' behavior, a logit model is used to examine the withdrawal phenomenon. Withdrawals are linked to producers having an incentive to include low cost-share payments and practices in the conservation plan that increase the probability of approval, but may not be profitable. These results are discussed in light of the changes to EQIP that have been introduced by the 2002 Farm Act.
© Thomson ISI

299. **Qualitative Evaluation of the Continuous Sign-Up Program: Results of Five Focus Groups.**
Applied Research Systems Natural Resource Conservation Service, 1996.
Notes: Prepared for Natural Resource Conservation Service.
Descriptors: Conservation Reserve Program/ United States/ Continuous CRP
Abstract: Presented the results of five focus groups comprised of farmers to a promotional campaign for buffer strips and continuous CRP.

300. **Reallocating water from agriculture to the environment under a voluntary purchase program.**
Isé, S. and Sunding, D. L.
Review of Agricultural Economics 20 (1): 214-226. (1998)
NAL Call #: HD1773.A3N6; *ISSN:* 0191-9016
This citation is provided courtesy of CAB International/CABI Publishing.

301. **Recruiting the new conservationists: Farmers' adoption of agri-environmental schemes in the United Kingdom.**
Morris, C. and Potter, C.
Journal of Rural Studies 11 (1): 51-63. (Jan. 1995)
NAL Call #: HT401.J68; *ISSN:* 0743-0167
Descriptors: conservation/ land diversion/ land management/ farmers' attitudes/ innovation adoption/ environmental policy/ contracts/ program participants/ incentives/ farm surveys/ south east England/ environmentally sensitive areas program/ agri environmental policy
Abstract: Financial incentives available to farmers under the Government's relaunched agri-environmental policy (AEP) promise to recruit more farmers into conservation schemes than ever before. The success of these voluntary schemes, which offer payments in return for farmers agreeing to desist from certain damaging operations or carry out environmentally sensitive ones, is widely proclaimed, chiefly with reference to the promising levels of enrolment that have already been achieved under the Environmentally Sensitive Areas (ESA) programme. Increasingly, however, attention is focusing on the environmental benefits that are being achieved on the ground and their longer-term durability. This paper reports on a survey of 101 farmers in South East England conducted with a view to investigating the level of engagement of those currently enrolled in such schemes. Focusing on the motivational aspects, it points to wide variations in the level of commitment and sympathy with the wider objectives of AEP schemes and places farmers on a participation spectrum ranging from the most resistant nonadopters at one end to the most active adopters at the other. The policy implications of this categorisation are explored and recommendations made for pushing more farmers towards the active end of the spectrum.
This citation is from AGRICOLA.

302. **Relationships among farm operators' water quality opinions, fertilization practices, and cropland potential to pollute in two regions of Virginia.**
Pease, J. and Bosch, D.
Journal of Soil and Water Conservation 49 (5): 477-483. (1994)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
This citation is provided courtesy of CAB International/CABI Publishing.

303. **Relevance of scale dependent approaches for integrating biophysical and socio-economic information and development of agroecological indicators.**
Dumanski, J.; Pettapiece, W. W.; and McGregor, R. J.
Nutrient Cycling in Agroecosystems 50 (1/3): 13-22. (Mar. 1998)
NAL Call #: S631.F422; *ISSN:* 1385-1314 [NCAGFC].
Notes: In the special issue: Soil and water quality at different scales / edited by P.A. Finke, J. Bouma and M.R. Hoosbeek. Proceedings of a workshop held August 7-9, 1996, Wageningen, The Netherlands. Includes references.
Descriptors: sustainability/ growth/ technology transfer/ innovation adoption/ indicators/ ecology/ agriculture/ ecosystems/ costs/ natural resources/ environmental degradation/ socioeconomics/ soil chemistry/ soil physical properties/ soil fertility/ water quality/ literature reviews
This citation is from AGRICOLA.

304. **Research experience with tools to involve farmers and local institutions in developing more environmentally friendly practices.**
Noe, E. and Halberg, N.
In: Environmental co-operation and institutional change: Theories and policies for European agriculture/ Hagedorn, K.
Cheltenham, UK: Edw. Elgar Publ., 2002; pp. 143-161.
Notes: ISBN: 1-84064-841-4
This citation is provided courtesy of CAB International/CABI Publishing.

305. **Results of irrigation management transfer in the Columbia Basin Project, USA.**
Svendsen, M. and Vermillion, D. L.
Colombo, Sri Lanka: International Irrigation Management Institute; Short Report Series on Locally Managed Irrigation No. 15, 1996. v, 16 p.
This citation is provided courtesy of CAB International/CABI Publishing.

306. **A review and evaluation of agroecosystem health analysis: The role of economics.**
Yiridoe, E. K. and Weersink, A.
Agricultural Systems 55 (4): 601-626. (Dec. 1997)
NAL Call #: HD1.A3; *ISSN:* 0308-521X [AGSYDS]
Descriptors: ecosystems/ resource utilization/ sustainability/ economic evaluation/ opportunity costs/ systems approach
Abstract: A conceptual framework for evaluating sustainable agroecosystems based on economic theory is presented. Agroecosystem sustainability embraces human socioeconomic and bioecological aspects. There are tradeoffs, complementarities, and interrelationships among alternative choices that have to be made in a world of resource scarcity in order to achieve a sustainable agroecosystem. Analyzing these choices in an integrated framework is a central component of modern economic analysis.
This citation is from AGRICOLA.

307. **A review of the socio-economic analysis of soil degradation problems for developed and developing countries.**
Thampapillai, D. J. and Anderson, J. R.
Review of Marketing and Agricultural Economics 62 (3): 291-315. (Dec. 1994)
NAL Call #: 286.8-N47M; *ISSN:* 0034-6616
Descriptors: soil degradation/ soil conservation/ topsoil/ farm inputs/ agricultural production/ renewable resources/ non renewable resources/ resource utilization/ costs/ economic impact/ income/ innovation adoption/ optimization methods/ developing countries/ common property resources/ user costs
This citation is from AGRICOLA.

308. **Risk of public disclosure in environmental farm plan programs: Characteristics and mitigating legal and policy strategies.**
Yiridoe, E. K.
Journal of Agricultural and Environmental Ethics 13 (1/2): 101-120. (2000)
NAL Call #: BJ52.5 .J68; *ISSN:* 0893-4282
This citation is provided courtesy of CAB International/CABI Publishing.

309. **Role of farmers' attitudes in adoption of irrigation in Saskatchewan.**
Kulshreshtha, S. N. and Brown, W. J.
Irrigation and Drainage Systems 7 (2): 85-98. (1993)
NAL Call #: TC801 .I66; *ISSN:* 0168-6291
This citation is provided courtesy of CAB International/CABI Publishing.

310. **The role of integrating concepts in watershed rehabilitation.**
Hilden, M.
Ecosystem Health 6 (1): 39-50; 48 ref. (2000)
This citation is provided courtesy of CAB International/CABI Publishing.

311. **The role of on-farm demonstrations in addressing constraints to the adoption of remedial practices.**
Nowak, P. and Hakanson, K.
In: Agricultural research to protect water quality: Proceedings of the conference. (Held 21 Feb 1993-24 Feb 1993 at Minneapolis, Minnesota.)
Ankeny, IA: Soil and Water Conservation Society; pp. 344-346; 1993.

NAL Call #: TD427.A35A49-1993
Descriptors: demonstration farms/ adoption/ assessment/ farmers
This citation is from AGRICOLA.

312. **The role of planting flexibility and the acreage reduction program in encouraging sustainable agriculture practices.**
Huang, W. Y. and Daberkow, S. G.
Journal of Sustainable Agriculture 7 (1): 63-79. (1995)
NAL Call #: S494.5.S86S8; *ISSN:* 1044-0046 [JSAGEB]
Descriptors: farm management/ decision making/ agricultural policy/ federal programs/ land diversion / participation/ deficiency payments/ crop mixtures/ diversification/ mathematical models/ sustainability/ farming systems/ case studies/ Corn Belt States of USA/ normal flex acres/ commodity programs
This citation is from AGRICOLA.

313. **Selection and sustainability of land and water resource management systems.**
Prato, T. and Hajkowicz, S.
Journal of the American Water Resources Association 35 (4): 739-752. (1999)
NAL Call #: GB651.W315
This citation is provided courtesy of CAB International/CABI Publishing.

314. **Sequential adoption of site-specific technologies and its implications for nitrogen productivity: A double selectivity model.**
Khanna, M.
Selected papers from the annual meeting of the American Agricultural Economics Association (1999)
NAL Call #: HD1405-.A44.
Notes: Supplemental online access through http://agecon.lib.umn.edu. Meeting held August 8-11, 1999 in Nashville, Tennessee.
Includes references.
Descriptors: site specific crop management/ nitrogen fertilizers/ soil testing/ variable rate application/ farm management/ decision making/ innovation adoption/ soil fertility/ probit analysis/ Illinois/ Iowa/ Indiana/ Wisconsin
This citation is from AGRICOLA.

315. **Simulation of a Group Incentive Program for Farmer Adoption of Best Management Practices.**
Ipe, V. C.; Devuyst, E. A.; Braden, J. B.; and White, D. C.
Agricultural and Resource Economics Review 30 (2): 139-150. (2001)
NAL Call #: HD1773.A2N6; *ISSN:* 1068-2805
Descriptors: United States, Illinois/ Watershed Management/ Agricultural Watersheds/ Best Management Practices/ Farms/ Environmental Policy/ Economic Aspects/ Watershed protection
Abstract: A group incentive program to encourage farmer adoption of best management practices is simulated for a typical watershed in central Illinois. The incentive payments, program costs and environmental impacts of the program are simulated. The results show that the best management practices may not actually reduce farm profits but may increase farm profits and reduce environmental pollution. The sponsor in most cases may not have to pay anything under the incentive contract. This may bring about a win-win situation for the sponsor, the farmer participating in the program, and society as a whole. The program could be implemented as an educational effort to demonstrate the benefits of sound management practices.
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316. **Site-specific management: The application of information technology to crop production.**
Plant, R. E.
Computers and Electronics in Agriculture 30 (1/3): 9-29. (Feb. 2001)
NAL Call #: S494.5.D3C652; *ISSN:* 0168-1699 [CEAGE6].
Notes: In the millennium special issue: Past Developments and Future Directions. Part I. Precision Agriculture and Information Technology / edited by D.L. Schmoldt. Includes references.
Descriptors: site specific crop management/ crop production/ crop yield/ spatial variation/ measurement/ data analysis/ information technology/ technology transfer/ innovation adoption/ economic evaluation/ reviews
Abstract: Site-specific management (SSM; also called, precision agriculture) is the management of agricultural crops at a spatial scale smaller than that of the whole field. Widespread farmer adoption of SSM practices is contingent on its economic advantage. Three criteria that must be satisfied in order for SSM to be justified are, (1) that significant within-field spatial variability exists in factors that influence crop yield, (2) that, causes of this variability can be identified and measured, and (3) that, the information from these measurements can be used to modify crop management practices to increase profit or decrease environmental impact. The objective of this paper is to review the state of SSM at the turn of the millennium and to offer some speculation as to its future course. The review is organized around the essential components of SSM listed above, i.e. measuring spatial variability, analyzing the data obtained from these measurements, using information gained from this analysis to effect changes in management practices, and determining whether the resulting benefits are worth the costs. The discussion section considers some potential effects of large-scale adoption of SSM, should this adoption occur.
This citation is from AGRICOLA.

317. **Social and economic challenges in the development of complex farming systems.**
Pannell, D. J.
Agroforestry Systems 45 (1/3): 393-409. (1999)
NAL Call #: SD387.M8A3; *ISSN:* 0167-4366 [AGSYE6].
Notes: In the special issue: Agriculture as a mimic of natural ecosystems / edited by E.C. Lefroy, R.J. Hobbs, M.H. O'Connor and J.S. Pate. Paper presented at a workshop held September 2-6, 1997, Williams, Western Australia, Australia.
Includes references.
Descriptors: farming systems/ agroforestry/ agroforestry systems/ social values/ economic analysis/ technology transfer/ sustainability/ farmers/ ecosystems/ profitability/ farmers' attitudes/ literature reviews
This citation is from AGRICOLA.

318. **A social exchange explanation of participation in the U.S. Farm Program.**
Thomas, J. K. and Thigpen, J.
Southern Rural Sociology 12 (1): 1-23. (1996)
NAL Call #: HT401.S68; *ISSN:* 0885-3436
Descriptors: farmers' attitudes/ agricultural policy/ federal programs/ program participants/ farm income/ environmental protection/ environmental policy/ conservation/ farm management/ Texas
Abstract: Passage of the 1990 Food, Agriculture, Conservation, and Trade Act resulted from the political influence of many environmental interest groups and, consequently, included many conservation provisions. As agricultural policy has increasingly reflected the environmental concerns of the public, farmers who participate in the Farm Program have adjusted their production practices to conserve land and water resources, minimize use of agrichemicals, and control animal wastes. Social exchange theory was used to examine personal and farm characteristics that could affect agroenvironmental attitudes, Farm Program participation, and conservation practices of Texas farmers (n = 1,063 farmers) in 1991. One in four farmers did not participate in a federal commodity/conservation program. Less than 8 percent of the variation in regulatory and environmental attitudes was explained by personal and farm characteristics, compared to 30 percent of the variation in Farm Program participation and 14 percent in use of conservation practices. Agroenvironmental attitudes and most background characteristics were poor predictors of farm-related behaviors. Level of gross farm income was the best predictor of farmers' attitudes and behaviors. Implications of these findings are discussed.
This citation is from AGRICOLA.

319. **Social issues related to soil specific crop management.**
Nowak PJ.
In: Proceedings of soil specific crop management: A workshop on research and development issues, April 14-16, 1992, Minneapolis, MN. (Held 14 Apr 1992-16 Apr 1992 at Minneapolis, MN.) Robert PC; Rust RH; and Larson WE (eds.); pp. 269-285; 1993.
This citation is provided courtesy of CAB International/CABI Publishing.

320. **Socio-economic methods in natural resources research.**
Farrington, J.
London, UK: Overseas Development Institute; ODI Natural Resource Perspectives No. 9, 1996. 4 p.
This citation is provided courtesy of CAB International/CABI Publishing.

321. **Socioeconomic and institutional constraints on the adoption of soil conservation practices in the USA: Implications for sustainable agriculture.**
Napier TL; Krecek J; Rajwar GS; and Haigh MJ
In: Hydrological problems and environmental management in highlands and headwaters, 1996; pp. 185-196
This citation is provided courtesy of CAB International/CABI Publishing.

322. **Socioeconomic pressure, demographic pressure, environmental loading and technological changes in agriculture.**
Giampietro, M.
Agriculture, Ecosystems and Environment 65 (3): 201-229. (Nov. 1997)
NAL Call #: S601.A34; *ISSN:* 0167-8809 [AEENDO]
Descriptors: farming/ farming systems/ sustainability/ agricultural production/ technology/ technical progress/ innovation adoption/ decision making/ socioeconomics/ population pressure/ land productivity/ environmental factors/ ecological balance/ farmers' attitudes/ opinions
This citation is from AGRICOLA.

323. **Socioeconomic profiles of early adopters of precision agriculture technologies.**
Daberkow, S. G. and McBride, W. D.
Journal of Agribusiness 16 (2): 151-168. (Fall 1998)
NAL Call #: HD1401.J68; *ISSN:* 0738-8950
Descriptors: maize/ crop enterprises/ farming systems/ innovation adoption/ technology/ decision making/ socioeconomic status/ farm size/ farm income/ crop yield/ probability
This citation is from AGRICOLA.

324. **The socioeconomics of groundwater protection in the Scioto River watershed of Ohio.**
Napier, T. L.
In: Agricultural research to protect water quality: Proceedings of the conference. (Held 21 Feb 1993-24 Feb 1993 at Minneapolis, Minnesota.)
Ankeny, IA: Soil and Water Conservation Society; pp. 242-243; 1993.
NAL Call #: TD427.A35A49-1993
Descriptors: watershed management/ groundwater pollution/ farming systems/ profitability/ Ohio
This citation is from AGRICOLA.

325. **Soil and water conservation behaviors within the upper Mississippi River Basin.**
Napier, T. L.
Journal of Soil and Water Conservation 56 (4): 279-285. (2001)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
This citation is provided courtesy of CAB International/CABI Publishing.

326. **Soil and water conservation policies and programs: Successes and failures.**
Napier, T. L.; Napier, S. M.; and Tvrdon, J.
Boca Raton, FL: CRC Press; 640 p. (2000)
Notes: Proceedings of an international conference convened at the Czech Agriculture University in Prague, Czech Republic in September of 1996.
NAL Call #: S622.2-.S63-2000; *ISBN:* 0849300053 (alk. paper)
Descriptors: Soil conservation---Government policy---Congresses/ Water conservation---Government policy---Congresses
This citation is from AGRICOLA.

327. **Soil and water conservation projects and rural livelihoods: Options for design and research to enhance adoption and adaptation.**
McDonald, M and Brown, K
Land Degradation and Development 11 (4): 343-361. (2000)
NAL Call #: S622.L26 S622.L26; *ISSN:* 1085-3278
Descriptors: farming/ hillside regions/ land husbandry/ natural capital/ project evaluation/ rural livelihoods/ social capital/ soil conservation/ water conservation
Abstract: This paper synthesizes the findings of a workshop which sought to consider the issues of poor uptake, adoption and adaptation of soil and water conservation techniques by farmers post-project by examining the experiences of projects which had research and extension elements. Critical factors contributing to the adoption and adaptation of soil and water conservation techniques by farmers are identified as 1) a more flexible approach and which enables learning within projects; 2) a process rather than output driven approach to soil and water conservation; 3) demonstration of immediate and tangible benefits of soil and water conservation to farmers (production, income, risk-minimization); and 4) avoiding a narrow focus on soil and water conservation-alternatives are 'better land husbandry' or 'sustainable rural livelihoods' approaches. A number of areas are identified as priorities for further research which would aid the successful adoption of sustainable agricultural techniques and which should guide future research, development and extension, bringing more sustained benefits to farmers, particularly in humid and subhumid hillside regions.
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328. **'Stinking, disease-spreading brutes' or 'four-legged landscape managers'? Livestock, pastoralism and society in Germany and the USA.**
Bieling, Claudia and Plieninger, Tobias
Outlook on Agriculture 32 (1): 7-12. (2003)
NAL Call #: 10 Ou8; *ISSN:* 0030-7270
Descriptors: human (Hominidae): farmer/ livestock (Mammalia)/ Animals/ Chordates/ Humans/ Mammals/ Nonhuman Mammals/ Nonhuman Vertebrates/ Primates/ Vertebrates/ cultural contexts/ political contexts/ rangeland pastoralism: ecological aspects, economical aspects/ societal contexts/ society pastoralist interactions: historical course/ sustainable farming practices
Abstract: Comparisons between the Black Forest region of Germany and the Sierra Nevada foothills in the USA show considerable parallels in the relationship between livestock raisers and society. This becomes evident by sketching the historic course of interactions between society and pastoralism as well as the present situation. The authors emphasize that purely economic or ecological studies of pastoralism are not sufficient to explain the characteristic features of livestock farmers. In both countries a specific livestock farming culture can be characterized by team spirit, a desire for independence from the outside world, ranch fundamentalism, and a special relationship with nature. This set of values and attitudes should be considered whenever dealing with pastoralism, whether in a scientific, political or everyday context.
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329. **Stochastic technology, risk preferences, and adoption of site-specific technologies.**
Isik, M. and Khanna, M.
American Journal of Agricultural Economics 85 (2): 305-317. (2003)
NAL Call #: 280.8 J822; *ISSN:* 0002-9092
This citation is provided courtesy of CAB International/CABI Publishing.

330. **Strategies for encouraging the use of organic wastes in agriculture.**
Oshins, C.
In: Agricultural utilization of urban and industrial by-products: Proceedings of a symposium. (Held 7 Nov 1993-12 Nov 1993 at Cincinnati, Ohio.)
Madison, Wis.: American Society of Agronomy/ Crop Science Society of America/ Soil Science Society of America; pp. 73-86; 1995.
Notes: Sponsors: Divisions S-6 and S-7 of the Soil Science Society of America and A-5 of the American Society of Agronomy
NAL Call #: 64.9-Am3-no.58; *ISBN:* 0891181237
Descriptors: waste utilization/ organic wastes/ municipal refuse disposal/ refuse/ agricultural wastes/ composting/ sustainability/ farmers' attitudes/ innovation adoption/ refuse compost/ social barriers/ regulations
This citation is from AGRICOLA.

331. **Strategies to overcome impediments to adoption of conservation tillage.**
Carter, Martin R.
In: Conservation tillage in temperate agroecosystems/ Carter, M. R.
Boca Raton, Florida: CRC Press, 1994; pp. 3-19.
Notes: ISBN: 0873715713
Descriptors: Angiospermae (Angiospermae)/ angiosperms/ plants/ spermatophytes/ vascular plants/ crop rotation/ minimum tillage/ rotational tillage/ sustainable agriculture/ tillage timing/ zone tillage/ Agronomy (Agriculture)/ Conservation/ Soil Science
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332. **A study of farmer attitudes towards riparian management practices.**
Parminter, T. G.; Tarbotton, I. S.; and Kokich, C.
Proceedings of the New Zealand Grassland Association 60: 255-258. (1998); *ISSN:* 0369-3902
This citation is provided courtesy of CAB International/CABI Publishing.

333. **Suggestions to States Interested in Developing Conservation Reserve Enhancement Programs.**
Environmental Defense Fund, 1998
http://web.archive.org/web/20030609041025/http://www.fb-net.org/CREP-EDF.htm
Descriptors: State conservation programs/ Conservation Reserve Enhancement Program
Abstract: Offered past state's suggestions on the issues an applying state would want to address, if they chose to pursue a CREP program of their own.

334. **A Summary of the SWCS Wetlands Reserve Program Survey.**
Despain, W.
Journal of Soil and Water Conservation 50 (6): 632-633. (1995)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
Descriptors: USA/ wetlands/ conservation/ surveys/ public participation/ water policy/ public opinion/ farming/ Wetlands Reserve Program/ Conservation in agricultural use
Abstract: The Wetlands Reserve Program (WRP) is a relatively new conservation program offered by the federal government. In 1992, farmers in nine states were given the opportunity to offer tracts of land for enrollment in the pilot program which would later be expanded to all 50 states. As a new program, the WRP involved several new elements and untested procedures. The Soil and Water Conservation Society, in a project directed by Max Schnepf, SWCW' director of public affairs, tried to find out farmers' reaction to the new program, and define ways that it could be improved. Farmers in seven of the nine pilot states were brought together ill focus groups to discuss their experience with the WRP and gather suggestions. The results of these focus groups were brought together in the book, available from the SWCS, "Farmer Perspectives on the Wetlands Reserve Program: A series of Focus Groups." Three focus groups were organized, in each of seven pilot states-California, Iowa, Louisiana, Minnesota, Mississippi, New York, and North Carolina. A total of 120 farmers were involved overall. Each focus group meeting was tape recorded, and extensive notes were taken on the proceedings. Participants in each meeting were asked the same series of questions, to determine their feelings about wetlands and wetland issues. Then they were asked a series of specialized questions to find out their feelings about their experience with the WRP.
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335. **A survey of water management practices of California rice growers.**
Hill, J E; Brouder, S M; Roberts, S R; Williams, J F; Scardaci, S C; and Wick, C M
Journal of Natural Resources and Life Sciences Education 23 (2): 119-124. (1994)
NAL Call #: S530 .J6; *ISSN:* 1059-9053
Descriptors: Hominidae (Hominidae)/ Oryza sativa (Gramineae)/ angiosperms/ animals/ chordates/ humans/ mammals/ monocots/ plants/ primates/ spermatophytes/ vascular plants/ vertebrates/ extension education
Abstract: Conventional, continuous flood management for rice (Oryza sativa L.) irrigation in California has resulted in off-site movement of rice herbicides and other pesticides. In 1991, the University of California Cooperative Extension and

the Soil Conservation Service surveyed rice growers in conjunction with the initiation of a 5-yr project designed to demonstrate and evaluate several feasible, alternative water management systems (alternative WMS). The objective of the survey was to collect baseline information on current water management practices and to identify grower-perceived problems and concerns that may pose barriers to adoption of alternative WMS. Grower respondents accounted for 35% of total California rice hectarage in production in 1991. Fifty-six percent of growers reported exclusive use of conventional WMS, while 23% have tried alternative WMS on a portion of their hectarage. Twenty-one percent of respondents have converted their entire rice production hectarage to alternative WMS. Only 43% of conventional WMS growers described themselves as being highly satisfied with their current practice; the same percentage reported that stricter future water quality regulations will force them to change to an alternative WMS. Growers already fully converted to alternative WMS expressed the highest degree of satisfaction, and 60% classified themselves as being well satisfied with their current system. The primary concern of growers anticipating change to an alternative WMS was the cost of constructing and operating the improved system. Secondary concerns were water availability and the future cost of water. The survey results demonstrate that there is a large audience for extension education efforts focused on cost-effective, alternative WMS that improve water conservation and quality of drainage water.
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336. **A survey on the planning and adoption of zero runoff subirrigation systems in greenhouse operations.**
Uva, W. F. L.; Weiler, T. C.; and Milligan, R. A.
HortScience 33 (2): 193-196. (Apr. 1998)
NAL Call #: SB1.H6; *ISSN:* 0018-5345 [HJHSAR]
Descriptors: crop production/ greenhouse culture/ subsurface irrigation/ runoff/ runoff water/ surveys/ environmental management/ decision making/ innovation adoption/ cost benefit analysis/ businesses/ size/ United States/ ebb and flow systems/ flood benches/ flood floor systems/ trough/ bench systems
This citation is from AGRICOLA.

337. **Sustainability of Pacific Northwest horticultural producers.**
Cordray, Sheila M; Lev, Larry S; Dick, Richard P; and Murray, Helene
Journal of Production Agriculture 6 (1): 121-125. (1993)
NAL Call #: S539.5.J68; *ISSN:* 0890-8524
Descriptors: plant (Plantae Unspecified)/ Angiospermae (Angiospermae)/ angiosperms/ plants/ spermatophytes/ vascular plants/ agrichemical use/ conservation/ economics/ low input production
Abstract: The sustainability of agriculture is of great concern and controversy, but there is little information on operational measurements and definitions of sustainability. This article examines the implications of defining and measuring agricultural sustainability. Two sets of variables were used to indicate sustainability: (i) changes in agricultural chemical use, and (ii) use of alternative production practices. Factor analysis revealed that it would be inappropriate to construct a single sustainability scale that included both sets of variables. Two separate scales were constructed. The types of producers viewed as 'sustainable' on each scale had very different characteristics. On the scale that examined changes in agricultural chemical use, producers in the sample reporting zero or declining use tended to have smaller farms, lower investments in machinery, and lower gross and net incomes than producers at the other end of this scale. The use of alternative practices, reflected in the second scale, showed that producers using a greater number of alternative management practices had larger farms, more investment in machinery, and larger gross and net incomes than producers at the other end of this scale. Producers classified as sustainable on either of the two scales differed little from other producers with regard to economic impacts on the community, organizational involvement, or attitudes about farming. In general, more useful comparisons were made among producers classified by structural variables such as farm size and principal occupation of operator. These findings suggest that policies should take into account the structural factors that influence the adoption of sustainable practices.
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338. **Sustainable agricultural practices for weed management: Implications to agricultural extension education.**
Kotile, D. G. and Martin, R. A.
Journal of Sustainable Agriculture 16 (2): 31-51. (2000)
NAL Call #: S494.5.S86S8; *ISSN:* 1044-0046
This citation is provided courtesy of CAB International/CABI Publishing.

339. **Sustainable agriculture in the Corn Belt: Production-side progress and demand-side constraints.**
Lighthall, D. R.
American Journal of Alternative Agriculture 11 (4): 168-174. (1996)
NAL Call #: S605.5.A43; *ISSN:* 0889-1893 [AJAAEZ]
Descriptors: low input agriculture/ ridging/ pesticides/ United States/ no-tillage/ alternative

farming/ farming/ sustainability/ farm structure/ farm size/ marketing/ innovation adoption/ resistance to change/ structural change/ farmers' attitudes/ Corn Belt States of USA/ conventional farming
Abstract: This paper explores the constraints to sustainable agriculture in the Corn Belt stemming from the trend toward increased farm size and the continued dependence of the region on undifferentiated farm commodities produced for regional, national, and international markets. It is based on a three-county comparison of 14 full-time farmers who have embraced sustainable principles and practices, and a randomly sampled group of 25 farmers. An encouraging finding was the substantial progress made towards lower-input production of corn and soybeans by the nine farmers who had adopted the ridge tillage system, which uses elevated seedbeds, banded herbicides, and post-plant nitrogen application to reduce both sod erosion and synthetic chemical inputs while maintaining yields. However, operators of large farms that depend on hired labor and highly dispersed field sites regarded these practices as too risky at their scale of production despite their short-term economic and long-tenn environmental benefits. The region's commercial farmers appear split between family farmers who wish to avoid the headaches of scale expansion and hired labor, and therefore, embrace more efficient low-input systems such as ridge tillage versus those who reject the increased management intensity and risks of lower-input systems in favor of scale expansion via more chemical-intensive no-till systems. Although ridge tillage represents movement toward low-input cash grain production, low-input production systems alone are not sufficient to improve the underlying social welfare of rural areas. Arresting the trend towards fewer and larger farms will also require development of more specialized or more localized markets for sustainably produced commodities.
This citation is from AGRICOLA.

340. **Taking stock of agroforestry adoption studies.**
Pattanayak, Subhrendu K; Mercer, D Evan; Sills, Erin; and Yang, Jui Chen
Agroforestry Systems 57 (3): 173-186. (2003)
NAL Call #: SD387.M8A3; *ISSN:* 0167-4366
Descriptors: tree (Spermatophyta)/ Plants/ Spermatophytes/ Vascular Plants/ agricultural technology: small holder adoption/ agroforestry adoption determinants/ agroforestry adoption studies/ contour hedgerows/ economic framework/ forestry technology: small holder adoption/ resource endowments/ soil conservation/ technology adoption factor categories: biophysical factors, market incentives, preferences, resource endowments, risk and uncertainty/ tropical areas/ water conservation/ Meta analysis
Abstract: In light of the large number of empirical studies of agroforestry adoption published during the last decade, we believe it is time to take stock and identify general determinants of agroforestry adoption. In reviewing 120 articles on adoption of agricultural and forestry technology by small holders, we find five categories of factors that explain technology adoption within an economic framework: preferences, resource endowments, market incentives, biophysical factors, and risk and uncertainty. By selecting only empirical analyses that focus on agroforestry and related investments, we narrow our list down to 32 studies primarily from tropical areas. We apply vote-counting based meta-analysis to these studies and evaluate the inclusion and significance of the five adoption factors. Our analysis shows that preferences and resource endowments are the factors most often included in studies. However, adoption behavior is most likely to be significantly influenced by risk, biophysical, and resource factors. In our conclusion, we discuss specific recommendations for the next generation of adoption studies and meta-analyses that include considering a fuller menu of variables, reporting key statistics and marginal probabilities, and conducting weighted meta-regressions.
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341. **A targeted policy approach to inducing improved rates of conservation compliance in agriculture.**
Stonehouse, D. P.
Canadian Journal of Agricultural Economics / Revue Canadienne d'Economie Rurale 44 (2): 105-119. (July 1996)
NAL Call #: 281.8-C16; *ISSN:* 0008-3976
Descriptors: soil conservation/ soil degradation/ farm management/ decision making/ resource utilization/ innovation adoption/ factor analysis/ renewable resources/ Canada/ United States/ cultural factors/ technical factors
This citation is from AGRICOLA.

342. **Technical efficiency and farmers' attitudes toward technological innovation: The case of the potato farmers in Quebec.**
Amara, N.; Traore, N.; Landry, R.; and Romain, R.
Canadian Journal of Agricultural Economics / Revue Canadienne d'Economie Rurale 47 (1): 31-43. (Mar. 1999)
NAL Call #: 281.8-C16; *ISSN:* 0008-3976
Descriptors: potatoes/ farmers' attitudes/ technical progress/ innovation adoption/ efficiency/ conservation/ technology/ farm comparisons/ farm surveys/ production functions/ mathematical models/ Quebec
This citation is from AGRICOLA.

343. **Technology adoption in agriculture: Implications for ground water conservation in the Texas high plains.**
Arabiyat, Talah S; Segarra, Eduardo; and Johnson, Jason L
Resources, Conservation and Recycling 32 (2): 147-156. (2001)
NAL Call #: TP156.R38R47; *ISSN:* 0921-3449
Descriptors: advanced irrigation technologies/ agriculture: technology adoption/ biotechnological advances/ ground water conservation
Abstract: The impact of technology adoption (advanced irrigation technologies and anticipated biotechnological advances) on the sustainability of agricultural activities in the Texas High Plains of the US is evaluated in this study. Specifically, a county-wide dynamic optimization model is used to (a) determine optimal ground water use levels and cropping patterns, and (b) evaluate the impacts of irrigation technology and biotechnology adoption on ground water use. The results indicate that current cropland allocation and levels of advanced irrigation technology adoption are not close to optimal. Approaching the issue of sustainability, the results show that the net present value of returns trade-off to achieve ground water conservation, in terms of what producers would have to give up to achieve ground water supply stability, would be relatively small.
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344. **Technology adoption in the presence of an exhaustible resource: The case of groundwater extraction.**
Shah, F. A.; Zilberman, D.; and Chakravorty, U.
American Journal of Agricultural Economics 77 (2): 291-299. (May 1995)
NAL Call #: 280.8-J822; *ISSN:* 0002-9092 [AJAEBA]
Descriptors: groundwater/ resource utilization/ water conservation/ technology/ mathematical models/ water costs/ irrigation/ land/ innovation adoption/ land quality
Abstract: In this paper we integrate technology diffusion within Hotelling's exhaustible resource model. The modern technology is a conservation technology such as drip irrigation used with groundwater. Resource quality heterogeneity and rising water prices are responsible for the gradual adoption of the modern technology, and under reasonable conditions the diffusion curve is an S-shaped function of time. Without intervention, the diffusion process will be slower than is socially optimal, and optimal resource use tax will accelerate the diffusion of the conservation technology and slow down excessive resource depletion caused by market failure due to open access conditions.
This citation is from AGRICOLA.

345. **Testing producer perceptions of jointly beneficial best management practices for improved water quality.**
Amacher, G. S. and Feather, P. M.
Applied Economics 29 (2): 153-159. (1997); *ISSN:* 0003-6846
This citation is provided courtesy of CAB International/CABI Publishing.

346. **A Theoretical Analysis of Economic Incentive Policies Encouraging Agricultural Water Conservation.**
Huffaker, R. and Whittlesey, N.
International Journal of Water Resources Development 19 (1): 37-53. (2003)
NAL Call #: TD201.I56; *ISSN:* 0790-0627.
Notes: Special Issue: Water Management and Irrigated Agriculture in the Western U.S.; DOI: 10.1080/0790062032000040764
Descriptors: Water Management/ Water Conservation/ Irrigation Efficiency/ Economic Aspects/ Water Costs/ Subsidies/ Comparison Studies/ Theoretical Analysis/ Model Studies/ Irrigation/ Economics/ Charges/ Finance/ Comparative studies/ Conservation in agricultural use/ Underground Services and Water Use/ Water & Wastewater Treatment/ Cost allocation, cost sharing, pricing
Abstract: A conceptual model of a representative irrigated farm is formulated to study farm responses to two economic policies commonly suggested to encourage agricultural water conservation, and to characterize the hydrological and economic circumstances in which these responses provide the desired conservation. The economic policies studied are to increase the irrigator's cost of applied water and to subsidize the irrigator's cost of investing in improved on-farm irrigation efficiency. Comparative statics results demonstrate that increasing the cost of applied water may be a more effectual water conservation policy than subsidizing the cost of improved on-farm irrigation efficiency.
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347. **Tillage method and crop diversification: Effect on economic returns and riskiness of cropping systems in a Thin Black Chernozem of the Canadian Prairies.**
Zentner, R P; Lafond, G P; Derksen, D A; and Campbell, C A
Soil and Tillage Research 67 (1): 9-21. (2002)
NAL Call #: S590.S48; *ISSN:* 0167-1987
Descriptors: Linum usitatissimum [flax] (Linaceae): oil crop/ Pisum sativum [field pea] (Leguminosae): vegetable crop/ Triticum aestivum [winter wheat] (Gramineae): grain crop/ Angiosperms/ Dicots/ Monocots/ Plants/ Spermatophytes/ Vascular Plants/ Thin Black Chernozem: prairie soil/ cropping system risk

Abstract: Producers throughout the Canadian Prairies have begun to extend (reducing summerfallow frequency) and diversify their traditional cereal-based rotations by devoting more areas to oilseeds and pulses, and by managing these newer cropping systems with conservation tillage practices. This study examined the economic performance and relative riskiness of monoculture cereal, cereal-oilseed, and cereal-oilseed-pulse rotations, each managed under conventional-, minimum-, and zero-tillage practices over a 12-year period (1987-1998) in the sub-humid Black soil zone of Saskatchewan. These crop rotations included: spring wheat (Triticum aestivum L.)-spring wheat-winter wheat (T. aestivum L.)-fallow (Ws-Ws-Ww-F), spring wheat-spring wheat-flax (Linum usitatissimum L.)-winter wheat (Ws-Ws-Fx-Ww), and spring wheat-flax-winter wheat-field pea (Pisum sativum L.) (Ws-Fx-Ww-P). Annual production costs for the complete rotation systems increased with cropping intensity and cropping diversity (monoculture cereal ($249 ha-1)<cereal-oilseed ($304 ha-1)<cereal-oilseed-pulse ($310 ha-1)); however, costs were not affected by tillage method. The savings in labor, fuel, repair and machinery overhead with minimum- and zero-tillage practices (compared with conventional-tillage) were generally offset by increased expenditures for herbicides. For most grain price scenarios examined, gross returns and net returns were generally highest for Ws-Fx-Ww-P, intermediate for Ws-Ws-Fx-Ww ($7-33 ha-1 lower), and lowest for Ws-Ws-Ww-F ($35-70 ha-1 lower). Within the mixed rotations, economic returns tended to be higher when managed using minimum- and zero-tillage practices (compared to conventional-tillage), reflecting the higher grain yields they produced. Income variability, or degree of riskiness, was lowest for conservation tillage and the mixed cropping systems. Our findings explain the recent changes in land use practices that have been adopted by most producers in this region.
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348. **Tillage systems and profitability: An economic analysis of the Iowa MAX Program.**
Liu, Shiping and Duffy, Michael D
Journal of Production Agriculture 9 (4): 522-527. *(*1996)
NAL Call #: S539.5.J68; *ISSN:* 0890-8524
Descriptors: agronomy/ biobusiness/ conservation tillage system/ conventional tillage system/ economics/ Iowa MAX Program/ mulch till system/ no till system/ plowing/ profitability/ reduced till system/ ridge till system/ tillage systems
Abstract: Using the Iowa MAX program participant's survey data set, this study found that conventional tillage (plowing, PL) resulted in lower profits per acre than most conservation tillage systems (no-till (NT), reduced-till (RE), ridge-till (RT), and mulch-till (MT)). The primary reason for higher profits with conservation tillage systems is the difference in operating costs. This study also found that it is not always true that conservation tillage uses more chemicals than PL. Ridge-till is very attractive in terms of profit and the expenditures on chemicals per acre. This indicates that, other than conservation compliance, economic benefits may be another major reason that farmers are adopting conservation tillage systems.
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349. **Timing nitrogen fertilizer application to reduce nitrogen losses to the environment.**
Huang, W. Y.; Heifner, R. G.; Taylor, H.; and Uri, N. D.
Water Resources Management 14 (1): 35-58. (Feb. 2000)
NAL Call #: TC401.W27; *ISSN:* 0920-4741 [WRMAEJ]
Descriptors: nitrogen fertilizers/ application date/ preplanting treatment/ seasons/ low input agriculture/ economic analysis/ returns/ farm results/ innovation adoption/ agricultural policy/ mathematics/ equations/ decision analysis/ decision making/ insurance premiums/ pollution control/ losses from soil/ nitrogen/ Iowa/ growing season/ best nitrogen management plan/ expected value variance analysis/ adoption insurance program
Abstract: Abstract: The advantages of using insurance to help a farmer adopt a best nitrogen management plan (BNMP) that reduces the impact of agricultural production on the environment is analytically and empirically demonstrated. Using an expected value analysis, it is shown that an insurance program can be structured so as to reduce a farmer's cost of bearing the adoption risk associated with changing production practices and, thus, to improve the farmer's certainty equivalent net return thereby promoting the adoption of a BNMP. Using the adoption of growing-season only N fertilizer application in Iowa as a case study, it is illustrated how insurance may be used to promote the adoption of this practice to reduce N fertilizer use. It is shown that it is possible for a farmer and an insurance company both to have an incentive to develop an insurance adoption program that will benefit both the farmer and the insurance company, increasing net social welfare and improving environmental quality in Iowa.
This citation is from AGRICOLA.

350. **Understanding landholder management of river frontages: The Goulburn Broken.**
Curtis, Allan and Robertson, Alistar
Ecological Management and Restoration 4 (1): 45-54. (2003); *ISSN:* 1442-7001
Descriptors: catchment management/ community

education/ current recommended practices/ landholder management
Abstract: In this paper we discuss the findings of research exploring landholder adoption of practices expected to improve the management of river frontages. This research was part of a larger project undertaken by the Goulburn Broken Catchment Management Authority (GBCMA) to assess the impacts of grazing on the condition of riparian zones in the GBCMA region. Our research employed a postal survey to a random selection of all river frontage owners in the GBCMA. Research findings highlighted the limited adoption of most current recommended practices (CRP) such as watering stock off-stream and fencing to manage stock access to river frontages. Higher adoption of CRP (in particular fencing) was correlated with greater knowledge of river frontage function and factors affecting river frontage condition; higher importance attached to the environmental, social and economic values of frontages; non-farming occupations; and higher confidence in the efficacy of CRP. These findings have important implications for managers and scientists. There has been a large investment in community education in the GBCMA and survey findings suggest this has been an effective strategy. At the same time, there should be changes in the approach to community education. It seems there is much to be done to improve the acceptability of fencing frontages along large rivers. Appeals to adopt CRP also need to move beyond a narrow focus on farmers and the benefits of increased agricultural production and embrace the range of landholders and the different values they attach to their frontages. Most respondents had no on-property profit and survey data indicated that financial constraints were an important factor limiting the adoption of CRP, particularly among farmers. There was considerable interest in taking up a grant scheme that would provide a higher level of support than is usually offered by government. These findings highlight the important role of economic incentives in assisting private landholders undertake conservation work along river frontages.
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351. **Use of conventional and conservation practices among farmers in the Scioto River Basin in Ohio.**
Napier, T. L. and Camboni, S. M.
Journal of Soil and Water Conservation 48 (3): 231-237. (May 1993-June 1993)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561 [JSWCA3]
Descriptors: soil conservation/ water conservation/ practice/ innovation adoption/ farming systems/ decision making/ prediction/ Ohio/ conservation practices
This citation is from AGRICOLA.

352. **The use of forestry incentives by nonindustrial forest landowner groups: Is it time for a reassessment of where we spend our tax dollars?**
Kluender, R A and Walkingstick, T L
Natural Resources Journal 39 (4): 799-818. (Fall 1999)
NAL Call #: HC79.E5N3; *ISSN:* 0028-0739
Descriptors: Arkansas---Environmental policy/ Land utilization---Tax aspects/ Forest conservation---United States---Arkansas/ Tax expenditures---United States---Arkansas/ United States---Tax policy/ Lumber industry---Environmental aspects
Abstract: Discusses incentive programs focusing on cost-share programs: Forest Incentives Program (FIP), Stewardship Incentives Program (SIP), and Conservation Reserve Program (CRS); based on a survey and subsequent analysis of 2,400 nonindustrial private forest (NIPF) landowners; Arkansas.
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353. **The use of no till farming in U.S. agriculture: Farmers' perceptions versus reality.**
Uri, N. D.
Journal of Sustainable Agriculture 15 (2/3): 5-17. (1999)
NAL Call #: S494.5.S86S8; *ISSN:* 1044-0046 [JSAGEB]
Descriptors: agriculture/ no-tillage/ farmers' attitudes/ costs/ labor costs/ tillage/ erosion/ runoff/ water quality/ glycine max/ triticum aestivum/ triticum durum/ surveys/ zea mays/ literature reviews/ United States
Abstract: A number of economic and environmental benefits are associated with the use of no till in in production agriculture in the United States. There are lower labor, energy, and machinery costs associated with no till farming relative to conventional tillage systems and other types of conservation tillage. The reduced erosion and runoff associated with no till also lead to a number of environmental benefits including a reduction in water quality impairment. In order to properly associate the benefits of no till with its use, it is important that farmers' perception of what constitutes no till and the actual use of no till be consistent. An analysis of the Agricultural Resource Management Study survey data for 1996 shows that for soybeans, winter wheat, spring wheat, and durum wheat, farmers' perceptions are consistent with reality. In the case of corn, however, nearly 18 percent of corn farmers believe they are using no till while in actuality, only slightly more than 12 percent are using this tillage system.
This citation is from AGRICOLA.

354. **Use of soil and water protection practices among farmers in the North Central Region of the United States.**
Napier, T. L.
Journal of the American Water Resources Association 36 (4): 723-735. (Aug. 2000)
NAL Call #: GB651.W315; *ISSN:* 1093-474X [JWRAF5]
Abstract: Data were collected in the fall of 1998 and the winter of 1999 from 1,011 land owner-operators within three watersheds in the North Central Region of the United States to assess adoption of soil and water protection practices. Farm owner-operators were asked to indicate how frequently they used 18 different agricultural production practices. Many farmers within the three watersheds had adopted conservation protection practices. However, they also employed production practices that could negate many of the environmental benefits associated with conservation practices in use. Comparison of adoption behaviors used in the three watersheds revealed significant differences among the study groups. Respondents in the Iowa and Ohio watersheds reported greater use of conservation production systems than did farmers in Minnesota. However, there were no significant differences between Ohio and Iowa farmers in terms of use of conservation production practices. This was surprising, since farmers in the Ohio watershed had received massive amounts of public and private investments to motivate them to adopt and to continue using conservation production systems. These findings bring into serious question the use of traditional voluntary conservation programs such as those employed in the Ohio watershed. Study findings suggest that new policy approaches should be considered. It is argued that "whole farm planning" should be a significant component of new agricultural conservation policy.
This citation is from AGRICOLA.

355. **Use of soil and water protection practices among farmers in three Midwest watersheds.**
Napier, Ted L and Tucker, Mark
Environmental Management 27 (2): 269-279. (2001)
NAL Call #: HC79.E5E5; *ISSN:* 0364-152X
Descriptors: human (Hominidae): farmers/ Animals/ Chordates/ Humans/ Mammals/ Primates/ Vertebrates/ agricultural production practices/ nonpoint source pollution/ social learning/ soil protection/ water protection/ watersheds
Abstract: Data were collected from 1011 farmers in three Midwestern watersheds (Ohio, Iowa, and Minnesota) to assess factors that influence the use of conservation production systems at the farm level. The "vested interests" perspective used to guide the investigation was derived from elements of social learning and social exchange theories. Respondents were asked to indicate their frequency of use for 18 agricultural production practices that could be adopted on Midwestern farms at the time of the study. Responses to the 18 items were summed to form a composite variable, termed "conservation production index," for use as the dependent variable in multivariate analysis. Eleven independent variables were identified from the theory as likely predictors of conservation adoption, including respondents' perceptions about production costs, output and risks, and perceived importance of access to subsidies, technical assistance, and informational/educational programs. Regression analysis was used to assess the performance of the independent variables in explaining variance in the conservation production index. Explained variance in the three regression models ranged from 2% in the Minnesota watershed to 19% in the Ohio watershed. The researchers concluded that the model had limited utility in predicting adoption of conservation production systems within the three study watersheds. Findings are discussed in the context of conservation programs within the three areas.
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356. **Using case-based reasoning methodology to maximise the use of knowledge to solve specific rangeland problems.**
Bosch, O J H; Gibson, R S; Kellner, K; and Allen, W J
Journal of Arid Environments 35 (3): 549-557. (1997)
NAL Call #: QH541.5.D4J6; *ISSN:* 0140-1963
Descriptors: case based reasoning methods/ rangeland management/ terrestrial ecology
Abstract: This paper describes a participatory research process designed to gather and structure community knowledge (local and scientific) into a single accessible decision support system, based on case-based reasoning methodologies. Special reference is made to the continuous enhancement of the knowledge base through research (by scientists), and implementation and monitoring of management action outcomes (by land managers).
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357. **Using Insurance to Enhance Nitrogen Fertilizer Application to Reduce Nitrogen Losses to the Environment.**
Huang, Wen-Yuan; Heifner, R. G.; Taylor, H.; and Uri, N. D.
Environmental Monitoring and Assessment 68 (3): 209-233. (2001)
NAL Call #: TD194.E5; *ISSN:* 0167-6369
Descriptors: Agriculture/ Nitrogen/ Fertilizers/ Insurance/ Environment management/ Water Pollution Control/ Agricultural Practices/ Best Management Practices/ Social Participation/ Economic Aspects/ Iowa/ Environmental action/

Water quality control/ United States
Abstract: The advantage of using insurance to help a farmer adopt a best nitrogen management plan (BNMP) that reduces the impact of agricultural production on the environment is analytically and empirically demonstrated. Using an expected value analysis, it is shown that an insurance program can be structured so as to reduce a farmer's cost of bearing the adoption risk associated with changing production practices and, thus, to improve the farmer's certainty equivalent net return thereby promoting the adoption of a BNMP. Using the adoption of growing-season only N fertilizer application in Iowa as a case study, it is illustrated how insurance may be used to promote the adoption of this practice to reduce N fertilizer use. It is shown that it is possible for a farmer and an insurance company both to have an incentive to develop an insurance adoption program that will benefit both the farmer and the insurance company, increasing net social welfare and improving environmental quality in Iowa.
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358. **Using social-psychology models to understand farmers' conservation behaviour.**
Beedell, J. and Tahir Rehman
Journal of Rural Studies 16 (1): 117-127. (2000)
NAL Call #: HT401.J68; *ISSN:* 0743-0167
This citation is provided courtesy of CAB International/CABI Publishing.

359. **Using voluntary approaches to reduce environmental damages: Evidence from a survey of New York dairy farms.**
Bills, N. L.; Poe, G. L.; and Wright, P.
Japanese Journal of Rural Economics
5: 35-50. (2003)
This citation is provided courtesy of CAB International/CABI Publishing.

360. **Utah's vegetable growers: Assessing sustainable agriculture.**
Drost, D.; Long, G.; and Hales, K.
HortTechnology 7 (4): 445-450.
(Oct. 1997-Dec. 1997)
NAL Call #: SB317.5.H68; *ISSN:* 1063-0198
Descriptors: vegetables/ crop production/ growers/ sustainability/ surveys/ cultural methods/ farmers' attitudes/ integrated pest management/ plant nutrition/ site preparation/ planting/ harvesting/ rotations/ fertilizers/ tillage/ farm inputs/ irrigation/ technology transfer/ Utah/ nutrient management/ field operations
This citation is from AGRICOLA.

361. **Utility-consistent discrete-continuous choices in soil conservation.**
Lohr, L. and Park, T. A.
Land Economics 71 (4): 474-490. (Nov. 1995)
NAL Call #: 282.8-J82; *ISSN:* 0023-7639 [LAECAD]
Descriptors: soil conservation/ program participants/ federal programs/ decision making/ econometric models / acreage/ opportunity costs/ farm surveys/ utility functions/ Michigan/ Illinois/ Conservation Reserve Program/ filter strip program/ discrete continuous choice model/ acreage enrollment
This citation is from AGRICOLA.

362. **Voluntary Incentives for Reducing Agricultural Nonpoint Source Water Pollution.**
Feather, P. M. and Cooper, J.
U. S. Department of Agriculture [Also available as: Agriculture Information Bulletin No. 716 (AIB-716)], 1995 (text/html)
NAL Call #: 1 Ag84Ab no.716
http://www.ers.usda.gov/publications/aib716/AIB716.pdf
Descriptors: best management practices/ nonpoint source pollution/ economic analysis/ agricultural policy/ motivation/ social benefit/ agricultural education/ environmental education/ United States/ incentives/ Water Quality Demonstration Project Areas/ BMPs
Abstract: Agricultural chemicals and sediment from cropland may reduce the quality of America's surface and ground water resources. The Clean Water Act stipulates that individual States are responsible for controlling agricultural nonpoint source pollution. Most State plans rely chiefly on education and technical assistance to promote the adoption of less polluting practices. Because profitability drives production decisions, these programs tend to be most successful when they promote inexpensive changes in existing practices. This report presents research findings on the success of incentive programs to control agricultural nonpoint source pollution.
This citation is from AGRICOLA.

363. **Voluntary versus mandatory agricultural policies to protect water quality: Adoption of nitrogen testing in Nebraska.**
Bosch, D. J.; Cook, Z. L.; and Fuglie, K. O.
Review of Agricultural Economics 17 (1): 13-24.
(Jan. 1995)
NAL Call #: HD1773.A3N6; *ISSN:* 1058-7195
Descriptors: groundwater/ water quality/ irrigation water/ nitrogen/ soil testing/ innovation adoption/ agricultural policy/ environmental protection/ farm management/ Nebraska
Abstract: Agriculture is an important source of nonpoint source pollution and potential damage to water quality. Voluntary incentives and regulatory policies are followed by both the states and the

federal government to reduce water quality damage from agricultural practices. Policy makers are concerned about the relative effectiveness of each approach for protecting water quality. The effectiveness of regulation versus a combination of voluntary incentive approaches are evaluated for an area in central Nebraska. Policy effectiveness is measured in two parts: (1) whether farmers receiving incentives are more likely to conduct soil or tissue nitrogen (N) tests; and (2) whether farmers use the test results as the most important factor in N management decisions. Personal interview surveys of Nebraska farmers were analyzed to determine farmers' use of soil and/or tissue testing to help make N fertilizer decisions on fields planted to corn. The effects of regulation and voluntary programs on the use of N testing were evaluated. The effects on adoption of farmers' education and experience; type, size, and tenure status of the farm; irrigation; and soil characteristics of the sample field were also considered. The results show that while regulation leads to higher levels of N test adoption, it does not have an "educational" effect on adopters. Voluntary incentive policies appear to be more effective in encouraging farmers to use information from N tests. Regulation to enforce adoption of practices to protect water quality may not induce the desired behavioral changes. Educational programs may be needed to complement regulations to insure that farmers change their behavior to achieve the goals of water quality protection programs.
This citation is from AGRICOLA.

364. **Watershed Success Stories: Applying the Principles and Spirit of the Clean Water Action Plan.**
U. S. Department of Agriculture and
U. S. Environmental Protection Agency.
U. S. Department of Agriculture; U. S. Environmental Protection Agency, 2000 (application/pdf)
http://www.cleanwater.gov/success/watershed.pdf
Descriptors: case studies/ watershed management/ water quality/ governmental programs and projects/ Clean Water Act/ water pollution/ pollution control/ environmental protection/ citizen participation/ ecological restoration/ estuaries/ urban development/ nonpoint source pollution/ wildlife habitats/ best management practices/ biodiversity/ acid mine drainage/ riparian buffers/ erosion control/ mining/ agricultural land/ aquatic habitat/ floodplain management/ issues and policy/
United States/ BMPs
Abstract: Presents 30 success stories in watershed restoration.

365. **What does objectivity mean for analysis, valuation and implementation in agricultural landscape planning? A practical and epistemological approach to the search for sustainability in 'agri-culture'.**
Bosshard, Andreas
Agriculture Ecosystems and Environment 63 (2-3): 133-143. (1997); *ISSN:* 0167-8809
NAL Call #: S601 .A34
Descriptors: agricultural landscape planning/ agriculture/ biobusiness/ conservation/ epistemology of validation process/ guiding model/ leitbild/ objectivity/ principle of subsidiary regulations/ regionally adapted solutions/ sustainability
Abstract: On the basis of summarized experiences in agricultural landscape planning of the few last years in Switzerland the landscape evaluation and the implementation process are analysed; the principles of a 'holistic' approach are outlined. It is shown that, epistemologically, objectivity in valuation and priority-setting emerges out of a dialectic cognition process between different poles (complementary aspects of different landscape scales, different viewpoints on respective interests, different hierarchy levels in project organization structure). Each sphere of complementarity needs its adapted methods and approaches, which are presented and discussed on referring to participative planning project examples. The results of such projects so far, compared with conventional approaches, have turned out encouragingly-both from the point of view of local people and of planners/governmental authorities. Nevertheless, several crucial conditions, challenges and obstacles have to be taken into account.
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366. **When stakeholders choose: Process, knowledge, and motivation in water quality decisions.**
Burroughs, R.
Society and Natural Resources 12 (8): 797-809. (Dec. 1999)
NAL Call #: HC10.S63; *ISSN:* 0894-1920 [SNREEI]
Descriptors: water quality/ planning/ social participation/ community involvement/ decision making/ estuaries/ Rhode Island/
Narragansett Bay, Rhode Island
This citation is from AGRICOLA.

367. **Who should manage the High Plains aquifer? The irrigators' perspective.**
White, S. E. and Kromm, D. E.
Water Resources Bulletin 31 (4): 715-727. (Aug. 1995)
NAL Call #: 292.9-Am34;
ISSN: 0043-1370 [WARBAQ]

Descriptors: irrigation/ aquifers/ groundwater/ water management/ attitudes/ surveys/ Colorado/ Kansas/ groundwater management/ locus of control
Abstract: A state-local partnership exists in Colorado and Kansas with respect to management of the High Plains aquifer. This paper examines 330 irrigators' attitudes about the locus-of-control for different management activities in the High Plains-Ogallala region. Local control was preferred by most irrigators. The local district was most supported for 19 active management activities, whereas the state was favored for eight specific activities, primarily research efforts and water rights administration. Eight activities that had the potential for restricting water use were rejected in that irrigators indicated that no agency should be involved. Kansas and Colorado exhibited statistically significant preference differences for only five management options. A significantly higher percentage of those irrigators who preferred local control believed in sustainable management of the aquifer and aggressive groundwater management, and that their district served their interests.
This citation is from AGRICOLA.

368. **A whole-farm economic analysis of no-tillage and tilled cropping systems.**
Triplett, GB; Robinson, JRC; Dabney, SM; and Santen, E van.
In: Making conservation tillage conventional: Building a future on 25 years of research -- Proceedings of 25th Annual Southern Conservation Tillage Conference for Sustainable Agriculture. (Held 24 Jun 2002-26 Jun 2002 at Auburn, AL.); pp. 48-52; 2002.
This citation is provided courtesy of CAB International/CABI Publishing.

369. **Whose watershed is this? A decision case study of agricultural drainage in the Midwestern USA.**
Dovciak, A. L. and Perry, J. A.
Journal of Natural Resources and Life Sciences Education 29: 95-101. (2000)
NAL Call #: S530 .J6; *ISSN:* 1059-9053
This citation is provided courtesy of CAB International/CABI Publishing.

370. **Why it pays to make conservation part of the farm enterprise.**
Curry, N.
Journal of the Royal Agricultural Society of England 158: 144-152. (1997)
NAL Call #: 10 R81; *ISSN:* 0080-4134
This citation is provided courtesy of CAB International/CABI Publishing.

371. **Why Targets of Regulations Do Not Comply: The Case of Conservation Compliance in the Corn Belt.**
Esseks, J. D.; Kraft, S. E.; and Furlong, E. J.
Journal of Soil and Water Conservation 52 (4): 259-264. (Aug. 1997)
NAL Call #: 56.8 J822; *ISSN:* 0022-4561
Descriptors: USA/ Corn Belt/ compliance/ regulations/ surveys/ regression analysis/ soil conservation/ cropland/ attitudes/ agricultural practices/ enforcement/ Watershed protection
Abstract: This article employs survey data to test hypotheses about Corn Belt farmers' intentions to apply conservation compliance plans. The data came from winter 1995 telephone interviews with a random sample of 839 farmers in that five-state region who had USDA-approved plans for their highly erodible cropland. For ethical and practical reasons noncompliance was measured indirectly - the respondents' estimates of the percentage of their peers in the county who would "not apply their plans to any meaningful extent in 1995." Regression analysis found that, as predicted by deterrence theory, farmers who believed in high probabilities of violations being detected or penalized were more likely to expect relatively low percentages of their peers out of compliance in the coming crop season. Other findings suggest that respondents were projecting their own farming situations onto their peers when making estimates of noncompliance. For example, relatively low estimates were more likely if the respondents had participated the previous year in either a federal commodity program or a federal crop insurance program. They tended to be lower also if the interviewees had either no till or contour farming practices in their plans.
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372. **Will voluntary and educational programs meet environmental objectives? Evidence from a survey of New York dairy farms.**
Poe, G. L.; Bills, N. L.; Bellows, B. C.; Crosscombe, P.; Koelsch, R. K.; Kreher, M. J.; and Wright, P.
Review of Agricultural Economics 23 (2): 473-491. (2001)
NAL Call #: HD1773.A3N6; *ISSN:* 1058-7195
This citation is provided courtesy of CAB International/CABI Publishing.

373. **Willingness of Ohio land owner-operators to participate in a wetlands trading system.**
Napier, T. L.; McCarter, S. E.; and McCarter, J. R.
Journal of Soil and Water Conservation 50 (6): 648-656. (Nov. 1995-Dec. 1995)
NAL Call #: 56.8-J822;
ISSN: 0022-4561 [JSWCA3].
Notes: Special issue on wetlands.
Includes references.
Descriptors: land use/ conversion/ wetlands/ construction/ landowners/ attitudes/ participation/ Ohio
This citation is from AGRICOLA.

374. **Woodlots in the rural landscape: Landowner motivations and management attitudes in a Michigan (USA) case study.**
Erickson, Donna L; Ryan, Robert L; and De Young, Raymond
Landscape and Urban Planning 58 (2-4): 101-112. (2002)
NAL Call #: QH75.A1L32; *ISSN:* 0169-2046
Descriptors: aesthetic appreciation/ agricultural watershed: increasing forest cover/ economic motivations/ environment protection/ hands off management approach/ landowner motivations/ management attitudes/ non industrial private forests/ rural landscape/ woodlots: environmental benefits, farm population owners, non farm population owners
Abstract: Woodlots provide important environmental benefits in the Midwestern (USA) landscape, where they are undergoing rapid change. An increasingly diverse farm and non-farm population owns these non-industrial private forests (NIPFs). It is essential to understand what motivates NIPF landowners to retain and manage their forests. We describe a study of NIPF owners in an agricultural watershed where forest cover is increasing. What motivations and management practices might be contributing to this increase? The results of a survey of 112 NIPF owners suggest that aesthetic appreciation is the strongest motivator for retaining woodlots, especially by non-farmers. Protecting the environment also seems to be important for both farmers and non-farmers, while economic motivations are significantly less important. Landowners indicated that they are primarily taking a "hands-off" approach to management. This study provides insights for those interested in understanding NIPF landowners' motivations and for developing effective programs.
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375. **WQIP: An assessment of its changes for acceptance by farmers.**
Kraft, S. E.; Lant, C.; and Gillman, K.
Journal of Soil and Water Conservation 51 (6): 494-498. (1996)
NAL Call #: 56.8-J822; *ISSN:* 0022-4561
This citation is provided courtesy of CAB International/CABI Publishing.

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