Nonpoint-Source Pollution Issues

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Nonpoint-Source Pollution Issues

1                             NAL Call. No.: aTD223.A26  1993
Accomplishments of the USDA hydrologic unit area projects.
Ebodaghe, Denis Abumere,
Addressing nonpoint sources of water pollution must become an international priority.
Duda, A.M.

Aggregate analysis of site-specific pollution problems: the case of groundwater contamination from agriculture.
Opaluch, J.J.; Segerson, K.

Agricultural nonpoint source pollution and economic incentive policies issues in the reauthorization of the Clean Water Act: water quality.
Malik, Arun S.; Larson, Bruce A.; Ribaudo, Marc
United States, Dept. of Agriculture, Economic Research
Agricultural nonpoint-source runoff and sediment yield water quality (NPSWQ) models: modeler's perspective.
Rose, C.W.; Dickinson, W.T.; Ghadiri, H.; Jorgensen, S.E.

Language: English
Descriptors: Soil water movement; Models; Runoff water; Sediment; Agricultural chemicals; Water quality; Literature reviews

Agriculture, agricultural chemicals, and water quality.
Carey, A.E.

Language: English
Descriptors: Water quality; Agricultural production; Pesticides; Environmental impact; Water pollution; Point sources; Environmental management; Environmental protection


Language: English
Agriculture's role in addressing nonpoint source pollution.
Burt, J.P.
Agriculture outlook (70th): p. 47-52; 1994. Meeting held
November 30 -December 1, 1993, Washington, DC.

Albemarle-Pamlico: case study in pollutant trading. Most of
the nutrients came from nonpoint sources.
Hall, J.; Howett, C.

Application of a GIS-based nonpoint source nutrient loading
model for assessment of land development scenarios and water
quality in Owasco Lake, New York.
Heidtke, T.M.
Water science and technology : a journal of the International
International Conference on "Diffuse (Nonpoint) Pollution:
Sources, Prevention, Impact, Abatement." September 19-24,

Assessment of nonpoint source pollution in stormwater runoff
in Louisville, (Jefferson County) Kentucky, USA.
Marsh, J.M.

Language: English

Descriptors: Kentucky; Cabt; Storms; Runoff water; Water pollution; Pesticides; Bioassays; Biological indicators; Fish

Helgesen, John O.; Stullken, Lloyd E.; Rutledge, A. T.

Language: English; English

Descriptors: Land use; Nonpoint source pollution; Groundwater

Assumed non-point water pollution based on the nitrogen budget in Polish agriculture.
Sapek, A.; Sapek, B.

Language: English

Descriptors: Poland; Cabt; Water pollution; Air pollution; Nitrogen; Agricultural production; Nitrogen balance

United States, Environmental Protection Agency, Office of Research and Development
xiii, 87 p. ; 28 cm. Shipping list no.: 92-268-P. September,

Language: English

Descriptors: Pesticides

15  NAL Call. No.: Z5862.2.W3F58  1993
A bibliography of selected nonpoint source literature.
Flippo, Herbert N.; Jackson, Donald R.
Susquehanna River Basin Commission
Harrisburg, PA (1721 N. Front St., Harrisburg 17102) :
Susquehanna River Basin Commission; 1993; PY S9642.2 B5825.
i, 81 p. ; 28 cm. (Publication (Susquehanna River Basin
Commission) ; no. 148.). January 1993.

Language: English; English

Descriptors: Nonpoint source pollution

16  NAL Call. No.: QH96.8.B5R53  1991
Biological metric development for the assessment of nonpoint
pollution in the Snake River ecoregion of Southern Idaho
Wayne
Pocatello : Idaho : Dept. of Biological Sciences, Idaho State
University,; 1991.
75 p. : ill., map ; 28 cm. 23 April 1991. Includes
bibliographical references (p. 70-71).

Language: English

Descriptors: Water quality bioassay; Water quality management;
Environmental monitoring

17  NAL Call. No.: TD420.A1P7
Biomonitoring and amelioration of nonpoint source pollution in
some aquatic bodies.
Chandra, P.; Tripathi, R.D.; Rai, U.N.; Sinha, S.; Garg, P.
Water science and technology : a journal of the International
Association on Water Pollution Research v. 28 (3/5): p.
323-326; 1993. Paper presented at the IAWQ First
International Conference on "Diffuse (Nonpoint) Pollution:
Sources, Prevention, Impact, Abatement." September 19-24,

Language: English

Descriptors: Orissa; Cabt; Uttar pradesh; Cabt; Body water;
Water pollution; Water purification; Aquatic plants

18  NAL Call. No.: TD224.W6B46  1993
Brown water, green weeds familiar signs of nonpoint source
pollution. Bennett, Steve
Wisconsin Nonpoint Source Water Pollution Abatement Program
Madison, Wis. : University of Wisconsin Extension, [1993?];
"I-05-93-10M-20-S"--P. [4].  "GWQ003"--P. [4].

Language:  English

Descriptors: Nonpoint source pollution; Water; Urban runoff;
Agricultural pollution

19                                   NAL Call. No.: S631.F422
Changing farm practice to meet environmental objectives of
nutrient loss to Oyster Harbour.
Weaver, D.M.; Prout, A.L.
Fertilizer research v. 36 (2): p. 177-184; 1993.  In the
special issue: Fertilizers and eutrophication in South-Western
Australia / edited by E.P. Hodgkin and J.S. Yeates.  Includes
references.

Language:  English

Descriptors: Western australia; Cabt; Watershed management;
Agricultural land; Nutrients; Phosphorus; Losses from soil;
Point sources; Farm management; Environmental management;
Water quality; Eutrophication

Abstract:  Eutrophication problems in waterbodies in south-
western Australia are primarily caused by inputs of nutrients
from diffuse sources within the agricultural catchments of
these waterbodies. To reduce the algal growth and seagrass
decline caused by these inputs, it is essential to modify land
management to minimize nutrient losses. Permanent reduction in
nutrient losses from agricultural catchments should involve
voluntary changes in farm management practices based on
improved land management. Specifically, these include on-farm
nutrient management such as soil testing, fertilizer
management, the use of perennial plants, and water and erosion
control measures to reduce nutrient loss from rural land. This
paper describes the management of nutrient loss from the
catchment of Oyster Harbour on the south coast of Western
Australia using a co-operative approach.

20                                   NAL Call. No.: TD224.T4N48 1992
Characterization of non-point sources and loadings to
Galveston Bay. Newell, Charles J.; Rifai, H. S.; Bedient,
Philip B.,
Galveston Bay National Estuary Program
Clear Lake, Tex. : Galveston Bay National Estuary Program,;
1992; W1137.7 G139 no.15.
Vol. 2: 28 x 45 cm.  Includes bibliographical references (v. 
1, p. 155-162).
Language: English

Descriptors: Galveston Bay (Tex.); Environmental impact statements; Watersheds; Land use; Hydrology; Water quality

21

NAL Call. No.: TD420.A1P7
Chesapeake experience: NPS Chesapeake challenge for sustainable development. Bauereis, E.I.

Language: English

Descriptors: Maryland; Sustainability; Water pollution; Body water; Coastal areas

22

NAL Call. No.: HC79.E5E5
Classification and spatial mapping of riparian habitat with applications toward management of streams impacted by nonpoint source pollution. Delong, M.D.; Brusven, M.A.

Language: English

Descriptors: Idaho; Habitats; Riparian vegetation; Erosion; Pollution; Information systems; Mapping; Watersheds; Farmland

23

NAL Call. No.: 56.8 J822

Language: English

Descriptors: Kansas; Water quality; Water pollution; Remote sensing; Watersheds; Simulation models; Landsat; Thematic mapper; Data collection

24

NAL Call. No.: TD423.C632 1993
Coastal nonpoint pollution control program program development and approval guidance.
United States, National Oceanic and Atmospheric
A comparison of runoff quality effects of organic and inorganic fertilizers applied to fescuegrass plots.

Edwards, D.R.; Daniel, T.C.
Bethesda, Md. : American Water Resources Association; 1994
Includes references.

Language: English

Descriptors: Arkansas; Cabt; Poultry manure; Pig manure; Npk fertilizers; Runoff; Water quality; Festuca arundinacea; Pastures; Pollution

Abstract: Application of fertilizer can degrade quality of runoff, particularly during the first post-application, runoff-producing storm. This experiment assessed and compared runoff quality impacts of organic and inorganic fertilizer application for a single simulated storm occurring seven days following application. The organic fertilizers used were poultry (Gallus gallus domesticus) litter, poultry manure, and swine (Sus scrofa domesticus) manure. All fertilizers were applied at an application rate of 217.6 kg N/ha. Simulated rainfall was applied at 50 mm/h for an average duration of 0.8 h. Runoff samples were collected, composited, and analyzed for nitrate N (NO3-N), ammonia N (NH3-N), total Kjeldahl N (TKN), ortho-P (PO4-P), total P (TP), chemical oxygen demand (COD), total suspended solids (TSS), fecal coliforms (FC), and fecal streptococci (FS). Application of the fertilizers did not alter the hydrologic characteristics of the receiving plots relative to the control plots. Concentrations of fertilizer constituents were almost always greater from treated than from control plots and were usually much greater. Flow-weighted mean concentrations of NH3-N, PO4-P, and TP were highest for the inorganic fertilizer treatment (42.0, 26.6, and 27.9 mg/L respectively). Runoff COD and TSS concentrations were greatest for the poultry litter treatment. Concentrations of FC and FS were greater for fertilized than for control plots with no differences among fertilized plots, but FC concentrations for all treatments were in excess of Arkansas' primary and secondary contact standards. Mass losses of fertilizer constituents were low (< 3 kg/ha) and were small proportions (< 3 percent) of amounts applied.
Lehman, D.A.; Shirmohammadi, A.; Shoraka, S.
Paper - American Society of Agricultural Engineers (90-2038):
Meeting, June 24-27, 1990, Columbus, Ohio. Includes
references.

Language: English

Descriptors: Groundwater pollution; Simulation models

27 NAL Call. No.: LU378.76 L930 1992 cock
A comprehensive assessment of groundwater nitrate pollution
from point and non-point sources.
Cockrell, Charles W.
vii, 67 leaves : ill., maps (some folded) ; 29 cm. Vita.
Abstract. Includes bibliographical references (leaves 65-66).

Language: English; English

Descriptors: Water, Underground; Hazardous waste sites; Wells

28 NAL Call. No.: S539.5.J68
The concept and need for a phosphorus assessment tool.
Lemunyon, J.L.; Gilbert, R.G.
Journal of production agriculture v. 6 (4): p. 483-486; 1993
Oct. Paper presented at the "Symposium on assessment of
potential phosphorus losses from a field site", November 4,
1992, Minneapolis, Minnesota. Includes references.

Language: English

Descriptors: Resource management; Phosphorus; Losses from
soil; Eutrophication; Water pollution; Risk; Assessment;
Indexes

29 NAL Call. No.: TD223.C73 1993
Created and natural wetlands for controlling nonpoint source
pollution. Olson, Richard K.
United States, Environmental Protection Agency, Office of
Research and Development, United States, Environmental
Protection Agency, Office of Wetlands, Oceans, and Watersheds
and Development, and Office of Wetlands, Oceans, and
Watersheds. Includes bibliographical references.

Language: English

Descriptors: Water quality management; Water; Wetland
conservation; Constructed wetlands
Current southern state programs for control of forestry nonpoint source pollution.
Lickwar, P.M.; Cubbage, F.W.; Hickman, C.A.
Bethesda, Md. : Society of American Foresters; 1990 May.
Language: English
Descriptors: South eastern states of U.S.A.; South central states of U.S.A.; Forestry; Pollution; Water composition and quality; Surveys

A decision support system for soil conservation planning.
Montas, H.; Madramootoo, C.A.
Language: English
Descriptors: Quebec; Soil conservation; Watersheds; Land use planning; Decision making; Expert systems; Information systems; Erosion; Simulation models; Rain; Soil types

Language: English
Descriptors: Iowa; Cabt; Water pollution; Sources; Agricultural production; Water quality

Development and implementation of the Virginia agronomic land use evaluation system (values).
Part 1.

Language: English

Descriptors: Virginia; Cabt; Fertilizer requirement determination; Soil testing; Nutrients; Management; Databases; Land use; Land evaluation; Water quality; Environmental protection; Water pollution; Pollution control; Point sources

34  
Olem, Harvey
International Association of Water Quality

Language: English
Descriptors: Nonpoint source pollution

35  
The distributed modelling of agricultural nonpoint pollution at basin scale: experimental research and model validation.
Preti, F.; Lubello, C.

Language: English
Descriptors: Italy; Cabt; Agricultural chemicals; Application; Rivers; Watersheds; Water pollution; Models

36  
Document it! Procedures for the documentation of nonpoint source project data--land treatment.
Hermesmeyer, B.
Drying interval effects on quality of runoff from fescue plots treated with poultry litter.

Edwards, D.R.; Daniel, T.C.; Moore, P.A. Jr; Vendrell, P.F.

Abstract: Land application of poultry (Gallus gallus domesticus) litter can lead to elevated runoff concentrations of organic matter and nutrients. This experiment was conducted to determine the effects of poultry litter treatment (0 and 218 kg of N ha⁻¹) and drying interval (4, 7, and 14 days) between litter application and simulated rainfall on quality of runoff from fescue grass (Festuca arundinacea Schreb.) plots. Runoff was generated from simulated rainfall (50 mm h⁻¹) and sampled at 0.08-h intervals during runoff. Composite runoff samples from each treatment and replication were analyzed for nitrate N (NO₃-N), ammonia N (NH₃-N), total Kjeldahl N (TKN), ortho-P (PO₄-P), total P (TP), chemical oxygen demand (COD), and total suspended solids (TSS). One set per treatment of the noncomposited runoff samples was also analyzed. Runoff concentrations of all parameters except NO₃-N were significantly (p < 0.05) higher for the litter-treated plots than for the control plots. Drying interval did not significantly (p < 0.05) affect either concentration or total mass of any constituent lost in the runoff. Concentrations of NH₃-N, TKN, PO₄-P, and TP decreased uniformly with increasing runoff rate and thus with time after beginning of runoff. Temporal variation in runoff concentrations of NO₃-N, COD, and TSS followed no identifiable general pattern.

Dynamic simulation of nonpoint source pollutant transport in agricultural watersheds.

Ashraf, M.S.; Borah, D.K.
Abstract: The limited success of command-and-control policies for reducing nonpoint source (NPS) water pollution mandated under the Federal Water Pollution Control Act (FWPCA) has prompted increased interest in economic incentive policies as an alternative control mechanism. A variety of measures have been proposed ranging from fairly minor modifications of existing policies to substantial revisions including watershed-wide policies that rely on economic incentives. While greater use of economic incentive policies, such as environmental bonds and point/nonpoint source trading is being advocated in the reauthorization of the CWA, the expected effects of individual proposals will be modest. The characteristics of NPS pollution, namely uncertainty and asymmetrical information, underscores that there is no single, ideal policy instrument for controlling the many types of agricultural NPS water pollution. Some of the usual incentive-based policies, such as effluent taxes, are not well suited to the task. Individual incentive policies proposed for the reauthorized CWA, such as pollution trading or deposit/refund systems, are not broadly applicable for heterogeneous pollution situations. Economic incentive policies may be appropriate in some cases, and command-and-control policies will be preferable in others and may in fact complement incentive policies.
Abstract: Multilevel samplers (MLSs) consisting of piezometers and tube samplers, a logical approach for determining the direction of groundwater flow and chemistry in shallow (<6 m) nonpoint source (NPS) groundwater investigations. These MLSs have evolved from fastening the tubing to conduit at specific depths while the conduit was lowered into the hollow stem auger train to the present method of installing preassembled MLSs in boreholes drilled by the reverse circulation rotary method without the use of drilling additives. This method allows the aquifer to be sectioned into discrete layers and provides an instantaneous snapshot of both flow and chemistry in three dimensions. The procedure has been used successfully at several sites in Nebraska. The method is cheap, fast, and accurate in areas where the depth to water is less than 6 m. While the same procedure can be used where depths to water exceed 6 m, the need for gas-driven samplers substantially increases the cost.

41 The effect of CRP enrollment on sediment loads in two southern Illinois streams.
Davie, D.K.; Lant, C.L.
Language: English
Descriptors: Illinois; Cabt; Soil conservation; Erosion control; Federal programs; Participation; Environmental impact; Sediment; Streams; Water pollution; Point sources

42 Effective monitoring strategies for demonstrating water quality changes from nonpoint source controls on a watershed scale.
Spooner, J.; Line, D.E.
Language: English
Descriptors: U.S.A.; Cabt; Water quality; Pollution; Sources; Watersheds; Agricultural production; Agricultural land; Treatment

43 Effects of agricultural nutrient management on nitrogen fate
Nitrogen inputs to, and outputs from, a 55-acre site in Lancaster County, Pennsylvania, were estimated to determine the pathways and relative magnitude of loads of nitrogen entering and leaving the site, and to compare the loads of nitrogen before and after the implementation of nutrient management. Inputs of nitrogen to the site were manure fertilizer, commercial fertilizer, nitrogen in precipitation, and nitrogen in ground-water inflow; and these sources averaged 93, 4, 2, and 1 percent of average annual nitrogen additions, respectively. Outputs of nitrogen from the site were nitrogen in harvested crops, loads of nitrogen in surface runoff, volatilization of nitrogen, and loads of nitrogen in ground-water discharge, which averaged 37, less than 1, 25, and 38 percent of average annual nitrogen removals from the site, respectively. Virtually all of the nitrogen leaving the site that was not removed in harvested crops or by volatilization was discharged in the ground water. Applications of manure and fertilizer nitrogen to 47.5 acres of cropped fields decreased about 33 percent, from an average of 22,700 pounds per year (480 pounds per acre per year) before nutrient management to 15,175 pounds of nitrogen per year (320 pounds per acre per year) after the implementation of nutrient management practices. Nitrogen loads in ground-water discharged from the site decreased about 30 percent, from an average of 292 pounds of nitrogen per million gallons of ground water before nutrient management to an average of 203 pounds of nitrogen per million gallons as a result of the decreased manure and commercial fertilizer applications. Reductions in manure and commercial fertilizer applications caused a reduction of approximately 11,000 pounds (3,760 pounds per year; 70 70 pounds per acre per year) in the load of nitrogen discharged in ground water from the 55-acre site during the three-year period 1987-1990.


Estimating changes in recreational fishing participation from national water quality policies.
Ribaudo, M.O.; Piper, S.L.
Includes references.

Language: English

Descriptors: Water quality; Water policy; Water pollution; Angling; Participation; Estimation; Models

Abstract: The complete evaluation of the offsite effects of national policies or programs that affect levels of agricultural nonpoint source pollution requires linking extensive water quality changes to changes in recreational activity. A sequential decision model is specified to describe an individual's decisions about fishing. A participation model for recreational fishing that includes a water quality index reflecting regional water quality is developed and estimated as a logit model with national level data. A visitation model for those who decide to fish that also includes the water quality index is estimated using ordinary least squares. The water quality index is found to be significant in the participation model but not in the visitation model. Together, the two models provide a means of estimating how changes in water quality might influence the number of recreation days devoted to fishing. The model is used to estimate changes in fishing participation for the Conservation Reserve Program.

Estimating daily nutrient fluxes to a large Piedmont reservoir from limited tributary data.
Nearing, M.A.; Risse, R.M.; Rogers, L.F.

Language: English

Descriptors: Georgia; Cabt; Lakes; Water quality; Watersheds; Pollution; Land use; Agricultural land; Stream flow; Nitrate nitrogen; Nitrogen; Phosphorus; Chemical oxygen demand; Variation

Abstract: Physically based models of lakes require estimates of daily, spatially varied water and nutrient fluxes into the lake from surrounding watersheds. Often, however, only a selected set of streams are periodically (monthly or biweekly) sampled. The objective of this study was to develop and test a method for estimating daily flux of nutrients into a large reservoir using data from sampling of selected watersheds. Flow rate, nitrate (NO3-N), total nitrogen (TN), soluble
reactive phosphorus (SRP), total phosphorus (TP), and chemical oxygen demand (COD) were measured monthly during 1991 for eight watersheds that feed Lake Lanier in northern Georgia. Daily stream flow in the eight streams was correlated to data from nearby USGS gauged stream stations, and daily nutrient concentrations were related to watershed land use and monthly variation in measured concentrations. Fraction of agricultural land in the watershed (AG) was the only land use parameter that correlated to nonpoint-source loads. Coefficients of determination for linear regressions between AG and NO3-N, TN, SRP, TP, and COD were 0.74, 0.73, 0.47, 0.84, and 0.52, respectively. The relationships were tested on an independent data set consisting of two samples from 19 additional streams. Coefficients of determination (r²) between measured and predicted data for the independent test data were 0.77, 0.52, 0.66, 0.64, 0.69, and 0.76 for stream flow, NO3-N, TN, SRP, TP, and COD, respectively. Percentages of nutrient loads attributable to nonpoint-source loads ranged between 76% for TN to 92% for TP and COD, whereas those attributable to agricultural nonpoint source were about 15% for COD, 28% for TN, 34% for NO3-N, 40% for TP, and 70% for SRP.


Language: English

Descriptors: Forest management; Water pollution; Water composition and quality; Clearcutting; Silviculture


Language: English

Descriptors: Maryland; Cabt; Cooperative extension service; Volunteers; Environmental education; Educational programs; Water quality; Water pollution; Fertilizers; Runoff; Mass media; Extension education; Technology transfer

52 Evaluation of GLEAMS and PRZM for predicting pesticide leaching under field conditions. Zacharias, S.; Heatwole, C.D.
Abstract: Pesticide simulation models, GLEAMS and PRZM, were evaluated for their ability to predict pesticide behavior using field data from a plot under no-till corn in the Coastal Plain region of Virginia. The models were evaluated in an uncalibrated mode as well as with adjustment of important hydrology parameters. The evaluation of model performance was based on graphical displays and statistical measures. Difference in evapotranspiration (ET) predictions by the two models caused the simulated results from their hydrology components to vary. Runoff and soil moisture measured in the field were predicted reasonably well after adjusting important hydrology parameters. Except for differences in magnitude, both models predicted the chemical concentration profiles similarly. Overall, GLEAMS represented pesticide behavior in soil better than PRZM. The models, GLEAMS and PRZM, performed well in predicting pesticide mass in the root zone, but were less reliable in predicting pesticide concentration distributions in soil. Model predictions of pesticide fate and transport were not greatly affected by changes in curve number and the water holding capacity of the soil.
Evaluation of the accuracy and precision of annual phosphorus load estimates from two agricultural basins in Finland.
Rekolainen, S.; Posch, M.; Kamari, J.; Ekholm, P.
Includes references.

Language: English

Descriptors: Finland; Agricultural land; Drainage; Runoff; Pollution; Phosphorus; Transport processes; Flow; Estimates; Sampling; Frequency; Monitoring; Mathematical models; Comparisons

Abstract: The accuracy and precision of phosphorus load estimates from two agricultural drainage basins in western Finland were evaluated, based on continuous flow measurements and frequent flow-proportional sampling of total phosphorus concentration during a 2 year period. The objective was to compare different load calculation methods and to evaluate alternative sampling strategies. An hourly data set of concentrations was constructed by linear interpolation, and these data were used in Monte Carlo runs for producing replicate data sets for calculating the accuracy and precision of load estimates. All estimates were compared with reference values computed from the complete hourly data sets. The load calculation methods based on summing the products of regularly sampled flows and concentrations produced the best precision, whereas the best accuracy was achieved using methods based on multiplying annual flow by flow-weighted annual mean concentration. When comparing different sampling strategies, concentrating sampling in high runoff periods (spring and autumn) was found to give better accuracy and precision than strategies based on regular interval sampling throughout the year. However, the best result was obtained by taking samples flow-proportionally within the highest peak flows plus additional regular interval (e.g. biweekly) samples outside these flow peaks. Using this strategy, which calls for automatic sampling equipment, accuracies better than 5% and precisions better than 10% can be achieved with only 30-50 samples per year.

Extending the RCWP knowledge base to future nonpoint source control projects. Robillard, P.D.

Language: English

Descriptors: U.S.A.; Water quality; Pollution control
Forest management activities may substantially alter the quality of water draining forests, and are regulated as nonpoint sources of pollution. Important impacts have been documented, in some cases, for undesirable changes in stream temperature and concentrations of dissolved oxygen, nitrate-N, and suspended sediments. We present a comprehensive summary of North American studies that have examined the impacts of forest practices on each of these parameters of water quality. In most cases, retention of forested buffer strips along streams prevents unacceptable increases in stream temperatures. Current practices do not typically involve addition of large quantities of fine organic material to streams, and depletion of streamwater oxygen is not a problem; however, sedimentation of gravel streambeds may reduce oxygen diffusion into spawning beds in some cases. Concentrations of nitrate-N typically increase substantially after forest harvesting and fertilization, but only a few cases have resulted in concentrations approaching the drinking-water standard of 10 mg of nitrate-N/L. Road construction and harvesting increase suspended sediment concentrations in streamwater, with highly variable results among regions in North America. The use of best management practices usually prevents unacceptable increases in sediment concentrations, but exceptionally large responses (especially in relation to intense storms) are not unusual.
Strickler, J.K.
Language: English
Descriptors: Kansas; Water quality; Forestry; Riparian forests

60 NAL Call. No.: Z6004.S94S76 1991
Freshwater wetlands, urban stormwater, and nonpoint pollution control a literature review and annotated bibliography., 2nd ed., rev. and updated.. Stockdale, Erik C.
Washington (State), Dept. of Ecology
Language: English
Descriptors: Wetlands; Urban runoff; Water; Water quality management

61 NAL Call. No.: 290.9 AM32P
GIS-based watershed rankings for nonpoint pollution in Pennsylvania. Hamlett, J.M.; Petersen, G.W.; Russo, J.; Miller, D.A.; Baumer, G.M.; Day, R.L.
Language: English
Descriptors: Pennsylvania; Watersheds; Water pollution; Information systems

62 NAL Call. No.: S605.5.A43
Ground water contamination from agricultural sources: implications for voluntary policy adherence from Iowa and Virginia farmers' attitudes. Halstead, J.M.; Padgitt, S.; Batie, S.S.
Greenbelt, Md. : Institute for Alternative Agriculture; 1990.
Language: English
Descriptors: Iowa; Virginia; Groundwater pollution; Contamination; Agricultural chemicals; Dairy wastes; Water quality; Farmers' attitudes; Questionnaires; Interviews; Farm management; Public opinion; Risk; Health hazards; Environmental impact; Economic impact; Crop production; Dairy farming; Agricultural policy; Programs; Incentives
Abstract: Contamination of ground water from agricultural sources has been documented in a majority of the contiguous United States. In this study, we examine the potential for voluntary adoption of management practices that reduce risk of ground water contamination and discuss how farm operators' attitudes regarding the environment might affect the success of voluntary programs. Farmers' behavior and attitudes in Rockingham County, Virginia, and Big Spring Basin, Iowa, reveal that both groups consider the ground water issue to be a serious problem to which they are contributing. This awareness is a significant first step in prompting consideration of management practices that reduce the threat to ground water quality. We also found that the worst offenders--that is, farmers applying nitrogen well above agronomic recommendations--were those with the least concern about the problem. If major shifts in farming practices are to occur voluntarily, major incentives or disincentives are needed. Even though the concern about ground water quality is high, the documented risks perceived by farmers are not strongly convincing. The economic incentives for change are questionable at best. Voluntary adoption of best management practices is only one of several policy options. Ultimately, policies designed to reduce ground water contamination may need a mix of strategies, including economic incentives and disincentives, zoning and land use restrictions, environmental regulations, and bans on agricultural chemicals.

63  NAL Call. No.: S590.C63
Ground water nonpoint source management in Nebraska.
Link, M.

Language: English
Descriptors: Nebraska; Groundwater pollution; Programs; State government; Water quality; Nitrate; Contamination

64  NAL Call. No.: 292.8 W295
Groundwater as a nonpoint source of atrazine and deethylatrazine in a river during base flow conditions.
Squillace, P.J.; Thurman, E.M.; Furlong, E.T.

Language: English
Descriptors: Iowa; Cabt; Atrazine; Metabolites; Groundwater;
River water; Rivers; Discharge; Water flow; Aquifers; Water pollution

Abstract: Alluvial groundwater adjacent to the main stem river is the principal nonpoint source of atrazine and deethylatrazine in the Cedar River of Iowa after the river has been in base flow conditions for 5 days. Between two sites along a 116-km reach of the Cedar River, tributaries contributed about 25% of the increase in the atrazine and deethylatrazine load, whereas groundwater from the alluvial aquifer contributed at least 75% of the increase in load. Within the study area, tributaries aggregate almost all of the discharge from tile drains, and yet the tributaries still only contribute 25% of the increase in loads in the main stem river. At an unfarmed study site adjacent to the Cedar River, the sources of atrazine and deethylatrazine in the alluvial groundwater are bank storage of river water and groundwater recharge from areas distant from the river. Atrazine and deethylatrazine associated with bank storage water will provide larger concentrations to the river during early base flow conditions. After the depletion of bank storage, stable and smaller concentrations of atrazine and deethylatrazine, originating from groundwater recharge, continue to be discharged from the alluvial aquifer to the river; thus these results indicate that alluvial aquifers are an important nonpoint source of atrazine and deethylatrazine in rivers during base flow.

Groundwater discharge and its impact on surface water quality in a Chesapeake Bay inlet.
Reay, W.G.; Gallagher, D.L.; Simmons, G.M. Jr
Bethesda, Md. : American Water Resources Association; 1992

Language: English

Descriptors: Virginia; Groundwater; Discharge; Surface water; Interactions; Sediment; Seepage; Nitrogen; Phosphorus; Agricultural land; Land use; Water quality; Water pollution; Estuaries; Seasonal fluctuations

Abstract: Surface water, groundwater, and groundwater discharge quality surveys were conducted in Cherrystone Inlet, on Virginia's Eastern Shore. Shallow groundwater below agricultural fields had nitrate concentrations significantly higher than inlet surface waters and shallow groundwater underlying forested land. This elevated nitrate groundwater discharged to adjacent surface waters. Nearshore discharge rates of water across the sediment-water interface ranged from 0.02 to 3.69 liters. m⁻².hr⁻¹ during the surveys. The discharge was greatest nearshore at low tide periods, and decreased markedly with increasing distance offshore. Vertical hydraulic heads, Eh, and inorganic nitrogen flux in the sediments followed similar patterns. Nitrate was the
predominant nitrogen species discharged nearshore adjacent to agricultural land use, changing to ammonium farther offshore. Sediment nitrogen fluxes were sufficient to cause observable impacts on surface water quality; nitrate concentrations were up to 20 times greater in areas of groundwater discharge than in the main stem inlet water. Based on DIN:DIP ratios, nitrogen contributions from direct groundwater discharge and tidal creek inputs appear to be of significant ecological importance. This groundwater discharge links land use activity and the quality of surface water, and therefore must be considered in selection of best management practices and water quality management strategies.

66 NAL Call. No.: aS21.R44A7

Language: English
Descriptors: Groundwater; Groundwater pollution; Models; Agricultural chemicals; Leaching

67 NAL Call. No.: KF3787.25.U55 1993

Language: English
Descriptors: Water; Coastal zone management; Marine pollution; Nonpoint source pollution

68 NAL Call. No.: 292.9 AM34

Language: English
Descriptors: Iowa; Maize soils; Agricultural land; Alluvium; Aquifers; Agricultural chemicals; Cyanazine; Alachlor; Atrazine; Nitrates; Vertical movement; Seasonal variation; Pollution

Abstract: A hydrologic investigation to determine vertical and seasonal variation of atrazine, alachlor, cyanazine, and nitrate at one location and to relate the variation to ground-water movement in the Iowa River alluvium was conducted in Iowa County, Iowa, from March 1986 to December 1987. Water samples were collected at discrete intervals through the alluvial sequence from the soil zone to the base of the aquifer. Alachlor, atrazine, and cyanazine were detected most frequently in the soil zone but also were present in the upper part of the alluvial aquifer. Alachlor was detected sporadically, whereas, atrazine, cyanazine, and nitrate were present throughout the year. In the alluvial aquifer, the herbicides generally were not detected during 1986 and were present in detectable concentrations for only a short period of time in the upper 1.6 meters of the aquifer during 1987. Nitrate was present throughout the alluvium and was stratified in the alluvial aquifer. The largest nitrate concentrations were detected in the middle part of the aquifer. Nitrate concentrations were variable only in the upper 2 meters of the aquifer. Vertical movement of herbicides and nitrate in the soil correlated with precipitation and degree of saturation. A clay layer retarded vertical movement of atrazine but not nitrate from the soil layer to the aquifer. Vertical movement could not account for the chemical variation in the alluvial aquifer.

69 NAL Call. No.: TD420.A1E5
Herbicide transport in rivers: importance of hydrology and geochemistry in nonpoint-source contamination.
Squillace, P.J.; Thurman, E.M.

Language: English

Descriptors: Iowa; Minnesota; Herbicide residues; Water pollution; River water; Groundwater pollution; Concentration; Models; Overland flow

70 NAL Call. No.: 292.9 AM34
Hydrologic response of an agricultural watershed to various hydrologic and management conditions.
Razavian, D.

Language: English
Abstract: The hydrologic responses from an agricultural watershed in southeast Nebraska were investigated under an array of physiographic, hydrologic, meteorologic, and management conditions. For analytical purposes, the hydrologic responses were narrowed to include only runoff and sediment yield. The study was performed by utilizing the ANSWERS (Area Nonpoint Source Watershed Environment Response Simulation) hydrologic-simulation model. Results of this study indicate that, generally, nonstructural (agronomic) Best Management Practices (BMPs) have a more significant impact in controlling erosion and nonpoint-source pollution than structurally oriented BMPs. The percentage of reduction in average soil loss as a result of changing tillage systems from conventional to chisel plow was in the mid-40s. The corresponding percentages of reduction in sediment yield from the watershed under minimum tillage and no-till systems were in the mid-60s and mid-80s, respectively. The impact of these management strategies on runoff varied considerably. That is primarily based on the watershed's antecedent soil moisture condition, land use, and the growth stage of crops. Generally, an intense, short, thunderstorm type of rainfall event had more relative impact on runoff, and therefore sediment yield than a long, gentle, and steady event.
The impact of fertilizer application techniques on nitrogen yield from two tillage systems.
Mostaghimi, S.; Younos, T.M.; Tim, U.S

Impact of rainfall and tillage systems on off-site herbicide movement. Shaw, D.R.; Smith, C.A.; Hariston, J.E.
Communications in soil science and plant analysis v. 23 (15/16): p. 1843-1858; 1992. Includes references.

Impacts of uncertainty on policy costs of managing nonpoint source ground water contamination.
The importance of precise rainfall inputs in nonpoint source pollution modeling.


Language: English

Descriptors: Ontario; Agricultural wastes; Losses from soil; Models; Pollutants; Rain; Soil properties

Abstract: Rainfall data provide a prime input in nonpoint source pollution (nps) modeling. The sensitivity of model outputs to variations in the time step selected for rainfall data has been explored for two nps models, a field-scale continuous model, and an event-based watershed-scale model, for the temperate climatic conditions of Southern Ontario, Canada. This study has revealed that model outputs regarding runoff, soil loss and sediment yield, and calibrated parameters representing soil hydraulic properties and erosion characteristics are extremely sensitive to small variations in the rainfall time step. Model users must use caution therefore to take these variations into account during the calibration and application of such models.

The influence of subsurface drainage practices on herbicide losses.


Language: English

Descriptors: Atrazine; Metolachlor; Water pollution; Subsurface drainage

Integrating water quality modeling with ecological risk assessment for nonpoint source pollution control: a conceptual framework.


Language: English

Language: English

Land use and incentive schemes for nonpoint pollution control in a spatial equilibrium setting. Graham-Tomasi, Theodore St. Paul, Minn.: University of Minnesota, Institute of Agriculture, Forestry and Home Economics; 1990. 31 p.; 28 cm. (Staff paper P; 90-31). April 1990. Includes bibliographical references (p. 31).

Language: English


Language: English; English


Abstract: Recent federal legislation strengthened nonpoint source pollution regulations and helped to support and standardize pollution control efforts. A comprehensive review of current state and federal programs for forest areas reveals a substantial increase in agency water quality protection activities. These new efforts emphasize monitoring to assess the use and effectiveness of best management practices (BMPs). Recent monitoring reveals that BMP use is increasing and that such use typically maintains water quality within standards. However, information is generally lacking about the cost effectiveness of BMP programs. Carefully designed and executed monitoring is the key to better specification of BMPs and more cost effective water quality protection.


86 NAL Call. No.: 290.9 Am32P
Managing agricultural chemicals in groundwater.
Jones, R.L.

Language: English
Descriptors: Groundwater pollution; Agricultural chemicals; Water management; Leaching

87 NAL Call. No.: QH540.J6
Managing agricultural phosphorus for protection of surface waters: issues and options.

Language: English
Descriptors: Phosphorus; Pollution; Soil management; Crop management; Losses from soil; Eutrophication; Runoff; Erosion; Soil fertility; Manures; Pollution control; Watershed management

Abstract: The accelerated eutrophication of most freshwaters is limited by P inputs. Nonpoint sources of P in agricultural runoff now contribute a greater portion of freshwater inputs, due to easier identification and recent control of point sources. Although P management is an integral part of profitable agrisystems, continued inputs of fertilizer and manure P in excess of crop requirements have led to a build-up of soil P levels, which are of environmental rather than agronomic concern, particularly in areas of intensive crop and livestock production. Thus, the main issues facing the establishment of economically and environmentally sound P management systems are the identification of soil P levels that are of environmental concern; targeting specific controls for different water quality objectives within watersheds; and balancing economic with environmental values. In developing effective options, we have brought together agricultural and
limnological expertise to prioritize watershed management practices and remedial strategies to mitigate nonpoint-source impacts of agricultural P. Options include runoff and erosion control and P-source management, based on eutrophic rather than agronomic considerations. Current soil test P methods may screen soils on which the aquatic bioavailability of P should be estimated. Landowner options to more efficiently utilize manure P include basing application rates on soil vulnerability to P loss in runoff, manure analysis, and programs encouraging manure movement to a greater hectareage. Targeting source areas may be achieved by use of indices to rank soil vulnerability to P loss in runoff and lake sensitivity to P inputs.


Language: English

Descriptors: Pollution; Agriculture; Simulation models; Geographical information systems; Computer software; Prediction

Abstract: This study documents the development of a link between a geographical information system (GIS) and a non-point source pollution model. The GIS ARC/INFO was linked to the agricultural non-point source pollution model and ORACLE data sources. Application of the system is demonstrated using the Bedford-Ouse catchment as a suitable case study. Water quality impacts are predicted from source data describing topography, soils, land use and river network. The model results were in agreement with observed nitrate concentrations at the catchment outlet, and more appropriate data sources are considered to be the main priority for improving model predictive ability. Management scenarios were established to assess the impact of changing agricultural management practices on predicted water quality. The approach has significant potential for the management of agricultural pollution in the UK.


Descriptors: Pollution; Sources; Management; Bibliographies
Metamodels and nonpoint pollution policy in agriculture. 
Bouzaher, A.; Lakshminarayan, P.G.; Cabe, R.; Carriquiry, A.; 
Gassman, P.W.; Shogren, J.F. 
Includes references. 

Language: English 

Descriptors: Herbicides; Agricultural chemicals; Groundwater; 
Surface water; Water pollution; Water quality; Simulation 
models; Statistical analysis 

Abstract: Complex mathematical simulation models are 
generally used for quantitative measurement of the fate of 
aricultural chemicals in soil. But it is less efficient to 
use them directly for regional water quality assessments 
because of the large number of simulations required to cover 
the entire region and because the entire set of simulation 
runs must be repeated for each new policy. To make regional 
water quality impact assessment on a timely basis, a 
simplified technique called metamodeling is suggested. A 
metamodel summarizes the input-output relationships in a 
complex simulation model designed to mimic actual processes 
such as groundwater leaching. Metamodels are constructed and 
validated to predict groundwater and surface water 
concentrations of major corn and sorghum herbicides in the 
Corn Belt and Lake States regions of the United States. The 
usefulness of metamodeling in the evaluation of agricultural 
nonpoint pollution policies is illustrated using an integrated 
environmental economic modeling system. For the baseline 
scenario, we estimate that 1.2% of the regional soils will 
lead to groundwater detection of atrazine exceeding 0.12 
micrograms/L, which compares well with the findings of an 
Environmental Protection Agency monitoring survey. The results 
suggest no-till practices could significantly reduce surface 
water concentration and a water quality policy, such as an 
 atrazine ban, could increase soil erosion despite the 
conservation compliance provisions.

Methods of controlling non-point source pollution from 
aricultural activity. Webster, K.T. 
Meeting held January 10-14, 1993, New Orleans, Louisiana. 
Includes references. 

Language: English 

Descriptors: Pollution control; Agricultural chemicals 

Methods to assess the water quality impact of a restored 
riparian wetland. Vellidis, G.; Lowrance, R.; Smith, M.C.;
Hubbard, R.K. 
Ankeny, Iowa : Soil and Water Conservation Society of America; 
223-230; 1993 May. Includes references. 

Language:  English 

Descriptors: Georgia; Water pollution; Animal wastes; 
Bioremediation; Water quality; Runoff; Riparian forests; 
Wetlands; Reclamation; Pollution control 

Microtargeting the acquisition of cropping rights to reduce 
nonpoint source water pollution. 
Kozloff, K.; Taff, S.J.; Wang, Y. 
Includes references. 

Language:  English 

Descriptors: Minnesota; Agricultural land; Land use; Land 
management; Watersheds; Water pollution; Water quality; 
Erosion; Sediment yield; Simulation models; Cost effectiveness 
analysis 

Abstract: Targeting cropland retirement programs to reduce 
agricultural nonpoint source pollution is accomplished by 
employing disaggregated information about physical and 
economic factors that influence the benefits and costs of 
adopting specific erosion control practices on specific land 
parcels. The agricultural nonpoint source (AGNPS) model is 
used in a Minnesota watershed to simulate the relative 
effectiveness of alternative targeting schemes with respect to 
budget outlays for annual payments to landowners, reduction in 
downstream sediment yield and nutrient loss, and reduction in 
on-site erosion. Cost-effectiveness increased with information 
on economic factors (the opportunity cost of retiring a parcel 
of land) as well as on physical factors (contribution of a 
parcel to downstream sediment yield). The marginal cost-
effectiveness of all schemes decreased as the enrolled 
proportion of watershed land increased. 

Minnesota nonpoint source management progress in federal 
fiscal year 1992 the 1992 report to U.S. Environmental 
Protection Agency. 
Minnesota Pollution Control Agency; United States, 
Environmental Protection Agency 
238 p. : maps ; 28 cm. 

Language:  English 

Descriptors: Water quality management; Nonpoint source
pollution

Mitigating nonpoint-source nitrate pollution by riparian-zone denitrification. Schipper, L.A.; Cooper, A.B.; Dyck, W.J.

Language: English

Descriptors: Nitrate; Nitrate fertilizers; Water pollution; Runoff; Drainage; Denitrification; Denitrifying microorganisms; Lakes; Rivers; Surface water; Soil types (ecological)

Modeling linked watershed and lake processes for water quality management decisions.
Summer, R.M.; Alonso, C.V.; Young, R.A.

Language: English

Descriptors: Watersheds; Lakes; Agricultural land; Simulation models; Water quality; Sediment; Nitrogen; Phosphorus; Chlorophyll; Wetlands; Watershed management; Weather; Trends; Farming systems

Abstract: A physically based modeling approach is used to link watershed with lake processes and to simulate their responses to land management and weather conditions. Components of the watershed model, AGNPS (agricultural nonpoint-source model), are hydrology, erosion, sediment transport, transport of nitrogen and phosphorus, and chemical oxygen demand. Using a cellular structure, runoff, sediment, and chemical variables from the watershed provide input to a take model. This one-dimensional model of water bodies simulates temperature stratification, mixing by wind, sedimentation, inflow density current, and algal growth. Unsteady advection-diffusion equations characterize the dynamics of suspended sediment, soluble and sediment-attached N and P, and chlorophyll. This model, AGNPS-LAKE, is driven by random generation of weather conditions on a daily basis. Resulting impacts of alternative management plans are simulated by changing agricultural practices and land use, thereby modifying inflow characteristics to a lake. Modeling capabilities are being tested on eutrophic lakes in Minnesota
for the purpose of simulating long-term trends and impacts of best management practices.


Language: English

Descriptors: Runoff water; Agricultural chemicals; Sediment; Nutrients; Pesticides; Models; Hydrology


Language: English

Descriptors: Water


Language: English

Descriptors: U.S.A.; Groundwater; Groundwater pollution; Pollutants; Movement in soil; Transport processes; Seepage; Soil water content; Simulation; Probabilistic models; Deterministic models; Comparisons

National Park Service activities outside park borders have caused damage to resources and will likely cause more: report to the chairman, Subcommittee on National Parks, Forests, and Public Lands, Committee on Natural Resources, House of Representatives. Activities outside park borders have caused damage to resources and will likely cause more
United States. General Accounting Office; United States, Congress, House, Committee on Natural Resources, Subcommittee on National Parks, Forests, and Public Lands

Language: English; English

Descriptors: National parks and reserves; Transboundary pollution; Nonpoint source pollution

104 NAL Call. No.: TD424.8.N65

Language: English; English

Descriptors: Nonpoint source pollution; Water quality; Watershed management

105 NAL Call. No.: QH540.N3

Language: English

Descriptors: Nebraska; Nitrate; Nitrate fertilizers; Groundwater pollution; Groundwater recharge; Farmland; Simulation models

106 NAL Call. No.: 290.9 Am32P

Language: English

Descriptors: Shellfish; Food sanitation; Water pollution; Fecal flora; Epidemiology; Foodborne diseases; Literature reviews; Zoonoses

Abstract: Many of the microorganisms pathogenic to both animals and man are transmitted via the fecal-oral route. Most of these pathogens could conceivably be transmitted through a shellfish vector. Bacteria potentially transmitted from animal to man via shellfish include most of the salmonellae, Yersinia enterocolitica, Yersinia pseudotuberculosis, Escherichia coli 0157:H7, Campylobacter jejuni, and Listeria monocytogenes. The protozoa most likely to be transmitted this way are Giardia lamblia and Cryptosporidium spp. Because the enteric viruses are highly species-specific, they are not likely to be transmitted from animals to humans. There are environmental data showing that bacterial pathogens shed by both domestic and wild animals have been isolated from shellfish. However, there is little epidemiological evidence that illness outbreaks have been caused by shellfish harvested from waters polluted by animals. Unfortunately, epidemiological observations are of limited value because most illnesses are probably not recorded. In addition, more than half of the recorded outbreaks are of unknown etiology, and more than half of the shellfish implicated in illness outbreaks cannot be traced to their points of origin. More lenient bacteriological standards should not be established for waters affected only by animal pollution until health effects studies have been performed, and an indicator that differentiates between human and nonhuman fecal pollution is available. Most of the pollution that originates from domestic animals could be eliminated by simple and inexpensive measures.
Nonpoint source evaluation for shellfish contamination in the Santa Barbara Channel.
Kolb, H.E.; LaBuddle, G.

Language: English
Descriptors: California; Cabt; Shellfish; Microbial contamination; Pollution; Sources; Water pollution

Nonpoint source news-notes. Nonpoint source news-notes
Terrene Institute
v. ; 28 cm. Description based on: #29 (May 1993); title from caption.

Language: English; English
Descriptors: Nonpoint source pollution; Water quality; Watershed management

Nonpoint source (NPS) pollution modeling using models integrated with geographic information systems (GIS).

Language: English
Descriptors: U.S.A.; Cabt; Pollution; Sources; Watersheds;
Nonpoint source phosphorus loads to Delaware's lakes and streams. Ritter, W.F.
New York, N.Y. : Marcel Dekker; 1992 May.

Language: English

Descriptors: Delaware; Lakes; Rivers; Water pollution; Phosphorus; Watersheds; Farmland; Forest soils

Nonpoint source pollution.. Nonpoint source
Doyle, Paul; Morandi, Larry B.
National Conference of State Legislatures

Language: English; English

Descriptors: Water quality management; Water, Underground; Water

Phillips, D.L.; Hardin, P.D.; Benson, V.W.; Baglio, J.V.

Language: English

Descriptors: Illinois; Cabi; Erosion; Carbon; Nutrient balance; Rotations; Water pollution; No-tillage; Alternative farming; Innovation adoption; Simulation models; Zea mays; Glycine max; Crop yield; Nitrogen; Phosphorus; Runoff

Nonpoint source pollution model for agricultural watersheds.
Borah, D.K.; Ashraf, M.S.
Nonpoint sources.
Spooner, J.; Coffey, S.W.; Brichford, S.L.; Arnold, J.A.; Smolen, M.D.; Jennings, G.D.; Gale, J.A.

Language: English

Descriptors: Water pollution; Groundwater; Surface water; Land use; Activity; Agricultural land; Forest soils; Urban areas; Economics; Planning; Water quality; Water resources; Models; Reviews

Nonpoint sources.
Line, D.E.; Osmond, D.L.; Coffey, S.W.; Arnold, J.A.; Gale, J.A.; Spooner, J.; Jennings, G.D.

Language: English

Descriptors: Water pollution; Soil pollution; Water quality; Water resources; Pollutants; Pesticides; Biodegradation; Pollution control; Models; Monitoring; Literature reviews

Nutrient losses through tile drains from two potato fields.
Madramootoo, C.A.; Wiyo, K.A.; Enright, P.

Language: English

Descriptors: Quebec; Solanum tuberosum; Agricultural soils; Tile drainage; Nutrients; Losses from soil; Water pollution; Water quality

Abstract: Two tile-drained potato (Solanum tuberosum L.) fields, approximately 5 ha (12.35 ac) each, at St. Leonard d’Aston, Quebec, were instrumented to measure tile drain flow over two growing seasons (April to November). The soil type was a St. Jude sandy loam. Nitrogen (N), phosphorus (P), and
potassium (K) concentrations in tile drain flow were monitored throughout the growing seasons. Nitrogen concentrations ranging from 1.70 to 40.02 mg/L were observed. Phosphorus concentrations ranged from 0.002 to 0.052 mg/L. On one field, it was found that K concentrations were always less than 10 mg/L. However, on the other field, concentrations were mostly greater than 10 mg/L. At the end of the growing season, in the final year of the project, the total amounts of N which were removed by the subsurface drainage systems of the two fields were 14 kg/ha (12.5 lb/ac) and 70 kg/ha (62.5 lb/ac).

Okonomiske analyser av tiltak mot fosforavrenning fra dyrket mark = Economic analyses of measures against phosphorus runoff from nonpoint agricultural sources.

Johnsen, Fred Hakon
As, Norge : Statens fagtjeneste for landbruket, ; 1990.
118 p. : ill. ; 25 cm. (Norsk landbruksforsking = Norwegian agricultural research. Supplement ; no. 7). Summary and abstract in English. Includes bibliographical references (p. 113-118).

Language: Norwegian

Opus: an integrated simulation model for transport of nonpoint-source pollutants at the field scale: volume I. Documentation.

Smith, R.E.

Language: English

Descriptors: Pollution; Pollutants; Transport processes; Movement in soil; Hydrology; Computer simulation; Simulation models; Water flow; Meteorological factors; Growth models

Paired watershed study design.

Clausen, John C.; Spooner, Jean

Language: English

Descriptors: Watersheds; Water quality; Nonpoint source
Partitioning solute transport between infiltration and overland flow under rainfall.
Havis, R.N.; Smith, R.E.; Adrian, D.D.
Includes references.

Abstract: Solute transport from soil to overland flow is an important source of nonpoint pollution and was investigated through tracer studies in the laboratory and at an outdoor laboratory catchment. The depth of surface water interaction with soil, defined as the mixing zone, is a useful value for approximate estimation of potential solute transport into surface water under rainfall. It was measured in the laboratory for a noninfiltration case (0.90 to 1.0 cm) and estimated through mass balance modeling for an infiltration case (0.52 and 0.73 cm). At an outdoor laboratory catchment, mixing zones were calculated through calibration of a numerical model that describes unsteady, uniform, infiltration and chemical transport. Overland flow was simulated using kinematic wave theory. Mixing zone depths ranged from 0.47 to 1.02 cm and were a linear function of rainfall intensity. Also, the fraction of solute present in the mixing zone at the time of ponding which was extracted into overland flow was a linear function of the initial soil moisture content. A steady state analytical approximation of the solute transport model was also developed which overpredicted solute transport into overland flow by 1 to 60%.

Patterns of periphyton chlorophyll a in an agricultural nonpoint source impacted stream.
Delong, M.D.; Brusven, M.A.
Includes references.

Abstract: An agricultural nonpoint source polluted stream in northern Idaho was examined to determine seasonal and longitudinal patterns of periphyton chlorophyll alpha. Chlorophyll alpha was measured at eight sites along Lapwai
Creek, a fifth order stream impacted by agricultural runoff containing nutrients and eroded soils. Seasonally, periphyton chlorophyll alpha was lowest in the spring (cumulative average = 60.4 mg m\(^{-2}\)) and highest in the summer (cumulative average = 222 mg m\(^{-2}\)). Winter concentrations were higher than expected (cumulative average = 168.6 mg m\(^{-2}\)). The headwaters, flowing through an open grassy meadow, had the lowest concentrations of the study (two-year average = 49.7 mg m\(^{-2}\)). Immediately below a small, eutrophic reservoir, periphyton chlorophyll alpha increased markedly (two-year average = 155.8 mg m\(^{-2}\)) and remained high through a deep canyon (two year average = 135.5 mg m\(^{-2}\)) and down to the mouth of the stream (two-year average = 172.3 mg m\(^{-2}\)). Periphyton chlorophyll alpha in Lapwai Creek was at least two times greater than values reported in the literature for comparable, undisturbed Idaho streams. We suggest that increased nutrient concentrations via agricultural nonpoint source pollution and increased light penetration from the removal of large, woody riparian vegetation have resulted in high periphyton chlorophyll alpha along the continuum of Lapwai Creek.

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Pesticide concentration patterns in agricultural drainage networks in the Lake Erie basin.
Richards, R.P.; Baker, D.B.
Language: English
Descriptors: Ohio; Pesticides; Water pollution; Trends; Agricultural land; Watersheds; Rivers; Runoff; Storms; Chemical properties; Application methods; Temporal variation; Variation; Pollutants; Land use; Water quality

128

Pesticide residues in ground water of the San Joaquin Valley, California. Domagalski, J.L.; Dubrovsky, N.M.
Language: English
Descriptors: California; Groundwater; Groundwater pollution; Pesticides; Pesticide residues; Leaching; Agricultural soils; Soil properties
Abstract: A regional assessment of non-point-source contamination of pesticide residues in ground water was made of the San Joaquin Valley, an intensively farmed and irrigated structural trough in central California. About 10% of the total pesticide use in the USA is in the San Joaquin Valley. Pesticides detected include atrazine, bromacil, 2,4-DP,
diazinon, dibromochloropropane, 1,2-dibromoethane, dicamba, 1,2-dichloropropane, diuron, prometon, prometryn, propazine and simazine. All are soil applied except diazinon. Pesticide leaching is dependent on use patterns, soil texture, total organic carbon in soil, pesticide half-life and depth to water table. Leaching is enhanced by flood-irrigation methods except where the pesticide is foliar applied such as diazinon. Soils in the western San Joaquin Valley are fine grained and are derived primarily from marine shales of the Coast Ranges. Although shallow ground water is present, the fewest number of pesticides were detected in this region. The fine-grained soil inhibits pesticide leaching because of either low vertical permeability or high surface area; both enhance adsorption on to solid phases. Soils of the valley floor tend to be fine grained and have low vertical permeability. Soils in the eastern part of the valley are coarse grained with low total organic carbon and are derived from Sierra Nevada granites. Most pesticide leaching is in these alluvial soils, particularly in areas where depth to ground water is less than 30 m. The areas currently most susceptible to pesticide leaching are eastern Fresno and Tulare Counties. Tritium in water molecules is an indicator of aquifer recharge with water of recent origin. Pesticide residues transported as dissolved species were not detected in non-tritiated water. Although pesticides were not detected in all samples containing high tritium, these samples are indicative of the presence of recharge water that interacted with agricultural soils.

129 NAL Call. No.: TD420.A1P7
Phosphorus export from nonpoint sources in the Berg River, Western Cape Province, South Africa.
Bath, A.J.; Marais, G.V.R.

Language: English

Descriptors: South Africa; Cabt; River water; Water pollution; Phosphorus; Pollution; Sources; Models

130 NAL Call. No.: QH540.J6
Phosphorus loads from selected watersheds in the drainage area of the Northern Adriatic Sea.
Vighi, M.; Soprani, S.; Puzzarini, P.; Menghi, G.

Language: English
Abstract: The Po Valley is one of the most productive agricultural areas in Europe and P losses from fertilizers are often accused of being among the main factors responsible for eutrophication of the Northern Adriatic Sea. To quantify nonpoint phosphorus loads in this area, 15 small watersheds were studied. Thirteen watersheds were in the intensive agricultural area near the coast and two watersheds were in the forested mountains. Land use in the watersheds was carefully examined and P loads from various sources were theoretically evaluated and experimentally measured. The results indicate fertilization does not increase the losses of P through leaching from the coastal soils, where the measured release were in the range 0.03 to 0.21 kg P/ha per year with a mean value of about 0.1 kg P/ha per year. There is, however, a greater loss of P through soil erosion from the mountain watersheds (0.6 kg/ha per year). It can be concluded that the control of point sources must take priority over nonpoint sources in efforts to reduce accelerated eutrophication of the Northern Adriatic Sea.
Abstract: In programs for trading pollution abatement between point and nonpoint sources, the trading ratio specifies the rate at which nonpoint source abatement can be substituted for point source abatement. The appropriate value of this ratio is unclear because of qualitative differences between the two classes of sources. To identify the optimal trading ratio, we develop and analyze a model of point/nonpoint trading. We find the optimal trading ratio depends on the relative costs of enforcing point versus nonpoint reductions and on the uncertainty associated with nonpoint loadings. The uncertainty does not imply a lower bound for the optimal trading ratio.

Abstract: The growing problem of nonpoint source ground water pollution management, and agricultural research.

Abstract: The growing problem of nonpoint source ground water pollution management, and agricultural research.
contamination from agricultural chemicals is conceptualized as an historical outcome of the production environment of capitalist agriculture in the Corn Belt. Chronic overproduction and ground water contamination reveal different aspects of the same technological treadmill. The debate over Iowa's 1987 Ground Water Protection Act symbolizes the contradiction between popular demand for clean water and structural limits on policymaking. Although the Act does provide for expanded research, education, and monitoring, a coalition of commercial farmers, local chemical dealers, and the national chemical industry defeated a tax on pesticide use. Analysis of alternate policy responses—Best Management Practices (BMPs), cross compliance, site-specific regulation of chemical use, and taxation of synthetic chemicals—reveals that all tend to founder on the same structural constraints. Without practical, profitable, low-input technologies that farmers, over time, would choose to adopt, both voluntary and regulatory approaches encounter major political or implementation difficulties. The public agricultural research agenda, therefore, emerges as a central control variable for ground water quality management and a central focus for political struggle.

136  NAL Call. No.: DISS 91-12,446
Poplar tree buffer strips grown in riparian zones for biomass production and nonpoint source pollution control.
Licht, Louis Arthur
1990; 1990.
xviii, 173 leaves : ill., maps ; 28 cm. Includes bibliographical references (leaves 166-173).

Language: English

Descriptors: Water quality management; Biomass energy; Soils; Riparian flora

137  NAL Call. No.: HD101.S6
Probabilistic cost effectiveness in agricultural nonpoint pollution control. McSweeney, W.T.; Shortle, J.S.

Language: English

Descriptors: Virginia; Maize; Soybeans; Wheat; Nitrogen; Pollution by agriculture; Water pollution; Runoff control; Water composition and quality; Farm management; Watersheds; Cost analysis; Tillage; No-tillage; Linear programming; Probabilistic models; Case studies

Abstract: Conceptual weaknesses in the use of costs of average abatement as a measure of the cost effectiveness of agricultural nonpoint pollution control are examined. A
probabilistic alternative is developed. The focus is on methods for evaluating whole-farm pollution control plans rather than individual practices. As a consequence, the analysis is presented in a chance-constrained activity analysis framework because activity analysis procedures are a practical and well developed device for screening farm plans. Reliability of control is shown to be as important as reduction targets in designing farm plans for pollution control. Furthermore, broad-axe prescriptions of technology in the form of Best Management Practices may perform poorly with respect to cost effectiveness.


Abstract: A conceptual framework of politics is set forth in relation to the federal environmental legislative process. This framework for analysis is then related to a hypothetical public problem--ground water pollution from agricultural chemicals. The public problem from the perspective of political analysis is found to involve several different types...
of difficult issues with which the legislative process must deal if legislation is to be enacted.

144
Proceedings the National RCWP Symposium : 10 years of controlling agricultural nonpoint source pollution : the RCWP experience : September 13-17, 1992, Orlando, Florida.
Language: English
Descriptors: Water quality; Water; Water-supply, Rural

145
Production systems to reduce nonpoint source pollution.
Donald, J.O.; Martin, J.B.; Gilliam, C.H.
Language: English
Descriptors: Alabama; Poultry manure; Agricultural wastes; Composting; Feed supplements; Pollution; Waste utilization

146
Language: English; English
Descriptors: Coastal zone management; Water; Marine pollution
147
Quantifying soil erosion for the Shihmen Reservoir watershed, Taiwan. Lo, K.F.A.

Language: English
Descriptors: Taiwan; Cabt; Watersheds; Erosion; Sediment; Nutrients; Flow; Transport processes; Sediment yield; Simulation models

148
Regional assessment of nonpoint-source pesticide residues in ground water, San Joaquin Valley, California.
Domagalski, Joseph L.; Dubrovsky, N. M.
v, 64 p.: ill., maps ; 28 cm. (Water-resources investigations report ; 91-4027 Regional aquifer-system analysis). Includes bibliographical references (p. 38-41).

Language: English
Descriptors: Water, Underground; Pesticides

149
Edwards, Rick; Partee, Grover; Fleming, Fred

Language: English
Descriptors: Nonpoint source pollution; Watershed management

150
Regulation and perceived compliance: nonpoint pollution reduction programs in four states.
Floyd, D.W.; MacLeod, M.A.

Language: English
The regulation of non-point source pollution under imperfect and asymmetric information.
Cabe, R.; Herriges, J.A.

Abstract: This paper develops a Bayesian framework for discussing the role of information in the design of non-point-source pollution control mechanisms. An ambient concentration tax is examined, allowing for spatial transport among multiple zones. Imposition of the tax requires costly measurement of concentrations in selected zones, and the selection of zones for measurement must be undertaken without perfect information regarding several parameters of the problem. Potentially crucial information issues discussed include: (a) the impact of asymmetric priors regarding fate and transport. (b) the cost of measuring ambient concentration, and (c) the optimal acquisition of information regarding fate and transport.

Language: English
Descriptors: U.S.A.; Water quality; Pollution control; Water management


Language: English
Descriptors: Groundwater; Groundwater pollution; Models; Leaching; Assessment


Language: English
Descriptors: Water; Water, Underground

Reviving the Chesapeake Bay. Comis, D. Washington, D.C. : The Service; 1990 Sep. Agricultural research - U.S. Department of Agriculture,
Risk considerations in the reduction of nitrogen fertilizer use in agricultural production.
Lambert, D.K.

River salination due to non-point contribution of irrigation return flow in the Breede River, Western Cape Province, South Africa.
Flugel, W.A.

Rural conservation practices for cleaner water.
Linquist, Perry; Korb, Gary; Katona, Juli

Rural conservation practices for cleaner water.
Linquist, Perry; Korb, Gary; Katona, Juli
Salicaceae family trees in sustainable agroecosystems.
Licht, L.A.
Ottawa : Canadian Institute of Forestry; 1992 Apr.

Language: English

Descriptors: Iowa; Salicaceae; Populus; Sustainability; Strip cropping; Groundwater; Water quality; Nitrates; Nitrogen; Nutrient uptake; Ecosystems

Abstract: Research at the University of Iowa is testing the ECOLOTREE BUFFER, a prototype wooded buffer strip planted between a creek and row-cropped land with roots grown intentionally deep enough to intersect the near-surface water table. This project demonstrates that Populus spp. trees cultured by using this technique are both ecologically sustaining and productive. Measured data prove that nitrate is removed from near-surface groundwater and that the nitrogen uptake is present as protein in the leaves and the woody stems. The tree's physiological attributes contribute to a harvested value that can "pay its way"; these include fast wood growth, cut-stem rooting, resprouting from a stump, phreatophytic roots, and a high protein content in the leaves. The wooded riparian strip changes the local agroecosystem by reducing fertilizer nutrients causing surface water eutrophication, by diversifying wildlife habitat, by reducing soils erosion caused by wind and water, by diversifying the crop base, by creating an aesthetic addition in the landscape. This idea is a potential technique for managing non-point source pollutants created by modern farming practices.

Language: English

Descriptors: Georgia; Cabt; Coastal plain soils; Agricultural soils; Phosphorus; Losses from soil; Runoff; Water pollution

164 NAL Call. No.: QD241.T6
Septic tank and agricultural non-point source pollution within a rural watershed.

Language: English

Descriptors: Texas; Water pollution; Watersheds; Reservoirs; Rural areas; Septic tank effluent; Pollution by agriculture; Chemical analysis; Ammonia; Phosphates; Fecal coliforms; Streptococcus; Aerial photography

165 NAL Call. No.: aZ5071.N3

Language: English

Descriptors: Simulation models; Agricultural chemicals; Water quality; Bibliographies

166 NAL Call. No.: aZ5071.N3

Language: English

Descriptors: Simulation models; Information systems; Groundwater pollution; Agricultural chemicals; Bibliographies
Simulation of sediment and plant nutrient losses by the CREAMS water quality model.
Yoon, K.S.; Yoo, K.H.; Soileau, J.M.; Touchton, J.T.
Bethesda, Md. : American Water Resources Association; 1992
Nov. Includes references.

Language: English

Descriptors: Alabama; Gossypium hirsutum; Conservation tillage; Tillage; Erosion; Runoff; Nitrogen; Phosphorus; Losses from soil; Water quality; Water pollution; Catchment hydrology; Simulation models; Prediction

Abstract: CREAMS was applied to a field-sized watershed planted to cotton in the Limestone Valley region of northern Alabama. The field was cultivated for three years with conventional tillage (CvT) followed by three years of conservation tillage (CsT). CREAMS is composed of three components: hydrology, erosion, and chemistry. Surface runoff and losses of sediment, N and P were simulated and results were compared with the observed data from the watershed. Curve numbers recommended in the CREAMS user's guide were not adequate for the watershed conditions. The hydrology submodel improved runoff simulation from CvT and CsT when field-data based curve numbers were used. The erosion submodel demonstrated that CsT reduced sediment loss more than CvT, even though CsT had higher runoff than CvT. The nutrient submodel based on the simulated runoff and sediment underpredicted N loss for both CvT and CsT. This submodel, however, accurately predicted P loss for CvT, but underpredicted for CsT (50 percent lower than the observed). The results of CREAMS simulation generally matched the observed order of magnitude for higher runoff, lower sediment, and higher N and P losses from CsT than from CvT.

Soil information related to nonpoint pollution.
Miller, G.A.
PM - Iowa State University, Cooperative Extension Service v.): 6 p.; 1992 Sep.

Language: English

Descriptors: Iowa; Soil types; Soil parent materials; Soil texture; Erodibility; Profiles; Soil surveys; Topsoil; Characteristics; Environmental factors

A spatial decision support system for assessing agricultural nonpoint source pollution.
Srinivasan, R.; Engel, B.A.
Abstract: A spatial decision support system (SDSS) was developed to assess agricultural nonpoint source (NPS) pollution using an NPS pollution model and geographic information systems (GIS). With minimal user interaction, the SDSS assists with extracting the input parameters for a distributed parameter NPS pollution model from user-supplied GIS base layers. Thus, significant amounts of time, labor, and expertise can be saved. Further, the SDSS assists with visualizing and analyzing the output of the NPS pollution simulations. Capabilities of the visualization component include displays of sediment, nutrient, and runoff movement from a watershed. The input and output interface techniques/algorithms used to develop the SDSS, along with an example application of the SDSS, are described.

Language: English; English

Descriptors: Forest management; Forests and forestry


Language: English

Descriptors: Sustainability; Farming; Farming systems; Natural resources; Use efficiency; Pollution control


Language: English

Descriptors: Ontario; Pollution by agriculture; Erosion; Sedimentation; Losses from soil systems; Erosion control; Soil and water conservation; Sediments; Watersheds; Upland areas; Lowland areas; Computer software


Language: English

Descriptors: Water quality; Pollution

176 NAL Call. No.: 282.9 G7992
Task force findings and recommendations for enhancing Great Plains water quality.
Lacewell, R.D.

Language: English

Descriptors: Northern plains states of U.S.A.; Southern plains states of U.S.A.; Groundwater; Surface water; Water quality; Environmental impact; Water pollution; Water policy

177 NAL Call. No.: 275.9 N213
Teaching soil conservation and non-point source pollution.
Dickinson, W.T.; Rudra, R.P.; Wall, G.J.

Language: English

Descriptors: Agricultural education; Teaching; Soil conservation; Simulation models; Soil pollution

178 NAL Call. No.: TD420.A1P7
Technical guidance for implementing BMPS in the Coastal zone.
Frederick, R.E.; Dressing, S.A.

Language: English

Descriptors: U.S.A.; Cabt; Water pollution; Coastal areas; Technical aid; Guidelines; Pollution; Sources

179 NAL Call. No.: TD224.I2R63 1991
Ten year report.. Rock Creek Rural Clean Water Program final
Terrain analysis: integration into the agricultural nonpoint source (AGNPS) pollution model.
Panuska, J.C.; Moore, I.D.; Kramer, L.A.

Language: English
Descriptors: Terrain; Pollution; Water quality; Erosion; Computer simulation

Three types of approaches to controlling non-point source pollution of agrochemicals from golf links in water resources management. Morioka, T.
Toxicity of sediments containing atrazine and carbofuran to larvae of the midge Chironomus tentans. 
Douglas, W.S.; McIntosh, A.; Clausen, J.C. 
Tarrytown, N.Y. : Pergamon Press; 1993 May. 

A tracking index for nonpoint source implementation projects. 
Dressing, S.A.; Clausen, J.C.; Spooner, J. 

Use of the Black Creek database to analyze techniques for estimating nonpoint source loadings from small watersheds (May 1988). 
Morrison, James; Christensen, Ralph G. 

Using the phosphorus assessment tool in the field. 
Stevens, R.G.; Sobecki, T.M.; Spofford, T.L. 
Abstract: The AGNPS (Agricultural NonPoint Source) model was evaluated for predicting runoff and sediment delivery from small watersheds of mild topography. Fifty sediment yield events were monitored from two watersheds and five nested subwatersheds in East Central Illinois throughout the growing season of four years. Half of these events were used to calibrate parameters in the AGNPS model. Average calibrated parameters were used as input for the remaining events to obtain runoff and sediment yield data. These data were used to evaluate the suitability of the AGNPS model for predicting runoff and sediment yield from small, mild-sloped watersheds. An integrated AGNPS/GIS system was used to efficiently create the large number of data input changes necessary to this study. This system is one where the AGNPS model was integrated with the GRASS (Geographic Resources Analysis Support System) GIS (Geographical Information System) to develop a decision support tool to assist with management of runoff and erosion from agricultural watersheds. The integrated system assists with the development of input GIS layers to AGNPS, running the model, and interpretation of the results.

Language: English

Descriptors: Water; Water quality


Language: English

Descriptors: Mississippi; Water quality; Agricultural production; Agricultural land; Environmental impact; Environmental degradation; Water pollution; Pollutants; Sediment; Nutrients; Pesticides; Coliform bacteria; Losses from soil systems; Soil conservation; Water conservation; Erosion control; Runoff; Eutrophication; Animal wastes; Waste treatment; Case studies


Language: English

Descriptors: Water quality; Pollution
Water quality effects and nonpoint source control for forestry
an annotated bibliography.
Craig, John
United States, Environmental Protection Agency, Office of
Wetlands, Oceans, and Watersheds, Nonpoint Source Control
Branch, Tetra Tech, inc Washington, DC : Nonpoint Source
Control Branch, Office of Wetlands, Oceans, and Watersheds,
U.S. Environmental Protection Agency; 1993. ii, 241 p. ; 28
"EPA-841/B-93-005"--Cover.
Language: English
Descriptors: Water quality; Forests and forestry

Water quality impacts associated with sorghum culture in
Southern Plains. Sharpley, A.N.; Smith, S.J.; Williams, J.R.;
Jones, O.R.; Coleman, G.A. Madison, Wis. : American Society of
Jan. Includes references.
Language: English
Descriptors: Sorghum bicolor; Nitrogen fertilizers; Phosphorus
fertilizers; Runoff; Sediment; Surface water; Tillage;
Transport processes; Water pollution; Water quality;
Watersheds; Environmental impact; Eutrophication

Water quality management tools for national and western
nonpoint source control.
Dean, R.
Fort Collins, Colo. : Rocky Mountain Forest and Range
Experiment Station, Forest Service, U.S. Department of
series analytic: Riparian management: common threads and
shared interests. Paper presented at a conference on Feb. 4-6,
1993, Albuquerque, New Mexico.
Language: English
Descriptors: U.S.A.; Cabt; Water pollution; Environmental
policy; Finance; Regulations
Zelivka river storage and treatment complex supplying the Prague Agglomeration with drinking water: addressing point and non-point pollution problems. Chour, V.; Holas, J.; Korab, J.; Srb, O.

Language: English

Descriptors: Czechoslovakia; Cabt; River water; Reservoirs; Water pollution; Sources; Eutrophication; Agricultural land

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June 1993

United States Department of Agriculture
National Agricultural Library
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