Evaluation of Agricultural Best Management Practices (I)

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EVALUATION OF AGRICULTURAL BEST MANAGEMENT PRACTICES

1 NAL Call. No.: TD172.J61
Agrichemical placement impacts on alachlor and nitrate movement through soil in a ridge tillage system. 
Clay, S.A.; Clay, D.E.; Koskinen, W.C.; Malzer, G.L. 
Journal of environmental science and health : Part B : 

Language: English 

Descriptors: Alachlor; Nitrates; Placement; Movement in soil; 
Ridging; Tillage; Lysimeters; Leachates; Rainfall simulators; 
Surface water; Water flow; Profiles; Downward movement 

2 

Agrochemical trends and the fate of pesticides. 
Menn, J.J. 
Oakland : University of California, Division of Agriculture and Natural Resources; 1987. 

Language: English 

Descriptors: Pesticides; Pesticide persistence; Pesticide residues; Environmental pollution; Integrated pest management 

3 

Assessing and managing agricultural nitrogen losses to the environment. Smith, S.J.; Schepers, J.S.; Porter, L.K. 
New York, N.Y. : Springer-Verlag; 1990. 

Language: English 

Descriptors: Nitrogen; Nitrogen cycle; Losses from soil systems; Groundwater pollution; Eutrophication; Air pollution; 
Volutilation; Ammonia; Nitrous oxide; Nitric oxide; Nitrogen dioxide; Nitrogen fertilizers; Use efficiency; Movement in soil; Leaching; Tile drainage; Runoff; Water erosion; Wind erosion; Conservation tillage; Soil conservation; Irrigation; 
Nutrient availability; Ammonium; Environmental impact; Research; Literature reviews 

4 

An assessment of Great Lakes tillage practices and their potential impact on water quality. 
Logan, T.J. 
Effects of conservation tillage on groundwater quality : nitrates and pesticides / edited by Terry J. Logan ... [et

Language: English

Descriptors: North central states of U.S.A.; Tillage; Water composition and quality; Fodder crops; Rotations

Basic hydrologic studies for assessing impacts of flow diversions on riparian vegetation: examples from streams of the Eastern Sierra Nevada, California, USA. Kondolf, G.M.; Webb, J.W.; Sale, M.J.; Felando, T.
New York: Springer-Verlag; 1987 Nov.

Language: English

Descriptors: California; Riparian vegetation; Stream flow; Losses; Hydrological data; Hydroelectric schemes; Geomorphology

Basin scale assessment of best management practices. Heatwole, C.D.; Bottcher, A.B.; Baldwin, L.B.

Language: English

Descriptors: Florida; Water management; Water composition and quality; Crop husbandry; Animal husbandry; Practice; Simulation models

Basin scale model for evaluating best management practice implementation programs.
Heatwole, C.D.; Bottcher, A.B.; Baldwin, L.B.

Language: English

Descriptors: Florida; River basins; Watersheds; Pastures; Cattle husbandry; Fencing; Watershed management; Grids; Simulation models; Nitrogen; Phosphorus; Losses; Runoff; Water composition and quality
8
Best management practices impacts on water quality in the appoquinimink watershed.
Ritter, W.F.; Chirnside, A.E.M.; Lake, R.W.
Language: English
Descriptors: Water composition and quality; Groundwater pollution; Farmland; Soil chemistry; Phosphorus; Nitrates; Atrazine; Erosion; Farm management; Improvement

9
Best management practices to reduce runoff of pesticides into surface water : a review and analysis of supporting research.
Language: English
Descriptors: Pesticides; Agricultural pollution; Water

10
BMP effectiveness evaluation using AGNPS and a GIS.
Language: English
Descriptors: Water quality; Watershed management; Hydrology; Simulation models

Language: English

Descriptors: Texas; Clay loam soils; Infiltration; Chiselling; Dikes; Furrows; Ponding; Rain; Impact; Kinetic energy; Surface layers; Crusts; Hydraulic conductivity; Water conservation

Abstract: Chisel tillage and furrow dikes (small earthen dams constructed in the furrow) are commonly used to increase infiltration and soil water storage in semiarid regions. Data quantifying the combined influences of these practices are limited. Our objective was to determine the effects of chisel tillage, furrow dikes (with and without ponding), and drop impact or surface crusts on infiltration. Infiltration rate (IR) and cumulative infiltration (CI) into an Olton day loam (fine, mixed, thermic Aridic Paleustoll) were measured by applying water at 65 and 80 mm h⁻¹ for 1 h using a rotating-disk-type rainfall simulator. Furrow dikes increased infiltration under both ponded and nonponded conditions. Cumulative infiltration was higher when raindrop impact energy was dissipated and, to some extent, when crusts were removed. Infiltration rate at the end of water application was lower with raindrop impact than when raindrop impact was eliminated; however, there were no differences in the final IR between the initially crusted and uncrusted soils. There were no differences in infiltration between chisel-disk and disk tillage measured during the mid growing season. Furrow dikes not only detain water on the surface to provide more time for infiltration, but also increase infiltration through increased hydraulic head and additional tillage performed during dike installation or by moving loose soil from the furrow into the dikes. Our data do not support using the same hydraulic-conductivity value for both diked and undiked field conditions, which may cause underestimation of conservation in furrow-diked fields.


Language: English

Descriptors: Tillage practices; Soil erosion; Soil conservation; Water pollution; Economic impact; Conservation practices; Yields; Trends

Abstract: Extract: Cropland in minimum tillage rose from 15.8...
percent of all cropland in 1973 to 29.1 percent in 1981. The share for no-till rose from 2.0 to 2.9 percent during the same period. These conservation tillage systems—minimum tillage and no-till—can also reduce soil loss up to 99 percent over conventional tillage. This report looks at trends in the use of various tillage systems and compares their economic impacts and effects on soil and water conservation, crop yields, and pesticide and energy use, using selected results from studies of tillage systems.

13

Computer-assisted analysis of best management practices.
Lanier, A.L.; Westerman, P.W.; Smolen, M.D.

Language: English
Descriptors: Water quality; Water management; Databases; Water pollution

14

Conservation impact a newsletter from the Conservation Technology Information Center.
Conservation Technology Information Center
v. : ill. ; 28 cm. Title from caption.

Language: English; English
Descriptors: Soil conservation; United States; Periodicals; Water conservation; United States; Periodicals; Water quality; United States; Periodicals; Agricultural conservation; United States; Periodicals

15

Conservation practice effects on phosphorus losses from Southern Piedmont watersheds.
Langdale, G.W.; Leonard, R.A.; Thomas, A.W.

Language: English
Descriptors: South eastern states of U.S.A.; Watersheds; Tillage; Phosphorus; Runoff water; Soil and water conservation; Water pollution
Conservation tillage effects on water conservation and runoff: project completion report.
Steichen, James M.; LaForce, Russell W.
United States, Dept. of the Interior, Kansas Water Resources Research Institute.
iii, 22 leaves : ill. ; 28 cm.. (Contribution (Kansas Water Resources Research Institute) ; no. 226.). Project completion report for period October 1, 1979 to December 31, 1981.
Prepared for United States Department of the Interior.
Bibliography: leaf 21.

Language: English

Descriptors: Conservation tillage; Water conservation; Runoff

Considerations for tile drainage-water quality studies in temperature regions. Milburn, P.; MacLeod, J.

Language: English

Descriptors: Water quality; Drainage; Tile drainage; Temperate zones; Crop management; Discharge; Experimental design

Abstract: Experimental designs of 14 subsurface drainage-water quality studies conducted over the past 18 years are reviewed. To more accurately determine mass contaminant flux and processes, more intense monitoring of drain discharge rate and drainage water quality is needed than in most past studies. A recently installed field scale system of subsurface drainage-water quality plots and associated equipment, capable of intense, year round monitoring, is described and preliminary data showing performance of the system is presented. The material presented should be of interest to those planning and designing drainage-water quality studies, or refitting existing drainage installation for water quality investigations.

Controlling toxic chemicals., 1st ed.
Postel, S.

Language: English
Costs of protecting water quality during harvesting on private forestlands in the southeast.
Lickwar, P.; Hickman, C.; Cubbage, F.W.

Language: English

Abstract: Data on harvest volumes, topography, and other site and area characteristics were obtained from 22 timber harvests in Alabama, Florida, and Georgia. An economic analysis was then used to estimate the marginal costs of implementing each state's recommended Best Management Practices (BMPs), as well as a set of enhanced BMPs at these sites. Considering all of the areas combined, the costs of using the recommended BMPs averaged 2.9% of gross timber sale revenue, $2.34 per thousand board feet (mbf) of timber harvested, or $12.45/ac. The cost of implementing the enhanced BMPs averaged 5.1% of gross stumpage value, $4.13/mbf, or $21.94/ac. Seed, fertilizer, and mulch, broad based dips, and water bars were the most expensive practices on a total cost basis. Culvert installation, streamside management zones, and road relocation costs were less expensive for most tracts.

Creams: a system for evaluating best management practices.
Knisel, W.G.; Foster, G.R.; Leonard, R.A.

Language: English

Abstract: Data on harvest volumes, topography, and other site and area characteristics were obtained from 22 timber harvests in Alabama, Florida, and Georgia. An economic analysis was then used to estimate the marginal costs of implementing each state's recommended Best Management Practices (BMPs), as well as a set of enhanced BMPs at these sites. Considering all of the areas combined, the costs of using the recommended BMPs averaged 2.9% of gross timber sale revenue, $2.34 per thousand board feet (mbf) of timber harvested, or $12.45/ac. The cost of implementing the enhanced BMPs averaged 5.1% of gross stumpage value, $4.13/mbf, or $21.94/ac. Seed, fertilizer, and mulch, broad based dips, and water bars were the most expensive practices on a total cost basis. Culvert installation, streamside management zones, and road relocation costs were less expensive for most tracts.
annual application of pig slurry to crop rotation of fodder crops].
Skarda, M.; Jokesova, J.
Language: Czech
Descriptors: Fodder crops; Rotation; Pig slurry; Economic analysis

22 NAL Call. No.: HD156.B55
Economic costs and benefits of degradation and its repair. A. Issues in the economic evaluation of soil and water conservation programs. Seckler, D.
Land degradation and society / Piers Blaikie and Harold Brookfield with contributions by Bryant Allen ... [et al.]... p. 84-96; 1987. This record corrects IND87077735 which was entered incorrectly under call number HD6189.T97.
Language: English
Descriptors: Environmental degradation; Cost benefit analysis; Land productivity; Soil conservation; Water conservation; Program evaluation; Terraces

23 NAL Call. No.: HD6189.T97
Economic costs and benefits of degradation and its repair. A. Issues in the economic evaluation of soil and water conservation programs. Seckler, D.
Tyranny of the household : investigative essays on women's work / edited by Devaki Jain, Nirmala Banerjee. p. 84-96; 1985.
Language: English
Descriptors: Environmental degradation; Cost benefit analysis; Land productivity; Soil and water conservation; Program evaluation; Bench terraces

24 NAL Call. No.: 100 C12CAG
Language: English
Descriptors: California; Crop management; Salinity; Drainage;
High water tables; Economic impact; Yields; Acreage

25 NAL Call. No.: S95.E2
Economic impacts of agriculture technologies that affect water quality. Tauer, L.W.
Language: English
Descriptors: U.S.A.; Pollution by agriculture; Water composition and quality; Economic impact; Minimum tillage systems; Multiple cropping

26 NAL Call. No.: TC401.A5
The economics of silvicultural best management practices. Dissmeyer, G.E.; Frandsen, E.
Bethesda, Md.: The Association; 1988 Nov.
Language: English
Descriptors: U.S.A.; Forest resources; Land resources; Water resource management; Forestry economics; Forest management; Water pollution; Control; Economic analysis

27 NAL Call. No.: 290.9 AM32P
Edge-of-field water quality impacts and costs of best management practices in Pennsylvania. Hamlett, J.M.; Epp, D.J.
Language: English
Descriptors: Pennsylvania; Soil conservation; Erosion control; Runoff; Percolation; Sediment

28 NAL Call. No.: TD428.A37T695 1989
The effect of best management practices on nitrogen transport into Chesapeake Bay. Staver, K.; Brinsfield, R.; Stevenson, J.C.
Denver, Colo.: U.S. Committee on Irrigation and Drainage;

Language: English

Descriptors: Maryland; Water pollution; Coastal areas; Pollution by agriculture; Nitrogen; Leaching; Groundwater pollution; Losses from soil systems; Prevention

29 NAL Call. No.: S604.E35
Effect of conservation tillage on processes affecting nitrogen management. Schepers, J.S.

Language: English

Descriptors: Tillage; Nitrates; Leaching; Groundwater; Water composition and quality

30 NAL Call. No.: FICHE S-72

Language: English

31 NAL Call. No.: FICHE S-72
Effect of land treatment upon flood flow. Chenoweth, J.W.
Paper presented at the 1986 Summer Meeting of the American Society of Agricultural Engineers. Available for purchase from: The American Society of Agricultural Engineers, Order Dept., 2950 Niles Road, St. Joseph, Michigan 49085. Telephone the Order Dept. at (616) 429-0300 for information and prices. Includes references.
Effect of standing small grain stubble on snow cover characteristics in alternate fallow strip cropping.
Carprio, J.M.; Grunwald, G.K.; Snyder, R.D.; Cleary, E.C.
Includes references.

Effect of surface application of polyvinyl alcohol on phosphorus losses in runoff and on corn growth.
Marsh, M.H.; Groenevelt, P.H.

Abstract: Phosphorus loading in surface water bodies due to runoff from cropland is a major concern with respect to water quality. Losses of water, soil, and different forms of P, from five runoff plots treated with polyvinyl alcohol (PVA), were compared to losses from five untreated plots. The plots were on a loam soil with 6.5 to 9.5% slopes. The effect of a single application of PVA was observed over 2 yr under natural rainfall. During the first year after application of PVA, runoff and soil losses were reduced by 56 and 80%, respectively. Extractable P, total P, and dissolved molybdate-reactive P (DMRP) losses were reduced by 79, 75, and 64%, respectively. Corn (Zea mays L.) grain yield on the treated plots was 12% higher than on the control plots. All the above differences were statistically significant. During the second year, in which no tillage occurred and no PVA was applied, total P and DMRP losses were reduced by 42 and 40%, respectively, by the PVA treatment of the previous year. Although runoff and soil loss were lower for the treated plots, these differences were not significant at P = 0.05 (P values were 0.11 and 0.10, respectively).
Effect of tillage on erosion, runoff and runoff water quality.
Daniel, T.C.; Mueller, D.H.; Andraski, B.J.; Springman, R.E.
Publication - University of Wisconsin, Cooperative Extension
Service (G3432): 5 p.; 1988. In subseries: Farm Management &
Water Quality.

Language:  English

Descriptors: Conservation tillage; Erosion control; Runoff;
Water quality; Phosphorus; Water pollution; Manures

Effect of tillage on infiltration and anion leaching.
Baker, J.L.; Kanwar, R.S.; Laflen, J.M.
American Society of Agricultural Engineers (Microfiche
at the 1986 Winter Meeting of the American Society of
Agricultural Engineers. Available for purchase from: The
American Society of Agricultural Engineers, Order Dept., 2950
Niles Road, St. Joseph, Michigan 49085. Telephone the Order
Dept. at (616) 429-0300 for information and prices. Includes
references.

Language:  English

Descriptors: Soil conservation; Plowing; Minimum tillage
systems; Leaching; Nitrates; Groundwater pollution

Effect of tillage on the crop-water production function of
sweet corn in western Oregon.
Petersen, K.L.; Mack, H.J.; Cuenca, R.H.
Alexandria, Va. : American Society for Horticultural Science;
Includes 10 references.

Language:  English

Descriptors: Oregon; Zea mays; Evapotranspiration; Yields; Row
tillage; No-tillage systems

Effect of tillage systems and rainfall patterns on atrazine
distribution in soil.
Sadeghi, A.M.; Isensee, A.R.
Jul. Includes references.
Abstract: High variability of atrazine (2-chloro-4-ethylamino-6-isopropylamino-1,3,5 triazine) residues in soil and shallow groundwater have been reported under various agricultural management systems. This 2-yr study was conducted to evaluate atrazine residue levels in soil as influenced by no-till (NT) vs. conventional-till (CT) under natural rainfall conditions. Atrazine was applied annually (at 1.34 kg/ha), 1 d after corn (Zea mays L.) planting, to two NT and two CT plots. Atrazine residues within the 0- to 10-cm soil depth of CT plots were higher than in the NT plots, regardless of the difference in the rainfall patterns. Higher (ca. 61%) mean atrazine residues in the CT plots over NT plots in 1988 was most likely related to the rainfall that began 12 h after application. In contrast, in 1987, it rained 3 to 4 d after application and the residues in the CT were only 31% higher than in NT. These results indicate that even a subtle difference in rainfall distribution (temporal) can result in marked spatial variability in the distribution of atrazine.
Effectiveness of agricultural best management practices implemented in the Taylor Creek/Nubbin Slough watershed and the Lower Kissimmee River Basin. Gunsalus, B.; Flaig, E.G.; Ritter, G.

The effectiveness of silvicultural nonpoint source control programs for several Southern states.
Ice, G.G.

Effects of a settling basin and tiled infiltration bed on runoff from a paved feedlot.
Edwards, W.M.; Owens, L.B.; White, R.K.; Pausey, N.R.
Discharges; Chemical analysis

43 NAL Call. No.: FICHE S-72
Effects of agricultural best management practices on groundwater in Maryland: study design.
McFarland, E.R.
Language: English
Descriptors: Maryland; Groundwater; Hydrology; Water composition and quality; Groundwater pollution; Agricultural production

44 NAL Call. No.: S604.E35
Effects of conservation tillage on groundwater quality nitrates and pesticides.
Logan, Terry James,
xviii, 292 p. : ill. ; 24 cm. Includes bibliographies and index.
Language: English
Descriptors: Conservation tillage; Environmental aspects; Water, Underground; Quality; Nitrates; Environmental aspects; Pesticides; Environmental aspects

45 NAL Call. No.: QK867.J67
Effects of different management practices on surface water quality from rice fields in south Louisiana.
Language: English
Descriptors: Louisiana; Flooded rice; Fields; Water quality; Mineral content; Nutrient content; Pesticide residues; Surface water; Water management; Cultivation; Flood irrigation; Sediment
Abstract: Water samples collected in the Mermentau River Basin over several years at Louisiana Department of Environmental Quality monitoring sites contained high levels
of total solids and nutrients during the spring that were highly correlated to pre- and post-plant discharges from rice fields. This study was developed to evaluate the potential of selected management practices (MP's) for reducing total solids, nutrients and pesticides from discharge water in order to improve the surface water quality in southwest Louisiana. Five rice plots located on the Rice Research Station in Crowley, LA represented the different MP's to be evaluated. The five water seeding MP's were: a.1-no till; a.2-water cultivation with 30-day settling, a.3-dry cultivation with clear water planting; a.4-mudding-in with vegetated filter, and b-mudding-in (control). Quality of discharged water from rice fields in the Mermentau River Basin was clearly affected by the different MP's. From the first year of data, all the MPa's were better than the mudding-in (MPb). The concentrations of the total solids (kg/ha) in the discharged water (initial + final drain) for the different MP's were in the order: MPb(4860) > MPa.3(3906) > MPa.4(3412) > MPa.2(3068) > MPa.1(1807). The Mpa.3, Mpa.4 and MPb had no detectable amounts of pesticides being released. The 30-day holding period (Mpa.2), clear water planting (Mpa.3) and the mudding-in with vegetated filter (Mpa.4) were similar as far as TDS, TSS and TS with the no-till (Mpa.1) being the least. The 30-day holding period (Mpa.2) and the no-till (Mpa.1) had less nutrients, but more pesticides released. Depending on the priority of the stream problems, different MP's may be more advantageous than others. All of the selected MP's were better than the control (MPb), and therefore, should help to improve water quality.

Effects of manure management and building environments on swine health and productivity.

Language: English
Descriptors: Gilts; Pig housing; Pig slurry; Waste disposal; Environmental factors; Ventilation

Effects of nutrient management on nitrate levels in ground water near Ephrata, Pennsylvania.
Hall, D.W.

Language: English

Language: English

Descriptors: Pennsylvania; Water management; Nutrients; Water quality; Groundwater; Pollution control


Language: English

Descriptors: Pennsylvania; Watersheds; Nutrients; Water management; Water quality


Language: English

Descriptors: Pennsylvania; Groundwater recharge; Aquifers; Farmland; Terracing; Water table


Language: English

Descriptors: Pennsylvania; Runoff water; Terraces; Water quality; Monitoring

52 NAL Call. No.: FICHE S-72
Effects of residue cover on pesticide losses from conventional and no-tillage systems.

Language: English

Descriptors: Atrazine; 2,4-d; Losses; Minimum tillage systems; Crop residues; Rainfall simulators; Runoff water; Water composition and quality

53 NAL Call. No.: S539.5.A77
Effects of risk perceptions and other characteristics of farmers and farm operations on the adoption of conservation tillage practices. Shortle, J.S.; Miranowski, J.A.

Language: English

Descriptors: Farm management; Risks; Tillage; Water pollution

54 NAL Call. No.: 292.9 AM34
Effects of sludge and chemical fertilizer application on runoff water quality. Mostaghimi, S.; Younos, T.M.; Tim, U.S.

Language: English

Descriptors: Virginia; Sludges; Nitrogen fertilizers; Phosphorus fertilizers; Application to land; No-tillage; Tillage; Nitrogen; Phosphorus; Losses from soil systems;
Runoff water; Water quality; Sediment

Abstract: Simulated rainfall was used on experimental field plots to compare the effect of chemical fertilizer and sludge application on sediment, nitrogen, and phosphorus in runoff from no-till and conventional tillage systems. Chemical fertilizer application under the no-till system resulted in the least amount of total N and P in surface runoff. However, sludge application under the no-till system resulted in the least amount of NO3-N and sediment in surface runoff. The worst water quality scenarios were observed when either sludge or chemical fertilizer were surface-applied under a conventional tillage system. Nitrogen losses from the conventional tillage system were minimized when sludge was incorporated into the soil. However, phosphorus and sediment yield from such a system were significantly higher when compared to phosphorus and sediment yield from the no-till system. The results from this study indicate that the use of sludge on agricultural land under a no-till system can be a viable alternative to chemical fertilizer for nitrogen and phosphorus control in runoff. A more cautious approach is recommended when the sludge is incorporated into the soil in a conventional tillage system because of potential for high sediment and phosphorus yield in surface runoff.

Setia, P.; Piper, S.

Language: English

Descriptors: Corn belt of U.S.A.; Maize; Soybeans; Pesticides; Agricultural chemicals; Soil management; Groundwater; Water quality; Leaching; Returns; Tillage; Federal programs; Conservation

Abstract: Economic and physical simulation models were utilized to evaluate the effect of alternative soil and agricultural chemical management systems, implemented under the Conservation Reserve and Conservation Compliance Programs, on pesticides' leaching, and returns to fixed farm resources. Findings of the study show that the selection of appropriate soil and chemical systems may not only increase farm returns but may also result in a significant reduction in leaching and hence ground water degradation.

Madison, C.E.; Blevins, R.L.; Frye, W.W.
Effects of tillage on quality of runoff water.
Baldwin, P.L.; Frye, W.W.; Blevins, R.L.
Includes references.

Effects of tillage on the preferential movement of pesticides.
Gish, T.J.; Isensee, A.R.; Nash, R.G.; Helling, C.S.

Effects on water quality.
Ames, Iowa : The Service; 1990 Nov.
Environmental and economic impacts of pesticide and irrigation practices: EPIC-PST simulation.
Sabbagh, G.J.; Norris, P.E.; Geleta, S.; Bernado, D.J.; Elliott, R.L.; Mapp, H.P.; Stone, J.F.

Language: English
Descriptors: Oklahoma; Groundwater pollution; Crop management; Environmental impact; Economic impact; Pest control; Irrigation; Computer techniques; Simulation models; Pesticides; Movement in soil; Runoff

Environmental effects of limited tillage.
Wauchope, R.D.; McDowell, L.L.; Hagen, L.J.

Language: English
Descriptors: Minimum tillage systems; Water pollution; Air pollution; Erosion; Pesticide residues; Weed control

Environmental impacts of conservation tillage.
Cook, M.G.

Language: English
Descriptors: North Carolina; Tillage; Soil and water conservation; Pesticide residues; Groundwater pollution; Denitrification; Nature conservation; Spraying precautions


Language: English
Descriptors: Tillage; Pollution by agriculture; Pesticides; Systems analysis
Environmental quality constraints and farm-level decision making. Turvey, C.G. 
Language: English 
Descriptors: Ontario; Surface water; Watersheds; Soil compaction; Farm management; Regulations; Environmental impact; Profitability; Costs; Constraints; Rain; Liabilities; Externalities; Decision making

Environmental significance of minimum-tillage. Thomas, G.W. 
Agricultural chemicals of the future : invited papers presented at a symposium held May 16-19, 1983, at the Beltsville Agricultural Research Center (BARC), Beltsville, Maryland / James L. Hilton, edit. p. 411-423; 1985. (Beltsville symposia in agricultural research ; 8). Includes references. 
Language: English 
Descriptors: U.S.A.; Minimum tillage systems; Herbicides; Environmental assessment; Erosion control; Runoff; Leaching; Pollution

Erosion, sediment, and economic effects of conservation compliance in an agricultural watershed. Prato, T.; Wu, S. 
Language: English 
Descriptors: Idaho; Watershed management; Erosion control; Sediment; Tillage; Conservation tillage; Rotations; Contour ridging

Estimated economic impact from adoption of water-related agricultural technology. Ellis, J.R.; Lacewell, R.D.; Reneau, D.R.

Language: English

Descriptors: Economic impact; Water use; Technology; Groundwater; Irrigation systems; Tillage

68 NAL Call. No.: TD223.N36 1992
Estimation of lag time for water quality response to BMPs.
Clausen, J.C.; Meals, D.W.; Cassell, E.A.

Language: English

Descriptors: Vermont; Water quality; Watersheds; Watershed management

69 NAL Call. No.: 100 Or3M no. 817
Evaluating coliform concentrations in runoff from various animal waste management systems.
Moore, James A.
Corvallis, Or. : Agricultural Experiment Stations, Oregon State University; 1988.

Language: English

70 NAL Call. No.: TD428.A37E9
Evaluating nutrient and sediment losses from agricultural lands vegetative filter strips.
Dillaha, T. A.
United States, Environmental Protection Agency, Chesapeake Bay Program, Virginia Polytechnic Institute and State University, Dept. of Agricultural Engineering, Virginia Agricultural Experiment Station, Virginia Polytechnic Institute and State University, Dept. of Agronomy
Annapolis, MD : U.S. Environmental Protection Agency, Region III, Chesapeake Bay Liaison Office; 1987.
xii, 93 p. : ill. , form ; 28 cm. (CBP/TRS ; 4/87). Project number X-00315-01-0. This study was conducted in cooperation with the Virginia Polytechnic Institute and State University Departments of Agricultural Engineering and Agronomy and the Virginia Agricultural Experiment Station. "Chesapeake Bay Program"--Cover. Includes bibliographical references (p. 67-70).
Evaluating the effectiveness of BMPs (Best Management Practices) from field studies (Controlling water quality problems).
Baker, J.L.; Johnson, H.P.

Evaluation of best management practices for controlling nonpoint pollution from silvicultural operations.
Lynch, J.A.; Corbett, E.S.

Evaluation of best management practices to control phosphorus nonpoint source pollution.
Rousseau, A.; Dickinson, W.T.; Rudra, R.P.

Evaluation of management practices to control agricultural pollutants.
McTernan, W.F.; Weand, B.L.; Grizzard, T.J.
Descriptors: Virginia; Watersheds; Pollution by agriculture; Land use; Minimum tillage systems; Crop management; Mathematical models; Water pollution; Runoff; Agricultural land


Language: English

Descriptors: Sewage sludge; Soil amendments; Nitrogen; Nutrient availability; Zea mays; Nutrient uptake; Soil testing


Language: English

Descriptors: Water


Language: English

Descriptors: Florida; Paspalum notatum; Ammonium sulfate; Ammonium nitrate; Application rates; Nitrogen; Movement in soil; Crop production; Nutrient content; Plant tissues; Water quality

78 Evaluering van bewaringsbewerkingpraktyke vir 'n braak-
koringstelsel in die sentrale Vrystaat  [Evaluation of conservation tillage practices for a fallow-wheat system in the central Free State].
Snyman, P.J.; Engelbrecht, C.; Van Der Merwe, S.W.J.

Language: Afrikaans

Descriptors: South Africa; Triticum; Conservation tillage; Crop residues; Crop yield; Fallow; Infiltration; Water conservation

79
NAL Call. No.: TD426.J68
A field study of the effects of soil structure and irrigation method on preferential flow of pesticides in unsaturated soil.
Ghodrati, M.; Jury, W.A.

Language: English

Descriptors: California; Soil pollution; Pesticides; Formulations; Movement in soil; Irrigation; Soil water regimes; Tillage; Sandy loam soils

80
NAL Call. No.: 290.9 AM32P
A field system to monitor tillage and crop rotation effects on groundwater quality.
Kanwar, R.S.; Baker, D.G.; Singh, P.; Noh, K.M.

Language: English

Descriptors: Groundwater; Water quality; Tillage; Rotations

81
NAL Call. No.: TD171.U5
A "fitting solution" at Snake Creek, Utah.
Wann, D.

Language: English

Descriptors: Utah; Water pollution; Pollution by agriculture; Phosphorus residual effect; Irrigation; Water management; Environmental impact reporting
82 NAL Call. No.: FICHE S-72
Ground water models for assessing agricultural best management practice. Shoemaker, L.L.; Magette, W.L.

Language: English

Descriptors: Models; Groundwater pollution; Fertilizer application; Pesticide application; Leaching

83 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

84 NAL Call. No.: QK867.J67
Growth and selenium uptake of range plants propagated in uranium mine soils. Hossner, L.R.; Woodard, H.J.; Bush, J.

Language: English

Descriptors: Texas; Panicum coloratum; Cynodon dactylon; Gramineae; Selenium; Ion uptake; Mineral content; Uranium; Mine spoil; Shoots; Dry matter accumulation; Cover crops

Abstract: High soil selenium (Se) levels have been found in association with uranium deposits in Texas. A concern that high Se concentrations may be found in forages grown on reclaimed mine lands prompted this investigation. A native soil sampled near the mining area, and overburden materials sampled from two Se enriched uranium mine soil sites were
compared in a plant growth study in the greenhouse. Shoot yields and shoot Se concentration in each of ten grasses common to the region were determined from plants harvested three weeks after germination and from shoot regrowth harvested four weeks after the first harvest. Shoot weights were reduced for 5 of the 10 species growing in soils with medium and high Se status. Total shoot weights of Cynodon dactylon and Panicum coloratum from two harvests were consistently highest in all soil materials and are highly recommended for use as a stabilizing cover crop for lands disturbed from uranium mining. Generally, no correlation was observed between shoot weight and plant Se concentration or uptake in the 10 species. However, plant tissue Se concentrations in all species for at least one of the two harvest dates were above the 5 mg kg-1 concentration considered potentially harmful to grazing livestock. Therefore, none of these species would be a suitable forage for livestock grazing on reclaimed Se-enriched uranium mining overburden.

85 NAL Call. No.: QH540.J6
Herbicide residues from winter wheat plots: effect of tillage and crop management.
Brown, D.F.; McCool, D.K.; Papendick, R.L.; McDonough, L.M.
Language: English
Descriptors: Washington; Triticum aestivum; Pisum sativum; Metribuzin; Bromoxynil; Residual effects; Soil pollution; Runoff; Tillage; Crop management; Winter; Erosion

86 NAL Call. No.: SB951.4.E58
Herbicides in surface waters.
Leonard, R.A.
Language: English
Descriptors: Herbicides; Surface water; Runoff water; Transport; Distribution; Persistence; Erosion control; Soil conservation; Tillage; Simulation models; Prediction

87 NAL Call. No.: S604.E35
Hydrologic effects of conservation tillage and their importance relative to water quality.
Baker, J.L.
Effects of conservation tillage on groundwater quality :
nitrates and pesticides / edited by Terry J. Logan ... [et al.]. p. 113-124; 1987. Literature review. Includes references.

Language: English

Descriptors: Tillage; Water composition and quality; Hydrology

88 NAL Call. No.: 292.2 AM34
Hydrological response of an agricultural watershed to various hydrologic and management conditions.
Razavian, D.
Minneapolis, Minn. : American Water Resources Association.

Language: English

Descriptors: Nebraska; Watersheds; Agricultural land; Pollution; Tillage; Erosion; Sediment yield; Runoff; Catchment hydrology; Climatic factors; Crops management; Simulation models

89 NAL Call. No.: 292.8 W295
Hydrological impacts of changing land management practices in a moderate-sized agricultural catchment.
Potter, K.W.

Language: English

Descriptors: Wisconsin; Stream flow; Catchment hydrology; Conservation tillage; Agricultural land; Land management; Land use; Soil conservation; Erosion; Runoff; Floods; Precipitation; Seasonal variation

Abstract: Since the mid-1930s a variety of soil conservation practices have been applied to agricultural lands throughout the United States. While intended to reduce soil erosion, if effective, these practices should alter the hydrology of streams which drain the treated lands. This hypothesis was explored for the East Branch of the Pecatonica River, a gaged 221 square mile agricultural catchment in southwestern Wisconsin. On the basis of the analysis of peak and daily flow data there has been a decrease in flood peaks and in winter/spring flood volumes and an increase in hydrologic rise times and in the contribution of winter/spring snowmelt events to base flow. These changes do not appear to be due to climatic variations, reservoir construction, or major land use changes. Instead, they appear to have resulted from the adoption of various soil conservation practices, particularly those involving the treatment of gullies and the adoption of conservation tillage.
Hydrology and the hypothetical effects of reducing nutrient applications of water quality in the Bald Eagle Creek Headwaters, southeastern Pennsylvania prior to implementation of agricultural best-management practices. Fishel, David K.; Langland, Michael J.; Truhlar, Mark V.


Language: English

Descriptors: Stream measurements; Water quality; Fertilizers; Hydrology


Language: English

Descriptors: Northern plains states of U.S.A.; Southern plains states of U.S.A.; Water quality; Groundwater; Surface water; Agricultural production; Environmental impact; Water supply; Agricultural chemicals; Irrigation; Conservation tillage


Language: English

Descriptors: Pesticides; Runoff; Water pollution; Water quality; Conservation tillage; Crop residues; Environmental impact reporting; Groundwater; Literature reviews
The impact of fertilizer application techniques on nitrogen yield from two tillage systems.
Mostaghimi, S.; Younos, T.M.; Tim, U.S

Language: English

Descriptors: Virginia; Agricultural land; Hapludults; Silt loam soils; Nitrogen; Losses from soil systems; Sediment; Runoff; Water pollution; No-tillage; Tillage; Nitrogen fertilizers; Subsurface application; Application methods; Artificial precipitation; Rain; Yields; Nitrate nitrogen; Ammonium nitrogen; Kjeldahl method; Eutrophication; Surface water; Movement in soil


Language: English

Descriptors: Sewage sludge; Tillage; Systems; Application methods; Runoff water; Water composition and quality; Sediments; Nitrogen; Losses from soil systems; Runoff control; Yield response functions

The impact of nitrogen and irrigation management and vadose zone conditions on ground water contamination by nitrate-nitrogen.
Watts, D.; Christiansen, A.; Frank, K.; Penas, E.

Language: English

Descriptors: Nebraska; Zea mays; Nitrogen; Irrigation; Groundwater; Pollution
Impact of pesticides on shallow groundwater quality.
Gish, T.J.; Isensee, A.R.; Nash, R.G.; Helling, C.S.

Language: English

Descriptors: Maryland; Alachlor; Atrazine; Carbofuran; Cyanazine; Groundwater; Monitoring; Movement in soil; Pesticide residues; Tillage; Water pollution; Water quality

Abstract: A three-year field study was initiated in 1986 to determine the impact of tillage practice, mode of pesticide application, and pesticide formulation on chemical transport. The 1.28-ha field site was divided into four plots, two each devoted to no-till and conventional tillage management. Pesticide transport was evaluated by monitoring the rate of change in concentrations of pesticides in a shallow perched water table, located approximately 1 m below the soil surface. Pesticides monitored included atrazine, alachlor, cyanazine and carbofuran. All three herbicides were applied as a single broadcast spray; granular insecticide carbofuran was band-injected at planting.

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.

Language: English

Descriptors: Glycine max; Cropping systems; Tillage; Conservation tillage; Herbicides; Losses from soil; Runoff; Water pollution

Impact of tillage practices on pesticide leaching in coastal plain soils. Brinsfield, R.; Staver, K.; Magette, W.

Language: English

Descriptors: Tillage; Techniques; Herbicide application; Leaching; Coastal plains; Soil; Groundwater pollution; Water


Language: English

Descriptors: Groundwater; Hydrology; Nitrogen; Losses; Models


Language: English

Descriptors: Iowa; Loess soils; Watersheds; Catchment hydrology; Tillage; Terracing; Pastures; Monoculture; Zea mays; Runoff; Evapotranspiration; Soil conservation


Language: English

Descriptors: Zea mays; No-tillage; Macropores; Macropore flow; Atrazine; Strontium; Bromides; Movement in soil; Groundwater pollution; Agricultural chemicals; Rain; Percolation; Leaching

Abstract: Previous research has established that macropores can rapidly transmit water through soil. This observation has raised concern that macropores may also promote rapid movement of agricultural chemicals to groundwater. This is a particular concern for no-till fields where lack of disruption by tillage can lead to the development of extensive macropore systems. In order to investigate the effect of initial rainfall on chemical transport, strontium bromide hexahydrate (SrBr2.6H2O)
and atrazine (2-chloro-4-ethylamino-6-isopropylamino-s-triazine) were surface-applied to six 30 by 30 by 30 cm blocks of undisturbed soil obtained from a 25-yr-old, no-till corn (Zea mays L.) field with evidence of well-defined macropores attributable to earthworm activity. Half of the blocks then received a 1-h 5-mm simulated rain, which did not produce percolate. Two days later, the blocks received a 0.5-h 30-mm simulated rain, followed by another 0.5-h 30-mm rain 1 wk later. The remaining blocks received only the two 30-mm events. An average of 12% of the applied water passed through all the blocks during and shortly after the first 30-mm rain. Bromide, Sr, and atrazine losses in this percolate were 7, 10, and 2 times less, respectively, from blocks that received the 5-mm rain than from blocks not receiving this initial, light rain. The second 30-mm rain on the blocks not receiving the initial 5 mm produced 1.6 X more percolate than the first 30-mm rain. Yet, transport and flow-weighted average concentrations of Br, Sr, and atrazine were all reduced. These results indicated that the first storm after application can move solutes into the soil matrix, thereby reducing the potential for transport in macropores during subsequent rainfall events.
Descriptors: Delaware; Groundwater; Water composition and quality; Irrigation water; Water management; Nitrogen; Nitrate reduction; Leaching


Language: English

Descriptors: Water quality management; Soil conservation; Tillage


Language: English

Descriptors: Sediment transport; Virginia


Language: English

Descriptors: Groundwater pollution; Nitrate nitrogen; Tillage; Rotations; Leaching; Pesticides; Fertilizers
Maintenance of stormwater BMPS in four Maryland counties: a status report. Lindsey, G.; Roberts, L.; Page, W.

Language:  English
Descriptors: Maryland; Water management; Storms; Regulations; Structures; Maintenance

Management effects on runoff, soil, and nutrient losses from highly erodible soils in the Southern Plains.
Berg, W.A.; Smith, S.J.; Coleman, G.A.

Language:  English
Descriptors: Oklahoma; Triticum aestivum; Rangelands; Land management; Environmental impact reporting; Watersheds; Soil management; Erosion; Runoff; Sediments; Nitrogen; Phosphorus; Losses from soil systems; Surveys; No-tillage

Manure management and environmental effects.
Nielsen, V.C.

Language:  English
Descriptors: Pig farming; Pig slurry; Waste disposal; Environmental pollution; Pollution

Maryland farmers' adoption of best management practices for nonpoint source pollution control.
Lichtenberg, E.; Lessley, B.V.; Howar, H.D.

Language:  English
Descriptors: Maryland; Water pollution; Water quality; Farm management; Runoff; Soil chemistry; Cost analysis
Mechanized tillage systems effects on soil erosion from an alfisol in watersheds cropped to maize (Nigeria).
Lal, R.
Amsterdam : Elsevier; July 1984.

Language: English
Descriptors: Nigeria

A method to measure the environmental impact of pesticides.
Kovach, J.; Petzoldt, C.; Degni, J.; Tette, J.

Language: English
Descriptors: New York; Pesticides; Environmental impact; Integrated pest management; Measurement; Comparisons; Toxicity; Regulations

Minimizing nitrate leaching in agricultural production: how good can we get?. Magdoff, F.

Language: English
Descriptors: U.S.A.; Crop production; Nitrate; Leaching; Groundwater pollution

Mobility of agrochemicals through soil from two tillage systems. Levanon, D.; Codling, E.E.; Meisinger, J.J.; Starr, J.L.

Language: English
Abstract: The fate of agrochemicals is often greatly affected by the surface-soil conditions in the field. This study was conducted to characterize the impact of two contrasting tillage systems on the movement of agrochemicals in soil. The two tillage systems were plow-tillage (PT) and no-tillage (NT) for corn (Zea mays L.) production. The study included incubation and leaching of undisturbed soil columns and disturbed soil samples from 16-yr plots subject to the two tillage regimes. The agrochemicals used in the study were NH4NO3, atrazine (2-chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine-2,4 diamine), carbofuran (2,3-dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate), diazinon (0,0-diethyl-O-(6-methyl-2(1-methylethyl)-4-pyrimidinyl phosphor-othioate), and metolachlor (2-chloro-N-(2-ethyl-6-methylphenyl)-N-(2-methoxy-1-methylethyl) acetamide). The results of this study show greater ponded flow movement of all agrochemicals in soils under PT vs. NT conditions. Strong evidence was found for preferential flow through the soil, with the chemicals bypassing much of the soil-matrix under recently plowed soils as well as NT soils. Nitrate leaching was significantly greater under PT than NT, apparently due to greater mineralizing activity of the PT soil compared with the NT soil. The pesticide movement also tended to be greater under PT than NT. Caution should be exercised in generalizing to field conditions, but these data suggest that there can be greater leaching losses of surface-applied agrochemicals to groundwater under PT than under NT.
Locked manure provides more plant-available nitrogen than does daily-spread manure.

116 NAL Call. No.: 290.9 AM32P
Modeling animal waste BMP impacts on bacteria levels in runoff from agricultural lands.
Language: English
Descriptors: Animal wastes; Bacterial count; Runoff water; Simulation models

117 NAL Call. No.: 290.9 AM32T
Modeling animal waste management practices: impacts on bacteria levels in runoff from agricultural lands.
Language: English
Descriptors: Virginia; Animal wastes; Water pollution; Runoff; Bacteria; Monte carlo method; Simulation models

118 NAL Call. No.: 292.9 AM34
Modeling cost-effectiveness of agricultural nonpoint pollution abatement programs on two Florida basins.
Language: English
Descriptors: Florida; Pollution by agriculture; Nitrogen; Phosphorus; Control methods; Water composition and quality; Cost benefit analysis; Project appraisal; Water resource management; Models; Coastal areas

119 NAL Call. No.: 292.8 W295
Abstract: Long-term assessment of solute transport in the unsaturated zone is an important consideration for irrigation management, pesticide management, and subsurface contaminant restoration analysis and design. Mathematical models are often used to perform such analyses. Modeling fluid flow and solute transport in the unsaturated zone typically requires solution of the nonlinear Richards equation and an advective-dispersive equation for contaminant transport as a function of time. Such solutions are possible but computationally expensive. A simplified water balance approach to solve fluid flow in shallow, drained unsaturated zones has been developed and refined over the last 15 years. The objectives of this study were to use results from a water balance model to obtain solutions for solute transport in drained, shallow water table soils, and to compare the results with solutions based upon Richards' equation. Transient soil water flux rates computed with a water balance model were used as input to a Petrov-Galerkin advective-dispersive transport model to simulate solute transport in unsaturated soils. The transport model was checked for consistency by comparison with an analytical solution. Sample simulations showed good agreement between a Richards' equation-based transport model and a water balance-based transport model. Simulations were performed to show predicted trends in water quality over 1-year periods.


Nitrogen leaching sensitivity to evapotranspiration and soil
water storage estimates in EPIC.
Language: English
Descriptors: U.S.A.; Water quality; Nitrogen; Leaching; Movement in soil; Percolation; Soil water balance; Evapotranspiration; Soil water; Storage; Estimation; Methodology; Comparisons; Simulation models; Climatic zones; Meteorological factors; Geographical distribution; Spatial variation; Soil variability; Crop growth stage; Crop management

126 NAL Call. No.: S651.N57
Nitrogen management to minimize adverse effects on the environment. Aldrich, S.R.
Language: English
Descriptors: Nitrogen fertilizers; Crop husbandry; Fertilizer application; Pollution by agriculture

127 NAL Call. No.: TD428.A37N67 1990
Assessing agricultural impacts on water quality and identifying preventive actions to reduce impacts
North Central Regional Water Quality Conference 1990 : University of Minnesota?.
1 v. (loose-leaf) : ill. ; 29 cm. Includes bibliographical references.
Language: English
Descriptors: Agricultural pollution; Water quality management; Water quality
Abstract: This North Central Regional Water Quality Conference Reference Manual contains numerous publications which provide the best available information on measures including pesticide applicator practices to minimize and prevent groundwater contamination and solve water quality problems. The six topic areas covered are: 1) site assessment;
2) pest management; 3) nutrient management; 4) waste management; 5) economics; and 6) policy. Where groundwater comes from, how it moves and the health effects of groundwater contamination as well as pesticide surface runoff, leaching, and exposure concerns are discussed.

128 NAL Call. No.: S589.757.W6N9 1989
Nutrient and pesticide best management practices for Wisconsin farms.. Best management practices for Wisconsin farms, 1st ed..
University of Wisconsin--Extension, Wisconsin, Dept. of Agriculture, Trade and Consumer Protection
Language: English; English
Descriptors: Agricultural pollution; Farm management; Agriculture; Pesticides; Fertilizers
Abstract: This manual summarizes recommended nutrient and pesticide Best Management Practices (BMPs) for pesticide applicators in the state of Wisconsin to reduce and/or prevent contamination of water resources by pesticides. It also includes an implementation survey of research assessment techniques used to determine management research issues, and cropland and crop-specific assessment techniques. Groundwater contamination susceptibility in Wisconsin is discussed and indicated on the map on the inside back cover.

129 NAL Call. No.: TD428.F67E35 1991
On-site assessment of best management practices as an indicator of cumulative watershed effects in the Flathead Basin.
Ehinger, William; Potts, Donald F.
Flathead Basin Forest Practices, Water Quality and Fisheries Cooperative Program
Language: English
Descriptors: Flathead National Forest (Mont.); Forest management; Water quality management; Sediment transport
Pesticide and nitrate movement under conservation and conventional tilled plots.
Steenhuis, T.; Paulesen, R.; Richard, T.; Staubitz, W.; Andreini, M.; Surface, J.
Planning now for irrigation and drainage in the 21st century:
Includes references.
Language: English
Descriptors: Pesticides; Nitrates; Soil water movement; Tillage; Experimental plots; Groundwater pollution; Soil analysis; Water composition and quality

Pesticide applicator training.. Slide scripts for private pesticide applicator training
266 slides : col. + 1 script. Title from running title on script. Title on script: Slide scripts for private pesticide applicator training.
Language: English
Descriptors: Pesticides; Pests; Pesticide applicators (Persons); Spraying equipment
Abstract: This private pesticide applicator training slide program with accompanying script consists of sections on Integrated Pest Management (IPM); pesticides including information on labels, formulations, toxicity, entry, exposure, poisoning symptoms, safe handling, storage and disposal; application equipment and calibration for chemigation and broadcast sprayers; pesticides in the environment, reducing their adverse effects and ground water contamination risks; and nitrogen management.

Pesticide contamination of ground water in the United States--a review. Ritter, W.F.
New York, N.Y. : Marcel Dekker; 1990 Feb.
Language: English
Descriptors: U.S.A.; Pollution by agriculture; Pesticides;
Groundwater pollution; Mathematical models; Environmental protection; Integrated pest management

133 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.

134 NAL Call. No.: 290.9 AM32T
Predicting runoff of water, sediment, and nutrients from a New Zealand grazed pasture using CREAMS.
Cooper, A.B.; Smith, C.M.; Bottcher, A.B.

Language: English
Descriptors: New Zealand; Grassland management; Grazing effects; Hydraulic conductivity; Losses from soil systems; Prediction; Runoff; Water quality; Computers; Simulation models

Abstract: The ability of the CREAMS model to predict loadings of runoff, sediment and nutrients from a New Zealand grazed pasture was evaluated. Before use, CREAMS was adapted to better represent N and P cycling in grazed pastures and the seasonal variation in hydraulic conductivity observed at the site. There was a moderately strong relationship (r2 = 0.81)
between daily surface runoff volumes predicted by this modified model and volumes measured at the site for 62 events over a three and one half year period. Although the ability of the model to predict daily losses of sediment and nutrients was considerably less (r^2 < 0.45), the model was always an unbiased predictor. This unbiased predictive ability provides good estimates of losses over longer time scales (e.g., seasonal) which is often sufficient when evaluating the impacts of land use practices on water quality. The adapted CREAMS model successfully simulated measured reductions in edge-of-field losses of sediment and nutrient upon installation of a vegetated filter strip. We conclude that although CREAMS has limitations in representing the dynamics of grazed pastures, it shows potential as a water quality management tool in pastoral watersheds.

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Language: English

Descriptors: Maryland; Atrazine; Cyanazine; Field tests; Groundwater; Movement in soil; Silt loam soils; Water pollution

Abstract: The relative importance of preferential pesticide transport in agricultural soils was determined in a two-phase study conducted on a silt loam soil in Maryland. The first phase (1984) consisted of evaluating persistence and mobility of atrazine [2-chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine] and cyanazine [2-chloro-4-(1-cyano-1-methylethylamino)-6-ethylamino-s-triazine] under no-tillage corn management. The second phase (1986) dealt with persistence and mobility of the same herbicides on fallow tilled soil subjected to frequent, large water inputs. Although preferential flow was observed under both treatments and water regimes, the no-till system had the most rapid movement of herbicide relative to water inputs. Additionally, all treatments indicated that the greatest potential movement of surface-applied pesticide occurred with the first water input subsequent to application. Once the pesticide has been preferentially transported, it appears to diffuse into the soil matrix, where it is no longer subject to significant preferential movement. Based on field data and calculated mass balance, persistence of atrazine and cyanazine was unaffected by tillage practice and water regime.
Research results: statewide IPM's first 10 years.
Grieshop, J.I.; Pence, R.A.
Oakland, Calif. : Division of Agriculture and Natural Resources, University of California; 1990 Sep.

Language: English

Descriptors: California; Integrated pest management; Research projects; Pesticides; Cultural control; Program effectiveness; Evaluation

Residue, chemical placement, and metolachlor mobility.
Mote, C.R.; Tompkins, F.D.; Allison, J.S.

Language: English

Descriptors: Tillage; No-tillage; Metolachlor; Herbicide residues; Soil pollution; Rain; Runoff water

Abstract: Monolithic soil cores were used to evaluate the impact of tillage and point-of-chemical placement on off-site movement of metolachlor. Nine 254-mm diameter soil cores were removed from an agriculturally productive field site and positioned under a rainfall simulator. Provisions were made for collecting surface runoff and deep seepage from the cores. A one-time application of metolachlor at a rate of 2.2 kg active ingredient per ha was made to three bare, tilled surfaces, three untilled surfaces beneath a covering of wheat straw, and three untilled surfaces over-the-top of a covering of wheat straw. The nine cores were subjected to simulated rainfall events of 26.5 mm per hr intensity at 4, 48, 168, 504, 1008, and 2016 hours after application of metolachlor. A small quantity of metolachlor exited the cores in both runoff and in deep seepage water. There were no significant differences in concentrations of metolachlor in deep seepage among cores with the three different surface treatments. There was, however, significantly more metolachlor in runoff from cores where the chemical was applied over-the-top of wheat straw. Results, thus, indicate that a contribution to improved water quality may be made by developing under-residue...
herbicide application practices.


Language:  English

Descriptors: Texas; No-tillage; Tillage; Soil management; Clay soils; Triticum aestivum; Zea mays; Sorghum bicolor; Sediment; Nutrients; Losses from soil; Runoff water; Water pollution; Nitrogen; Phosphorus; Agricultural land; Watersheds

Abstract: Agricultural source pollution of water resources has been a source of concern in recent years. Research is needed to define mechanisms of chemical and sediment loss in runoff from agricultural land, and to develop management practices that minimize transport of these pollutants. This study was designed to compare the effect of no-till (NT) and conventional chisel-till (CT) soil management on runoff water volumes, sediment loss, and N and P loss from small watersheds on a clay soil. Three NT and three CT watersheds located on Houston Black clay vertisol soil (fine, montmorillonitic, thermic, Udic Pellusterts) in east central Texas were used for the study. Wheat (Triticum aestivum L.), corn (Zea mays L.) and sorghum [Sorghum bicolor (L.) Moench] were grown rotationally on the watersheds from 1984 to 1989. Runoff amounts, sediment loss, and N and P losses were measured for each rainfall event that produced runoff. Runoff volume was not changed by tillage system and sediment loss and N and P losses in runoff were less, on average, from NT than from CT. Runoff averaged 1.3 ML ha-1 annually for both CT and NT. Average annual quantities for sediment and nutrient losses were: 160 kg ha-1 and 1575 kg ha-1 for sediment, 3.8 kg ha-1 and 8.1 kg ha-1 for N, and 0.8 kg ha-1 and 1.5 kg ha-1 for P for NT and CT, respectively. These results indicate that the loss of sediment and nutrients from agricultural lands could be minimized by using NT on clay soils.

Soil chemistry after eleven annual applications of cattle feedlot manure. Chang, C.; Sommerfeldt, T.G.; Entz, T.

Abstract: In a long-term experiment at Lethbridge, AB, the effects of cattle (Bos sp.) manure on soil characteristics were determined after 11 annual applications. Manure, incorporated by cultivating, rototilling or plowing, was applied annually from 1973 to 1983 at 30, 60, and 90 Mg ha-1 (wet wt.) and 60, 120, and 180 Mg ha-1, respectively, to nonirrigated and irrigated dark brown Chernozemic (Typic Haploborolls) clay loam soil. On both the nonirrigated and irrigated soil, the effects from manure, applied annually at greater than recommended rates for 11 yr, were minimal on Cu and NH4 content and substantial on other parameters determined. There were no significant effects due to tillage methods on these soil parameters. The effects on these soil parameters extended to greater depths under irrigation than under nonirrigation. Most of the applied NH4 was nitrified, volatilized, or fixed. The accumulation of organic matter, total N, NO3, total P, available P, soluble Na, Ca+Mg, Cl, SO4, HCO3, and Zn in the soil increased with increasing rates of manure applied. The electrical conductivity and sodium adsorption ratio of the soil increased and the soil pH in the surface 60 cm of nonirrigated and 90 cm of irrigated decreased with increased manure rates. The total NO3 accumulation in the 150-cm soil depth was near 1 Mg ha-1, even at recommended rates, and was high enough to potentially cause soil and water pollution. The available P accumulated mostly in the surface soil and might be sufficient to interfere with the nutrient balance of some crops. Long-term annual application of cattle manure to southern Alberta soils at maximum recommended rates [30 mg ha-1 and 60 Mg ha-1 (wet wt.) for nonirrigated and irrigated land, respectively] is not advisable.
Kraft, S.E.; Toohill, T.L.
Language: English
Descriptors: Illinois; Soil degradation; Land use; Farm management; Analysis; Tillage; No-tillage; Soil conservation; Law; Programming

143 NAL Call. No.: QH540.J6
Soil tests for estimating labile, soluble, and algae-available phosphorus in agricultural soils.
Wolf, A.M.; Baker, D.E.; Pionke, H.B.; Kunishi, H.M.
Language: English
Descriptors: U.S.A.; Agricultural soils; Phosphorus residual effect; Soil testing; Water pollution

144 NAL Call. No.: 56.8 SO39
Some concepts concerning soil site assessment for water quality. Mausbach, M.J.; Nielsen, R.D.
Language: English
Descriptors: Water quality; Land evaluation; Surface water; Contamination; Groundwater pollution; Contaminants; Nutrients; Pesticides; Site factors; Soil types; Runoff; Soil water; Geometry; Vertical movement; Horizontal infiltration; Slope; Geomorphology; Surface layers; Soil properties; Soil formation; Land use; Land management; Tillage; Spatial variation; Temporal variation; Horizons; Profiles; Catchment hydrology

145 NAL Call. No.: S622.2.S65
Spatial simulation to aid in evaluating and treating erosion and water quality problems affecting Lake Erie.
Beasley, D.B.

Abstract: Management of surface water has four broad objectives: (1) Appropriate removal of excess water during wet periods, (2) Water conservation for crop use, (3) On-site erosion control to protect long-term soil productivity and reduce short term damages, and (4) Off-site damage prevention from sedimentation and water pollution. The various techniques of water management vary in effectiveness for the four objectives given. However, for production of crops on erodible land the importance of water conservation to enhance yield and potential profits must be emphasized. The benefits of water management for on-site erosion control are well established. Economic studies, however, conclude that structural approaches to control on-site erosion are seldom profitable in terms of protecting soil productivity. The use of a tillage and cropping system designed for erosion protection is economically more attractive than structures, especially if the cropping system does not greatly reduce the total value of farm products sold. In contrast to the on site losses annual costs of off-site damages from cropland erosion and runoff are probably 10 to 55 times as great. Grain crop production on highly erodible land continues to be difficult and risky. Whether farmers can achieve this profitably, and with conservation compliance as defined by the 1985 Food Security Act, will greatly depend upon the alternative types of land available and the extent of conservation treatment required.
Abstract: Extract: The public cost of reducing erosion in a west Tennessee watershed pilot program was 34 percent lower than the national average. The difference was attributed to the pilot program's emphasis on targeting specific erosion problems and to the establishment of permanent vegetative cover on highly eroding land. Even greater use of permanent vegetative cover, no-till cropping practices, and less reliance on cover improvement and terraces could reduce erosion in the area by an additional 32 percent with the same level of funds. A variable cost-sharing approach to erosion control may yield even bigger dividends in a targeting program.

Language: English

Descriptors: Idaho; Water quality; Water management; Project implementation; Program evaluation

151 NAL Call. No.: FICHE S-72
Tillage and N-fertilizer management effects on groundwater quality. Kanwar, R.S.; Baker, J.L.; Baker, D.G.

Language: English

Descriptors: Groundwater pollution; Water composition and quality; Agricultural land; Tillage; Nitrogen fertilizers; Leaching

152 NAL Call. No.: 290.9 AM32T
Tillage and split N-fertilization effects on subsurface drainage water quality and crop yields.
Kanwar, R.S.; Baker, J.L.; Baker, D.G.

Language: English

Descriptors: Tillage; Zea mays; Nitrogen; Drainage water; Water composition and quality; Crop yield; Subsurface drainage

153 NAL Call. No.: 100 SO82 (3)
Tillage effects on agrichemical fate in the soil and aquifer.
Clay, D.E.; Clay, S.A.; Schumacher, T.E.
TB - Agricultural Experiment Station, South Dakota State University (97): 2 p. (soil PR 90-40); 1991.

Language: English

Descriptors: South Dakota; Agricultural chemicals; Movement in soil; Aquifers; Groundwater pollution

154 NAL Call. No.: TD201.V57 no.162
Tillage effects on runoff water quality from sludge-amended soils. Mostaghimi, Saied
Virginia Water Resources Research Center, Geological Survey (U.S.), Branch of Water Institute Programs
Blacksburg : Virginia Water Resources Research Center, Virginia Polytechnic Institute and State University; 1988.
Bibliography: p. 77-81.

Language: English

Descriptors: Soil conservation; Methodology; Sewage sludge as fertilizer; Environmental aspects; Tillage; Environmental aspects; No-tillage; Environmental aspects; Runoff; Soils; Composition

Tillage effects on sediment and soluble nutrient losses from a Maury silt loam soil.
Blevins, R.L.; Frye, W.W.; Baldwin, P.L.; Robertson, S.D.

Language: English

Descriptors: Kentucky; Zea mays; Tillage; Chiselling; No-tillage; Runoff; Sediment; Runoff water; Ammonium nitrate; Triple superphosphate; Potassium fertilizers; Triazine herbicides; Crop yield; Silt loam soils

Abstract: As the role of nonpoint-source contamination of surface waters becomes more evident, increasingly more attention is focused on the effects of agricultural practices on soil erosion and water quality. Tillage systems are known to affect the amount of water moving over the surface and through the soil. This study compared the contributions of three tillage systems used in corn (Zea mays L.) production with (i) sediment losses and surface runoff and (ii) the potential for nonpoint-source surface water pollution from N and P fertilizers and triazine herbicides. Tillage treatments were no-tillage, chisel-plow tillage, and conventional tillage (moldboard plow plus secondary tillage). The study site was on a Maury silt loam (Typic Paleudalfs). Over the 4-yr period, conventional tillage runoff volume was 576.7 kL ha-1, chisel-plow 205.7 kL ha-1, and no-tillage 239.9 kL ha-1. Total soil loss from conventional tillage was 19.79 Mg ha-1, chisel plow 0.71 Mg ha-1, and no-tillage 0.55 Mg ha-1. Amounts of NO3(-), soluble P, and atrazine leaving the plots in surface runoff were greatest from conventional tillage and about equal from chisel-plow and no-tillage. The magnitudes of the losses in surface runoff water were small for all chemicals measured.
Transport comparison of technical grade and starch-encapsulated atrazine. Gish, T.J.; Schoppet, M.J.; Helling, C.S.; Shirmohammadi, A.; Schreiber, M.M.; Wing, R.E.

Language: English

Descriptors: Atrazine; Encapsulation; Groundwater; Leaching; Movement in soil; Starch; Trickle irrigation; Water pollution

Abstract: The feasibility of using starch-encapsulated atrazine to minimize convective transport under conditions favoring preferential flow was evaluated. Forty small, undisturbed, soil columns (45 cm2 X 3 cm) were removed from an established no-tillage management site and randomly grouped into one of five atrazine treatments: 1) technical grade; 2) borate process, starch-encapsulated; 3) jet-cooked, pearl starch-encapsulated; 4) jet-cooked, waxy starch-encapsulated; and 5) untreated control. Columns were drip-irrigated at the rate of 2.5 cm every three days. Highest atrazine levels, 1.30 mg L-1, were observed in the effluent from columns receiving technical-grade atrazine after the first irrigation (2.3 pore volumes), even though piston flow theory indicated that atrazine should not have appeared before 21.9 pore volumes. Computer simulations using the general convection-dispersion equation with first-order dissipation and linear adsorption also significantly underpredicted atrazine mobility. All encapsulated formulations, relative to technical-grade, revealed significantly lower initial atrazine levels in the effluent. Cumulative effluent concentrations indicate that after 16.1 pore volumes, 35, 10, 3, and < 1% of the available atrazine had been leached from the technical-grade, borate, pearl, and waxy starch formulations, respectively.
consists of soluble P (SP) and a variable portion of particulate P (PP). Evaluation of the impact of agricultural management on BAP in runoff will aid assessment of the resultant biological productivity of receiving water bodies. Soluble P, PP, and bioavailable PP (BPP) (estimated by NaOH extraction) were determined over a 5-yr period in runoff from 20 unfertilized and fertilized, grassed, and cropped watersheds in the Southern Plains. Soluble P, BPP, and BAP loss in runoff was reduced by practices minimizing erosion and runoff, with respective mean annual amounts ranging from 237 to 122, 1559 to 54, and 1796 to 176 g P ha-1 yr-1 (for peanut-sorghum [Arachis hypogaea L.-Sorghum bicolor (L.) Moench] and native grass watersheds, respectively). However, as vegetative cover improved, BAP (SP plus BPP) comprised a larger portion of total P (TP) loss (29% for peanut-sorghum and 88% for native grass). This results from an increasing contribution to BAP of SP (13% for peanut-sorghum and 69% for native grass watersheds) and BPP to PP (26% for peanut-sorghum and 69% for native grass watersheds). Clearly, P bioavailability is a dynamic function of physiochemical processes controlling erosion, particle size enrichment, P desorption-dissolution reactions, and plant residue breakdown, in addition to soil and fertilizer P management. Hence, the change in trophic state of a water body may not be adequately reflected by TP inputs only. To more reliably evaluate the biological response of a water body to agricultural P inputs, particularly from conservation tillage practices, it may be necessary to determine BAP in runoff.
Phosphorus; Computer simulation; Pollution by agriculture

160
NAL Call. No.: 275.29 IO9PA
Vegetative filter strips for improved surface water quality.
Smith, M.
PM - Iowa State University, Cooperative Extension Service

Language: English

Descriptors: Water quality; Filters; Grass strips; Vegetation types; Grasses; Effects

161
NAL Call. No.: 56.8 J822
Water quality consequences of conservation tillage.
Baker, J.L.; JSWCA; Laflen, J.M.

Language: English

Descriptors: Water quality; Tillage practices; Conservation practices; Water pollution

Abstract: Extract: Conservation tillage, which leaves some or all of the residue from the previous crop on the soil surface, effectively protects the soil against erosion. Use of conservation tillage has other environmental implications as well, particularly for water quality.

162
NAL Call. No.: QH540.J6

Language: English

Descriptors: Sorghum bicolor; Nitrogen fertilizers; Phosphorus fertilizers; Runoff; Sediment; Surface water; Tillage; Transport processes; Water pollution; Water quality; Watersheds; Environmental impact; Eutrophication

163
NAL Call. No.: QH540.J6
Abstract: Water quality information regarding wheat culture in the Southern Plains is sparse. The objective of this study is to determine the extent to which the area's surface and ground-water quality is influenced by different wheat cultural practices. Concentrations and amounts of sediment, N and P in surface runoff water were determined for conventional till (CT), reduced till (RT), and no till (NT) wheat (Triticum aestivum L.) watersheds in the High Plain, Reddish Prairie, and Rolling Red Plain land resource areas of Oklahoma and Texas. During the 4 to 6 yr study periods, RT and NT practices were superior to CT for reducing sediment and associated particulate nutrient discharge. Mean annual discharge ranged from 230 to 15 900 kg ha-1 for sediment, 1 to 27 kg ha-1 for total N, and 0.1 to 6 kg ha-1 for total P. Irrespective of tillage practice, annual soluble nutrient losses in surface runoff water tended to be small, often < 1 kg ha-1 N or P. Successful prediction of soluble P, particulate P, and particulate N losses was achieved using appropriate kinetic desorption and enrichment ratio procedures. Soluble N in runoff posed no particular water quality problem, but recommended P levels were exceeded, even from baseline, unfertilized grassland watersheds. With regard to groundwater quality, elevated levels of NO3- (e.g., 34 mg N L-1 maximum) were observed on one Reddish Prairie NT watershed.
Water table management practice effects on water quality.
Wright, J.A.; Shirmohammadi, A.; Magette, W.L.; Fouss, J.L.; Bengtson, R.L.; Parsons, J.E.

Language: English
Descriptors: Water management; Water quality; Water table; Drainage; Hydrology; Simulation models; Subsurface irrigation

Abstract: Impacts of water table management (WTM) practices on water quality were modeled using a linked version of CREAMS and DRAINMOD (Parsons and Skaggs, 1988). The CREAMS denitrification component and the linked DRAINMOD-CREAMS model were modified to simulate daily hydrology (runoff, infiltration, evaporation, and soil moisture content), erosion, and nutrient processes for different WTM conditions. Measured data from Baton Rouge, Louisiana, were used to validate the linked model, and then controlled drainage-subirrigation (CD-SI) was simulated to investigate the effects of different WTM systems on runoff, erosion, and nitrogen losses. Results of the study indicated that the linked models performed better than the original CREAMS model in predicting runoff, infiltration, soil moisture content, and erosion, and that the modified linked model performed better than both CREAMS and the original linked model in predicting nitrogen losses from the study site. Results also showed that the CD-SI system simulated by the modified DRAINMOD-CREAMS model predicted increased denitrification and lowered nitrate leaching, unlike the original version. This study concluded that the CD-SI system may be used as a BMP to reduce nitrogen leaching to shallow groundwater systems for areas with high water table conditions.

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June 1993

United States Department of Agriculture
National Agricultural Library
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