



Extension news

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1987 SOIL AND WATER CONSERVATION PACKET Agriculture Extension

Conservation Efforts Help Keep Iowa's Water Safe

AMES, Iowa--Keeping Iowa's water supplies safe to drink is becoming the focus of conservation efforts as scientists learn more about the impact of farming on water quality, according to an Iowa State University agronomist.

"The protection of Iowa's groundwater from adverse effects of farming methods has taken on increased importance as farmers adopt new production techniques to reduce costs and increase farm income," Gerald Miller said. In recent decades, farmers have become increasingly dependent on chemical fertilizers and pesticides to boost production and hold down costs.

Miller said showing farmers how to use the best management practices to get the optimum economic return while providing maximum protection for the environment is the goal of the Integrated Farm Management Demonstration Project. Miller is responsible for directing the project that is coordinated by the ISU Cooperative Extension Service.

The project involves a series of demonstrations at farm sites across Iowa. The demonstrations show how to reduce energy consumption through reduced (conservation) tillage and more effective use of chemical nutrients and pesticides, Miller said. Environmental protection results from reduced soil erosion and chemical runoff to surface water and reduced leaching of chemicals into groundwater.

Conservation tillage plots have been established at seven statewide locations. These plots consist of three or four alternative tillage practices at each location. Although the tillage practices demonstrated differ from site to site, one practice, no-till, is demonstrated at all seven sites. Also included as part of each demonstration is the tillage practice that the farmer is using on the rest of the field where the demonstration plots are located.

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Other components of the project include studies of the application rates, methods and timing of nitrogen fertilizers and placement of herbicides, according to Miller. Tillage methods that give the best yields with the least environmental impact also are being demonstrated.

In addition, the project includes innovative approaches to crop production such as a system that uses a drainage and irrigation system to recycle water from wet seasons for use in high production fields during dry seasons.

"All of the projects are conservation-oriented with the goal of delivering nutrients to growing crops in the most efficient method and with the least amount of leaching and runoff of nutrients, chemicals and sediment," Miller said.

This year's Integrated Farm Management projects are being conducted at nearly 60 sites on private farmland and at ISU outlying research centers. The program is to continue for at least five years under the terms of the 1987 Groundwater Protection Act adopted by the Iowa General Assembly.

In addition to the field demonstrations, there are two ongoing programs to measure the use of best management practices. One is a continuing study of all farming methods in the Big Spring Watershed, located in northern Clayton County in northeast Iowa. The groundwater geology in that part of the state has allowed scientists to make precise measurements of the impact of farming methods on water quality.

Miller said a similar long-range project was started this year in the Upper Blue Grass Watershed in Audubon County. In both the Big Spring and Upper Blue Grass projects, farmers are cooperating by keeping track of their management practices and their effect on groundwater.

The Integrated Farm Management Demonstration Project is funded by the state Agricultural Energy Management Council and is being conducted in cooperation with other state and federal agencies and private foundations. These include the Iowa Department of Agriculture and Land Stewardship, Division of Soil Conservation; the Iowa Department of Natural Resources, Energy and Geological Resources Division and Environmental Protection Division; Iowa Agriculture Experiment Station; Iowa Natural Heritage Foundation; the University of Iowa, University Hygienic Laboratory; and the University of Northern Iowa.

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Source: Gerald A. Miller, extension agronomist, phone (515) 332-1923.

(EDITORS: This story was transmitted electronically via MediaLink Aug. 17.)



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1987 SOIL AND WATER CONSERVATION PACKET Agriculture Extension

Resourceful Farmers Demonstrate Profitable Conservation Methods

DES MOINES, Iowa--Farmers in every Iowa county are demonstrating conservation tillage, improved fertilizer efficiency and reduced chemical use this year through the Resourceful Farming Project, according to Duane Sand, project director.

He said more than 180 farmers were chosen for the project by the Iowa Natural Heritage Foundation, a non-profit conservation organization that coordinates the demonstrations.

John Brus, Morris, Iowa, and Mark McCully, Oakville, Iowa
(Names and hometowns) are conducting demonstrations locally. Sand said project participants help identify profitable farming techniques to protect soil and water resources. Conservation tillage is used on all demonstration fields and many farmers choose ridge-till or no-till systems.

To improve fertilizer efficiency and cut nitrate losses, reduced nitrogen rates or split applications are often used. Integrated pest management is included in all demonstrations and professional weed and insect scouting is provided without charge as part of the project.

"Other farmers considering reduced tillage, fertilizer or chemical inputs want to know what works and what is profitable," Sand said. "By sharing yield results and comparing profits, these farmers show how a variety of conservation techniques can be used in practical farming systems. Their experience provides valuable information for others wanting to fine-tune their management."

The yields of demonstration fields will be compared with similar

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Add 1--Resourceful Farmers

fields under normal management. Detailed results will be published in January and distributed free through local soil conservation district offices.

The demonstrations are supported by the Integrated Farm Management Program of the Agricultural Energy Management Fund and the Iowa Department of Agriculture and Land Stewardship. For more information, contact the Iowa Natural Heritage Foundation office at phone (515) 288-1846.

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(EDITORS: Participants in the 1987 Resourceful Farming Demonstration Project are listed below. In some cases landowners are listed jointly with farm operators.)

ACKWORTH: Tom and Maria Hanks
ADEL: Bob Collins
ALBERT CITY: Orlando Leimer
ALBIA: John Lawless
ALDEN: Lauren Tibbs
ALGONA: Hugh and James Ed Black
ALTON: Tony Pottebaum Jr.
ALTOONA: Ted Griffieon
AMANA: Amana Farms
APLINGTON: James Lindamon
ARMSTRONG: Curtis Tonderum
ATLANTIC: Larry Harris and Denise O'Brien
AUDUBON: Amos Asmus, Vic and Cindy Madsen
AURORA: Steve Goldenstein
BAGLEY: Ivan Kenney
BANCROFT: Dennis McCarthy, James Antoine
BELLEVUE: Gary Kunde
BELMOND: Dale Arends
BLAIRSTOWN: Charles Vogel/Cornell College
BLOCKTON: Kenneth Smith
BLOOMFIELD: Don Chickering
BOONE: Dick and Sharon Thompson
BRITT: Charles and Helen McLaughlin
BUSSEY: Craig Bonnett
CARROLL: Norman Shettler, Vic Tomka Jr.
CARSON: Mark Schnepel
CASCADE: Larry Manternach
CEDAR FALLS: John Miller
CEDAR RAPIDS: Kirkwood Community College
CHARITON: Andrew Offenburger
CHARLES CITY: James Hughes
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1987 SOIL AND WATER CONSERVATION PACKET **Agriculture Extension**

Determining the Best Conservation Practices for Your Farm

AMES, Iowa--Farmers interested in conserving soil and water can evaluate alternatives to help determine the best conservation methods for their farms, according to Mike Duffy, an Iowa State University Extension economist.

All farmers who farm erodible land must have an approved conservation plan by Jan. 1, 1990, to remain eligible for government program benefits. These plans must be fully implemented by Jan. 1, 1995.

Stewart Melvin, ISU Extension agricultural engineer, said several alternatives are available. These include terracing, minimum tillage, strip-cropping, contour planting and crop rotations. He said the best alternative depends on characteristics of the individual farm.

"There is no best method for everyone," Melvin said. "It will depend on the farm, the cost of the system and how much is earned for the commodities."

He said positive features of terracing include the farmer being able to continue with a corn and soybean rotation and the high probability of erosion control. Some negative considerations include the initial expense and the physical restrictions for farm equipment.

Melvin said using various forms of conservation tillage systems allows farmers to use more intensive row cropping while reducing production expenses. However, specialized equipment may be needed and soil abuse may occur in the future if conservation tillage systems are discontinued.

Using a crop rotation to conserve soil is compatible with the current government program. It allows diversification of crops and there are not physical restrictions on machinery. However, crop rotation may reduce the future row crop base of the property and soil abuse could occur in the future if the rotation is not strictly followed.

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Duffy said the first step in determining the best alternative is estimating soil loss under current conditions.

Before selecting an alternative, he said farmers should determine if soil loss will be reduced enough and what effects a specific method will have on production costs and profits.

The economist said a farmer can determine if a conservation method reduces soil loss sufficiently by using the Universal Soil Loss Equation.

When determining costs, Duffy suggests amortizing the investment over the expected life of the alternative to determine annual costs.

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Sources: Mike Duffy, ISU Extension economist, phone (515) 294-6160; Stewart Melvin, ISU Extension agricultural engineer, phone (515) 294-0465



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1987 SOIL AND WATER CONSERVATION PACKET Agriculture Extension

Conservation Tillage is Cost-Effective Way to Control Erosion

AMES, Iowa--Conservation tillage is considered the single most cost-effective way to control erosion on land that is continuously row cropped, according to an Iowa State University Extension agronomist.

Min Amemiya said conservation tillage also provides opportunities to reduce production costs by reducing tillage intensity and frequency.

"Reductions in time, machine costs and fuel consumption can be significant," Amemiya said. This is especially true when switching from a multiple pass plow-disk-harrow-plant system to a one-pass slot plant or no-till system.

He said conservation tillage refers to tillage-planting systems that leave all or part of the residue from the previous crop on the soil surface after planting. The residue should cover at least 30 percent of the soil surface, according to the Conservation Technology Information Center.

"The response of crops to different tillage systems is influenced by soil properties and crop sequence," Amemiya said. Soil properties related to drainage or soil wetness are especially important in influencing crop response.

Studies in Iowa and neighboring states generally show very little difference in crop yield among different tillage systems, for both continuous and rotational corn, when there are favorable drainage conditions. Also, conservation tillage may provide an advantage for coarse textured soils that tend to be droughty because the plant residues tend to conserve moisture.

However, soil wetness and poor drainage conditions could mean a yield
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penalty for continuous corn when there are large amounts of residue, such as when slot plant or no-till is used. Rotational corn will also be affected, but to a lesser degree.

It is possible to overcome this disadvantage by ridge planting rather than flat planting. Ridge planting also may allow earlier planting. Amemiya said data show that soybeans are relatively insensitive to different tillage systems.

"About half of the row crop acres in Iowa are in some form of conservation tillage right now," Amemiya said. During the 1986 crop year, values for individual counties ranged from 87 percent in Harrison and Iowa counties to 12 percent in Mills County. It is estimated that about 90 percent of these conservation tillage acres received full width tillage, usually involving a disk or chisel type implement, and more than one pass prior to planting. Nearly 8 percent of the conservation-tilled corn and soybean acres were slot planted (or no-tilled). The remainder were strip-tilled, usually in association with ridge-planting.

In the next several years, the number of conservation tillage acres is expected to increase sharply, especially those acres in slot or strip tillage systems. Amemiya said this is expected because producers will begin to consider conservation tillage as an important component of conservation plans developed to meet provisions of the 1985 farm bill.

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Source: Min Amemiya, ISU Extension agronomist, phone (515) 294-1923.

(EDITORS: This story was electronically transmitted via MediaLink Aug. 17.)



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1987 SOIL AND WATER CONSERVATION PACKET Agriculture Extension

New Law Has Soil Conservation Impact in Iowa

DES MOINES, Iowa--The 1985 Food Security Act (Farm Bill) could have a significant impact on soil erosion in Iowa. Under the law, farmers must get an approved conservation plan and protect highly erodible soils or lose their eligibility for U.S. Department of Agriculture (USDA) programs.

"This is the first time a farm bill has addressed conservation programs along with other USDA programs," said Mike Nethery, state conservationist for the Soil Conservation Service (SCS). "There is an incentive to use the programs and make the two work together."

"This farm bill is very ambitious," Nethery said. "Essentially, it calls for conservation work that hasn't been accomplished in 50 years to be done in fewer than 10 years. But the potential good it can do for future crop production, water quality, wildlife and sediment damage reduction is tremendous."

Nethery estimates the Soil Conservation Service will be writing an average of 600 to 700 conservation plans in each county before January of 1990.

"About half our cropland is highly erodible and most farmers are likely to have at least some highly erodible land," Nethery said. "More than 90 percent of the state's farmers are involved in farm programs, so that means we'll be dealing with soil erosion problems with more farmers than ever before."

That means a great opportunity for soil conservation progress in the state, Nethery said. He said the farm bill has already produced benefits.

One part of the bill, the Conservation Reserve, has already retired about a million acres of Iowa cropland for at least 10 years.

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"The Conservation Reserve Program (CRP) protects the highly erodible land and supplies the farmer with an income," he said. "The land that is planted to grasses for the 10-year contract also benefits our wildlife by supplying wildlife habitat. In some cases trees are planted and that helps replenish our forest areas that have disappeared over the years.

"Iowa ranks fifth in the country for participation in CRP and has the potential to have four times as much acreage in the reserve as is currently enrolled," Nethery said.

Local SCS offices have a list of highly erodible soils. There are many different ways those soils can be protected, Nethery said.

"Reducing the amount of tillage, going to a different tillage system, stripcropping, contouring or terracing, or changing the crop rotation are all options," Nethery said.

He added that the soil conservation work outlined in the plan is carried out over several years.

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Source: J. Michael Nethery, state conservationist, Des Moines, Iowa,
phone (515) 284-4260.



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1987 SOIL AND WATER CONSERVATION PACKET Agriculture Extension

Soil Conservation Helps Protect Water Quality

AMES, Iowa--Using conservation techniques can help protect surface water from the effects of soil erosion, according to an Iowa State University Extension weed science specialist. Richard Fawcett said soil erosion has many detrimental effects on water quality.

"Eroding soil carries nutrients and pesticides that contaminate surface water," he said. Sedimentation of lakes and streams reduces the usefulness of these areas for recreation and navigation and harms wildlife.

"Many techniques are effective in protecting surface water from the effects of soil erosion," Fawcett said. "These include terraces, contour planting, strip cropping, growing perennial forage crops and conservation tillage, which has recently become popular."

He said although conservation tillage is effective in reducing soil erosion, there are some concerns.

"Some people believe there may be a trade-off that occurs with the adoption of conservation tillage," Fawcett said. "The benefits of reduced soil erosion with conservation tillage may come at the expense of increased pesticide use, and possibly more contaminated water."

Misunderstandings about current pesticide practices are partly responsible for fears about increased chemical use with conservation tillage.

Fawcett said conservation tillage may change the types of weeds found in fields and therefore change the kinds of herbicides used. But national and regional surveys have shown that on the average, herbicide rates per acre with conservation tillage are similar to those used with conventional tillage.

Some tillage systems reduce herbicide use. He said early pre-plant herbicide application in no-till usually eliminates the need for special

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non-selective herbicides. Most farmers using ridge-till systems band herbicides only over the crop row.

"This cuts herbicide use by one-half to two-thirds compared with broadcast application," Fawcett said.

However, certain insect problems can be more common with no-till. Scouting fields for insects can limit the use of insecticides to sites where populations exceed economic thresholds.

Conservation tillage also can reduce runoff of agricultural chemicals because it reduces soil erosion and often reduces water runoff, Fawcett said.

"Because some soil conservation techniques, such as terraces and conservation tillage, can increase water infiltration, some people fear leaching of nitrates and pesticides may also be increased," Fawcett said.

Newly initiated studies should tell if these practices increase the risk of groundwater contamination. Early research results show that using no-till can reduce nitrate leaching, compared with plowing.

This apparently happens because no-till leaves natural soil pores intact, letting water quickly infiltrate without soaking through soil particles containing nitrate, Fawcett said.

Effects of conservation tillage on herbicide leaching are not well documented yet. Research shows that selecting products that are strongly absorbed in soil particles, low in solubility and short in persistence greatly reduces risk of leaching and is especially important where soils are sandy and groundwater is shallow.

A major concern in some areas of Iowa, according to Fawcett, is contamination of groundwater through surface water runoff into natural sinkholes or into agricultural drainage well inlets.

Fawcett said that in these areas, soil conservation techniques, such as conservation tillage, terraces and grass strips, can reduce the amount of eroded soil and runoff water reaching sinkholes and drainage wells. This is especially important in reducing contamination by agricultural chemicals.

"The use of soil conservation practices along with sound management decisions on the use of fertilizers and pesticides is necessary to protect surface water and groundwater. Efficient use of pesticides, fertilizers and soil conservation makes economic sense as well as environmental sense," Fawcett said.

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Source: Richard Fawcett, ISU Extension weed scientist, phone (515) 294-1160

(EDITORS: This story was electronically transmitted via MediaLink Aug. 17.)

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Iowa Farmer Plants Trees to Conserve Soil

WAUCOMA, Iowa--"We've always believed in conservation, but this is the biggest step we've taken to conserve soil on our farm."

Mark and Janice Balk, Fayette County farmers, said planting 13 acres of trees on their set-aside land earlier this year was a new experience for their family. They plan to plant an additional 8.3 acres next spring.

The Balks became interested in planting trees through their participation in the Conservation Reserve Program (CRP). Mark Balk said about half the land was in timber when his father began farming in the 1920s, but most of it was destroyed by a tornado in 1968. He said the CRP provided an opportunity to restore the land to the way it was before the tornado.

They planted about 8,400 trees on the 13 acres, more than 600 trees per acre. Balk said the trees will help shade the ground quickly to kill off other vegetation. The Balks plan to thin the growing trees, using the wood for fuel. Some trees will be lost to pests, disease and poor weather.

"On a scale this size, you can't really prevent rodents and other animals from damaging the trees," Balk said.

The initial investment for the project was more than \$300 per acre, with half of that funded by the Agricultural Stabilization and Conservation Service (ASCS). Costs include trees, soil preparation and chemicals.

Mark Balk said the ASCS will cost-share 50/50 with qualifying producers. The trees cost between 8 and 40 cents each, soil preparation about \$20 per acre and chemicals about \$3 per acre. Balk said the soil was prepared in the same way it is prepared for a crop like corn or oats.

The ground was fall chisel plowed, spring disked and soil finished. Before planting the trees, the Balks planted 1 1/2 bushels of oats and 4 pounds of timothy per acre to help prevent soil erosion.

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"The only equipment we needed to plant the trees was a tractor, a skid loader and a tree planter," Mark Balk said. "There was a lot of busy work to do, but not a lot of physical labor."

Usually, the crew consisted of nine people. Someone rode in the skid loader beside the tree planter, handing seedlings to the person riding the planter. After the trees were planted, youngsters would follow and stomp down the soil. It took two days to plant all the trees.

"It is a real nice family project," Janice Balk said. "It will be a good learning experience."

Both hardwoods and evergreens were planted, including Douglas fir, Scotch pine, white pine, white spruce, white oak, black walnut, black cherry and sugar maple. Rows of evergreens were alternated with rows of hardwoods, and, in some areas, hardwood trees were alternated with conifers within the row. Mark Balk said this arrangement will help the hardwoods grow straight and tall to make good saw logs, rather than bushing out like shade trees.

"One nice thing about trees is that you only have to plant them once in a lifetime," he said. Also, there is very little maintenance. The black cherry trees developed a leaf problem and were sprayed with Orthonex.

But regular maintenance of the trees does not take much time. Balk said he walks the field regularly to see how the trees are doing and will spray herbicides for the next 5 years and mow the grass a few times during the year.

The Balks conserve in other ways on their 200-acre farm. They planted 8 1/2 acres to grasses as part of the 10-year CRP and have 15 acres of no-till corn. Balk said he also tries to plant many acres with minimum till. He grows corn, oats and hay and the rest of the farm is permanent pasture.

The Balks also have 25 stock cows and produce about 800 hogs from farrow to finish.

They have four children: Darin, 10; Tami, 8; Brenda, 4; and Bobby, 3.

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Sources: Mark and Janice Balk, Waucoma, Iowa, phone (319) 776-4351

EDITORS: The photo for the following cutline is available from Clay Herman, 102 Morrill Hall, Iowa State University, Ames, Iowa 50011; phone (515) 294-5672.

Cutline

Mark Balk, Fayette County farmer, shows one of the new seedlings in his tree planting.

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Farmer Eligible for USDA Programs

LEMARS, Iowa--Gil Winter is a step ahead of the conservation rules the U.S. Department of Agriculture (USDA) is asking farmers to follow in order to stay eligible for USDA benefits.

The Plymouth County farmer has protected his land against soil erosion by practicing soil conservation for the past 20 years. That means Winter can continue to participate in USDA programs such as price supports, crop insurance, crop storage and others.

The 1985 Food Security Act (Farm Bill) requires farmers to control soil losses in order to stay eligible for most farm program benefits. Any farmer with highly erodible land will need a conservation plan for that land approved by his soil and water conservation district by Jan. 1, 1990. The conservation practices need to be fully applied by Jan. 1, 1995.

"When I heard about these new rules, it confirmed to me that I'd been doing the right thing over the years by protecting the land," Winter said. "I've got mixed emotions about the rules. Our system is built on free enterprise, so I hate to see more government involvement in farming. On the other hand, I've seen so much erosion that I don't think overall we can afford to keep losing topsoil like we have been."

Winter said the conservation compliance rules look to the future and are needed.

"I think there are a number of farmers who don't like these rules, and many who don't understand how the rules will affect them. And, there are still some who aren't aware of the 1990 and 1995 provisions," Winter said.

Winter uses no-till farming, conservation tillage (disk and plant),

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terraces and waterways to help control soil erosion. He farms around the hills on the contour, uses crop rotations and has grass headlands instead of end rows at field borders.

"I did this conservation work over several years, during good times in farming," Winter said. "The alternative conservation system the USDA is talking about seems to be a reasonable approach. With those systems, they don't require a farmer to get soil losses entirely to ideal levels but they do encourage a guy to start accomplishing the soil conservation goal. In these times, the cost of complete conservation protection could be a real hardship on some people. They're headed in the right direction."

Winter farms approximately 1,000 acres just west of LeMars. He and his wife Pat also feed out 5,000 to 6,000 head of cattle in their grain and livestock operation.

USDA also has "sodbuster" and "swampbuster" rules. Farmers lose eligibility for most USDA programs if they convert a wetland for crop production, or if they break out highly erodible land for crop production without an approved conservation system.

Contact any USDA office for more information on how to stay eligible for USDA programs and protect land you own or rent from soil erosion.

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Source: Gil Winter, LeMars, Iowa, phone (712) 546-5497.

EDITORS: The following photographs are available from Clay Herman, 102 Morrill Hall, Iowa State University, Ames, Iowa 50011; phone (515) 294-5672.

1. Narrow base terraces on the Gil Winter farm, three miles west of LeMars in the Plymouth County Soil and Water Conservation District.
2. Plymouth County Soil Conservation District Clerk Lynn Bohnenkamp discusses highly erodible land with Gil Winter, a Plymouth County farmer.