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Protected soil will last forever

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(EDITOR'S NOTE: This is part two of a four-part series)

(IDPA)—Iowa has lost half of its original layer of topsoil in less than a century, but by using conservation methods, farmers could preserve the remaining 6 to 8 inches for 2,000 years.

So said William Brune, state conservationist for the U.S. Department of Agriculture's Soil Conservation Service.

"Using the best soil conservation system," said Brune, "the original soil lasts 22 centuries, with more produced to take its place."

By using conservation practices in their farming plans, farmers can protect all cropland from the devastating effects of water and wind erosion.

Contouring the terrain will double the topsoil's lifespan. This method, which is cost-free, involves planting crops in curves around sloping lands and around hills. While this was a common practice several years ago, some farmers have abandoned contouring with the advent of larger and time-saving machines, Brune said.

Contours are most easily negotiated with four-row planters, which farmers are dropping in favor of eight-and 12-row machines, which can work the fields faster.

"We often hear big equipment is a problem" said Brune, "that contouring is not being done because the equipment doesn't handle well on the contour. Because of the equipment and time reasons, some farmers are no longer contouring."

While contours provide a guard against water erosion on sloping lands, the hilly terrain can be even better shielded from soil loss with the construction of terraces.

Two forms of terraces alleviate water erosion. Both are manually constructed and extremely costly.

Standard terraces are ridges of earth formed laterally across a slope, creating a series of stair-steps down the hill. These ridges intercept sediment loosened by rainfall and direct the water across or around the ridge into a nearby pond. The terraces must be carefully maintained by the farmer, who should regularly clean them out to avoid their becoming clogged with sediment.

Tile-outlet terraces are an even better protection against erosion. "The tile-outlet system traps nearly all sediment that would otherwise run off from the field," said Brune.

During construction, a tile is placed underground, with a spout exposed. Water running down the slope is guided along a ridge into the spout. The underground tile then moves the run-off into a pond or waterway.

"Only 60,000 miles of a needed 368,000 miles of terraces have been built," said Brune. "The job is only one-sixth completed. We've got to have more terraces."

But terraces are one of the most expensive forms of conservation. The standard terraces, much inferior to the tile-outlets, cost approximately \$125 an acre to construct while tile-outlet terraces cost between \$250-\$300 an acre.

Landowner sometimes can receive cost-sharing monies from the state or federal government to offset expenses. The assistance programs, offered through the federal government's Agricultural Conservation Program or Iowa's Department of Soil Conservation, absorb 50 per cent of the initial costs for installation of permanent conservation tools, but a farmer can receive no more than \$2,500 a year from cost-sharing monies.

"It's (terraces) a long-term investment," said Brune. "I have to admit we don't have all the economic answers for a farmer. I wish we could say how much he could save (economically) by building terraces."

If a landowner uses terraces and contours, he could triple the topsoil's lifespan. But he can go even one step further.

"If he practices no-till farming, with contour terraces and crop residue on the ground, the topsoil will last 2,224 years," said Brune. Because the topsoil regenerates itself at a rate of one inch every 500 years, its productivity could last indefinitely.

No-till or conservation tillage is a farming practice to which many Iowans are turning.

To work the soil in this manner, a farmer uses a chisel plow, disk or buffalo-type planter instead of the standard moldboard plow when tilling the land in the fall after the harvest.

Conventional tillage, using the moldboard, overturns the earth, resulting in loose soil particles extremely vulnerable to erosion. But the other machines dislodge only narrow strips of the soil and leave the field covered with crop residue—the stalks and field "trash" of unused plant portions.

By not harshly disrupting the ground and permitting a layer of residue to remain on the surface, much erosion can be prevented.

"If you leave half of this year's stalks on top of the ground, you stop most wind

erosion," said John Maddy, SCS agronomist. "And you generally cut water erosion in half."

Maddy added that the key to controlling erosion by this method is the amount of mulch left on the surface. Fields covered with more residue will suffer less erosion. While 3,600 pounds of residue per acre can control much erosion on gently sloping lands, steeper slopes require the farmer to leave 5,000 pounds for maximum protection.

Conservation tillage is one of the few methods, which, after the initial machinery cost, requires no other expenses.

An energy savings also results from the farmer making fewer trips across the fields in fall plowing, said Bill Mills, Polk county soil conservation district commissioner. By using the conservation tillage machinery, farmers need to make just one trip across a field and are advised against going over the field more than once with the chisel, the plow used by most farmers in reduced tillage.

If a farmer chisel-plows a field more than once, the land could be just as subjective to erosion as a moldboard, tilled field.

"Farmers who chisel two or three times bury most of their residue," said Maddy. "Especially on soybean ground. Last year, soybean ground that was overchiseled blew nearly as badly as conventionally plowed ground."

"If a chisel plow is misused, it can really wreck a field in a hurry," said Cecil Sieglaff, who farms 420 acres in Black Hawk County.

More farmers than ever before are including conservation tillage in their farming plans, said Brune. While the method was practiced on just 440,000 acres in 1968, the total increased to more than 7 million acres last fall—an 18 per cent increase over 1975.

"There is potential for reduced tillage on all of Iowa's cropland," Brune said.

Farmers who use reduced tillage generally agree the results are encouraging.

"Minimum tillage is going to be one of the best conservation tools we have," said Dale Reedy, a Humboldt County farmer near Hardy.

"He'll see the benefits the same year, but he might not get such a big yield response," said Vincent Willey, who farms 750 acres near Onawa in Monona County. "Once that soil washes off, we'll never recover it."

(Next: Some problems remain with conservation tillage.)