



IOWA

PROFILES IN soil health

Gene DeBruin
330 Acres
No-till Corn and Soybeans
Planting: Cereal Rye

unlock the
SECRETS
IN THE
SOIL

Earthworms Replace Tillage Tools.

Southern Iowa farmer Gene DeBruin is replacing costly tillage with the free tillage service provided by earthworms and cover crop roots. The Oskaloosa corn and soybean grower no longer tills his 330 acres of cropland, but instead relies on earthworms for tillage. He also plants cover crops for even more erosion control and superb soil structure.

DeBruin says he dabbled with no-till for a long time, but he finally committed to it eight years ago. "No-till is a different management tool because timeliness is very important for planting and weed control. I really like it, though," he said. "I like knowing that there is biological activity below ground. You dig down six inches and the earthworms are there. The worms are my tillage tool!"



Earthworm holes in DeBruin's soils show signs of biological activity, which is helping to improve soil stability and water infiltration.

DeBruin said there is some skepticism from local farmers about his farm practices, but he is confident in his management. "I've been told – no-till, no crop – but I've had 200 bushel corn, and although I don't get that every year, I get more consistent yields with no-till," he said.

Along with no-till, DeBruin has planted cover crops on portions of his cropland for five years. Last fall, he planted cereal rye on 220 acres. "I want better soil than anyone," he said. "I want to reduce the use of chemicals, and go back to a more natural way of farming."

"The soil was made to work for itself," he said. "We need to get back to that."

DeBruin sets aside 20 acres – which he rotates annually – to grow and harvest cereal rye seed. He uses some of the seed for himself and sells what's leftover.

For the last five years he has experimented with planting and termination methods, and various cover crop plant species. As of now, he's settled on cereal rye for its resiliency and ability to hold the soil in place. DeBruin aerial-applied cereal rye in 2015, but he plans to drill it in following soybeans this fall, hoping to get a more even stand.

For cover crop termination, he would like to begin crimping cereal rye before planting soybeans, but so far he has mostly used chemicals for cover crop termination.

DeBruin feels the combination of no-till and cover crops is adding organic matter to the soil and increasing biological activity. He recently hosted a cover crops field day on his farm, where soils experts from USDA's Natural Resources Conservation Service (NRCS) and Iowa State University discussed soil health benefits from low soil disturbance farming methods and cover crops. "We dug into the soil and they pointed out all of the living organisms," said DeBruin. "I was impressed. I don't think I'd ever seen that before on this farm."

DeBruin farms in the 51,000-acre Muchakinock Creek Watershed. Muchakinock Creek, known locally for flooding busy Highway 92 just west of Oskaloosa, was added to the Environmental Protection Agency (EPA) Impaired Waters List in 2002, due to habitat



Newly planted soybeans begin to sprout through a terminated cereal rye cover crop and corn residue. DeBruin has no-tilled for eight consecutive years and planted cover crops five straight years.

alterations. More than half of the main creek channel was straightened in the 1950s, from Pella to Oskaloosa, to improve farming conditions. The creek headwaters are in Pella, flowing into the Des Moines River at Eddyville in southeast Iowa.

Meleia Shelman, Muchakinock Creek watershed coordinator, says the creek scores poorly for fish habitat due to sedimentation, largely from farm practices such as tillage. "Sediment is our biggest issue, but we are working hard to fix that," she said.

In 2005, state and local conservationists began working on a watershed project focused primarily on erosion and sediment control, and flood reduction. The watershed is also home to about 1,700 acres of abandoned mines, which support little plant life and cause mine spoil acids to seep or flow into streams. Officials with the Iowa Department of Agriculture & Land Stewardship's Mines and Minerals Bureau have worked with landowners to reclaim abandoned mines to reduce acid drainage into streams.

State leaders recently extended the watershed project three years, through 2018, which offers farmers 75 percent cost-share to install terraces, grade stabilization structures, and water and sediment control basins, and to plant cover crops.

profiles in soil health

Gene DeBruin, Iowa

DeBruin is one of six farmers in the watershed who will plant a 40-acre cover crop demonstration area for the remaining three years of the watershed project. "I think it's a big commitment these farmers are making to help educate other landowners in the watershed," said Shelman.

DeBruin says he can tell cover crops are helping to reduce erosion. "Just this spring we had a two-inch rain and I heard neighboring farmers talking about the gullies," he said. "For me, it didn't even wash down the waterways. The cover crops held the soil in place and my soils allowed the rain to infiltrate better."

To learn more about ways to improve your soil health, visit your local NRCS office or go to www.ia.nrcs.usda.gov.



Working through the local USDA Service Center, DeBruin (right) has had a strong relationship with local, state and federal conservationists in Mahaska County. He is involved in conservation programs that are helping to improve water quality in the Muchakinock Creek Watershed.

Want to unlock the secrets in YOUR soil?

Go to: www.nrcs.usda.gov

USDA  **NRCS**
United States Department of Agriculture
Natural Resources Conservation Service