

SYSTEMS APPROACH TO CONSERVATION

By Darrell Boone



For Jim and Jamie Scott of Pierceton, profitability and taking care of the soil aren't on opposite sides of the fence. Joined at the hip is more like it.

"Whenever you see a river or stream with muddy water, you know that there's topsoil floating away, but there's a whole lot more," says Jamie. "In that topsoil, there are also nutrients and chemicals, which also means some farmer's dollars."

This attitude of recognizing that what's good for your topsoil is also good for your bottom line led Jamie's dad, Jim, to start no-tilling corn on his Kosciusko County farm in 1980. Over the years, Jim, and later Jamie, have continued to add layers of conservation practices — GPS guidance systems, cover crops, nutrient management and crop scouting — to evolve into what they refer to as a "systems approach."

This systems approach, as practiced by the Scotts on their mostly rolling, 2,000-acre operation of corn, soybeans, wheat, alfalfa and grass hay, is a "whole-is-greater-than-the-sum-of-its-parts" philosophy in which no one practice is a silver bullet.

They also use an array of supportive conservation practices to protect their topsoil for coming generations. Improvements include grass waterways, 40- to 100-foot filter strips along streams, water and sediment control basins, and windbreaks. On former pastureland, they've replaced cows with an estimated 25,000 to 30,000 trees.

"We've got over 100 lakes here in Kosciusko County, and the Tippecanoe River is one of the most diverse rivers in the world," says Jamie, who is the current treasurer of the Indiana Association of Soil and

Water Conservation Districts. "The people who live around those bodies of water don't want our topsoil, nutrients and chemicals. Neither does the Gulf of Mexico."

ELEMENTS OF THE SYSTEM

Jim reports that the conservation practices they use work well across their many and varied soil types, predominantly Rensselaer, Whittaker, Wawasee, Kosciusko and Martinsville. Individual practices that make up the Scotts' systems approach include:

No-till: When Jim started no-tilling corn more than 30 years ago, he quickly discovered that fall residue needed to be evenly distributed to allow the soil to warm up uniformly. Otherwise he's made no-till work for him with little more than minimal planter adjustments. Jim and Jamie do apply starter fertilizer with phosphorus included to jump-start early growth in their slow-warming northern Indiana soils. Soil erosion is drastically reduced (as are nutrient and chemical runoff), fuel savings are significant, and they've experienced no yield drag.

Cover crops: The Scotts have used cover crops for the past seven or eight years, and Jim's only regret is that he didn't start 30 years ago. He feels cover crops really are key to enhancing and accelerating many of the benefits of no-till. Jim especially likes annual ryegrass, which he appreciates for its deep root system (as deep as 60 inches). It helps attack and break up years of accumulated compaction. Other benefits include less purchased nitrogen, improved soil quality and structure, increased organic matter, freeing up of accumulated nutrients and micronutrients,

CONSERVATION SYSTEMS: A GLOBAL PERSPECTIVE

BEFORE BECOMING the coordinator for Indiana's Conservation Cropping Systems Initiative, Hans Kok had the opportunity to study tillage practices all over the world. After receiving his agricultural engineering degree in his native Netherlands, he did graduate work in Israel and consulting work on most of the continents. He says there are some compelling reasons why Hoosier farmers need to re-evaluate their tillage practices.

"We've been kind of stagnant in adopting new tillage practices in Indiana," says Kok bluntly. "While three-fourths of the state's soybeans are no-tilled, less than a quarter of corn is. Several of our major competitors across the world – Argentina, Brazil, Australia and New Zealand – are almost entirely no-till. We're setting ourselves up for a really big disadvantage in the world marketplace by sticking to fairly old-fashioned technology."

Kok has learned that whether in the U.S. or around the world, the adoption of conservation practices is largely a matter of attitude.

"On most continents, I've found farmers who make no-till work whatever the soil types and conditions, while others do not," he says. "Whether it's the cold, clay soils of Indiana; the hot, humid soils of Chile; or the arid soils of Australia, they find a way. Of those who don't, it's interesting to hear the discussion. A lot of farmers just don't want to make that change. The array of reasons is wide and deep, usually involving social, labor or capital issues."

Kok says farmers like Jim and Jamie Scott have not only a big economic

TAKING ON THE WORLD: Hans Kok, coordinator of Indiana's Conservation Cropping Systems Initiative, offers his take on how Hoosier farmers use no-till and other practices. He notes there's plenty of opportunity in the state.



edge by practicing a conservation cropping system, but also an "enormous advantage" in soil health and preservation.

"In a conventional tillage system, you lose a lot of soil to erosion, but the Scotts are actually adding to their soil base, increasing their organic matter and creating more topsoil," he says. Then he adds, "In American agriculture, we'd better be careful. We're at a stage where we could lose a lot of our farm base if we don't preserve it with systems like theirs."

increased moisture retention, and phenomenal erosion control capability.

"Its root system is as thick as hairs on a dog's back," says Jim. "That soil's not going anywhere, no matter what you throw at it."

GPS/precision application: "Technology's allowed us to do a lot of things more efficiently," says Jim. "By using GPS with a yield monitor and mapping, we know where the yield comes from, and it helps with our soil sampling. GPS has also allowed us to add nutrients just where we need them, rather than the whole field. This has been our biggest cost-savings. And we don't have that 2-, 3-, 4-foot overlap anymore."

Crop scouting: "We do a lot of scouting so we're not out there blanket-applying chemicals over the whole field when we don't need them and there's no economic benefit," says Jim.

Nutrient management: "We try to keep a good eye on our fertilizer usage, and get our nutrients balanced in the soil profile from top to bottom," says Jim. To accomplish this, they regularly pull soil and stalk nitrate tests and tissue tests, and use chlorophyll meters during the growing season to fine-tune and balance nutrients.

Jim says whenever they rent or buy a new farm, they immediately implement their systems approach. "Then after about three years, we're seeing a different farm in terms of improved soil structure, reduced erosion and improved nutrient availability," he says.

After 30-plus years of conservation practices, Jim and Jamie are still constantly tweaking their system, but they like what they're seeing at this point.

"The soil is very different when you have all these things working for you," says Jim. "With roots going down that far, it creates more oxygen in the soil, plus the moisture can percolate up and down throughout the whole soil profile so much better. Earthworms also work up and down through the profile. Then next year's crops will follow the worm channels and the old root channels of the cover crops, which places less stress on the plant."

Jim says he and Jamie aren't the only ones who've noticed the benefits of their system. They've picked up some new farms because landowners

have noticed what they're doing and the results they're getting.

For producers who may be considering making the leap of faith to conservation tillage and practices but haven't committed yet, Jim says it isn't as difficult as they might think.

HEALTHIER SOIL: Jim Scott shows the root system from their annual ryegrass cover crop test plots. He just wishes he had started using cover crops a lot earlier than eight years ago.



"For most of us, the biggest transition is between the ears," he says. "If you think it will work, you're right. And if you think it won't work, you're right. If you're not sure, try some of these practices on part of your acreage and see how it works compared to what you're currently doing."

He adds that not only is the effort worth it, but it also is necessary for long-term sustainability. He thinks recent methods have taken a toll on the soil, water and air.

"For the last few decades, we've mostly had a corn-soybean rotation in the Midwest," he reflects. "That's asking a lot from the soil. If we're going to be sustainable forever, we need to be careful with the soil, preserve and grow its organic matter, reduce erosion, improve our fertilizer usage, and clean up our water a lot. If you've taken out some fencerows, even 30 years later, you can still tell a difference in fertility, yield, moisture retention — better than any other part of the field. If we can get that whole field back as good as that fencerow was, we're making progress."

Boone writes from Wabash.

EXPERIENCE IS BEST TEACHER

LIKE MANY no-tillers, Jim and Jamie Scott attend the National No-Till Conference every year. They learn new ideas and techniques from no-till farmers from all over the country. But once those seeds have been planted in their minds, they've found there's no substitute for planting them on their own farm.

Other lessons they've learned along the way include:

■ **Dig root pits.** "What matters is what you can't see going on below the ground," says Jamie. "Like with annual ryegrass – it's hard to believe that something only 3 to 4 inches tall can have roots growing down 60 inches. But you don't know that till you dig the root pit."

■ **Patience is critical.** "With no-till, there are times you have to wait an extra day to get in the field," says Jamie. "You don't want to work on a field for 10 years, and then get in a hurry and put that compaction layer back in."

■ **Good drainage helps.** "We believe it's important to have fields tilled to gain the maximum benefit from no-till and other systems," says Jim.

■ **Conservation is easier today.** "It's a lot easier to manage these systems now than it was in the '80s," says Jim. "With the equipment, technology, seed and chemicals we have today, any farmer can make it work."

■ **Help is available.** "We're fortunate to have the Natural Resources Conservation Service staff that we do in the state," says Jamie. "When programs come along we want to do, they help us every step of the way."

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