

# The Missing Link

Mike Brocksmith - Vincennes, Indiana

Mike Brocksmith says he may have found the missing link buried in the soil of his farm near Vincennes, Indiana. It's not a jawbone or an arrowhead—it's the extensive root system of a cereal rye cover crop reaching nearly three feet into the ground.

"I think cover crops were the missing link for us in our soil conservation system," he says. "These soils in this field have been no-tilled for 20 or 25 years. We already had great soil health. Now we're going to the next level."

For Brocksmith, who farms with his wife and two daughters, the next level in crafting a conservation farming system for his family's farm is building healthy, nutrient-rich soils that help nurture crops even in bad years.

"We want to weather-proof our soil for the occasional dry spell, and even for wet spells," he explains.



Mike Brocksmith is weather-proofing his soils.

## Light Bulb Moment

The Brocksmiths have been completely no-till since 1990, following years of experimenting, fine-tuning the practice, and adopting new no-till tools that made the practice increasingly viable.

"Our first no-till corn in 1978 was a failure," Mike confesses. "In 1990, we went cold turkey."

Similarly, Brocksmith says he "dabbled" in cover crops for the past 15 or 20 years before planting his entire farm to cover crops for the past three years. He says he was sold on the power of cover crops to help boost his no-till program at a spring field day several years ago. Barry Fisher, region soil health team leader for the USDA Natural Resources Conservation Service (NRCS), was emphasizing that there's more going on with cover crops than you can see on the surface. Fisher dug a soil pit to prove his point. It worked.

"I remember looking at two-inch-tall cereal rye at a field day in March with roots 30 inches deep," Brocksmith recalls. "That was the light bulb moment for me—when I saw those roots with two-to-three-leaf [cereal] rye."

## The Next Generation

Building healthy soils is a long process, so it's no surprise that Mike Brocksmith and his wife Susan—who chairs the Agribusiness program at Vincennes University near their farm—created Student Soil Health Field Days to inspire high school and college students to adopt conservation farming practices.

"A 60-year-old farmer is probably not going to change the way he's farming, but hit a kid before he goes back to the farm and maybe you can get him to no-till," Mike Brocksmith says. "We have students visiting the farm and I tell them, 'I'm 58 and I waited too long. You're young: start now.'"

With help from the Knox County Soil and Water Conservation District, the Southwest Indiana NRCS Soil Health Team and Conservation Cropping Systems Initiative (CCSI), more than 100 students at a time visit the Brocksmith farm near Vincennes for hands-on soil health experiments.

"Having students on the farm is the coolest thing we do," Brocksmith says.

## Adding Organic Matter

One of the things that was most appealing to Brocksmith about the cover crop's root system was the abundance of organic matter it added to the soil.

"For years we were doing a corn/bean rotation in no-till," he adds. "An early bean crop doesn't do anything to build your organic matter. There's nothing there. That's 50% of your rotation. That's where cover crops come in. A corn/bean rotation without cover crops may not be sustainable the way we thought it would be."

Brocksmith boosts his corn/soybean rotation with some wheat after corn, followed by double crop soybeans. That adds more residue to the equation.

So do cover crops.

"We're still fine-tuning what works for us on our farm," he says. "In our case, I don't think it's a \$40-an-acre mix with radishes. It's more like the \$13 to \$20 cereal rye/rape mix. We have some cereal rye on every acre—it looks like it might be the base of our cover crop system. It's economical to plant."

After corn, Brocksmith seeds 45 pounds of cereal rye. Following soybeans—whose earlier harvest date permit

more cover crop growth—he blends cereal rye with spring oats and rape. He says rape has been dependable, and he's very enthusiastic about the prospects for spring oats.

"We got tremendous growth of spring oats, and they just winter-killed in January," Brocksmith says. "I think we're going to like this. I just love the way spring oats can grow in the fall. They're capturing nitrogen and building organic matter. I've been taught the only way to build organic matter is with nitrogen and sunlight."

In 2012, the Brocksmiths established test plots to compare long-term no-till with no-till plus cover crops as part of the Conservation Cropping Systems Initiative (CCSI), which is investigating the economic and environmental impacts of conservation practices by studying various conservation practices on 12 farms around the state.

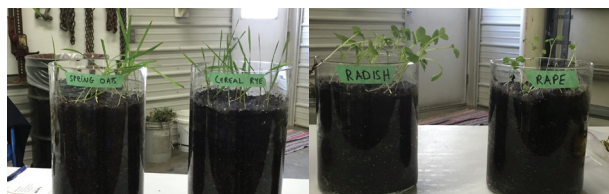


Mike and Susan Brocksmith spread the word on conservation by hosting Student Soil Health Field Days.

## Nitrogen Efficiency

Brocksmith sees signs that conservation farming is bolstering his fertilizer program, though he has not cut rates of nitrogen like some farmers have.

"I honestly have been afraid to cut nitrogen rates like we read about in magazines," he confesses. "But compared to 10 years ago, we are getting more yield per pound of nitrogen. In my case, we haven't increased nitrogen, but we've increased yields. When I began farming many years ago, we were talking 1 pound, 1-1/4 pound of nitrogen [per bushel of corn]. Now we're getting a bushel for 0.75 to 0.8 pounds. I think a lot of that is due to our organic nitrogen in our soil."



Cover crops on display at a Student Soil Health Field Day.

## Planting Into Live Cover

Killing cover crops isn't a problem for Mike Brocksmith on his Vincennes, Indiana, farm. The trick is timing—planting into half-dead cereal rye is challenging, and you may be losing out on the opportunity to build up extra biomass that can protect cash crop seedlings and build organic matter.

"If we don't get [cover crops] killed knee-high or below, we're going to plant it green," Brocksmith says. "I've planted into 6-foot-tall cereal rye. Auto-steer is wonderful. You can't see your planter marker in six-foot-tall rye."

"I've also planted into three-to-four-inch cereal rye and let it grow another two to three weeks," he adds. "You get a tremendous amount of biomass. That mulch will keep the field from drying out. We've sidedressed through that without an issue, then come back with a spring postemergence herbicide."

## Feed the System

Brocksmith sees cover crops as a valuable boost to his family's conservation farming system—something worth investing in, though it's hard to put dollar values on the practice.

"We've attempted to quantify everything we've spent and everything we've harvested," he says. "It has been a wash. The cover crops have not necessarily made us more money. But we've at least broken even on the plants we have, and I would definitely feed the system 15, 20, 25 dollars an acre—whatever it took."

It's all about investing in controlling erosion, building healthier soils and stockpiling more organic matter, Brocksmith explains.

"That's the longer-term idea," he says. "That's where our resiliency and nutrient storage come from. We're not in a 100-yard dash. We're in a marathon."

This is part of a series of sheets on the economics of conservation systems developed as part of Indiana's Conservation Cropping Systems Initiative (CCSI) in cooperation with the Conservation Technology Information Center and Purdue University. For more information on the Conservation Cropping Systems Initiative, visit [ccsin.org](http://ccsin.org).

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