

Time for soil rehab

With the loss of half the soil organic matter in the Corn Belt, it's time for cover crop innovation.



This spring, Minnesota farmer Bryan Biegler green-planted a plot of soybeans right into his cereal rye cover crop, which was sprayed the day before planting. He says it planted really well, and within five days the cereal rye was all brown and killed off. Only five days after planting, the beans emerged through the burned-down cereal rye.

By Jonathan Eisenthal and Kurt Lawton

Frustrated by poor results with preharvest aerial cover crop seeding two years in a row, Minnesota farmer Bryan Biegler shifted to ground application for better results. In Indiana, Mark Kingma has transitioned some acres from fall seeding of cover crops to corn sidedress time — called interseeding. He's seeing benefits beyond soil improvement, like potential weed control.

Farmers are hungry for more return on fewer inputs, and innovative farmers know that adding more fertilizer to get more bushels is not sustainable. The soil biology is dead. They understand the rehab value

of cover crops, so they experiment to find that initial management sweet spot of timing and seeding success.

Rehab soil organic matter

In Illinois, crop consultant Matt Van Slyke specializes in cover crops and beneficial biological agents. He helped a half dozen farmers establish interseeded cover crops this year — to begin the soil rehabilitation process.

"If a farm is kind of dead, it's got low carbon levels, and a cover crop is a big part of the solution," says Van Slyke, based in Grayslake. "A ton of cover crop contains 900 pounds of biologically available carbon. Microbes love carbon. It is one of their main food sources. A cover crop system helps you spoon-feed your cash crop. As the cover crop [killed

just before planting the cash crop] decomposes, it is slowly releasing nutrients. The captured or produced nutrients from the cover become available, particularly at the reproductive stage of the cash crop."

Huge nitrogen efficiency gains

Van Slyke says his farmers have been able to achieve nitrogen efficiencies of 0.4 to 0.5 pound of N per bushel of corn, compared to the effective rate of many growers of 1 to 1.2 pounds of N per bushel.

Both Biegler and Kingma see cover crops as a practical solution to agronomic and environmental problems. Compaction on field edges and headlands, lack of water infiltration, and general soil health are the key

This ryegrass cover crop was interseeded at sidedress time on the Indiana farm of Mark Kingma. He noticed a dramatic difference in his cover crop test strips: The pigweed, lambsquarters and marestail that plagued many other acres were completely absent in the strips with cover crops. Kingma is among the 65 cooperators in the Soil Health Partnership, an initiative begun by the National Corn Growers Association to focus on-farm research into the development of best management practices for soil health, such as cover crops and reduced tillage.

agronomic issues for both farmers. Nitrogen and sediment loss are the key environmental issues.

Biegler, who farms near Lake Wilson, Minn., took a high-clearance sprayer and added a 32-row air seeder so he can drive right into tall corn and broadcast seed in between rows. He's seen strong stands and good results in the two years he's been at it. He not only covers the majority of his acres with a ryegrass mix, but also custom-seeds covers for a growing number of clients, planting 3,000 acres for them this year. He favors the late-season application of seed, but may build a drill-style seeder this winter so he can try interseeding at V4.

Kingma has planted covers at his farm near DeMotte, Ind., for six years — mostly postharvest using a shallow vertical-tillage rig to incorporate the seed. The past two years he has cooperated in a research project on interseeding at sidedress time. This timing creates a six-week window when the corn plant can germinate and develop without competition from cover crops.

"I am definitely sold on the idea [of cover crops] — on the soil health benefits that we see from them through added drainage and water-storage capacity in the ground," says Kingma.



Weeds be gone?

It's far from a scientific conclusion, but Kingma noticed a dramatic difference in his cover crop test strips: the pigweed, lambsquarters and marestail that plagued many other acres were completely absent in the strips with cover crops.

"You can still see that [weed-free condition] in our soybean crop this year," Kingma says, noting that there seems to be a subsequent-year benefit.

Dan Towery, a field manager for the Soil Health Partnership, the organization overseeing Kingma's interseeding research strips, reports observing a cover crop effect on weeds, and says researchers at University of Pennsylvania have observed the same phenomenon.

"In Mark's fields, it's still a preliminary finding, but where we interseeded, we had better weed control than where we didn't," says Towery. He makes the caveat, "That's the way it worked on that field for that year. [Researchers at U Penn have] seen the same thing. We haven't done trials. It's just observation. It hasn't been studied as to which weed species are affected, in what soil types

Think different

"After World War II we converted unused ammunition into fertilizers — we literally 'turned guns into butter' — that's partly how we became the breadbasket of the world. But all that productivity came at a cost.

- ▶ We lost half our organic matter in the Corn Belt.
- ▶ This generation is now faced with the task of organic matter rehab.

"I believe that we can still help feed the world, and do it without yield drags, while also creating organic matter and building up the soil at the same time. The old model was 'command and control.'

"Now, the big shift — it's a huge shift — we are learning to empower nature by creating healthy soils. Cover crops are the central best practice for soil rehabilitation."

— Matt Van Slyke, crop consultant