



Cover crops case studies

Gary Sommers Farm

Cash grain

Christopher Anderson and Diane Mayerfeld

Wisconsin is seeing a renewed interest in planting cover crops to prevent soil erosion, retain or add nutrients, reduce pest pressures, provide forage, and accomplish other goals. Farmers and extension educators are asking questions about which cover crops to plant, how to fit them into different cropping systems, and what equipment is needed to plant and manage them.

This case study shares the experience of one Wisconsin farmer who has been growing cover crops for twenty years. He presents his philosophy of cover crop use, explains what cover crop management practices have and have not worked on his farm, and describes what benefits he sees from growing cover crops. Farmers and researchers can use this information as a starting point to explore how they might develop cover crop systems to meet their own goals.

Summary of the operation

Gary Sommers' farm in Clinton, Wisconsin, is just down the road from his boyhood home. He grows corn, soybeans, and winter wheat on 1,475 of his 1,500 acres. The remaining 25 acres are enrolled in the Conservation Reserve Program. Most of his croppable acres are in a corn-soybean rotation, with an occasional stand

of continuous corn. About 10 percent of his land is gently or moderately rolling terrain with slopes under 12 percent. These sloping fields are in a three-year rotation of corn, soybeans, and wheat.

Gary does most of the work on his farm, but he hires a neighbor to help with planting and harvest, and at harvest time hires another neighbor to drive truck to the local elevator where he sells all his cash crops.

Gary's use of no-till methods distinguishes his farm from many in the area, though in other respects Gary considers his farm pretty typical of local grain farms. When asked why he uses no-till, Gary replied, "It's been a labor saver and a fuel saver, and helps with the soil erosion. It's probably what got me started no-tilling more than anything else—the soil erosion, the conservation benefits."

Cover crops grown on the farm

Gary mainly uses cover crops on his steeper fields. Usually he sows cover crops—including buckwheat, soybeans, oats, and Berseem clover—after harvesting winter wheat in mid-July. The following spring he plants these fields to corn. Cover crops which do not winter-kill are terminated in the fall to prevent corn planting delays.



Saved buckwheat seed from Gary's crop

When Gary follows soybeans with winter wheat, the emerging wheat provides cover during the fall and winter months. Soybean fields that are to be planted in corn the following spring are usually left bare after harvest. Gary has experimented with planting cover crops between the fall soybean harvest and spring corn planting, but the interval between these two operations leaves little time for a cover crop to grow.

For the last couple of years, Gary has experimented with frost seeding red clover into winter wheat along with his early spring fertilizer application. The clover seeds fall into cracks created as the ground freezes and thaws. Although one year his clover didn't grow very well, most years he has seen tremendous clover growth following the wheat harvest and no decrease in wheat yield. Frost seeding only costs Gary the price of the clover seed. As the seed is mixed and spread with his spring fertilizer, it requires no additional labor or fuel. The clover cover crop allows him to cut back on the nitrogen he applies for the next year's corn. The clover's main drawback is that it interferes with baling the wheat straw.

Gary is still experimenting to develop the best cover crop system for his farm. He is considering trying a mix of species—a cover-crop “cocktail”—or tillage radish, or perhaps crimson clover after winter wheat.

Goals and benefits of cover crops

Gary sees value in conserving the soil on his farm. Reducing soil erosion is his primary motivation for cover cropping. When asked what benefits he has seen from his cover crops, Gary said, “It’s just the feeling that you are protecting the soil . . . adding some organic matter, maybe improving soil tilth a little bit.”

He has, on occasion, derived income from his cover crops. In some years his buckwheat, oats, and soybean cover crops have produced harvestable seed. “But that is not the primary motivation for planting a cover crop,” he said. “It just sometimes works out that way.”

Gary added that his cover crops have “created a curiosity in the neighborhood.”

The challenges of cover crops

Production costs are one challenge Gary sees with cover crops. “There is a cost associated with the seed and getting the cover crop established . . . then you need a way to kill the cover crop before you plant the next crop, and that adds a cost as well,” he observed.

Other challenges include the potential for these crops to harbor pests. Gary has observed higher levels of armyworms in cornfields after a cover crop of cereal (winter) rye. For this reason, he has not used cereal rye for a number of years.

In his experience, weather is the primary factor determining the success of a cover crop. For instance, ideal conditions for frost seeding clover into winter wheat may occur only a few days of the year. And if the weather is extremely hot and dry after he plants a cover crop following wheat harvest, he can end up with slow or no growth.

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Cover crops in the crop rotation

Gary sows cover crops as soon as possible after his winter wheat harvest, particularly cover crops that could produce harvestable seeds, such as buckwheat and soybeans. If he bales the wheat straw, he can't plant until the straw is off the field, but each day of planting delay can significantly reduce the overall growth of the cover crop.

Gary would like to plant cover crops on some of his steeper ground after soybean harvest, but he has yet to find the right crop. A cover crop wouldn't have much time to grow between soybean harvest and winter. While farmers 150 miles south of Clinton have used annual ryegrass in a similar situation, this crop may not work with Gary's somewhat shorter growing season, and he is concerned about the potential for the grass to go to seed and turn into a weed. He has thought about trying oats or barley because they can grow a fair amount in the fall, before they winter-kill.

Tools and techniques

Gary makes sure his cover crops complement his no-till practices. "Any time I have a cover crop, I either want to have a crop that dies by itself during the winter or I want to kill it in the fall," he said. He typically kills winter-hardy cover crops like clover with the same herbicide he normally applies for fall weed control, so there is no additional cost. He uses a no-till drill to plant all cover crops except frost-seeded red clover, which he broadcasts as part of his spring fertilizer application. On two occasions he has needed to cut his clover cover crop in early September to keep the mat from getting unmanageably thick.

Gary does not incorporate cover crops into the soil, or plow them in. He leaves the residue on the soil surface, then uses his no-till equipment to cut through it and plant his cash crop.

The economics of cover cropping

Gary always calculates and considers the costs of his cover crops, but acknowledges that it is



Gary uses this no-till seed drill to plant most cover crops

hard to quantify their benefits: "I just have to decide, well, this is what it's going to cost me and do I think there is enough benefit . . . that I want to do it without having any definite proof. . . . It's just hard to quantify if you're benefiting the soil. . . . It's kind of a long-term investment, you know. Does it show up next year? Well, maybe not. But maybe, over the long term, there's enough benefit that it's worth the expense of doing it." He added, "If cost was the only consideration, you probably wouldn't do it because you can't really quantify a return."

Gary has observed some benefits from his cover crops, however. "I have noticed that—and usually I plant my winter wheat on acres that I would consider the poorer soils, maybe more hilly and stuff—but I get some of my best yields from those fields that are planted to wheat [followed by a cover crop] and then the following year planted to corn," he said. In addition, cover cropping is one of the practices that qualifies his farm for the Natural Resources Conservation Service (NRCS) Conservation Stewardship Program.

“ It's just hard to quantify if you're benefiting the soil. . . . It's kind of a long-term investment. ”

Gary always tries to limit the cost of cover crop seed to \$20 per acre or less. Maintaining this threshold is increasingly difficult because seed costs have gone up in recent years.

To control costs, Gary saves his own buckwheat seed and derives a small amount of income selling this seed to his neighbors.

Cost and labor requirements vary, depending on the cover crop. For instance, frost seeding clover into wheat requires no additional labor because the seed is broadcast by the fertilizer applicator. But drilling buckwheat, soybeans, or some other legume into the field after wheat harvest costs approximately \$12 to \$15 per acre.

Learning and planning for the future

Gary gets most of his information about cover crops from Rock County UW-Extension Agent Jim Stute and from farm magazines. He would like to see more research on cover crops. Although erosion control, rather than economics or fertility, is his motivation for cover crop use, he is interested in knowing if there is a competitive payback from cover



Gary's no-till planter cuts through cover crop residue to plant his cash crop

cropping when fertilizer prices are high. Gary would also like to see research on new cover crop varieties.

To farmers interested in trying cover crops on their farms, Gary offers this advice: “Any time you try something new, you have to be willing to accept a little risk. Because you’re doing things in a little bit of a nonconventional way, you have to sometimes change the way you do things or change the way you think about things, and there are going to be some instances where things don’t turn out the way you thought. You might say, well, why am I bothering to do this, if it is something that creates problems . . . ? I think it’s just something you have to be willing to work with. . . . Be willing to try something different. See if it works for you.”

“ Be willing to try something different.”

Further information on cover crops:

Midwest Cover Crops Council, www.mccc.msu.edu

UW Soils Extension, www.soils.wisc.edu/extension/covercrop.php

Cover Crops on the Intensive Market Farm, John Hendrickson, UW-Madison Center for Integrated Agricultural Systems, www.cias.wisc.edu/wp-content/uploads/2008/07/cvrcrop.pdf

Managing Cover Crops Profitably, Sustainable Agriculture Research and Education Program, www.sare.org/Learning-Center/Books/Managing-Cover-Crops-Profitably-3rd-Edition/Text-Version

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