Cover Crops Critical to Erosion Control in Missouri

Tim Gottman farms near Monroe City, Missouri. Along with his brother, Trent, they own and operate TJT Gottman, Inc., growing corn, soybeans and wheat. While Tim remembers the days of farming with his dad and grandpa with a moldboard plow, he knows the productivity and longevity of his farm depend on continuing to evolve his approach.

Today, Tim and Trent leverage vertical tillage and cover crops to reduce erosion, maintain nutrients, and protect water quality. Through collaboration with Soil Health Partnership (SHP), Missouri Corn Merchandising Council, Missouri Soybean Merchandising Council and the Missouri Department of Natural Resources, they are studying the impacts of these management practices – both on their farm and on the surrounding environment.

Approaching Soil Health at TJT Gottman Inc.

The timeline below overviews their planning process, starting in late summer when cover crop decisions are initiated and focusing on a cover crop program ahead of soybeans. Tim is still experimenting with a cover crop system before corn that works for their farm.

<table>
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<tr>
<th>Late Summer</th>
<th>After Corn Harvest</th>
<th>Spring Ahead of Soybeans</th>
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<tr>
<td>Starts having conversations with local ag retailer in late July/early August for cover crop orders</td>
<td>Contacts ag retailer to have cover crop seed broadcast applied with P&amp;K application for fields going to soybeans or wheat</td>
<td>Initiates pre-plant chemical termination (April/early May), when cover crop growth is still manageable – targets the vegetative growth stage between 2-3 feet</td>
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<td>Plans cover crop selection based on current crop rotation, estimated harvest dates and field needs</td>
<td>Targets broadcasted cereal rye rates at 40 lbs. per acre</td>
<td>Makes one spring vertical tillage pass, depending on soil moisture and weather conditions (cover crops are dead and turning yellow at this time)</td>
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<td>Begins strategically planning each field’s estimated cover crop application schedule</td>
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Overall Fertilizer Program

Tim applies lime, P and K as needed for all fields, determined using a three-year grid soil sampling program. In corn, he also uses a split-applied nitrogen program to help optimize both nitrogen rate and timing. This includes applying anhydrous in the spring and top-dressing urea in-season.
Soil health efforts are making an impact on erosion

Through the Missouri Edge of Field Water Quality Monitoring Program, Tim is measuring soil loss on a field with cover crops and one without (these trial fields are located near his SHP field). Over the last several years, he has been able to see how much soil he is saving on the cover cropped field, as compared to the one without (Figure 1), which has been about 28 tons (or two tandem dump truck loads) per acre over the last three-and-a-half years.¹

By looking at data from both SHP’s research and the edge-of-field study, we can see that soil structure plays a big role in keeping that soil in place. One way to evaluate soil structure is by testing for aggregate stability, which measures how well the soil holds together during rain events and is known to contribute to improved moisture infiltration. Tim has seen a significant increase in aggregate stability on his SHP trial field in the cover cropped strips (Figure 2).

Along with these benefits, Tim has seen no significant yield drag and relatively little change in net income. He said, “I think people look at the cash cost of [cover crops], but if you can save 5-10% in fertilizer per year and it stays in the soil instead of running off through erosion – I don’t have to do the math; that’s money ahead.”

¹ It is important to note that, while cover crops have helped reduce erosion on that field, the non-cover cropped field has additional characteristics (e.g., topography) that made it especially susceptible to erosion – making the differences between the two fields particularly stark.

Read the complete Business Case at soilhealthpartnership.org/business-case.