Iowa farmers incorporate cover crops into nutrient management strategy

Seven years ago, Roger and his son Wesley Zylstra set out to improve stewardship of their land. By paying attention to nutrient management and incorporating cover crops, they started down the path of adapting their management system to meet soil health, yield, and economic goals.

The Zylstras farm 700 acres in Central Iowa on primarily silt loam soils. They grow corn and soybeans, and their land is typically in a corn-corn or corn-soybean rotation. Roger and Wes also raise hogs on the farm, and swine manure provides an important source of nutrients for their cash crops.

Crop management changes on the Zylstra farm

2014
- **Cover crop trials began**
  - Manure application and fall anhydrous used until 2014
  - Tested 12 acres of cover crops in 2014

2015
- **Cover crops on all soybean acres**
  - Joined SHP to trial cover crops on one field
  - Planted cover crops on all soybean acres using a broadcast spreader
  - Incorporated cover crop seed with vertical tillage

2016
- **First year drilling cover crops**
  - Drilled cover crops to improve seed-to-soil contact and moisture availability
  - Timed nutrient application to meet cash crop needs with pre-plant and sidedress nitrogen (eliminated fall anhydrous)

2017
- **Dialed in their system**
  - Adjusted cover crop seeding rates and methods
  - Planted 70-90% of acres to cover crops

2019
- **Determined best practices for their farm**
  - Added liquid P and K to planter & added zinc to starter to further support yields
  - Returned to broadcast-seeding cover crops and incorporating with vertical tillage (due to maintenance and time constraints)

2020
- **Advanced soil health practices**
  - Met goal of eliminating dry fertilizer
  - Attempted planting soybeans green into 2-foot-tall cereal rye

Business Case: Roger and Wesley Zylstra

Roger and his son Wesley Zylstra on their Central Iowa farm
Incremental changes

The Zylstras changed their management system by making incremental changes and experimenting over a number of years. What benefits do they see?

■ **Same amount of nitrogen, higher yields.** The primary benefit that Wes and Roger see has been the ability to improve nutrient use efficiency by changing nitrogen sources and the timing of application. While a liquid fertilizer program costs more per unit, the nutrients are used more efficiently by the crop. “In corn years we allow the corn to utilize more of the nutrients, and are able to prevent nitrogen from leaching into our creeks and streams,” Roger said.

■ **Soil health testing suggests cover crops have increased microbial activity.** Results from soil health testing on the Zylstra’s Soil Health Partnership field show that respiration – an indicator of microbial activity – has increased significantly on the cover cropped portion of the field. One tangible benefit of this increased microbial activity at the farm scale has been an increased rate of residue turnover on acres with cover crops.

■ **Improved soil structure.** The Zylstras credit improvements in soil structure with reducing soil surface compaction during the wet years of 2018 and 2019. In comparison to other farms within their area that created ruts in their fields and had water standing after large rainfall events, they see fewer equipment tracks and less ponding. These improvements in soil structure also reduce the potential for erosion during times of maximum disturbance, such as when they are harvesting. Although it can be difficult to quantify the value of changes in soil structure, getting in the field sooner makes all of the difference to getting the crop planted, sprayed, or harvested in a timely manner.

Read the complete Business Case at [soilhealthpartnership.org/business-case](http://soilhealthpartnership.org/business-case).