OREGON RYEGRASS
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No-Till and Cover Crops – Boosting Soil Organic Matter and Carbon

Illinois Extension Educator Loves the Concept but Not the New NRCS Regs

Since 1969, select farm plots at the University of Illinois have been in continuous no-till. In that time, the measure of organic matter has been boosted three-fold – from about 1 percent to 3.2 percent, without cover crops. In the same period, rotating between corn and soybean crops, the stored carbon in that soil has risen from 25,200 lbs per acre to 99,300 lbs.

It's said that agriculture is a big contributor to the carbon load in the atmosphere, and that conventional tillage is largely to blame. Mike Plumer, who has directed the no-till research at the UI Extension from the start, believes farms are a potential ally in lowering the release of carbon dioxide into the atmosphere. A natural resources management educator, Plumer has also been an avid promoter of cover crops as a companion to no-till.

"Conventional tillage burns carbon and decreases organic matter," he said. "Cover crops essentially speed the recapture of organic matter and carbon in the soil." He points to annual ryegrass as an example. "Its network of deep roots sequester carbon over the winter while increasing organic matter, rebuilding soil structure more quickly than by no-till alone." Cover crops also reduce erosion, store nitrogen, mine deeper minerals and, particularly in the case of annual ryegrass, produce channels for subsequent corn and soybean crops to follow, allowing them access to deeper moisture in dry years.

In a 2 year, replicated study on a southern Illinois farm where corn yields were compared with conventional, no-till and no-till with annual ryegrass, Plumer found that crop productivity increased substantially with annual ryegrass. Moreover, the yield increased as the years in no-till and cover crops increased. Here's a brief look at the data, collected during 2006 and 2007 seasons:

Type of tillage	Ave. yield in bushels/acre
Conventional	52.5
Conventional (1st yr), No-till (2nd)	61.5
No-till	79.0
No-till w/annual ryegrass cover crop	121.0

Positive results, while not always as pronounced as these, have encouraged farmers throughout the Midwest to adopt no-till and cover crops. Likewise, crop associations and government agencies are developing incentives and standards for farms, hoping to capitalize on the promise of increased yields and improved soils while reducing carbon dioxide in the atmosphere.
But Plumer is discouraged with how conservation tillage programs are now being administered. “In years past, farmers wanting to participate signed a simple contract with the government, and were largely left to determine the best management techniques under loose guidelines. The government hoped that farmers would jump onboard with those interim incentives. But, some will change only when mandated, and so the government has upped the ante,” Plumer said.

Under the new laws, Plumer added, “farmers wanting to participate become a federal vendor and must comply with strict management rules or face heavy fines,” he said. “The carrot has behind it a huge club, not just a stick.”

“The conservation stewardship program is already costing farmers because they can’t make adjustments to their management practice based on the weather, soil conditions and other factors,” Plumer continued. “I know a guy who lost 20 bushels per acre last year because he couldn’t adjust the nitrogen level without violating his contract and inviting sanctions.” Others report that farmers are asked to sign a five year contract to grow cover crops, even if they’ve never done so before, and aren’t told how much they’ll be paid.

“It’s a shame,” Plumer said, “but under these contract conditions I won’t recommend to anybody that they sign a contract with the government for conservation tillage.”