What Was Done

In our On-Farm Network Tillage case study, the focus is on evaluating the economic impact of fall ripping of soybean stubble by measuring the corn yields the following year.

While everyone realizes the need to look at multiple years of data, we understand that preliminary data is important to growers as well. This case study report reflects the first year of results on 34 sites completed from the 2003 crop season. These sites will continue to be monitored for at least two seasons. In addition, 74 additional trials were established in the fall of 2003.

Breaking up soil pans, in theory, allows for better moisture absorption, better internal soil drainage, and deeper rooting, which in turn allows plants to bring up nutrients and water from deeper in the soil. Better internal drainage should also mean less surface ponding in fields after heavy rainfall. All of these seem good for corn and soybean production.

There is a theory among some that as we've moved away from "conventional" tillage in recent years, we've created pans deeper in the soil than our chisels and field cultivators can reach. Hence the proliferation of deep rippers (V and In-line) in recent years, and the marketing pitches that go along with them. Marketing pitches are one thing. Credible data showing economic benefit are often another.

Observations of growers suggested the gamut of responses to deep ripping – everything from huge yield improvements to delayed planting and even yield decreases. Common sense might tell us to expect the greatest yield response in highly compacted end rows and truck loading areas. Too, we should also expect a response in finer textured, more easily compacted soils.

To develop credible data, replicated strip tests were established on fields in central and NE Iowa. These tests were designed to evaluate the yield effects of deep ripping (16 in.) with a John Deere 2100 minimum-till ripper. The same tractor and ripper was used on all the locations. Other than the ripping on the four 50 ft. strips, all other practices were the normal practice of the grower and held constant across the site. On each farm, there were eight strips, 50 ft. wide, that alternated between ripped and non-ripped treatments. These strips extended the length of the field resulting in four replications. Yield data was collected with combines equipped with GPS and yield monitors and processed in by ISA.

The trial should consist of only two different tillage practices. An example layout could look like:

Field Design Concept of An 80 Acre Field

Tools of the trade

Yield Monitors

Roughly half of all new combines are equipped with yield monitors. When properly calibrated and operated, yield monitors help growers measure the yield as it is collected, over all portions of a field.

GPS

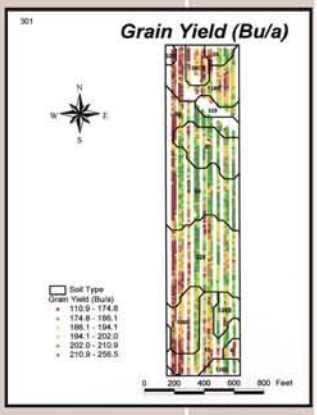
Adding a global positioning system (GPS) receiver to a yield monitor allows yield data to be linked to a specific position in the field. GPS units greatly increase the power of the information gathered by the yield monitor.

This setup allows growers to not only measure yield differences in treatment test strips across a field, but also differences in a smaller part of a field with unique characteristics (eg: soil type).

Ripper

To help standardize the demonstrations. John Deere donated the use of a model 2100 Minimum-Till In-line ripper. The ripper's open design and coulters up front allow it to rip up to 16 in. deep with only minimal soil disturbance.

Yield Map



Growers can use yield data to apply specific practices on specific areas via GIS (geographic information systems) to get the best possible economic and environmental results for any operation.