



Increasing soybean profitability with innovative tillage

George Silva, ANR Agent, Eaton County and Bettsie Dierberger, ANR Agent, Ingham County

County: Ingham

Cooperator: Lavern Eldred

Nearest town: Leslie

Tillage: Deep Slots (18-inch) versus No-till

Previous crop: Corn

Planting date: May 4, 2004

Variety: Round-up Ready Northrup King Group 2.3 Maturity

Herbicide: Roundup - Twice

Row width: 7-inch twin rows spaced 22.5 inches apart

Harvest population: 170,000

Harvest date: October 27, 2004

Experimental design: Alternate Strips 4 replications

Purpose: Compare grain yield between deep slots (18-inch) and traditional no-till

Results:

Lavern Eldred – Soybean Tillage Plots 2004

Treatment	Moisture (%)	Yield Bu/A*
No-Slots	15.2	45.7**
Fall Slots	15.4	46.4

* Treatment means not significantly different at 5%

**Yield adjusted to 13% moisture

The data suggested that there was no significant soybean yield increase on deep slots compared to no-till (no slots) at this location. This was the second year of this investigation on this farm. In both years, deep slots were not directly associated with a significant yield increase over the conventional no-till practice.

This field had been on no-till practice for 16 consecutive years. During that time the subsoil was never disturbed until the deep slots were made in 2004. However, the cooperator felt that a compacted plow layer did not exist in this field.

Observations from three-foot deep soil pits dug in late season (when the crop was turning yellow) indicated that slots promoted more root growth and distribution in their vicinity (digging of 3-foot pits with a backhoe was much easier on slots compared to no slots because soil had been loosened in the previous fall). More roots were able to reach deeper soil depths in association with the slots. In the no-slots treatment, root growth was limited below 18 inches, and roots found below this depth were invariably associated with earthworm holes. In this regard the desirable role-played by earthworms in aiding root growth and deeper penetration cannot be underestimated.

A similar tillage study was carried out with another cooperator where the field was located on low ground. Heavy rains caused flooding twice in the spring. The farm cooperator was aware that he needed to tile this field for optimum crop growth. He felt, however, that slot tillage plots provided much better drainage after heavy spring rains. As a result the seed germination and plant stand at maturity was considerably higher on slots compared to no-till plots. This evidence suggests that deep slots provide improved drainage compared to no-till for soybean growth during extraordinary wet years, such as the one we encountered in 2004.

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