

Have you ever wondered if no-till really reduces soil erosion and runoff?

Results from a three-year tillage study at the East Central Experiment Field near Ottawa provide answers to that question. The study site was a ten acre field in a grain sorghum-soybean rotation with 2-5 % slopes. Soils were a mixture of Eram-Lebo and some Dennis-Bates complex. The treatments were a combination of: no-till, with fertilizer and herbicides broadcast on the soil surface; no-till with fertilizer deep-banded 3-5 inches deep and herbicides broadcast on the surface; and conventional tillage system, which included a chisel-disk-field cultivator, with fertilizer and herbicides incorporated. For grain sorghum 70 lb N, 30 lb P<sub>2</sub>O<sub>5</sub>, and 11 lb K<sub>2</sub>O/a were used and atrazine and Dual (metolachlor) were used for weed control. No fertilizer was used for soybeans and Roundup Ultra and Dual were used to control weeds.

Averaged over the three years, 49 % of the total rainfall left the field in the no-till system and 29 % ran off the field in the conventional tillage system. The researchers explained this difference in runoff was due to the looser and drier soil after each tillage operation in the conventional tillage system. This allowed more water to infiltrate into the soil.

However, there was three times greater soil loss (sediment) in the water that left the field in the conventional tillage system than with the no-till system.

There were greater concentrations of soluble phosphorus, atrazine, and Dual in the runoff with the surface applications of fertilizer and herbicides in no-till. The greatest losses of soluble phosphorus and herbicides in the runoff occurred early in the season after the first rains.

What's the bottom line?

Plant nutrients and pesticides leave the field in runoff water and attached to soil particles. No-till doesn't necessarily reduce the amount of runoff, as some people think, but it certainly reduces the amount of soil leaving the field. Unfortunately, the common practice of using surface applications of fertilizers and pesticides in a no-till system, instead of incorporating these products into the soil causes them to be lost in the runoff. If these products were incorporated, there would be less chance of them being in the runoff.

For details about this research see:

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Jim Shroyer  
Extension Specialist  
Crop Production