

Why Not “A Little” Tillage For No-Till Wheat?

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Previous Kentucky research has shown that continuous no-tillage soil management generally increases summer annual crop (corn and soybean) yield. This is not the case with winter annual crops (barley and wheat), where yields have been not been improved with no-tillage. Tillage can change the soil environment, burying residue, decreasing soil moisture, raising soil temperature and reducing soil compaction (within the tilled volume). The question is, if no-till wheat soils are no more productive than tilled (chisel plowed/disked) wheat soils, is there some less intense level of tillage that is more optimal? Could no-till wheat yields be improved with “a little” tillage?

Recently, both pasture aerators (Aerway, etc.) and rotary harrows (Phoenix, Phillips, etc.) have been used by some wheat producers. These implements are less aggressive than chisel plows/disks, disturbing less soil prior to otherwise no-till wheat establishment. The objective of the field experiments reported here was to evaluate whether aeration and rotary harrow tillage would increase wheat yields relative to no-tillage. The work was done on two different soils (Maury and Loradale silt loams), for three years (2005-07 harvest years), near Lexington. The Loradale soil exhibited less slope and deeper topsoil. Aeration or aeration plus rotary harrow tillage (Genesis II helical tine aerator equipped with a rotary harrow) was compared with no-tillage at each of four rates of fertilizer nitrogen (N). In all cases, a Lilliston 9680 no-till drill was used to establish 30 -40 seed per square foot into corn residues.

After the tillage operations, there was very little reduction in residue coverage of the soil surface (data not shown). Tillage did break the corn residue into smaller pieces and less stover remained attached to the soil. Grain yield was generally not influenced by an interaction between

Wheat Yield Response to Tillage				
Tillage Used	Harvest Year			3-Year Average
	2005	2006	2007	
Location 1—Maury Silt Loam				
No-Till	66.4 _a	70.2 _a	46.4 _a	61.0 _a
Aeration	61.8 _a	74.0 _a	47.5 _a	61.1 _a
Location 2—Loradale Silt Loam				
No-Till	69.4 _a	50.3 _a	56.0 _a	71.9 _a
Aeration	75.2 _a	69.0 _a	56.0 _a	73.4 _a
Aeration + Harrow	71.1 _a	50.1 _a	56.9 _a	72.7 _a
*within a location-year, mean values followed by the same letter are not significantly different, at the 90% level of confidence.				

tillage and N treatments and only the yield response to the tillage treatments is reported (below).

Wheat yields were lower on the Maury silt loam, which is less productive for winter wheat. Yields were lowest in 2007, due to freeze damage. The 2005-2007 wheat production season was excellent, for both soils. However, no-till wheat yields were not improve by “a little” tillage, regardless of location. Scratching the soil merely scoured the wallet. Δ

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