

No-Tillage Wheat
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Objective:

The objective of this experiment is to see if high yields can be produced by no-till wheat and to see if no-till wheat is an economical alternative to conventionally planted wheat on a long term basis. The experiment includes different tillage methods, nitrogen rates and herbicides.

Methods:

The experiment is at Princeton, Ky on a Pembroke silt loam soil that is moderately well drained. Pioneer 2540 was planted on Oct. 10 at 35 seeds/sq. ft. Conventional plots were chisel plowed and disked twice. The plots were 10 ft. x 30 ft. The soil test was pH-6.3, P-39, and K-169 and 0-60-50 lb/ac. as N-P₂O₅-K₂O was applied before planting. Gaucho insecticide was coated on all seed at 2 oz/100 wt. and Tilt was sprayed at 4 oz/ac. at heading.

Results:

The method of planting (no-till vs. conventional) had a significant effect on yields this year and the conventional tillage treatment yielded 7 bu/ac. more than no-till wheat. The reduction in yield by no-tillage may have been due to the freeze in March and more vole damage. The six-year average is about 5.5 bu/acre greater for the conventional tillage treatment.

Treatment	Yields According to Tillage	
	1998 Yields (bu/ac)	Yields (^{'93-'98})
Conventional	85 a	93.3
No-Till	78 b	87.8

Nitrogen was managed for intensive production with 1/3 of N applied at Feekes 3 and the remainder at Feekes 5. Increasing the N rate from 90 to 120 lb/ac. had little effect on yield this year. There is also little difference in the six-year average yields.

Yields According to Nitrogen Rate

Treatment (lb/ac)	Yields (bu/ac)	Yields (^{'93-'98})
No-Till 90	76 b	86.0
No-Till 120	79 b	87.8
Conv. 90	86 a	91.5
Conv. 120	83 a	93.8

Weeds were mainly common chickweed, henbit, and a small amount of cheat. In general, the level of weed control for conventional till plots treated with Harmony Extra in the spring were equal to the no-till plots treated with Gramoxone Extra in the fall followed by Harmony Extra in the spring. Treatment of no-till with only Harmony Extra in the fall or spring resulted in weed control sufficient for high yields. Cheat was found in only small amounts in the no-till plots. The weed pressure in the untreated no-till plots did not reduce the wheat yields this year but the six-year average yields show that weed control is important. The six-year average indicates that all 3 of the no-till weed control treatments used are about equally effective for yield.

Herbicide Treatments

Treatment	1998 Yields (bu/ac)	Yields (^{'93-'98})
No-Till - Fall Harmony Only	77 a	89.2
No-Till - Spring Harmony Only	75 a	87.8
No-Till - No Herbicides	75 a	75.3
No-Till - Peak	77 a	
No-Till -Fall Gramoxone Spring Harmony	79 a	89.8

The fall stand counts over a five-year average show about 10% less plants in the no-till plots as compared to the conventional plots when planted at the same rate. This year plant counts were almost identical for the two treatments.

Wheat Stands (Plants/sq. ft.)

Treatment	Fall - 1998	Fall (5 Yrs. Avg.)
No-Till	26.6	25.6
Conventional	26.5	27.6

Conclusions:

High yields can be obtained with no-till wheat. Yields are about 6% less than with till planted wheat. In many years, the yields were the same. The years when the no-till yields were lower are primarily associated with winter or spring freezes. Chemical weed control is important, but can be achieved by several methods.