



University of Kentucky
UKnowledge

Soil Science News and Views

Plant and Soil Sciences

4-1989

What Happened with No-Till in 1988

Morris J. Bitzer
University of Kentucky

Robert L. Blevins
University of Kentucky

Wilbur Frye
University of Kentucky

Right click to open a feedback form in a new tab to let us know how this document benefits you.

Follow this and additional works at: https://uknowledge.uky.edu/pss_views

 Part of the [Soil Science Commons](#)

Repository Citation

Bitzer, Morris J.; Blevins, Robert L.; and Frye, Wilbur, "What Happened with No-Till in 1988" (1989). *Soil Science News and Views*. 43. https://uknowledge.uky.edu/pss_views/43

This Report is brought to you for free and open access by the Plant and Soil Sciences at UKnowledge. It has been accepted for inclusion in Soil Science News and Views by an authorized administrator of UKnowledge. For more information, please contact UKnowledge@lsv.uky.edu.



Department of Agronomy

Soil Science News & Views



Vol. 10, No. 5, April 1989

What Happened with No-Till in 1988

M. J. Bitzer, R. L. Blevins and W. W. Frye

No-till (NT) received some bad publicity in 1988 in Kentucky and throughout the Midwest, especially during the early part of last summer's drought. Some farmers found that corn yields were lower with NT than with conventional tillage (CT). However, others observed that the NT corn recovered faster and grew better than CT corn following the rains. Data from Kentucky and Nebraska tend to support this latter observation.

Possible Causes of Poor NT Performance

In a recent Conservation Technology Information Center newsletter, several problems were listed as possible causes of poor results with NT corn in 1988. These were:

1. Lack of soil moisture, particularly where NT corn was planted into a cover crop or a legume.
2. Poor nitrogen fertilizer performance from dry soil.
3. NT into previously compacted soil.
4. Planting too shallow in a dry year.
5. Improperly adjusted equipment for NT.

Results in Nebraska

Nebraska data indicated that yields from NT turned out better than what it had appeared they would be earlier in the season. At 11 different sites in drought-stricken eastern Nebraska, NT was side-by-side with CT in farmer fields. In 10 cases, NT had higher yields. NT corn (three sites) averaged 102 bu/A, nearly 21 bu/A more than the CT corn. Similarly, NT sorghum (three sites) averaged 102 bu/A, compared to 95 bu/A for the CT systems. Average soybean yield at the four sites was 32.5 and 30.3 bu/A for NT and CT, respectively, and one site had slightly lower yield with NT.

Observations in Kentucky

Depletion of soil water by cover crops appeared to be the most likely cause of poor NT corn performance in Kentucky in 1988. The drought started in April; therefore, the water removed by the cover crops was not replenished by rainfall. The NT corn that was planted into winter cover crops had much poorer early-season growth than CT corn grown without a cover crop.

AN EQUAL OPPORTUNITY EMPLOYER

OFFICIAL BUSINESS
 PENALTY FOR PRIVATE USE, \$300

This is a potential problem every spring, which can be diminished by early killing of the cover crop. Recent studies in Kentucky showed that killing the cover crop 2 to 3 weeks before planting corn may result in higher crop yields (Table 1).

Yield differences between NT and CT appeared to be affected greatly by planting date in 1988. Most of the very early-planted corn (prior to April 10) was CT and most of this corn failed to silk and produce ears due to the severe drought and high temperatures. Early-planted NT corn seemed to be affected most by the drought when the soil water was depleted by a cover crop and in most cases this corn also tasseled and silked before the rains came resulting in very poor seed set and low yields.

Late-planted NT corn, however, generally yielded higher than late-planted CT corn, even when the cover crop was not killed early, as occurred in our conservation tillage experiment at Lexington in 1988 (Table 1). The planting date was May 20. Similar results were obtained in our long-term NT/CT experiment at Lexington in which yields averaged 62 bu/acre for CT and 73 bu/acre for NT. Planting date was also May 20. We believe that early growth of late-planted NT corn was delayed more than that of CT corn because of the lack of water during the early stages of growth. Because of this NT corn was not as far advanced into the reproductive stage as CT corn when the rains came and was more able to recover from the drought and make higher yields.

Summary

The 1988 growing season was a difficult one for many Kentucky farmers, whether they used NT or CT. The onset of drought was in April, resulting in essentially no replenishment of soil water lost by transpiration from winter cover crops in NT fields. Consequently, early-planted NT corn into a cover crop suffered the greatest drought-related yield loss. Late-planted NT corn, being held back more than CT by the drought, recovered more readily and made higher yields than CT after the rains came. Thus, corn yields were related more to stage of growth when the rains came than to tillage systems.

Producers should realize that 1988 was not a typical year, and NT will be successful again in the future as it has been in the past.

Table 1. Effect of Tillage and Time of Killing Rye Cover Crop on Corn Yields (Bu/A).

Time rye cover crop killed	Tillage system ^{1/}			
	CH	DT	CT	NT
	<u>1985 - 1987</u>			
At planting	77	77	63	84
2-3 wks before planting	82	80	68	91
	<u>1988</u>			
At Planting	102	101	72	116

^{1/} CH = Chisel-plow tillage, DT = Disk tillage, CT = Conventional tillage and NT = No-tillage. Yields averaged across N rates of 75, 150 and 225 lbs/A.

Morris J. Bigger
 Morris J. Bigger, Extension Grains Specialist