

Strip Tillage and Fall-Applied Fertilizer Effects on Corn

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Objective

To evaluate corn response to strip-tillage vs. conventional-tillage systems and to fall-applied nitrogen within these systems.

Background

Cooperator:	Carlton Meyer	Soil Test:	P 118 ppm, K 77 ppm,
County:	Henry		OM 1.9%, CEC 5.7
Soil Types:	Millgrove loam	Fertilizer:	See methods
Previous Crop:	Soybean	Variety:	Pioneer 34E79
Tillage:	See Methods	Planting Date:	May 1, 2000
		Planting Rate:	32,000 seeds/A
		Harvest Date:	November 6, 2000

Methods

The experimental design was a randomized complete block of field length and 12-rows wide (0.8 acres) in four replications. Three treatments were established as follows: 1) Fall strip-tillage and fertilizer with sidedress N applied; 2) fall strip-tillage and fertilizer with no sidedress N applied; and 3) conventional tillage and fall fertilizer. Fall strip-tillage and conventional tillage were done on October 21, 1999.

Conventional tillage consisted of chiseling and field cultivating and then strip till. Anhydrous ammonia plus dry fertilizer sources of phosphate and potash were applied in the fall for a total actual nutrient application of 200 lbs. N, 48 lbs. P₂O₅, and 85 lbs. K₂O per acre. Anhydrous was used in the spring for the sidedress treatment at a rate of 40 lbs. actual N per acre.

At the V2 corn stage (7-inch height), 12-inch-deep soil-nitrate samples were taken before sidedress nitrogen application. At corn silking stage, ear leaf tissue samples were taken. At corn maturity (black layer), corn-stalk nitrate samples were taken. Also, at this time ear and stalk population counts were taken.

Results

The soil nitrate level averaged 12.5 ppm across treatments at the V2 corn stage.

Table 1. Corn Stalk Analysis, Population, and Yield.

Treatments	Ear Leaf Tissue			Stalk Nitrate (ppm)	Harvest Population (plants/A)	Yield (bu/A)
	%N	%P	%K			
Fall Conventional	3.13	0.34 a	2.07	350 a	28,500 a	149.0 a
Fall Strip Till	3.42	0.35 ab	2.25	925 a	30,750 ab	154.3 ab
Fall Strip Till plus Spring Sidedress	3.6	0.38 b	2.32	2275 b	32,750 b	160.3 b
LSD (0.05)	NS	0.04	NS	1522	3,771	7.8

Means followed by the same letter are not significantly different.

NS = Not Significant

Summary

Strip tillage compared to conventional tillage with identical fertilizer application had similar corn yields. Corn yields were not significantly different comparing fall-applied anhydrous ammonia nitrogen to the same system with an extra 40 lb. per acre of actual N sidedress. Although the fall strip till plus spring sidedress yielded significantly more than the fall conventional, the extra fertilizer cost would have made it breakeven.

For additional information, contact:

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