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Seeding Rates and Fertilizer Placement to Improve Strip-Till and No-Till Corn

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Abstract

In 2013, late planting resulted in corn yields that were less than 110 bu/a. Yields were not increased with seeding rates above 26,000/a, but a small increase in yield was obtained with knife applications of fertilizer nitrogen (N) compared with dribble.

Keywords

corn yield, seeding rate, fertilizer placement, strip tillage, no-till

Cover Page Footnote

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Summary

In 2013, late planting resulted in corn yields that were less than 110 bu/a. Yields were not increased with seeding rates above 26,000/a, but a small increase in yield was obtained with knife applications of fertilizer nitrogen (N) compared with dribble.

Introduction

Use of conservation tillage systems is promoted because of environmental concerns. In the claypan soils of southeastern Kansas, crops grown with no-till may yield less than crops grown in systems involving some tillage operation, often because of reduced plant emergence. Strip tillage provides a tilled seed-bed zone in which early spring soil temperatures might be greater than those in no-till soils. Like no-till, strip tillage leaves residues intact between the rows as a conservation measure. Optimizing seeding rates for different tillage systems should improve corn stands and yields.

Experimental Procedures

In 2013, the experiment was conducted at the Parsons Unit of the Southeast Agricultural Research Center. The experimental design was a split-plot arrangement of a randomized complete block with three replications. The whole plots were three tillage systems: conventional, strip tillage, and no-till. Conventional tillage consisted of chisel and disk operations in the spring. Strip tillage was done with a Redball (Benson, MN) strip-till unit in the spring prior to planting. The subplots were a 5 × 2 factorial combination of five seed planting rates (18,000, 22,000, 26,000, 30,000, and 34,000 seeds/a) and two N fertilizer placement methods: surface band (dribble) on 30-in. centers near the row and subsurface band (knife) at 4 in. deep. Corn was planted at both sites on May 15, 2013.

Results and Discussion

In 2013, wet field conditions delayed planting until mid-May. The lack of rain for more than four weeks prior to silking resulted in low corn yields that were less than 110 bu/a for any treatment (data not shown). Tillage did not significantly affect corn yields. Although significant, the effect of seeding rate on corn yield was variable and tended to increase with seeding rates up to 26,000 seeds/a with no increase with higher seeding rates. Subsurface band (knife) application of fertilizer N increased yields by 6% above surface band (dribble) applications.

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