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Abstract

Many crop rotation systems are used in southeastern Kansas. This experiment was designed to determine the long-term effect of selected tillage and N fertilizer placement options on yields of short-season corn, wheat, and double-crop soybean in a rotation.

Keywords

Tillage, no-till, nitrogen placement, corn, wheat, soybean

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Tillage and Nitrogen Placement Effects on Yields in a Short-Season Corn/Wheat/ Double-Crop Soybean Rotation

D.W. Sweeney and D. Ruiz-Diaz¹

Summary

Under high-yielding conditions, corn yield in 2017 was not statistically affected by tillage. Applying nitrogen (N) fertilizer approximately doubled corn yield, but with no difference between N application methods.

Introduction

Many crop rotation systems are used in southeastern Kansas. This experiment was designed to determine the long-term effect of selected tillage and N fertilizer placement options on yields of short-season corn, wheat, and double-crop soybean in a rotation.

Experimental Procedures

A split-plot design with four replications was initiated in 1983 with tillage system as the whole plot and N treatment as the subplot. In 2005, the rotation was changed to begin a short-season corn/wheat/double-crop soybean sequence. Use of three tillage systems (conventional, reduced, and no-till) continued in the same areas used during the previous 22 years. The conventional system consisted of chiseling, disking, and field cultivation. Chisel operations occurred in the fall preceding corn or wheat crops. The reduced-tillage system consists of disking and field cultivation prior to planting. Glyphosate (Roundup) was applied to the no-till areas. The four N treatments for the crop were: no N (control), broadcast urea ammonium nitrate (UAN; 28% N) solution, dribble UAN solution, and knife UAN solution at a 4 in. depth. The N rate for the corn crop grown in odd years was 125 lb/a. Corn was planted on April 11, 2017.

Results and Discussion

Overall, yields were high in 2017. Tillage did not statistically affect corn yields (Figure 1). In general, adding N by any placement method approximately doubled the yield obtained without N. However, corn yield in 2017 was not affected by N placement method or by the interaction of tillage by N treatments.

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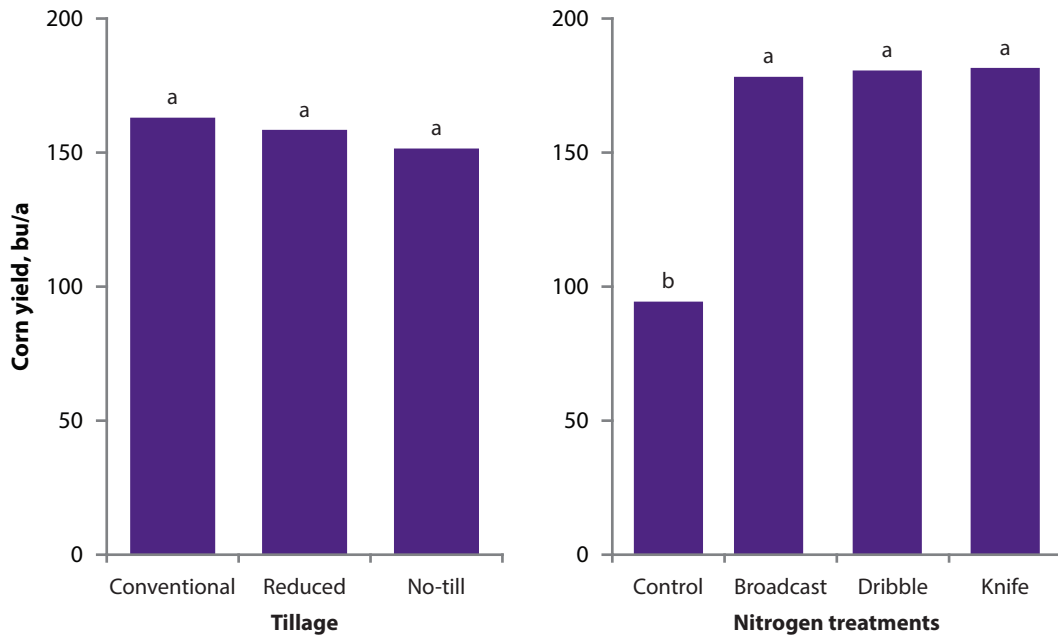


Figure 1. Effect of tillage and nitrogen placement on corn yield in 2017. Within a graph, bars with the same letter are not significantly different according to LSD (0.05).