

Vertical Tillage Study

Kevin Van Dee, superintendent

Introduction

This project was designed to study the yield effects of a vertical tillage system as compared with conventional and no-till systems in corn. There has been increasing interest in vertical tillage systems in recent years, so the goal of this project was to compile information on these three systems.

This study at the Southeast Research and Demonstration Farm in 2004 was a one-year project that was designed to provide preliminary information on these various tillage techniques with plans to conduct more thorough research in the future. This project focused on spring seedbed preparation practices. Subsequent research will focus on both fall and spring tillage practices.

Materials and Methods

In this study the field was in a corn/soybean rotation where the previous crop was soybeans. The conventional tillage system consisted of spring disking and field cultivation. The no-till system consisted of planting directly into the soybean stubble. The vertical tillage system consisted of a single pass with a Phoenix harrow. A John Deere 7000 planter was set to plant 32,000 seeds/acre in 30-in. rows.

A soil sample suggested that phosphorus and potassium levels were limiting, so these fertilizers were applied in the fall of 2003. In addition, 150 lb of nitrogen in the form of anhydrous ammonia was applied in the fall. The

soil sample also suggested that the soil had a pH of 5.85, but no adjustments were made.

The study was randomized and replicated four times. The farm superintendent selected the corn hybrid to be planted. Finally, in addition to the yield collected, plant stand counts were taken at the end of the season.

Results and Discussion

Stand counts taken suggested that there was little difference among these tillage systems as shown in Figure 1. However, the conventional tillage system suffered some lodging whereas the other systems did not (data not shown).

Yield results suggested that there were only small differences due to the various tillage systems as shown in Figure 2. The data suggests that the vertical tillage system yielded slightly more than the no-till or conventional till systems with the no-till system yielding in between the other two systems.

Although the yield results among these systems were modest, it is encouraging to plan for more comprehensive research in the future. The goal is to study these tillage systems in both corn and soybeans under systems that include fall and spring tillage practices.

Acknowledgments

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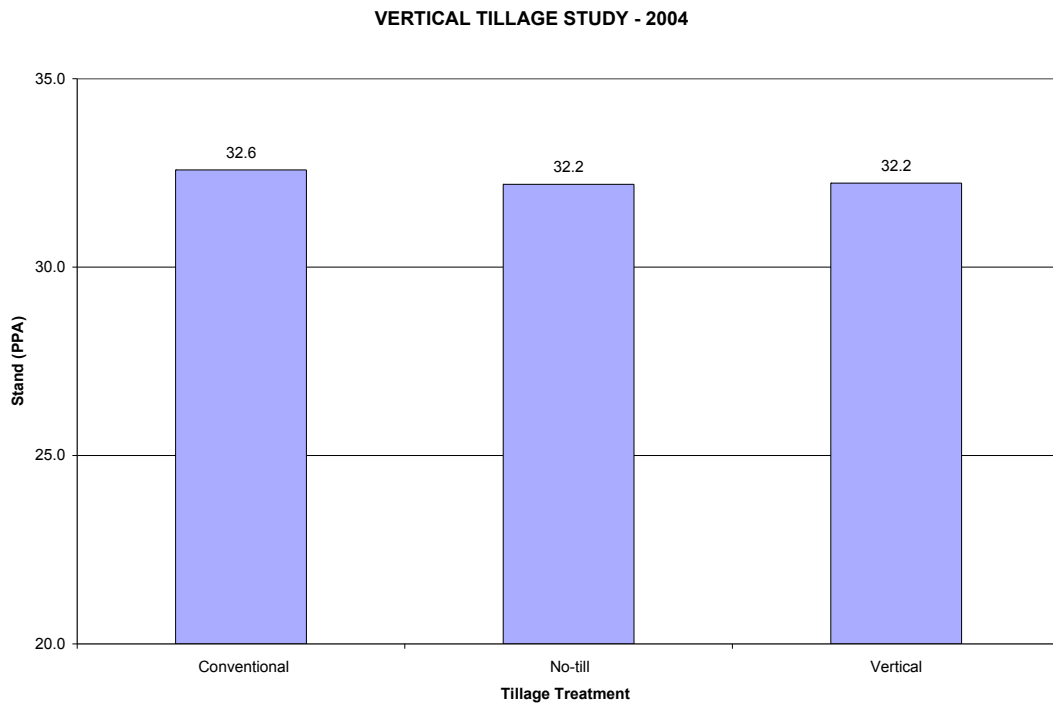


Figure 1. Effect of tillage systems on corn stand counts for 2004 at Crawfordsville, IA.

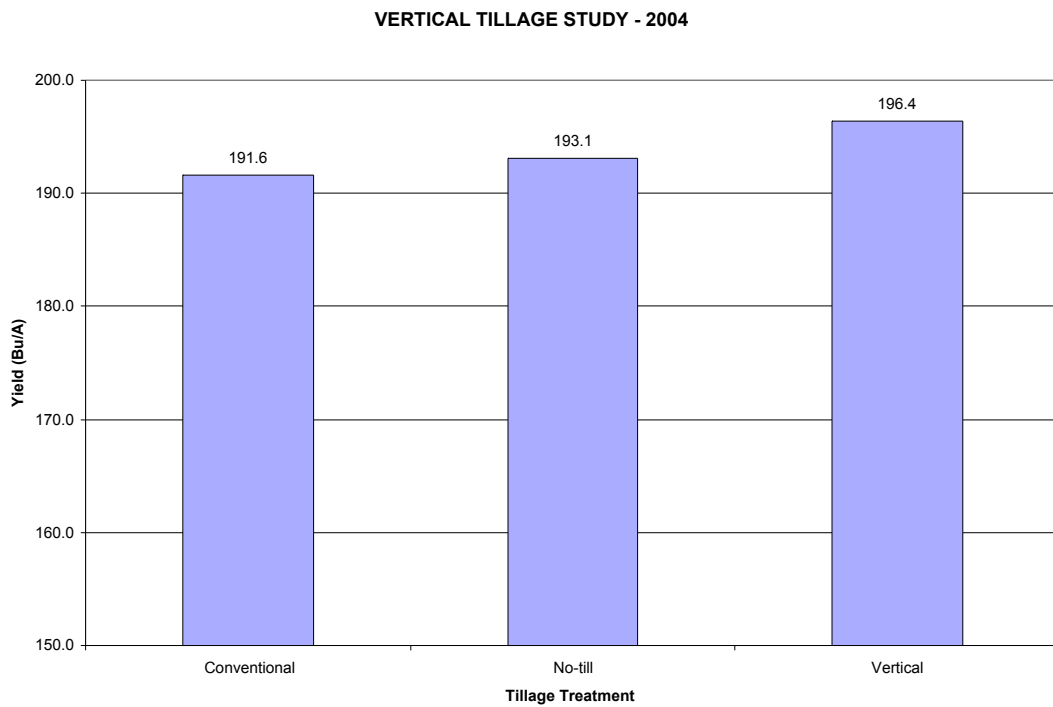


Figure 2. Effect of tillage systems on corn yield for 2004 at Crawfordsville, IA.