

# Starter Fertilizer, Row Width, and Planting Date Effects on Corn Yield in North Central Iowa

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## Introduction

Delayed planting or replanting of corn can result in significant yield losses. Recently, planting date studies in Iowa have shown 3% yield loss comparing mid-May planting dates with late April planting dates and 20-30% yield loss comparing June planting dates with late April planting dates. These yield losses can be partially attributed to the hastened vegetative development from increased accumulation of thermal units at later planting dates, which contribute to lessened capture of light resources and thus less carbon fixation. In Iowa, it has been shown that starter fertilizer can increase the early growth of corn from stage V3 to V8. Narrow row spacing will also improve light interception during early vegetative development. During the 1999 and 2000 growing seasons, the effects of planting date, row spacing, and starter fertilizer on corn yield were evaluated. The objective of this study was to determine whether the use of starter fertilizer and row spacing at later planting dates would reduce the associated yield loss by improving early resource capture.

## Materials and Methods

The experimental layout was a split-split-split plot design. Whole plot treatments were planting dates and split plot treatments were hybrid, row spacing, and starter fertilizer/no starter fertilizer. Pioneer Brand® 35N05 (105-day relative maturity), Pioneer Brand® 34R07 (108-day relative maturity), and Pioneer Brand® 33A14 were evaluated under all treatments. Starter fertilizer as a 6-24-6 NPK blend was used at a rate of 52.7 pounds per acre

applied at planting in the seed furrow to the starter fertilizer treated plots. Individual plots were 6 rows (30-inch) or 11 rows (15-inch) by 40 feet long. A White 6100 series planter with a 6900 series splitter attachment was used to plant all plots. Planting dates were 28 April, 23 May, and 18 June 1999; and 15 April, 15 May, and 9 June 2000. Plots were over-planted and hand thinned to 29,750 plants per acre. All plots were mechanically harvested, and yield was adjusted to 15.5% moisture.

## Results and Discussion

Summarized in Table 1 are the results of the 1999 study. Starter fertilizer significantly increased yields in the 15-inch row spacing at the first planting date. Starter fertilizer and 15-inch row spacing at the third planting date increased yields over 30-inch rows with no starter fertilizer.

Summarized in Table 2 are the results of the 2000 study. Again, starter fertilizer significantly increased yields in the 15-inch row spacing at the first planting date. No significant differences were found between treatments at the second or third planting dates.

Starter fertilizer in 15-inch row spacing significantly increased yields at the first planting date in both years. The mid-May target planting dates did not produce treatment differences in either year. June planting dates saw significant differences to 15-inch row spacing over 30-inch/no starter treatments in 1999 but not in 2000.

Use of starter fertilizer may produce significant increases in yield at early planting dates. Attention to soil test values and time of planting date should guide starter fertilizer decisions.

Narrow row spacing produces small and inconsistent increases in yield.

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**Table 1. Effect of row spacing and starter fertilizer on corn yield for three planting dates in 1999 at Kanawha, IA.**

Row Spacing/Fertilizer	28 April	23 May	18 June
15 inch/no starter	188	175	106
15 inch/starter	199	176	104
30 inch/no starter	194	180	95
30 inch/starter	200	176	103
LSD <sub>(0.05)</sub>	10	NS	9

**Table 2. Effect of row spacing and starter fertilizer on corn yield for three planting dates in 2000 at Kanawha, IA.**

Row Spacing/Fertilizer	15 April	15 May	9 June
15 inch/no starter	162	156	109
15 inch/starter	172	152	110
30 inch/no starter	172	151	112
30 inch/starter	179	150	118
LSD <sub>(0.05)</sub>	8	NS	NS