2009

Corn Planting Date

Lori Abendroth
Iowa State University, labend@iastate.edu

Roger W. Elmore
Iowa State University, relmore@iastate.edu

Stephanie Marlay
Iowa State University

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Abstract
Producers attempt to plant corn earlier every year. For example, in 2006, 50% of the statewide crop was planted by approximately April 25. Earlier planting dates are attributed to several causes: larger acreage per producer, less spring tillage, advancements in hybrids, and seed treatments. However, in contrast to this, Iowa producers in 2008 did not have half of Iowa's corn acreage planted until May 13 due to weather; this is eighteen days later than 2006. Planting the crop during the optimum window is one management practice that is generally important in achieving high yields.

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences

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Lori Abendroth, agronomy specialist
Roger Elmore, professor
Stephanie Marlay, agricultural specialist
Department of Agronomy

Introduction

Producers attempt to plant corn earlier every year. For example, in 2006, 50% of the statewide crop was planted by approximately April 25. Earlier planting dates are attributed to several causes: larger acreage per producer, less spring tillage, advancements in hybrids, and seed treatments. However, in contrast to this, Iowa producers in 2008 did not have half of Iowa's corn acreage planted until May 13 due to weather; this is eighteen days later than 2006. Planting the crop during the optimum window is one management practice that is generally important in achieving high yields.

Previous Iowa State University (ISU) recommendations for 100% maximum yield, relative to planting date, were identified as April 20 to May 19 (refer to Corn Planting Guide, PM 1885). We believe that this planting window can be earlier while still achieving high yields. Planting date research requires multiple years and locations to identify overall trends and manage risk. We have conducted research at this location since 2006 (refer to Corn Planting Date report ISRF06-13). Research will continue in the future so that sound recommendations can be made for agronomists and producers. In this report only 2008 results are highlighted.

Materials and Methods

Five planting dates were evaluated, in approximately 14-day increments: April 16, April 30, May 13, May 25, and June 11. This research was conducted in both a corn-soybean and continuous corn rotation. A 98-day hybrid (Pioneer 37Y14) and a 111-day hybrid (Pioneer 33W84) were selected and planted at 35,077 seeds/acre in 30 in. row spacing. Both fields were tilled prior to planting, and weeds were controlled with one pre-emergent herbicide application while planting and one post-emergent herbicide application on June 4.

Individual plots were 15 ft wide (six rows) by 50 ft long (corn-soybean rotation) and 60 ft long (continuous corn rotation), with rows 3, 4, and 5 harvested for grain yield. Plant population (measured June 17 and July 1) and grain yield were collected. Planting dates 1, 2, and 3 were harvested October 18, while planting dates 4 and 5 were harvested November 4. Grain yield was adjusted to 15 percent moisture basis. The experimental design employed at this location does not allow a direct comparison of corn following soybean and corn following corn. Therefore the results are presented separately, by rotation. SAS PROC Mixed was the statistical program used in analyzing the data, with a significance level of $P \leq 0.05$.

Results and Discussion

Corn Following Soybean. Plant population varied based on the planting date and hybrid used (Table 1). Plant populations were greatest with the May 13 and May 25 planting dates and were lower when planted earlier or later. Plant populations of Pioneer 37Y14 at early and late planting dates were less than those of Pioneer 33W84. Factors such as increased seed mortality, seedling stress, and planter adjustments can cause differences in plant populations as occurred in this study.

Grain yield also varied based on the planting date and hybrid used (Table 1). Grain yield of Pioneer 37Y14 was greatest when planted between April 30 and May 25, whereas Pioneer 33W84 was greatest when planted

April 30. The hybrids varied in overall average yields, with Pioneer 33W84 at 197 bushels/acre and Pioneer 37Y14 at 184 bushels/acre. Although, Pioneer 37Y14 had a lower average plant population (31,700 plants/acre) compared with Pioneer 33W84 which had an average of 33,100 plants/acre.

Corn Following Corn. Plant population varied based on the planting date and hybrid used (Table 2). Plant populations were generally greatest for both hybrids with planting dates between April 30 and May 25, and were lower when planted earlier or later. Reasons for this reduction in plant population are similar to those listed in the 'Corn Following Soybean' section.

Grain yield also varied based on the planting date and hybrid used (Table 2). Grain yield of the Pioneer 37Y14 yielded similar for all planting dates except with the June 11 planting. Whereas, Pioneer 33W84 yielded the greatest when planted April 30 and less before or after that. The hybrids varied in overall average yields, with Pioneer 33W84 at 167 bushels/acre and Pioneer 37Y14 at 157 bushels/acre. Average plant population was similar for both hybrids when averaged over planting dates (approximately 32,400 plants/acre).

Conclusion

The yield response of Pioneer 37Y14 (98 RM) to planting date contradicts what we generally expect. In the corn-soybean rotation, highest yields were attained in the middle of the range tested (May 13 +/- approximately 10 days). Yields in the corn-corn system were fairly stable across all planting dates except for a substantial reduction when it was planted June 11, no yield reduction occurred from the earliest planting date.

Our normal expectation is to have higher yields associated with late April and early May planting dates. The yield response of Pioneer 33W84 to planting date was generally a quadratic response, with the greatest yield associated with an April 30 planting date. Past research has typically been conducted using hybrids that have relative maturities between 105 and 112. We therefore, hypothesize that the differential response of Pioneer 37Y14 is due to its shorter maturity.

Plant population also significantly changed in both systems and both hybrids in relation to planting date. This may partially have caused reduced yields.

Consider this data as 'preliminary' as it is only one location and one year; more data is needed before adjusting management practices related to planting date.

Acknowledgements

Appreciation is extended to Kenneth Pecinovsky, Northeast Farm superintendent, and Ralph White, field lab technician, for their efforts in establishing, maintaining, and harvesting the trial. We also thank Pioneer Hi-Bred International, BASF Corporation, and Monsanto Company for seed and chemicals for this study.

Table 1. *Corn Following Soybean.* Planting date influence on final plant population and grain yield for two hybrids following soybean.[1]

Planting date	Final plant population	Grain yield adjusted to 15% moisture	Final plant population	Grain yield adjusted to 15% moisture
	plants/acre	bushels/acre	plants/acre	bushels/acre
	Pioneer 37Y14 (98 RM)		Pioneer 33W84 (111 RM)	
April 16	28,630 c	182 b	30,250 d	211 b
April 30	33,000 b	192 ab	33,000 c	219 a
May 13	35,750 a	199 a	36,250 a	210 b
May 25	34,130 ab	192 ab	33,750 bc	202 c
June 11	26,880 c	150 c	32,130 cd	142 d

[1]Treatment means within a column with any letter in common are not significantly (NS) different from one another.

Table 2. *Corn following Corn*. Planting date influence on final plant population and grain yield for two hybrids following corn.[1]

Planting date	Final plant population	Grain yield adjusted to 15% moisture	Final plant population	Grain yield adjusted to 15% moisture
	plants/acre	bushels/acre	plants/acre	bushels/acre
	Pioneer 37Y14 (98 RM)		Pioneer 33W84 (111 RM)	
April 16	29,880 c	161 a	25,630 c	178 bc
April 30	32,750 b	163 a	34,500 ab	200 a
May 13	35,250 a	169 a	35,380 a	184 b
May 25	34,130 ab	161 a	32,880 b	170 c
June 11	30,630 c	129 b	33,000 b	106 d

[1]Treatment means within a column with any letter in common are not significantly (NS) different from one another.