2010

Twin Row vs. Single Row Spacing at Variable Seeding Rates

Stephanie Marlay
Iowa State University

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

Lori Abendroth
Iowa State University

Follow this and additional works at: http://lib.dr.iastate.edu/farms_reports

Part of the Agricultural Science Commons, Agriculture Commons, and the Agronomy and Crop Sciences Commons

Recommended Citation
Marlay, Stephanie; Elmore, Roger W.; and Abendroth, Lori, "Twin Row vs. Single Row Spacing at Variable Seeding Rates" (2010). Iowa State Research Farm Progress Reports. 426.
http://lib.dr.iastate.edu/farms_reports/426

This report is brought to you for free and open access by Iowa State University Digital Repository. It has been accepted for inclusion in Iowa State Research Farm Progress Reports by an authorized administrator of Iowa State University Digital Repository. For more information, please contact digirep@iastate.edu.
Twin Row vs. Single Row Spacing at Variable Seeding Rates

Abstract
As corn production practices improve, row widths decrease. Although most producers plant in 30-in. rows, more and more acres are being planted to narrower row widths (15 in. to 20 in.). In addition, plant populations continue to increase every year with the introduction of more stress-tolerant hybrids. Wider row widths force more plants into a concentrated area, whereas narrower rows allow more equidistant spacing of plants.

Keywords
RFR A9071, Agronomy

Disciplines
Agricultural Science | Agriculture | Agronomy and Crop Sciences
Twin Row vs. Single Row Spacing at Variable Seeding Rates

RFR-A9071
Stephanie Marlay, agricultural specialist
Roger Elmore, professor
Lori Abendroth, agronomy specialist
Department of Agronomy

Introduction
As corn production practices improve, row widths decrease. Although most producers plant in 30-in. rows, more and more acres are being planted to narrower row widths (15 in. to 20 in.). In addition, plant populations continue to increase every year with the introduction of more stress-tolerant hybrids. Wider row widths force more plants into a concentrated area, whereas narrower rows allow more equidistant spacing of plants. In theory, many advantages should exist with narrower row widths. Advantages include using the same planting equipment for corn and soybean, increased light utilization, more even plant-to-plant spacing, reduced weed competition, and earlier canopy closure. However, previous Iowa State University (ISU) research (1995–2000) found no yield difference when comparing 15-in. to 30-in. row widths. While considering the investment in different harvest and spray equipment when transitioning to a narrow spacing system, one might consider twin-rows on 30-in. centers as an alternative.

More recent research (2003–2005) conducted at the ISU Armstrong Research and Demonstration Farm (Lewis, IA) showed no yield difference between a twin-row configuration and 30-in. row spacing.

Research conducted at the ISU Northwest Research and Demonstration Farm, Sutherland, IA in 2009, compared the response of three corn hybrids in a twin row system to that in 30-in. spacing at several seeding rates.

Materials and Methods
A Great Plains planter was used to plant the 30-in. and twin rows on May 4. The twin row configuration places two rows on 30-in. centers with 8 in. between the twin rows. Three DeKalb hybrids were chosen (DK 48-37, DK 52-59, and DK 41-60) and planted at four seeding rates: 28,000, 33,000, 38,000, and 43,000 seeds per acre. The plots were four 30-in. rows or eight twin rows (10 ft) wide and approximately 240 ft long.

The research was conducted on a field that was planted to corn in 2008. Stalks were chopped and the field was chiseled in the fall of 2008. In the spring of 2009, the field was disked once and field-cultivated twice. Nitrogen was applied at 28% at 200 lb/acre in the spring. Weeds were controlled with one pre-emergent herbicide application as well as hand-weeding during the summer. The plots were harvested November 26 and 27; grain yield was adjusted to 15% moisture basis.

Plots were arranged in a randomized complete block design (RCBD) with hybrid as the main plot, seeding rate as split plot, and row spacing as the split-split plot. SAS PROC MIXED was the statistical program used in analyzing the data, with a significance level of P≤0.05.

Results and Discussion
Grain yields were lower than expected, ranging from 140 to 175 bushel/acre. However, long-term Iowa research has identified an average yield penalty for corn following corn as approximately 15% compared with corn following soybean. High yields may have approached 200 bushel/acre if this trial were following soybean instead of...
corn. In addition, volunteer corn may have resulted in variable stress levels among treatments within a replicate.

Hybrids differed in grain yield, grain moisture, and stalk lodging as shown in Table 1. The early season hybrid, 91-day relative maturity (RM), DK 41-60, yielded less than the two fuller-season hybrids, DK 48-37 at 98 RM, and DK 52-59 at 102 RM.

Grain yields were similar across the four seeding rates evaluated. Single, 30-in. rows yielded 3% more than twin rows (Table 1). These differences in grain yield between twin and 30-in. rows were consistent across all three hybrids and all four seeding rates.

Early-season plant populations were slightly less in twin than in 30-in. rows. At maturity, R6, plant populations of both row widths were similar. In addition, early plant populations of twin rows at the highest seeding rate were about 2500 less per acre than those of 30-in. rows (data not shown). However, at maturity, these differences were not detected. The differences in plant population early in the season may have affected yield potential of twin rows. However, small plant population differences like this usually affect yield very little.

Acknowledgements
We want to thank Ryan Rusk, Northwest Farm superintendent, and Josh Sievers, agricultural specialist, for their efforts in maintaining and harvesting the trial. Appreciation also is extended to Great Plains Manufacturing of Salina, KS and Monsanto for their efforts in establishing and supporting this research.