Row Width and Hybrid Effects on Corn Yield in Iowa

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Introduction

In Iowa, corn historically has been grown in row widths of 30 inches or wider. During the last decade, many Iowa producers developed a renewed interest in the productiveness of corn in narrower rows. Much of this renewed interest was a result of the observed yield benefits of planting soybeans in rows narrower then 30 inches. In addition, the advancements made in farm machinery today have established effective means by which farmers can plant and harvest these narrow rows. As a result, research is needed to evaluate the effect of row spacing and related planting decisions on the yield of modern, high-yielding corn hybrids. The designed purpose of this study was to test the responses of different hybrids (based on relative maturity) to narrow row spacings. This study was conducted over three years, 1997-1999. In addition to this site, this study has been conducted at five other university research farms.

Materials and Methods

The experimental design was a randomized complete block design with split plots and three replicates. Whole plot treatments were hybrids and split plot treatments were row widths (15- or 30-inch). Hybrids used were Max23 and N4242Bt (96- to 103-days relative maturity), N4640Bt and Max21 (102- to 110-days relative maturity), and Max454 and N6800Bt (109- to 114-days relative maturity). A harvest stand density of 28,000 plants per acre was established for all plots. Individual plots were 6 rows (30-inch) or 11 rows (15-inch) wide by 40 feet long. A White 6100 series corn planter outfitted with a 6900 series splitter attachment was used to plant all plots. Planting dates were 1 May 1997, 29 April 1998, and 1 May 1999. Plots were mechanically harvested on 30 October 1997, 30 October 1998, and 11 November 1999. Reported plot yields (corrected to 15.5% moisture) are shown in Table 1.

Results and Discussion

Summarized in Table 1 are the results from 1997-1999. When averaged across hybrids and years, 15-inch rows produced a 3% yield advantage over 30-inch rows (not significant). During 1998, a significant yield response to 15-inch rows was observed. Overall, four of the six hybrids tested yielded better in 15-inch rows; however, only Max21 showed a significant difference (10%). From these results, small differences in hybrid responses to narrow rows do seem to be evident. In addition, maximum yields for both row widths, when averaged across years, were achieved when the fullest season hybrid (N6800Bt) was used. Finally, grain moistures were influenced by hybrids, but not by row widths.

In summary, a small, non-significant yield advantage to narrow rows was observed; however, the yield advantage may be of little practical significance when considering the associated cost of switching to narrow rows. Furthermore, for producers considering or using narrow rows, these results suggest that yields may be optimized by the proper selection of a hybrid that responds well to narrow rows.

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Table 1. Effect of row width and hybrid on corn grain yield and moisture at Sutherland, IA (1997-1999).

	1997		1998		1999		Average	
Hybrid	15-inch	30-inch	15-inch	30-inch	15-inch	30-inch	15-inch	30-inch
	----------Grain yield (bu./acre)----------							
MAX23	101	120	165	137	169	167	145	141
N4242Bt	141	144	147	148	160	165	149	152
N4640Bt	163	163	152	144	180	178	165	162
MAX21	--	--	145	130	162	151	**154**	**140***
MAX454	140	145	166	156	171	178	159	160
N6800Bt	182	184	157	146	181	178	173	169
Average	146	151	**156**	**144**	171	170	158	154
	----------Grain moisture (%)----------							
MAX23	19.3	19.2	17.1	17.2	12.9	13.1	16.4	16.5
N4242Bt	18.5	19.1	17.3	17.8	13.3	13.0	16.3	16.6
N4640Bt	18.6	19.0	17.4	17.1	13.2	13.0	16.4	16.4
MAX21	--	--	18.3	17.6	13.1	13.6	15.7	15.6
MAX454	20.0	21.6	19.1	19.6	13.5	13.2	17.5	18.1
N6800Bt	23.1	23.0	19.3	19.9	14.1	14.3	18.8	19.0
Average	19.9	20.4	18.1	18.2	13.4	13.4	16.9	17.0

*Differences between bold faced yield means were statistically significant ($P < 0.05$).