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Row Spacing with Variable Seeding Rates

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Row Spacing with Variable Seeding Rates

Abstract

Current row widths employed by producers typically vary from 15 in. to 38 in., with most producers at 30 in. today. Yet more and more acres are being converted to narrower row widths (most often 15 in. or 20 in.). Numerous advantages exist with narrower row widths. These include using the same planting equipment for corn and soybeans, reduced weed competition, increased shading of the soil, increased light interception per plant, and less in-row crowding.

Keywords

Agronomy

Disciplines

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Row Spacing with Variable Seeding Rates

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Introduction

Current row widths employed by producers typically vary from 15 in. to 38 in., with most producers at 30 in. today. Yet more and more acres are being converted to narrower row widths (most often 15 in. or 20 in.). Numerous advantages exist with narrower row widths.

These include using the same planting equipment for corn and soybeans, reduced weed competition, increased shading of the soil, increased light interception per plant, and less in-row crowding.

Plant populations also continue to increase every year (+400 plants/acre/year). Using wide row widths force more plants to be in a concentrated area, whereas narrower rows allow better dispersment and area available per plant.

Iowa State University research (1995–2000) has shown no yield difference when comparing 15 in. row width to 30 in. This data is included in the ISU Corn Planting Guide (PM 1885). Year-to-year response varied; yet in general, corn planted in a 15 in. row width yielded the same as 30 in. row width.

Research has been conducted recently investigating the yield response of a twin row corn production system compared with 30 in. row spacing. A twin row configuration places two rows typically on 30 in. centers. The twin rows are normally only 7-8 in. apart. This design allows for some of the benefits associated with narrow row systems while still being able to use a 30 in. combine head.

Materials and Methods

Research has been conducted at the ISU Armstrong Research and Demonstration Farm

in 2006 and 2007; the 2007 results are discussed here. Two row spacing configurations (30 in. or twin row) and five seeding rates (32,000, 36,000, 40,000, 44,000, and 48,000 seeds/acre) were compared to see if seeding rates would respond differently to the row configuration employed. The field was planted to soybeans in 2006. Golden Harvest 9190 HxLL was planted on May 1, 2007. Weeds were controlled with pre- and post-emergent herbicides.

Individual plots were 20 ft wide × 50 ft long, with the center rows harvested for grain yield. Grain yield was adjusted to 15.0% moisture basis. SAS PROC MIXED was the statistical program used in analyzing the data, with a significance level of $P \leq 0.05$.

Results and Discussion

The response to row spacing was dependent on the seeding rate used since the interaction of the two treatments was significant ($P = 0.0046$) (Table 1). Both row spacings resulted in high yields although they were not at the same seeding rate. The 32,000 to 44,000 seeding rate for 30 in. spacing all yielded fairly similar (all have a letter in common in Table 1). The highest seeding rate (48,000) reduced yield, especially in relation to the three lowest seeding rates (32,000–40,000).

The 40,000 and 44,000 seeding rates for the twin rows yielded similarly to those listed above as top yielders in the 30 in. spacing. The lower end of the seeding rates used in the study (32,000 and 36,000 seeds/acre) tended to yield lower in twin rows than the higher seeding rates.

Research in 2007 at this location seems to show an inverse relationship between the two row configurations. The 30 in. row spacing has optimum yields at the lower to moderate seeding rates and begins to have a downward yield trend as seeding rate increases. This is in

contrast to the twin row system that exhibited a general yield increase as seeding rate increased.

Please consider this data as ‘preliminary’ and do not use it in adjusting management practices at this time. Analysis of multiple locations and years of data are needed to make overall recommendations although these research results are interesting and worthwhile to discuss. If these trends are consistent over years, it is possible that in the future recommended seeding

rates will vary based on the row configuration utilized by a producer.

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Table 1. Interaction of seeding rate and row spacing on grain yield.¹

Row spacing	Seeding rate (seeds/acre)	Grain yield adjusted to 15.0% moisture (bu/acre)	Grain yield significance
30 in.	32,000	196	a
30 in.	36,000	186	abc
30 in.	40,000	183	abc
30 in.	44,000	179	abcd
30 in.	48,000	163	d
Twin row	32,000	163	d
Twin row	36,000	176	cd
Twin row	40,000	194	ab
Twin row	44,000	182	abc
Twin row	48,000	178	bcd

LSD=18

¹Treatments means with any letter in common are not different from one another.