Corn Row Spacing and Seeding Rate

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Introduction

Corn plant populations have increased at approximately 400 plants/acre per year over the last two decades. Seeding rates are now commonly 32,000 to 38,000 seeds/acre. Additionally, grain yields are increasing at approximately 1.8 bushels/acre per year since 1996. Because corn plant populations and grain yields are increasing, there has been a renewed interest in looking at corn row spacing and seeding rate.

Materials and Methods

This set of trials was conducted in 2016 using two Dekalb hybrids (DKC52-84 and DKC53-56) in trial one and two Pioneer hybrids (P0157 and P0339) in trial two. These trials were not designed to compare brand genetics. Each trial was set up as a randomized complete block design. The seeding rates used were 30,000, 34,000, 38,000, and 42,000 seeds/acre at a 20- and 30-in. row spacing for each hybrid.

Results and Discussion

In trial one, the main effects of hybrid, seeding rate, and row spacing on yield were significant at 95 percent confidence (Table 1). DKC 52-84 yielded 16 bushels/acre greater than DKC 53-56. The seeding rate of 42,000 yielded between 9.3 and 6.2 bushels/acre less than the other seeding rates. The 20-in. row spacing yielded 16.2 bushels/acre more than 30-in. row spacing. The only interaction with a significant p-value was the interaction of hybrid by seeding rates ($P = 0.0001$).

In trial two, the only significant effect was the main effect of row spacing, which was significant with $P < 0.0001$ (Table 2). The 20-in. row spacing yielded 7.9 bushels/acre more than the 30-in. rows. Interaction effects were not found to be significant in this trial.

Acknowledgements

Table 1. Corn grain yields for trial one (DeKalb)–hybrid × seeding rate × row spacing, 2016.[1]

	DKC 52-84	DKC 53-56	30,000 seeds/ac	34,000 seeds/ac	38,000 seeds/ac	42,000 seeds/ac	20-in. row	30-in. row
	grain yield (bushels/acre)							
DKC 52-84	277.4							
DKC 53-56		261.4						
	P <0.0001							
30,000 seeds/ac	274.2	271.1	272.7					
34,000 seeds/ac	279.8	264.2		272.0				
38,000 seeds/ac	277.8	261.4			269.6			
42,000 seeds/ac	277.6	249.1				263.4		
	P = 0.0001		P = 0.0014					
20-in. row	287.0	268.1	280.6	280.6	276.1	272.8	277.5	
30-in. row	267.7	254.8	264.7	263.4	263.1	253.9		261.3
	P = 0.0838		P = 0.6357				P <0.0001	

[1]P-values within boxes are used to compare yields of the main effects or interaction effects within each box. Underlined yields are significantly higher at P < 0.05.

Table 2. Corn grain yields for trial two (Pioneer)–hybrid × seeding rate × row spacing, 2016.[1]

	P0157	P0339	30,000 seeds/ac	34,000 seeds/ac	38,000 seeds/ac	42,000 seeds/ac	20-in. row	30-in. row
	grain yield (bushels/acre)							
P0157	273.0							
P0339		274.5						
	P = 0.3657							
30,000 seeds/ac	269.2	273.8	271.5					
34,000 seeds/ac	275.0	276.6		275.8				
38,000 seeds/ac	275.0	277.5			276.2			
42,000 seeds/ac	272.9	270.3				271.6		
	P = 0.4773		P = 0.0742					
20-in. row	277.9	277.6	275.7	279.7	279.0	276.5	277.7	
30-in. row	268.2	271.5	267.3	271.9	273.5	266.6		269.8
	P = 0.2847		P = 0.8129				P < 0.0001	

[1]P-values within boxes are used to compare yields of the main effects or interaction effects within each box. Underlined yields are significantly higher at P < 0.05.