Corn Hybrid, Seeding Rate, and Row Spacing Trial

RFR-A1934

Terry Tuttle, farm superintendent
Mark Licht, assistant professor and extension cropping systems specialist
Department of Agronomy

Introduction
Corn plant populations have increased at approximately 400 plants/acre per year over the last two decades. Seeding rates now are commonly in the 32,000 to 38,000 seeds/acre range. Additionally, grain yields are increasing at 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
These trials were conducted in 2019 using two Wyffels hybrids (W4196RIB and W5516RIB), two Pioneer hybrids (P0157AMXT and P0688AM), and two Dekalb hybrids (DKC50-08RIB and DKC55-53RIB) in separate trials. These trials were not designed to compare brand genetics. Each trial was set up as a randomized complete block design. The seeding rates were 30,000, 35,000, and 40,000 seeds/acre with 30-in. and 20-in. row spacing used for each hybrid.

Results and Discussion
The main effects of hybrid and row spacing were significant in all three of the brand trials and seeding rate was significant in two of the brand trials. Across all three trials 20-in. rows yielded 10.8 bushels/acre higher than 30-in. rows. In 2019, this was the most consistent and higher advantage of 20-inch rows compared with trials from 2015-2019. Additionally, 30,000 seeds/acre was the poorest yielding seeding rate in all three trials. Individual brand trial results for the main effects of hybrid, seeding rate, and row spacing, as well as the two-way interactions, can be found in Tables 1-3.

Acknowledgements

Table 1. Corn grain yields for the Wyffels hybrid x seeding rate x row spacing trial, ISU Northwest Research Farm.[1]

	W4196RIB	W5516RIB	30,000 seeds/ac	35,000 seeds/ac	40,000 seeds/ac	20-in. row	30-in. row
			grain yield (bushels/acre)				
W4196RIB	240.1 B						
W5516RIB		247.5 A					
	P = < 0.0001						
30,000 seeds/ac	236.9	242.8	239.8 B				
35,000 seeds/ac	241.5	248.4		245.4 A			
40,000 seeds/ac	242.0	251.2			246.6 A		
	P = 0.6407			P = 0.0019			
20-in. row	246.4 B	256.7 A	247.6 B	249.9 AB	257.0 A	251.5 A	
30-in. row	233.9 C	238.2 C	232.0 C	239.9 C	236.2 C		236.1 B
	P = 0.0463		P = 0.0169			P = < 0.0001	

[1]P-values within boxes are used to compare yields of the main effects or interaction effects within each box. Yields that are significantly different at $P < 0.05$ have different letters following the yield values within each box.

Table 2. Corn grain yields for the Pioneer hybrid x seeding rate x row spacing trial, ISU Northwest Research Farm.[1]

	P0157AMXT	P0688AM	30,000 seeds/ac	35,000 seeds/ac	40,000 seeds/ac	20-in. row	30-in. row
	grain yield (bushels/ac)						
P0157AMXT	223.9 B						
P0688AM		232.0 A					
	P = 0.0008						
30,000 seeds/ac	219.5	227.8	223.6 B				
35,000 seeds/ac	224.4	237.6		230.1 A			
40,000 seeds/ac	227.7	230.5			229.1 AB		
	P = 0.1560		P = 0.0245				
20-in. row	228.3	236.2	228.2	234.8	233.7	232.2 A	
30-in. row	219.5	227.7	219.0	227.2	224.4		223.6 B
	P = 0.9540		P = 0.9323			P = 0.0004	

[1]P-values within boxes are used to compare yields of the main effects or interaction effects within each box. Yields that are significantly different at P < 0.05 have different letters following the yield values within each box.

Table 3. Corn grain yields for the Dekalb hybrid x seeding rate x row spacing trial, ISU Northwest Research Farm.[1]

	DKC50-08RIB	DKC55-53RIB	30,000 seeds/ac	35,000 seeds/ac	40,000 seeds/ac	20-in. row	30-in. row
	grain yield (bushels/ac)						
DKC50-08RIB	227.7 B						
DKC55-53RIB		242.1 A					
	P = < 0.0001						
30,000 seeds/ac	225.0	240.2	232.6				
35,000 seeds/ac	229.7	244.3		236.5			
40,000 seeds/ac	228.4	241.7			235.0		
	P = 0.8783		P = 0.0977				
20-in. row	230.8	247.2	236.9	241.3	239.0	239.0 A	
30-in. row	224.6	236.9	228.3	232.8	231.1		230.7 B
	P = 0.2021		P = 0.9781			P = < 0.0001	

[1]P-values within boxes are used to compare yields of the main effects or interaction effects within each box. Yields that are significantly different at P < 0.05 have different letters following the yield values within each box.