Dryland Corn Seeding Rates Effect on Product Grain Yield

Trial Objective

- Selecting the appropriate products and seeding rates are key to achieving higher yields in dryland corn production.
- Low corn populations can promote the formation of tillers (a.k.a. “suckers”). There is a controversy as to whether these tillers compensate for grain yield when producing more than one ear per plant.
- The objective of this trial was to determine the effect of corn seeding rate on tiller incidence and grain yield for multiple Bayer corn products compared to three competitor products.

Experiment/Trial Design

Location	Soil Type	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield (bu/acre)	Seeding Rate (seeds/acre)
Gothenburg, NE	Hord silt loam	Wheat	No-till	05/13/2021	11/09/2021	200	See below

- The trial was set up as a randomized complete block design with four replications.
- A total of 20 corn products were selected for this trial, seventeen Bayer products and three competitor products with relative maturities (RM) ranging from 100 to 114 days.
- The four corn seeding rates used were 12,000, 16,000, 20,000, and 24,000 seeds/acre.
- Tiller incidence was reported as a percentage of the number of plants that presented tillers relative to the total number of plants in the plot.
- Corn was fertilized with a stream bar before planting (04/06/2021) with 90 lb/acre of nitrogen (N), 40 lb/acre of phosphorus (P), and 20 lb/acre of sulfur (S). Nitrogen was also side dressed on 06/22/2021 using Y-drops at 60 lb/acre.
- Weeds were controlled uniformly across the study area.

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Understanding the Results

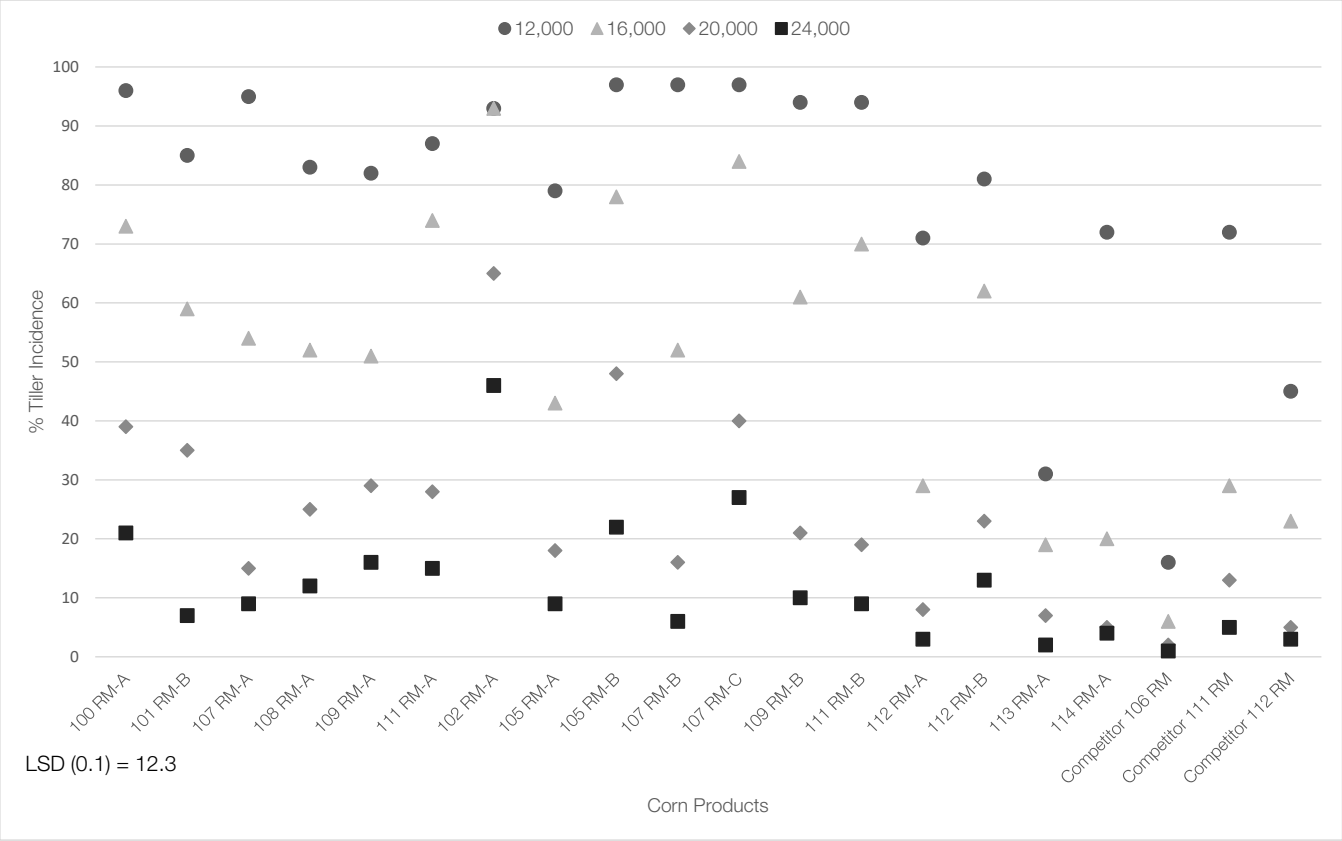

Figure 1. Tiller incidence (%) of different corn products according to seeding rates in dryland conditions at the Bayer Water Utilization Learning Center, Gothenburg, NE (2021).

- There was a significant interaction between product and seeding rate in tiller incidence in this study.
- Even though tiller incidence was variable by corn products, a greater tiller incidence was observed under lower corn seeding rates of 12,000 and 16,000 seeds/acre compared to the higher seeding rates of 20,000 to 24,000 seeds/acre (Figure 1).

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Table 1. Difference in tiller incidence according to seeding rate and product selection at the Bayer Water Utilization Learning Center, Gothenburg, NE (2021).

Corn Product	Seeding rate (seeds/A)					
	12,000 to 16,000	12,000 to 20,000	12,000 to 24,000	16,000 to 20,000	16,000 to 24,000	20,000 to 24,000
	Difference in tiller incidence (%)					
100 RM-A	-23.0	-57.0	-75.0	-34.0	-52.0	-18.0
101 RM-B	-26.0	-50.0	-78.0	-24.0	-52.0	-28.0
107 RM-A	-41.0	-80.0	-86.0	-39.0	-45.0	-6.0
108 RM-A	-31.0	-58.0	-71.0	-27.0	-40.0	-13.0
109 RM-A	-31.0	-53.0	-66.0	-22.0	-35.0	-13.0
111 RM-A	-13.0	-59.0	-72.0	-46.0	-59.0	-13.0
102 RM-A	0.0	-28.0	-47.0	-28.0	-47.0	-19.0
105 RM-A	-36.0	-61.0	-70.0	-25.0	-34.0	-9.0
105 RM-B	-19.0	-49.0	-75.0	-30.0	-56.0	-26.0
107 RM-B	-45.0	-81.0	-91.0	-36.0	-46.0	-10.0
107 RM-C	-13.0	-57.0	-70.0	-44.0	-57.0	-13.0
109 RM-B	-33.0	-73.0	-84.0	-40.0	-51.0	-11.0
111 RM-B	-24.0	-75.0	-85.0	-51.0	-61.0	-10.0
112 RM-A	-42.0	-63.0	-68.0	-21.0	-26.0	-5.0
112 RM-B	-19.0	-58.0	-68.0	-39.0	-49.0	-10.0
113 RM-A	-12.0	-24.0	-29.0	-12.0	-17.0	-5.0
114 RM-A	-52.0	-67.0	-68.0	-15.0	-16.0	-1.0
Competitor 106 RM	-10.0	-14.0	-15.0	-4.0	-5.0	-1.0
Competitor 111 RM	-43.0	-59.0	-67.0	-16.0	-24.0	-8.0
Competitor 112 RM	-22.0	-40.0	-42.0	-18.0	-20.0	-2.0

RM, relative maturity. Shaded cells represent statistical significance at Least Square Difference (LSD) (0.1) = 12.3

- The tiller incidence reduction from 12,000 to 20,000, and from 12,000 to 24,000 seeds/acre was significant for all corn products in this trial (Table 1).
- The least tiller incidence reduction was observed from 20,000 to 24,000 seeds/acre (Table 1).

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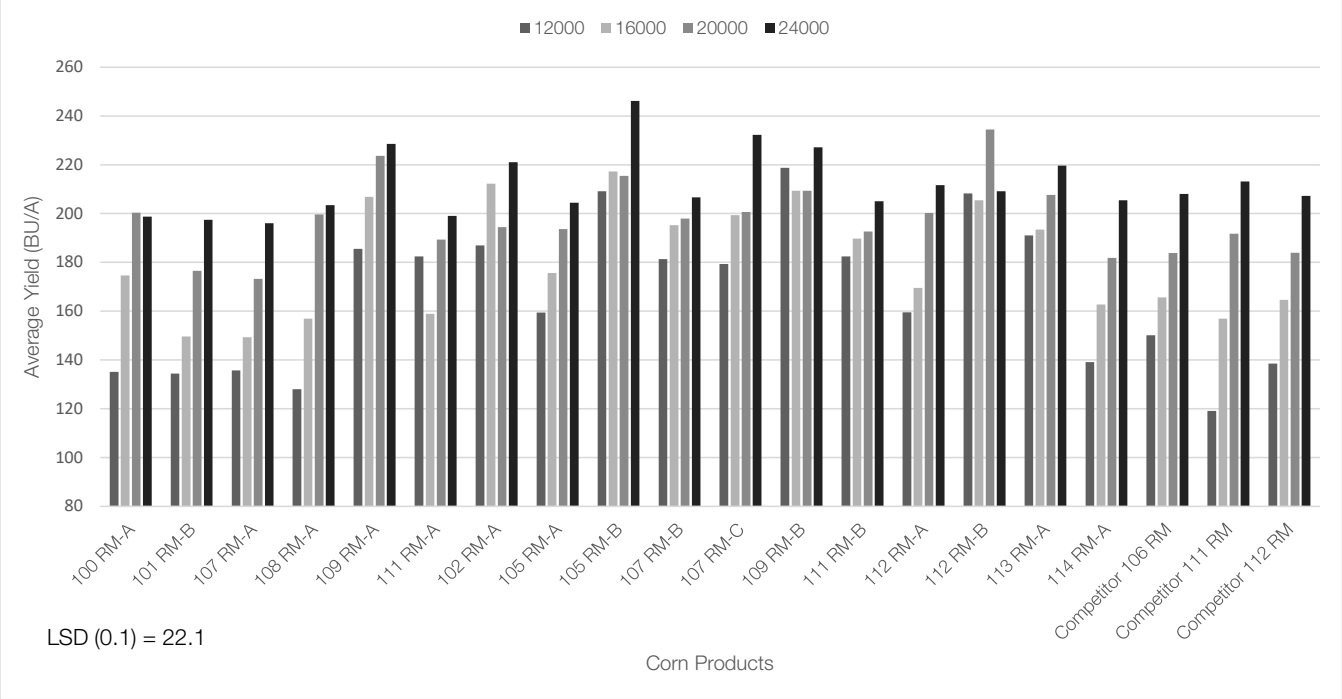

Figure 2. Average grain yield of corn products according to seeding rates under dryland conditions at the Bayer Water Utilization Learning Center, Gothenburg, NE (2021).

- There was a trend of greater corn grain yield as seeding rates were increased in this study, except for product 109RM-B (Figure 2).

Dryland Corn Seeding Rates Effect on Product Grain Yield

Table 2. Difference in corn grain yield according to seeding rate and product selection at the Bayer Water Utilization Learning Center, Gothenburg, NE (2021).

Corn Product	Seeding Rate (seeds/acre)					
	12,000 to 16,000	12,000 to 20,000	12,000 to 24,000	16,000 to 20,000	16,000 to 24,000	20,000 to 24,000
	Difference in Grain Yield (bu/acre)					
100 RM-A	39.5	65.2	63.6	25.7	24.1	-1.6
101 RM-B	15.2	42.1	63.0	26.9	47.8	20.9
107 RM-A	13.6	37.5	60.3	23.9	46.7	22.8
108 RM-A	28.9	71.6	75.4	42.7	46.5	3.8
109 RM-A	21.3	38.2	43.1	16.9	21.8	4.9
111 RM-A	-23.5	6.9	16.6	30.4	40.1	9.7
102 RM-A	25.4	7.5	34.2	-17.9	8.8	26.7
105 RM-A	16.2	34.2	45.0	18.0	28.8	10.8
105 RM-B	8.2	6.4	37.1	-1.8	28.9	30.7
107 RM-B	13.9	16.6	25.3	2.7	11.4	8.7
107 RM-C	20.0	21.3	53.0	1.3	33.0	31.7
109 RM-B	-9.5	-9.5	8.4	0.0	17.9	17.9
111 RM-B	7.3	10.2	22.6	2.9	15.3	12.4
112 RM-A	10.0	40.7	52.2	30.7	42.2	11.5
112 RM-B	-2.8	26.3	0.9	29.1	3.7	-25.4
113 RM-A	2.4	16.6	28.7	14.2	26.3	12.1
114 RM-A	23.6	42.7	66.3	19.1	42.7	23.6
Competitor 106 RM	15.5	33.7	57.9	18.2	42.4	24.2
Competitor 111 RM	37.8	72.6	94.1	34.8	56.3	21.5
Competitor 112 RM	26.1	45.4	68.7	19.3	42.6	23.3

RM, relative maturity. Shaded cells represent statistical significance at Least Square Difference (LSD) (0.1) = 22.1

- The corn grain yield response to seeding rate was product selection dependent. Table 2 displays the difference in grain yield between different seeding rate increments: 12,000 to 20,000; 12,000 to 24,000; and 16,000 to 24,000 (Table 2).
- Product 109RM-B did not show differences in grain yield relative to the seeding rate used (Table 2).

Key Learnings

- Lower corn seeding rates produce more tillers but had reduced grain yield potential.
- Even though more tillers were observed in lower populations, tillers did not compensate for grain yield. However, the presence of tillers was not associated with reduced corn grain yield.
- Talk to your local Bayer representative to determine which corn product and seeding rate best fit your production system.

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