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Spacing for Success: Row Width and Seeding Rate in Winter Wheat

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Short and S-Wheat:

- **15-inch row spacing did not result in a yield penalty or increased weed pressure in 2025**
- **Increasing seeding rate can improve yield, but gains level off beyond an optimal rate**
- **Higher seeding rates were associated with reduced grain protein levels**

Introduction

For growers looking to plant winter wheat without investing in a grain drill, 15-inch row spacing offers a practical alternative. While traditional 7.5-inch rows are generally reported to deliver higher yields than wider row spacings, 15-inch rows may still perform respectably, especially when paired with the correct seeding rate. Wider rows may encourage more tillering and allow for intercropping with soybeans, making them a flexible option for farms already equipped with planters or air seeders. However, wider rows can create more opportunities for weed competition.

Trial #1

The objective of this research is to evaluate the impact of narrow (7.5-inch) versus wide (15-inch) row spacing in winter wheat planted at different seeding rates (Table 1) on grain yield, test weight, and protein levels. FS 745 winter wheat was planted on September 20, 2024, at the Arlington Agricultural Research Station in Arlington, WI. The same custom plot planter was used for both row spacings to eliminate equipment-related variability. Fertility management followed University of Wisconsin-Extension guidelines. In spring, Huskie herbicide was applied for weed control. The trial was harvested on July 15, 2025. Grain yield, moisture, test weight, and protein content were measured in the field using electronic sensors integrated into the plot harvester.

Table 1. Row spacings and seeding rates

Row spacing inches	Million seeds/acre
7.5	0.75
15	1.00
	1.25
	1.50
	1.75
	2.00

Results

Row spacing had no effect on grain yield (79 bu./acre), test weight (56.7 lb./bu.), or protein content (11.0%). Additionally, no significant interactions were found between row spacing and seeding rate for any of these parameters. Furthermore, no distinctions in weed pressure between the two row spacings were observed. It's important to recognize that multiple factors, including weather conditions, can influence the outcomes of management trials. Therefore, relying on a single year of data may lead to misleading conclusions; multi-year evaluations are essential for making sound management decisions. This research will be repeated in the 2025-2026 growing season.

Trial #2

The objective of this research is to evaluate the effects of varying seeding rates and varieties (Table 2) on winter wheat performance across multiple growing environments (Table 3). Fertility management followed University of Wisconsin-Extension guidelines. In spring, Huskie herbicide was applied for weed control. Grain yield, moisture, test weight, and protein content were measured in the field using electronic sensors integrated into the plot harvester.

Table 2. Varieties and seeding rates

Variety	Million seeds/acre
FS 606	0.75
FS 745	1.00
	1.25
	1.50
	1.75
	2.00
	2.25

Table 3. Trial location information

Location	Planting date	Harvest date
Arlington, WI	9/20/2024	7/15/2025
Fond Du Lac, WI	9/24/2024	7/22/2025
Waterloo, WI	9/26/2024	7/21/2025
Random Lake, WI	9/30/2024	7/25/2025

Results

Increasing seeding rates generally led to higher wheat yields for both varieties, though the response began to plateau at the upper densities—suggesting a point of diminishing agronomic return (Fig. 1). This yield trend closely aligns with established seeding rate guidelines (Table 5). Higher seeding rates were also associated with reduced grain protein levels, possibly due to limited nitrogen availability within the plant. Increasing the seeding rate from 0.75 to 2.25 million seeds per acre resulted in a 5.7% reduction in grain protein concentration.

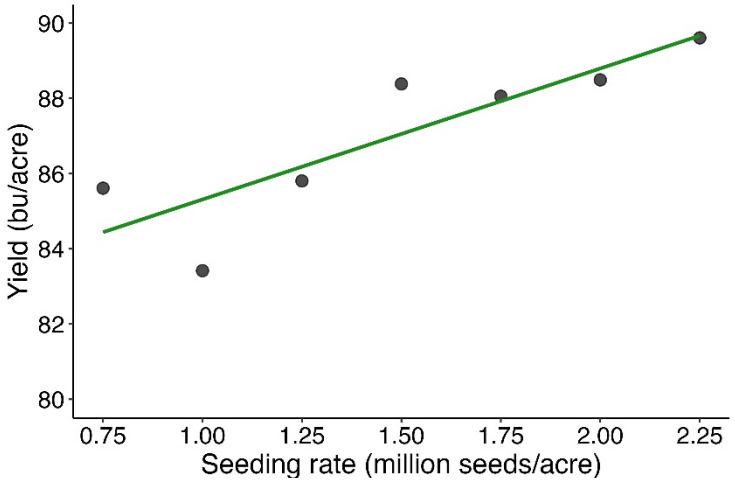

Figure 1. Winter wheat grain yield response to increasing seeding rates across four locations in Wisconsin (2025).

Table 5. Wisconsin Winter Wheat Seeding Rate Recommendations

Seeds/acre (million)	Seeds/ft.^{2}	Row width (in.)		
		6	7	7.5
		Seeds foot^{-1} of row		
1.50	34.4	17.2	20.1	21.5
1.55	35.6	17.8	20.8	22.2
1.60	36.7	18.4	21.4	23.0
1.65	37.9	18.9	22.1	23.7
1.70	39.0	19.5	22.8	24.4
1.75	**40.2**	**20.1**	**23.4**	**25.1**
Recommended seeding rate prior to Oct. 1				
1.80	41.3	20.7	24.1	25.8
1.85	42.5	21.2	24.8	26.5
1.90	43.6	21.8	25.4	27.3
1.95	44.8	22.4	26.1	28.0
2.00	**45.9**	**23.0**	**26.8**	**28.7**
Recommended seeding rate Oct.1 to Oct.10				
2.05	47.1	23.5	27.5	29.4
2.10	48.2	24.1	28.1	30.1
2.15	49.4	24.7	28.8	30.8
2.20	50.5	25.3	29.5	31.6
2.25	**51.7**	**25.8**	**30.1**	**32.3**
Recommended seeding rate after Oct.10				
2.30	52.8	26.4	30.8	33.0
2.35	53.9	27.0	31.5	33.7
2.40	55.1	27.5	32.1	34.4
2.45	56.2	28.1	32.8	35.2
2.50	57.4	28.7	33.5	35.9