

Hard Red Winter Wheat Seeding Rate Trial-2006
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Field research was initiated in the fall of 2005 to investigate the effect of seeding rate on yield and other agronomic characteristics of hard red winter wheat (hrww). The trial was seeded on September 9, 2005 with a no-till drill into 8-inch flax stubble at a seeding depth of 1.5 to 2 inches. Plot size was 4 x 20 ft in length with 7, 7-inch spaced rows. Harvest size was 4 x 16 ft in length. The experimental design was a randomized complete block with four replicates. The soil type was a Svea-Barnes loam. The cultivar Jerry was planted at four seeding rates of 0.75, 1.0, 1.25, and 1.5 million pure live seed (PLS)/acre. The germination was 96% and the 1000-seed weight was 40.8 grams. The fall soil test for NPK was 32-11-120. Urea fertilizer was surface applied at a rate of 118 lbs/a of actual N on April 18, 2006 just prior to 1 inch of precipitation. Weeds were controlled by the use of herbicides. Harvest date was July 29, 2006.

Data was collected on initial plant stand (IPS), heading date, plant height, lodging, test weight, seed weight, heads per square foot, kernels per head and yield. Initial plant stand (IPS) was determined at the 1.5 leaf stage by counting two random 4-foot lengths within each plot. The 4-foot lengths were marked in each plot at IPS determination and heads/ft² was recorded from these same areas just prior to maturity. Plant height was an average erect plant taken at maturity. Heading date was recorded when 50% of the heads in each plot were completely out of the boot. Kernels/head was calculated from yield, head/ft² and 1000-seed weight.

Stored soil moisture was good for the start of the 2006 growing season. Precipitation from April to July was 6.90 inches, 2.58 inches below normal. Temperature was 3.6⁰F above normal for the same time period. Disease pressure from foliar diseases and fusarium head blight was minimal because of the warm dry conditions.

Initial plant stands were significantly greater at the 1.5 million PLS/a seeding rate compared to all other seeding rates. The 0.75 million PLS/a seeding rate had the lowest IPS while no significant differences were observed between the 1.0 and 1.25 million PLS/a seeding rate (Table 1). Differences among seeding rates for IPS were expected due to the larger amount of seeding being sown. Head/ft² was significantly greater at the 1.5 million PLS/a seeding rate but it was not different from the 1.0 million PLS/a seeding rate. No significant differences occurred among the lowest three seeding rates for head/ft². Seeding rate effect on heading date, plant height, lodging, protein, test weight, 1000-seed weight, kernels/head, and yield were all non-significant. This indicates that hrww has the ability to compensate for lower seeding rates by producing greater heads/ft², kernels/head and 1000-seed weight. Although head/ft² were greater for the 1.5 million PLS/a seeding rate in this study, the kernels/head and 1000-seed weight was the lowest among the seeding rates although the differences were not significant.

Results from this study indicate that hrww should be seeded at a rate between 0.75 and 1.0 million PLS/a. Differences in seeding rate in bu/a will vary depending on seed size (Table 2). This study will be conducted again in 2007.

Table 1. Influence of seeding rate on agronomic characteristics of hrww at Langdon, ND, 2006.

Seeding rate million PLS/a – bu/a†	Yield bu/a	Initial plant stand ft ²	Heads ft ²	Heading date June	Plant Height in	Lodging 0-9	Protein %	Test weight lbs/bu	1000-seed weight grams	Kernels/ head
0.75 - 1.2	61.5	13.8	40.0	11.3	47.3	0.3	10.2	59.8	30.2	32.0
1.00 - 1.6	63.6	19.1	46.2	11.3	48.8	0.8	10.6	59.2	29.3	29.6
1.25 - 2.0	61.4	21.3	41.0	11.3	47.8	0.5	10.4	59.3	29.1	33.0
1.50 - 2.4	62.7	28.8	50.6	11.3	48.5	0.8	10.6	59.2	28.9	27.0
LSD 5%	NS	3.6	7.4	NS	NS	NS	NS	NS	NS	NS
C.V.%	3.5	10.9	10.5	0	1.7	103.7	3.1	1.1	3.7	13.5

† Bu/a seeding rate for seedlot with 1000 seed weight of 40.8 grams or 11,127 seeds/lb.

Table 2. Seed size effect on seeding rate in bushels per acre.

Seeding rate million PLS/a†	1000-seed weight (g)/seeds/lb		
	30.0/15,133	35.0/12,971	40.8/11,127
	-----bu/a-----		
0.75	0.9	1.0	1.2
1.00	1.1	1.3	1.6
1.25	1.4	1.7	2.0
1.50	1.7	2.0	2.4

† Assumes a 96% germination.