

IMPACT OF PLANTING DATE AND SEEDING RATE ON WHEAT VARIETIES

TRIAL OVERVIEW

- How is wheat yield potential affected when planting too early or too late?
- Can an increased seeding rate compensate for less tiller development and help maintain yield potential in late-planted wheat?

RESEARCH OBJECTIVE

- The objective of this study was to evaluate the influence of planting date and seeding rate on yield potential in rainfed winter wheat in west-central Nebraska.

Location	Soil	Previous Crop	Tillage Type	Planting Date	Harvest Date	Potential Yield/Acre	Planting Rate/Acre
Gothenburg, NE	Hord silt loam	Soybean	Vertical tillage			85 bu/acre	0.8M, 1.4M, 2.0M
Grant, NE	Kuma silt loam	Wheat	Conventional tillage			40 bu/acre	0.8M, 1.4M, 2.0M

SITE NOTES:

- Four wheat varieties were used: WB4303 (medium maturity), Winterhawk (medium maturity), WB4721 (medium-late maturity), and WB-Grainfield (medium-late maturity).
- The study was designed as a split-split plot blocked by planting date as the main effect, seeding rate as the split plot, and wheat variety as the split-split plot at both sites. There were four replications.
- At the Gothenburg site, wheat was planted in vertical-tilled dryland soybean stubble at three different seeding rates and four different planting dates: 9/30/16, 10/14/16, 11/01/16, and 11/16/16.
- At the Grant site, wheat was planted in conventional-tilled dryland wheat stubble at three different seeding rates and four different planting dates: 9/30/16, 10/14/16, 10/28/16, and 11/11/16.
- Weeds were controlled uniformly throughout the season and no insecticides or fungicides were needed to control insects or diseases at either site.
- Soil test results at the Gothenburg site: pH – 6.6, organic matter – 4%, residual N – 37 lbs/acre, residual P – 40 ppm.
- Soil test results at the Grant site: pH – 6.6, organic matter – 2.1%, residual N – 134 lbs/acre, residual P – 50 ppm.
- At both sites, yield was the only factor that was measured at harvest.

UNDERSTANDING THE RESULTS

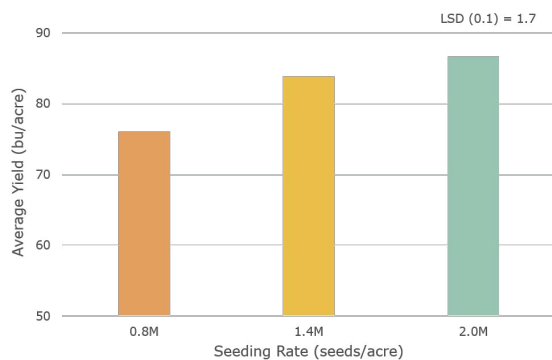


Figure 1. Average wheat yields by seeding rate at the Gothenburg site

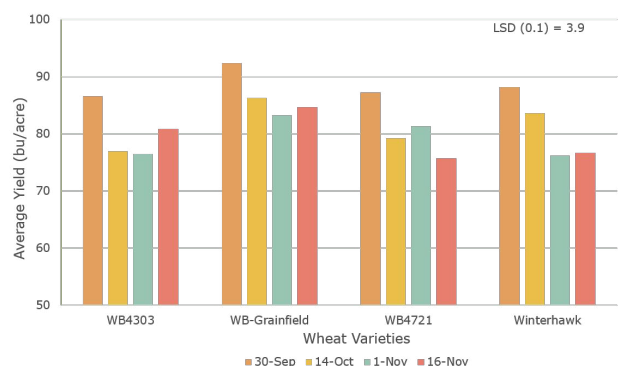


Figure 2. Average wheat yields by planting date at the Gothenburg site

Gothenburg

- Higher yields were consistently obtained with higher seeding rates across all planting dates and wheat varieties (Figure 1).

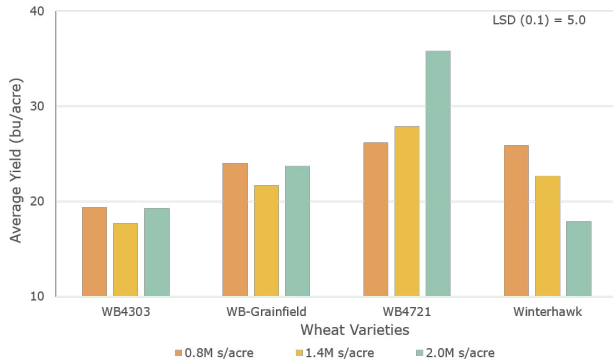


Figure 3. Average wheat yields by seeding rate at the Grant site

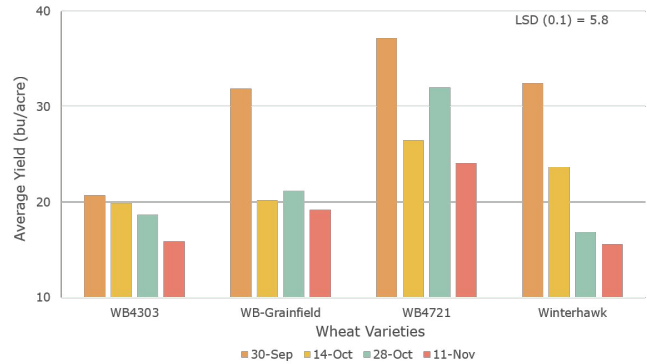


Figure 4. Average wheat yields by planting date at the Grant site

Month	Gothenburg, NE		Grant, NE	
	2016-17 total	Average	2016-17 total	Average
Inches				
September	0.61	1.55	1.4	1.5
October	2.69*	1.41	0.6	1.3
November	0.55	0.89	0.0	0.8
December	0.38	0.45	0.1	0.4
January	0.7	0.45	0.4	0.5
February	0.43	0.51	0.0	0.7
March	2.7	1.41	1.8	1.4
April	1.5	2.26	2.1	2.2
May	2.53	3.71	3.3	3.2
June	0.75	3.67	0.4	3.1
July	1.52	3.23	3.0	3.1
Total	14.36	19.54	13.1	18.2

Table 1. Accumulated moisture at Gothenburg and Grant. *Two inches of irrigation water was applied on October 21, 2016 to ensure good stand establishment.

- There was a significant interaction between planting date and wheat variety. Higher yields were observed for all varieties at the earliest planting date. However, varieties responded differently to later planting dates (Figure 2).
- **Grant**
- Across seeding rates, there was no significant difference in yield for two of the varieties, WB4303 and WB-Grainfield, whereas WB4721 had increased yield with increasing seeding rate and Winterhawk had decreased yield with increasing seeding rates (Figure 3).
- The earliest planting date (September 30) had the highest yields across all varieties; however, the magnitude of the yield increase varied. Three of the four varieties had significantly higher yields for the earliest planting date (Figure 4).

WHAT DOES THIS MEAN FOR YOUR FARM?

- The impact of planting date affects yield potential with typically higher yields observed with planting dates that allow for sufficient tiller development without excessive foliage growth in the fall. Planting dates from mid-September to the first part of October are reasonable for the central Great Plains.
- The results of this study suggest that in high-yielding environments (above 75 bu/acre), higher seeding rates may result in higher yield potential. In lower-yielding environments (below 35 bu/acre) wheat varieties may have more variability in regards to yield potential.

LEGAL STATEMENT

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