

Project Title: 2020 Off-Station Winter Wheat Nitrogen Management

Objective: To evaluate the performance of the rates and split-application of nitrogen in rainfed winter wheat production environment in northwestern Montana

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Summary:

The off-station winter wheat for nitrogen (N) trial was planted under no-till rainfed ground with row-spacing 12-in apart on Sept. 23, 2019. See Table 1 for detailed management information.

The Nitrogen rates applied were: 1) 0 as control, 2) 40, 3) 80, 4) 80 but were split-applied, 5) 120, and 6) 120 but were split-applied lbs N/A. Urea was used as an N fertilizer source. The soil had a 25 lbs/A residual nitrate and 10 lbs N drilled with the seeds at planting.

The highest yield response was recorded at the 120 lbs N /A rate, applied either in early spring or split (early spring + heading). There were no significant differences in yield between these two treatments. There was also no statistical yield difference between the 80 lbs/A N application in the spring or split in the spring + heading application. We observed a similar trend in the grain protein (Figure 2) as the grain yield with N application rates. The plant height, test weights, and the falling number increased at 80 lbs/N and plateaued after that (data not presented).

In the spring, this nursery received 9.7 inches of rain.

Table 1. Management Information

Seeding date:	9/23/2019	Field Location:	Big Mahugh
Julian date:	267	Harvest date:	Aug. 3, 2020
Seeding rate:	90 lbs/A	Julian date:	216
Previous crop:	Peas	Soil type:	Flathead very fine sandy loam
Herbicide:	5/5: Beyond	Tillage:	No-till
		Variety	Brawl CL
Insecticide:	None	Soil residual nutrient	
		(NO₃⁻, P, K lb/A):	25-18-172
Fungicide:	None	Nutrient fertilizer applied	10-35-45 (10 S, 1 Zn) - drilled
		(N, P₂O₅, K₂O lb/A):	N applied varied, see N treatment

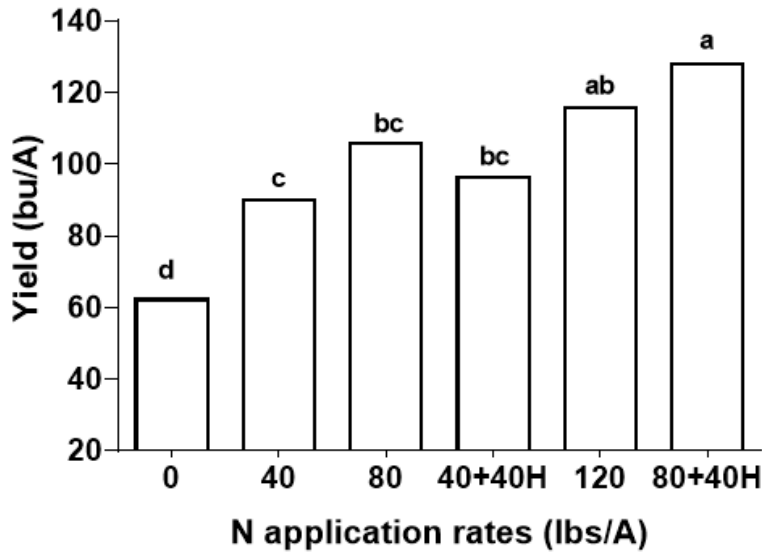


Figure 1. Yield response to nitrogen (N) application rates and timing (split-applied at heading). The first application was in early spring. The split (second) application is indicated by a '+' sign and H (at Heading). The application rates specified did not include the residual N (25 lbs/A) and the amount drilled with the seeds (10 lbs/A). The same letter assignment indicates nonsignificance at $P < .05$.

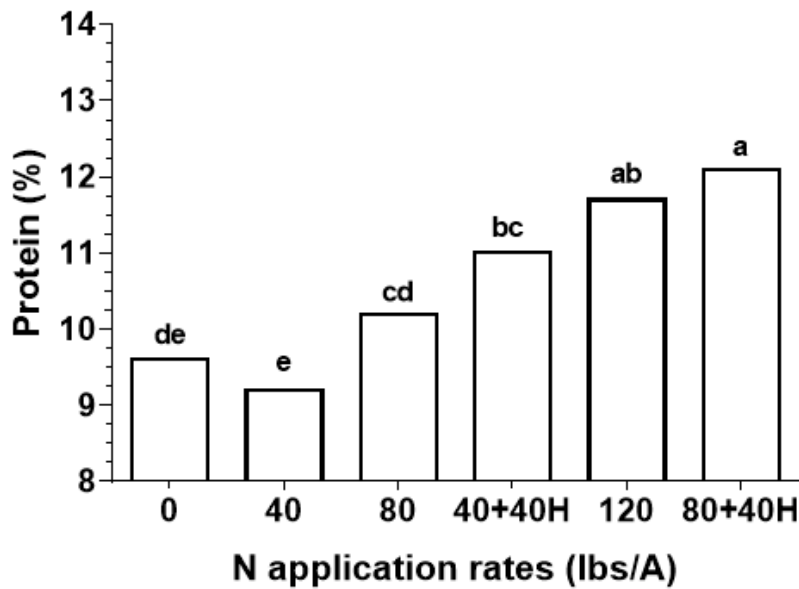


Figure 2. Protein response to nitrogen (N) application rates and timing (split-applied at heading). The first application was in early spring. The split (second) application is indicated by a '+' sign and H (at Heading). The application rates specified did not include the residual N (25 lbs/A) and the amount drilled with the seeds (10 lbs/A). The same letter assignment indicates nonsignificance at $P < .05$.