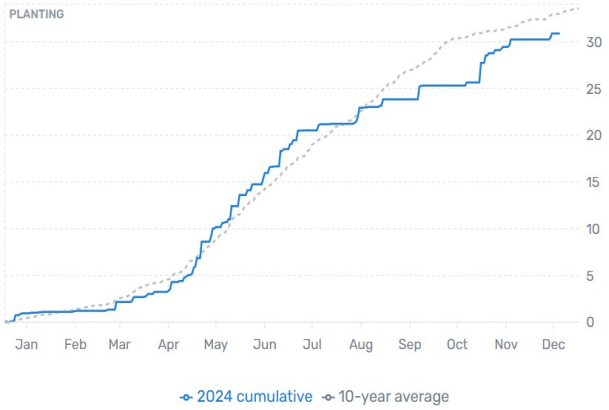
Evaluating Nitrogen Rates in Wheat

Study ID: 0656127202401
County: Nemaha
Soil Type: Pohocco silty clay loam 6-11% slopes, eroded; Gymer silty clay loam 6-11% slopes, eroded
Planting Date: 10/01/23
Harvest Date: 6/25/24
Population: 1,500,000
Row Spacing (in): 7.5”
Variety: WestBred®
Reps: 4
Previous Crop: Soybean
Tillage: No-Till
Foliar Fungicides: Miravis® Ace
Fertilizer: 30 lb N/ac, 30.03 lb/ac potash, 50 lb P/ac, and 7.5 lb S/ac applied pre-plant.

Note: Some freeze damage
Irrigation: None
Rainfall (in):



Introduction: This study evaluated two different N rates of Urea broadcast in Winter Wheat against an untreated check that has only 30 lb N/ac as base rate for all treatments. The three different N rates evaluated in this study were 30, 45, and 90 lb N/ac applied by broadcasting urea in a mid-season application (Figure 1). The application width was 80’ wide.

Figure 1: Prescription Map of Urea Applications

Results:

Treatment	Moisture (%)	Yield (bu/ac)†	Partial factor profit (lb bu/ lb N)	lb N/bu	Marginal Net Return‡ ($/ac)
30 lb N/ac total (0 lb N/ac urea)	7.7 A*	56 A	111.9 A	0.54 C	370 A
75 lb N/ac total (45 lb N/ac urea)	8.2 A	59 A	46.7 B	1.3 B	327 A
120 lb N/ac total (90 lb N/ac urea)	8.5 A	60 A	29.8 C	2.1 A	275 B
P-value:	0.019	0.23	<0.001	<0.001	0.10

*Values with the same letter are not significantly different at a 90% confidence level.
†Bushels per acre corrected to 13.5% moisture.
‡Marginal net return based on $6.60/bu wheat, and $0.60 lb N/lb

Summary:

- There were no significant differences in moisture or yield between treatments.
- There was a significant difference in marginal net return, with the 30 and 75 lb N/ac rates having a higher net return than the 120 lb N/ac rate.
- Freeze damage may have reduced stand count which could have impacted N uptake.
- This study suggests that the lowest N rate may have been appropriate for this field in 2024.