

Spring Wheat Response to Liquid Nitrogen, Carrington, 2008

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The objective of this study was to examine spring wheat performance with several sources and application timings of liquid nitrogen (N), to provide additional information to a database to revise NDSU wheat N recommendations. Experimental design was a randomized complete block with four replications. The field study was conducted at the NDSU Carrington Research Extension Center on a Heimdal Emrick loam soil. Spring soil analysis indicated 3.6% organic matter, 7.2 pH, and 61 lbs./acre nitrate-N and 23 ppm phosphorus. Illinois Soil N Test levels were 344 ppm at 0-6 inch depth and 226 ppm at 6-12 inch depth. Urea-ammonium nitrate (UAN) or Nitramin N Fusion (NNF = Georgia-Pacific 25.3-0-0 urea-polymer) plus water were applied preplant (PP) using stream nozzles on April 23. Rainfall totaling 0.23 inches was received during April 24 to May 10 (NDAWN). 'Glenn' HRS wheat was direct-seeded at 1.6 million seeds/acre in previous wheat ground on April 30. The trial was harvested with a plot combine on August 19.

Plant lodging was not present in trial. Plant height with the untreated check generally was shorter compared to N treatments (Table). Seed yield increased with N compared to the untreated check. Seed yield reached 59.4 bu/acre with UAN at 90 lbs. N/acre and 58.2 bu/acre with NNF at 120 lbs. N/acre. Test weight and kernel size generally were less than the untreated check with N at 120 or 150 lbs./acre. Protein increased with N at 90 lbs./acre or higher compared to the untreated check. Wheat response to NNF was generally similar to UAN.

| Table. Spring wheat response to liquid N. | | | | | | |
|---|-------------------|--------------|------------|-------------|---------------|---------|
| Nitrogen | | Plant Height | Wheat | | | |
| Rate | Source | | Seed Yield | Test Weight | Kernel Weight | Protein |
| lb N/acre | | cm | bu/acre | lb/bu | g/250 | % |
| untreated check | | 85 | 44.3 | 64.5 | 8.20 | 12.7 |
| 30 | UAN | 92 | 52.1 | 64.5 | 8.19 | 13.1 |
| 60 | UAN | 89 | 54.5 | 63.9 | 7.94 | 13.2 |
| 90 | UAN | 94 | 59.4 | 63.8 | 7.92 | 14.8 |
| 120 | UAN | 96 | 58.6 | 63.3 | 7.68 | 15.4 |
| 150 | UAN | 94 | 58.7 | 63.1 | 7.70 | 15.8 |
| 30 | Nitramin N Fusion | 88 | 50.5 | 64.3 | 8.11 | 13.2 |
| 60 | Nitramin N Fusion | 90 | 53.3 | 64.2 | 8.08 | 13.3 |
| 90 | Nitramin N Fusion | 94 | 57.9 | 64.1 | 8.19 | 14.5 |
| 120 | Nitramin N Fusion | 94 | 58.2 | 63.3 | 7.89 | 15.1 |
| 150 | Nitramin N Fusion | 93 | 54.7 | 63.1 | 7.70 | 15.3 |
| mean | | 92 | 54.8 | 63.8 | 8.00 | 14.2 |
| C.V. (%) | | 3.9 | 6.3 | 0.7 | 3.0 | 4.7 |
| LSD (0.05) | | 5 | 5.0 | 0.7 | 0.35 | 1.0 |