

Spring wheat response to liquid nitrogen, Carrington, 2007

Greg Endres and Dave Franzen

The objective of this study was to examine spring wheat performance with several sources and application timings of liquid nitrogen (N). Experimental design was a randomized complete block with four replications. The field study was conducted at the NDSU Carrington Research Extension Center on a Heimdahl-Emrich loam soil. Spring soil analysis indicated 2.7% organic matter, 7.3 pH, 47 lb/acre nitrate-N and 40 ppm phosphorus. Illinois Soil N Test levels were 226 ppm at 0-6 inch depth and 127 ppm at 6-12 inch depth. Urea-ammonium nitrate (UAN) or Nitramin N Fusion (NNF = Georgia-Pacific 25.3-0-0 urea-polymer) plus UAN at 25/75% combination were applied preplant (PP) using stream nozzles at 30, 60, 90, and 120 lb nitrogen/acre on May 3. Rainfall totaling 1.14 inches was received on May 3-5. 'Glenn' HRS wheat was direct-seeded into soybean stubble at 1.6 million seeds/acre on May 10. POST Nitramin (Georgia-Pacific 30-0-0 urea-polymer) or UAN at 30 lb nitrogen/acre, both mixed at a 50/50% ratio with water, were applied using flat-fan nozzles on June 26 to wheat in the flag-leaf stage following PP UAN at 60 lb nitrogen/acre. The trial was harvested with a plot combine on August 16.

Plant lodging was minimal in the trial and no differences occurred among treatments (data not shown). Plant height with the untreated check was shorter compared to N treatments (Table). Seed yield increased with PP UAN at 90 and 120 lb nitrogen/acre, and the N mixture at 120 lb nitrogen/A compared to the untreated check. Test weight was reduced with POST UAN compared to the untreated check, likely due to significant burn of the flag leaf. Kernel weight was reduced with the POST N compared to the untreated check. All N treatments tended to increase protein compared to the untreated check. Protein increased with PP nitrogen at 120 lb/acre and the treatment that included POST Nitramin, compared to the untreated check.

Table. Spring wheat response to liquid nitrogen, Carrington, 2007.

Nitrogen			Wheat				
Rate	Source	Timing	Plant Height	Seed Yield	Test Weight	Kernel Weight	Protein
lb N/acre			inches	bu/acre	lb/bu	g/1000	%
untreated check			82	37.3	62.4	31.05	14.4
30	UAN	PP	90	42.4	62.2	31.28	15.3
60	UAN	PP	92	44.7	62.3	30.69	15.2
90	UAN	PP	94	46.1	62.2	30.49	15.7
120	UAN	PP	94	45.9	61.8	30.86	16.1
30	25% NNF + 75% UAN	PP	90	44.0	61.8	31.13	15.1
60	25% NNF + 75% UAN	PP	90	42.3	62.2	29.96	14.8
90	25% NNF + 75% UAN	PP	93	43.1	62.0	31.10	15.1
120	25% NNF + 75% UAN	PP	92	46.6	61.8	29.77	16.0
60/30	UAN/Nitramin	PP/POST	87	40.3	61.5	29.32	16.0
60/30	UAN/UAN	PP/POST	92	35.0	61.2	28.52	15.6
mean			91	42.5	61.9	30.38	15.4
C.V. (%)			3.7	7.9	0.6	2.4	4.2
LSD (0.05)			5	4.8	0.6	1.06	0.9