Atlantic Grains Council (AGC) and Perennia

2017 Nitrogen Fertilizer Timing on Winter Wheat

Summary: This is the second year's results for a trial that was designed to help Maritime winter wheat growers answer the following questions; 1) Do you split spring nitrogen on feed wheat? 2) How early should you apply N to winter wheat? 3) What's the total amount of nitrogen fertilizer that pays?

In 2017, field trials assessed grain yield response on an individual treatment area of between 0.5-0.8 acres, with two replicates per field. All six trial fields had ammonium nitrate applied by the same custom operator, using a Kuhn broadcast spreader with the Quantron E2 technology (on-board scales and electronic rate adjustment). The four treatments assessed were;

- 90 kg N/ha all applied in one application on April 19th;
- split treatment with 30 kg N/ha on March 25th and 60 kg N/ha applied on April 19th
- higher split treatment of 30 kg N/ha on March 25th and 90 kg N/ha applied on April 19th
- 120 kg N/ha applied in one application on April 19th

When looking at the 2017 data from all 6 sites together, there is an indication that the March 25th application was not needed, nor financially beneficial in increasing yield. A similar trend occurred in the 2016 yield results for the 90 kg N/ha rate. The single nitrogen application in mid-April is what our growers should be aiming for, where Nova Scotia wheat tends to break dormancy between April10-20th most years. When applying this nitrogen in mid-April there should still be some hard morning frosts to allow proper field travel without leaving any marks. This research did not show that 120 kg/ha of total nitrogen applied all on April 19th was any more profitable or costly than the single application of 90 kg/ha of nitrogen applied at the same time. Both yields (5.1-5.4 t/ha or 2.0-2.2 tonnes/acre) and grain test weight (76.0-76.8 kg/HL or 61.0-61.5 lbs/bushel) were very good for this 2017 trial. Thanks to the Atlantic Grains Council grower levy research fund, and to federal or Nova Scotia funding through Growing Forward 2. Thanks also to participating growers (James Kinsman, Allen Bent, Jim-Klay-Bailey Ansems), to Kevin Baker for fertilizer application at all sites, and statistical analysis completed by Melanie Leclerc. Report was done by Jack van Roestel of Perennia and posted at www.perennia.ca

2017 Combined Data for all Ammonium Nitrate Fertilizer Timing Trials on Winter Wheat

Nitrogen Timing or Rate Treatments	Number of Data Points	Grain Test Weight (kg/HL)	Grain Crude Protein (%)	Yield @ 14.5% Moisture (kg/ha)	Return on Nitrogen Fertilizer Cost ($/ha)
0 kg/ha N on March 25 + 90 kg/ha N on April 19	13	76.0 a	9.9 b	5277 ab	900 a
30 kg/ha N March 25 + 60 kg/ha N on April 19	13*	76.1 a	10.5 ab	5108 b	847 a
30 kg/ha N March 25 + 90 kg/ha N on April 19	13	76.3 a	10.9 a	5332 ab	846 a
0 kg/ha N on March 25 + 120 kg/ha N April 19	13*	76.8 a	10.8 a	5477 a	895 a

*12 data points for yield. Means followed by the same letter are not significantly different at $\alpha = 0.05$. For return on nitrogen costs we subtracted $1.50/kg N plus $20/ha for custom spreading from the yield $value ($200/tonne wheat)

2017 Individual Field Wheat Yields for all Ammonium Nitrate Fertilizer Trials (6 NS sites)

Nitrogen Timing or Rate Treatments	Yield @ Lewis field (kg/ha)	Yield @ Speelman field (kg/ha)	Yield @ ChuteRd. field (kg/ha)	Yield @ Reimer field (kg/ha)	Yield @ Bent 706 field (kg/ha)	Yield @ Bent 707 field (kg/ha)
0 kg/ha N on March 25 + 90 kg/ha N on April 19	6055 a	5000 a	5676 a	4638 a	5215 a	4483 a
30 kg/ha N March 25 + 60 kg/ha N on April 19	5816 a	5052 a	5813 a	4587 a	4815 a	4230 a
30 kg/ha N March 25 + 90 kg/ha N on April 19	6150 a	5156 a	5876 a	4535 a	5300 a	4437 a
0 kg/ha N on March 25 + 120 kg/ha N April 19	6256 a	5397 a	5852 a	4897 a	5565 a	4552 a

Each field site had individual plot area of 0.4-0.8 acres and had two replicates of each treatment at all farms.
Means followed by the same letter are not significantly different at $\alpha = 0.05$.

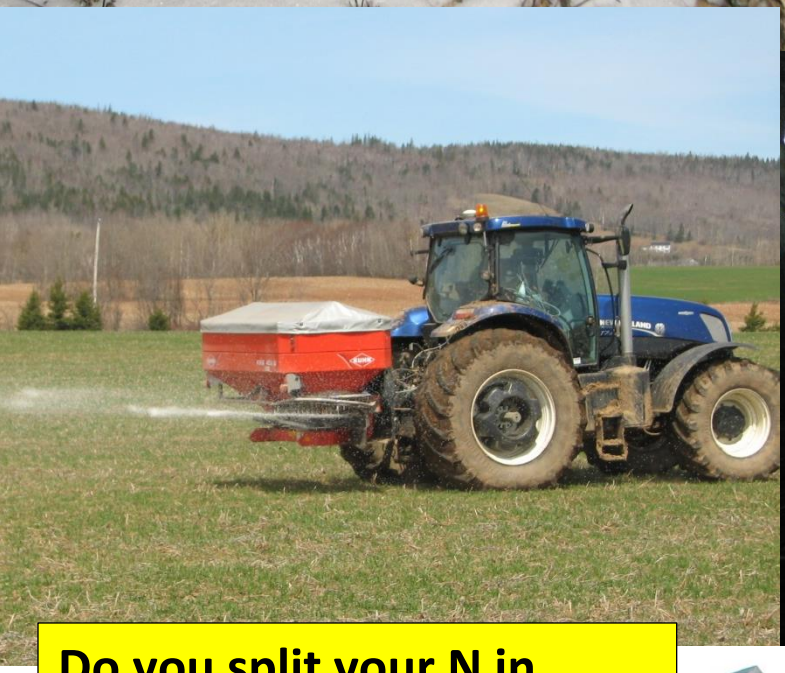
2016 Combined Data for Ammonium Nitrate Fertilizer Trials on Winter Wheat (3 NS sites)

Treatment	% Moisture	Grain Test Weight (kg/HL)	Grain Crude Protein (%)	Yield @ 14.5% Moisture (kg/ha)
0 kg/ha N on March 24 + 90 kg/ha N on April 19	13.3 a	79.5 a	9.9 a	5699 a*
30 kg/ha N March 24 + 60 kg/ha N on April 19	13.5 a	78.5 a	9.3 b	5503 a
30 kg/ha N March 24 + 90 kg/ha N on April 19	13.5 a	79.3 a	10.0 a	5904 a

*Means followed by the same letter are not significantly different at $\alpha = 0.05$.

Additional Crop Management Information

2017 Grower Cooperators	2016 Crop	Wheat Variety	Planting Date
James & Amanda Kinsman (Lewis field, Berwick, Kings Co.)	Soybeans	Pioneer 25R40	October 12, 2016
James & Amanda Kinsman (Speelman field, Somerset, Kings)	Soybeans	Pioneer 25R40	October 8, 2016
James & Amanda Kinsman (Chute Rd field, Weston, Kings Co.)	Silage Corn	Pioneer 25R40	October 5, 2016 no-till seeded wheat
Jim, Klay & Bailey Ansems (Reimer field, Woodville, Kings)	Soybeans	Pioneer 25R40	October 18, 2016
Allen & Jacqueline Bent (707 field, Clarence, Annapolis Co.)	Silage Corn	Pioneer 25R40	October 1, 2016
Allen & Jacqueline Bent (706 field, Clarence, Annapolis Co.)	Silage Corn	Pioneer 25R40	October 1, 2016



Do you split your N in spring on wheat? NO

How early should you apply N? mid-April

Was a single application of 90 kg N or 120 kg/ha N better? NO clear winner