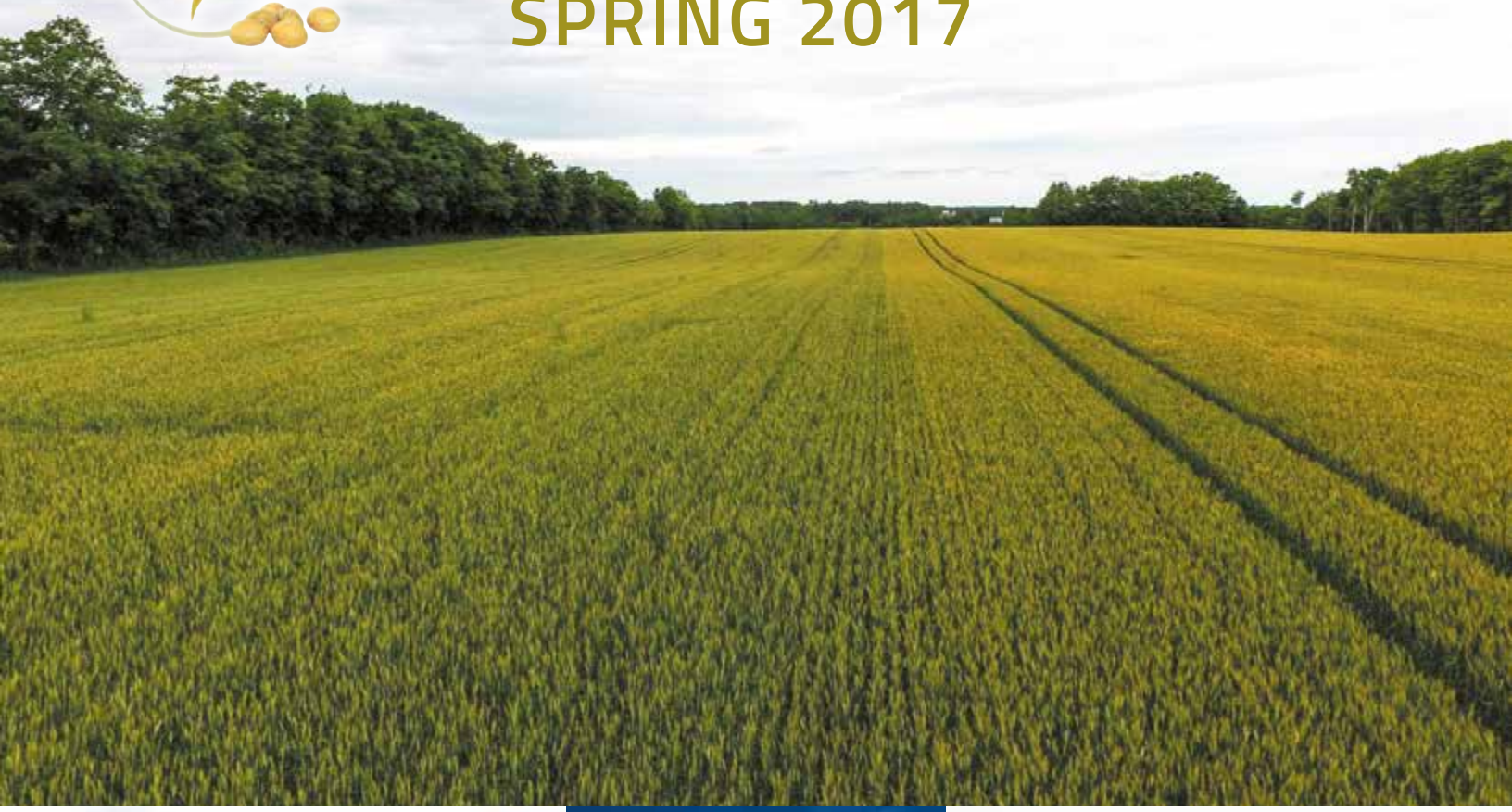
Atlantic Grains Council

NEWSLETTER

SPRING 2017



Agriculture and Agri-Food Canada | Agriculture et Agroalimentaire Canada | New Brunswick | Nouveau Brunswick | NOVA SCOTIA | Prince Edward Island CANADA | Growing Forward 2 | Cultivons l'avenir 2 | Canada

Contact info:

ATLANTIC GRAINS COUNCIL

381 Killam Drive, Moncton, NB E1C 3T1

Telephone: 506.380.9663 ▪ Email: agc@bellaliant.com

Visit our website www.atlanticgrainscouncil.ca for Research Updates.
Email agc@bellaliant.com with your research goals for your farm and other feedback.

Multi-Year Small Plot Trials: Soybean Disease Control and Yield Enhancement

Background

The Atlantic Grains Council (AGC) has been jointly funding the Agri Science Project Initiative of Growing Forward 2, "Focused Research for Atlantic Grains and Oilseeds Producers", with Agriculture and Agri-Food Canada (AAFC) and Atlantic provinces. In 2016, the third year of four years of small plot field studies was conducted to evaluate the agronomic effects of foliar and seed fungicide treatments on soybean at the Charlottetown Research and Development Centre, AAFC in PEI (Fig.1). Dr. Adam Foster, a research scientist and plant pathologist from AAFC, currently coordinates this work at the Harrington Research Farm.

Trials

Three trials were conducted from 2014-2016 that examined the effect on yield, disease and agronomic factors of:

1. Foliar fungicide effect on yield
2. Fungicide seed treatment effect on yield
3. Cultivar specific response to yield after fungicide seed treatments

Foliar fungicide effect on yield

A range of foliar fungicides that are commercially available in Atlantic Canada were tested in this trial on a pair of popular commercially available cultivars. At the Harrington Research Farm experimental site disease pressure was low for all 3 years of the study and no statistically significant treatment effects were observed (Fig.2).

Fungicide seed treatment effect on yield

Different commercially available fungicide seed treatments were tested. Despite having little visual disease symptoms, the roots, stem leaves and pods on soybean plants of some seed treatments caused a statistically significant difference in yield when

Fig 1. Small plot soybean trial at the Harrington Research Farm 2016.

compared with plants grown from untreated seed (Fig. 3). Seed treated with either Cruiser Maxx Beans (1.95ml/kg seed) or a combination of Dynasty 100FS (0.2ml/kg seed) and Cruiser Maxx Beans resulted in the highest yields, where the combination treatment resulted in a 20% increase in yield.

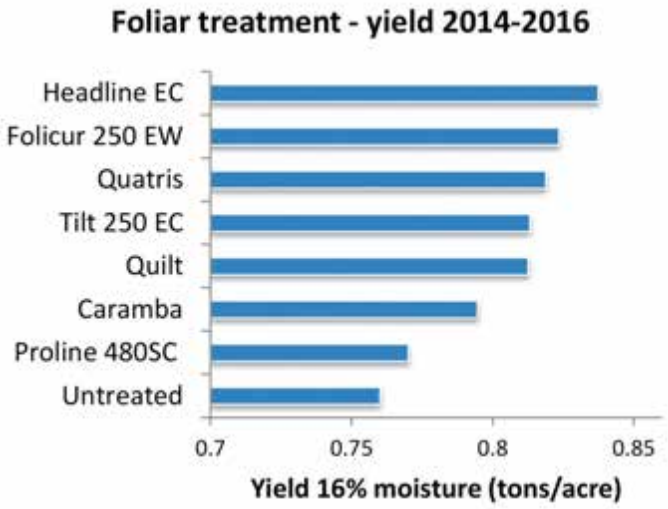


Fig 2. Effect of foliar fungicide on soybean yield in small plot trials. Bars show the mean yield response combined for 2 cultivars for all years 2014-2016. No significant differences in yield were observed between treatments. Treatments: Quatris (azoxystrobin 250 g/L) 500 ml product/ha; Quilt (azoxystrobin 75 g/l, propiconazole 125 g/L) 1000 ml product/ha; Tilt 250 EC (propiconazole 250 g/L) 500 ml product/ha; Folicur 250 EW; Caramba (metconazole 90 g/L) 700 ml product/ha; Headline EC (pyraclostrobin 250 g/L) 600 ml product/ha; Proline 480SC (prothioconazole 480 g/L) 210 ml product /ha.

Cultivar specific response to yield after fungicide seed treatments

This trial was conducted to determine if different soybean cultivars would react differently to a range of seed treatments. However, no cultivar had a different response to seed treatment in any of the 3 years of this trial. Of the 4 cultivars tested, Atwood, Bicentennial, DH401, and DH863, the highest yielding was Bicentennial regardless of seed treatment. Bicentennial was also the cultivar with the longest days to maturity of those tested.

Conclusions

The results presented here indicate the expected yield response of soybean to fungicide treatment when environmental conditions generate low disease pressure. In a year where disease pressure is high, plants treated with foliar and fungicide seed treatments could potentially produce a larger difference in yield when compared with untreated plants.

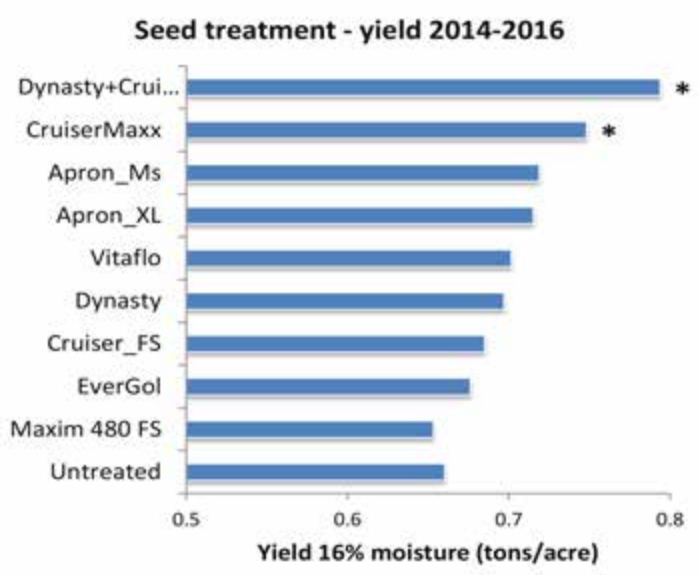


*Fig 3. Effect of fungicide seed treatment on soybean yield in small plot trials. Bars show the mean yield response for all years 2014-2016. Bars lighted with * indicate a statistically significant difference in yield compared with untreated. Treatments: Vitaflo 280 (carbathin 15.59%, thiram 13.25%) 3.30 ml product/kg seed; Apron XL LS (Metalaxyl-M and S-isomer 33%) 0.40 ml + 2.9 ml H2O/kg seed; Apron MaxxRFC (Fludioxonil 2.31% and Metalaxyl-M and S-isomer 3.46%) 1 ml plus 2.3ml H2O/kg seed; Maxim 480FS (fludioxonil 40%) 0.1 ml / kg seed + 3.3 ml H2O; Cruiser 5FS (insecticide – thiamethoxam 29.9%) 0.83 ml/kg plus 2.5 ml H2O; Cruiser Maxx Beans (thiamethoxam 22.6%, metalaxyl-M and S-isomer 1.70% and fludioxonil 1.12%) 1.95 ml/kg seed; Dynasty 100FS (azoxystrobin 100 g/l) 0.2 ml/kg + 3.0 ml H2O; Dynasty 100FS plus Cruiser Maxx Beans at recommend rates above; EverGol Energy (penflufen 38.4 g/L, prothioconazole 76.8 g/L, metalaxyl 61.4 g/L) 0.65 ml/kg seed.*

2016 On-Farm Agronomy Research - Update

Atlantic Grains Council (AGC) successfully continued the On-Farm Agronomy Research Program in 2016, based on the priorities established through working with Maritime grain and oilseed producers and specialists. Trials included research on:

- soybean seeding rates;
- nitrogen application for barley production;
- nitrogen application for corn production;
- fungicide application for spring wheat production;
- fungicide application for soybean production;
- nitrogen and fungicide application for oat production;
- fungicide application for corn production; and
- early and late plantings of winter wheat.

In total, there were 75 sites throughout Prince Edward Island, New Brunswick and Nova Scotia. These on-farm research projects were carried out on a farm scale with a minimum of 1 acre for each treatment. This resulted in farmers splitting fields to compare treatments side by side. The AGC would like to sincerely thank producers for their time put into these research activities in 2016.

Over the winter the AGC presented results from the on-farm research to producers across the Maritime region. These presentations included five AGC producer days, provincial producer annual conferences, the AGG Symposium held in Truro and Berwick, and industry producer days. The AGC also attended the 2017 annual Farm Machinery Show in Moncton to discuss the research project findings. At AGC's producer days, input was requested from producers to identify any new and evolving priorities for the potential to be implemented in the final year of the Growing Forward 2 work or the Next Policy Framework.

The AGC successfully applied for an amendment to the Growing Forward 2 program to increase government funding for the final year (2017/18) of the project. This will allow an increase in the number of producers participating in AGC research, including expansion of the research into Newfoundland.

The information that follows will show trends over the past two field seasons for the Maritime provinces. Weather conditions were quite variable from 2015 to 2016 and differences were noted between provinces.

The AGC is excited to announce the launch of a new online research tool that provides producers with individual trial results as well as average results for each experiment. This tool can be searched by province, by year and by crop. The online research tool can be found at AGC's website: **www.AtlanticGrainsCouncil.ca**

AGC On-Farm Agronomy: Nitrogen Application to Barley 2015 and 2016

The Maritime barley crop is produced for feed or malting purposes. Nitrogen was added to the barley crop to determine the responses on yield and protein. All the samples met malting grade for the past two years at all of the nitrogen application rates.

The field rates of actual Nitrogen added to the barley treatments ranged from 30 kg/ha to 80 kg/ha. The barley research for the two years included 11 sites on PEI; 2 sites in NS; and 4 sites in NB. Spring and fall soil samples were taken for each of the sites and can be viewed through AGC's online research tool. Combined yields were taken from 1/8 or more acres per treatment. Samples from each treatment were submitted to PEI Analytical Lab for moisture, protein and bushel weight analysis. The following results shows yields, bushel weight, and protein at a moisture level of 15% for each province for 2015 and 2016:

Table 1. Response of all PEI barley sites to varying rates of nitrogen (15% moisture)

	2015				2016			
Treatment	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
30 kg/ha	2	1.32	8.47	49.97	3	1.40	8.94	49.88
40 kg/ha	2	1.44	8.44	53.64	2	1.82	9.10	49.03
50 kg/ha	5	1.56	8.91	51.68	6	1.68	9.21	50.31
70 kg/ha	5	1.75	9.11	52.06	6	1.81	9.86	42.34
80 kg/ha	2	1.50	9.36	53.19	3	2.02	10.80	50.61

For PEI the barley yields increased with added nitrogen rates. Protein and bushel weight tended to increase with added nitrogen rates.

Table 2. Response of NB (Kings) barley sites to varying rates of nitrogen (15% moisture)

	2015				2016			
Treatment	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
30 kg/ha	2	1.88	8.62	52.41	1	1.28	9.72	54.38
50 kg/ha	2	1.89	8.69	53.44	1	1.21	9.89	52.73
70 kg/ha	2	1.93	9.02	53.17	1	1.17	10.91	54.24

For southern NB (Kings) the increase in nitrogen rates resulted in an increase in yield, protein and bushel weight for 2015.

Table 3. Response of NB (Kent) barley site to varying rates of nitrogen (15% moisture)

	2016			
Treatment	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
30 kg/ha	1	1.14	8.04	47.59
50 kg/ha	1	1.20	8.49	48.64
70 kg/ha	1	1.36	8.99	50.60

For NB (Kent) the increased nitrogen showed an increase in yield, protein and bushel weight for 2016.

Table 4. Response of NS barley sites to varying rates of nitrogen (15% moisture)

	2016			
Treatment	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
40 kg/ha	2	1.61	9.76	44.72
50 kg/ha	2	1.85	9.66	46.30
70 kg/ha	2	1.98	9.84	46.19

For the two sites in NS the increase in nitrogen rates showed an increase in yield, protein and test weight.

AGC On-Farm Agronomy: Nitrogen Application for Corn Production

The Maritime corn crop is produced for high moisture feed and grain purposes. Nitrogen was added to the corn crop to determine the responses to yield and protein. The field rates of actual Nitrogen added to the corn treatments ranged from 85 kg/ha to 155 kg/ha. Additional rates were added by individual farmers and can be viewed on the on-line research tool. The corn research for the two years included 9 sites on PEI and 4 sites in NB. Spring and fall soil samples were taken for each of the treatments and are available through the on-line research tool. Combined yields were taken from 1/8 or more acres per treatment, with samples submitted to PEI Analytical Lab for moisture, protein and bushel weight analysis.

The following results shows yield, bushel weight, and protein at a moisture level of 15% for each province for 2015 and 2016. All results from 2015 and 2016 show that corn yields tended to increase with added nitrogen rates. Further, protein and bushel weight tended to increase with added nitrogen.

Table 5. PEI Average Results (15% moisture)

	2015				2016			
Treatment	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
85 kg/ha	5	3.08	7.62	44.71	4	2.98	6.74	44.89
120 kg/ha	5	3.12	7.49	45.22	4	3.18	7.64	44.86
135 kg/ha	5	3.30	7.53	44.51	4	3.37	7.45	43.92
155kg/ha	5	3.12	7.89	45.62	4	3.39	7.19	43.82

Table 6. NB (Carleton) Average Results (15% moisture)

	2015				2016			
Treatment	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
85 kg/ha	3	3.32	6.54	44.82	4	3.35	7.17	48.77
120 kg/ha	3	3.42	6.68	42.40	4	3.70	7.23	49.69
135 kg/ha	3	3.29	6.87	43.80	4	3.79	7.97	49.92
155kg/ha	3	3.56	7.12	45.33	4	3.80	8.32	49.35
180 kg/ha					3	3.98	8.02	49.35

Table 7. NB (Kings) Average Results (15% moisture)

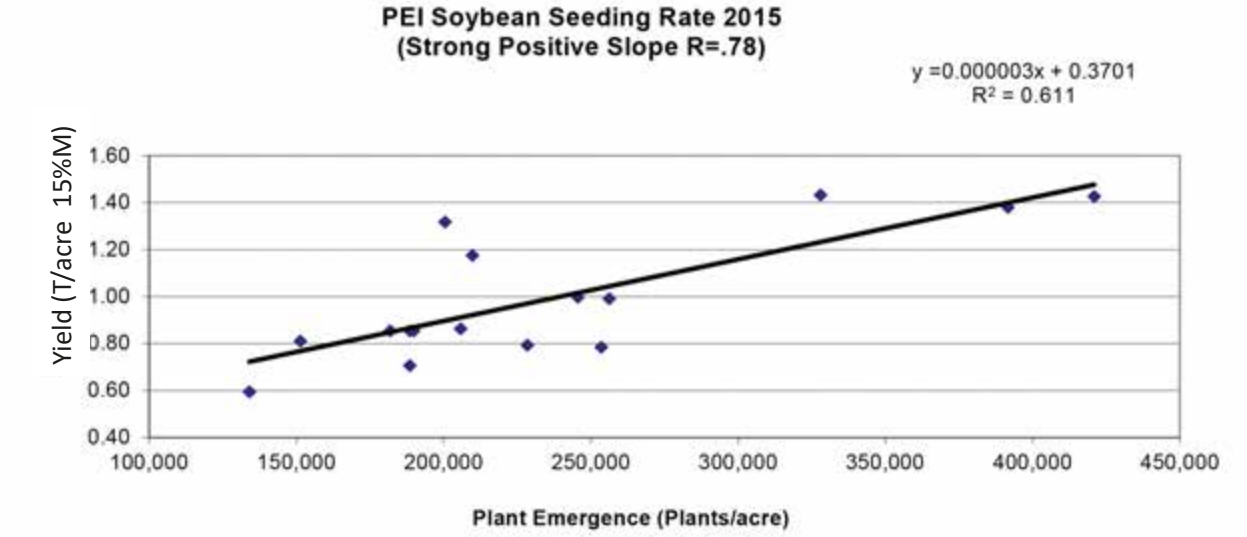
	2015				2016			
Treatment	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
85 kg/ha	2	3.68	6.82	45.57	2	2.61	5.94	47.90
120 kg/ha	2	4.67	8.45	45.51	2	2.68	6.52	47.77
135 kg/ha	2	5.29	7.15	45.24	2	2.83	7.00	48.02
155kg/ha	2	5.03	7.99	45.70	2	2.84	7.11	48.01

AGC On-Farm Agronomy: Soybean Crop Yield Response to Seeding Rates

Soybeans were planted at different seeding rates to determine the response to yields across the Maritime region. The rates that were examined were 130,000, 160,000, and 190,000 plants per acre. Farmers added additional seeding rates to the protocol.

Plant emergence per acre was determined to confirm planting rates. Combined yields were collected and weighed off from 1/8 acre or more for each treatment. Samples from each yield treatment were taken and analyzed by PEI Analytical Lab for moisture, protein and bushel weight. Each treatment was soil sampled spring and fall. The individual results of the soil samples are available on the AGC's online research tool. Over 2015 and 2016, there were a total of 11 sites on PEI, 5 sites in NB and 6 sites in NS.

The plant emergence was compared against yield for PEI sites. The results show a trend towards increased yields as the seeding rate increased. The graphs below show the yield at 15% moisture with plant emergence per acre for 2015 and 2016:



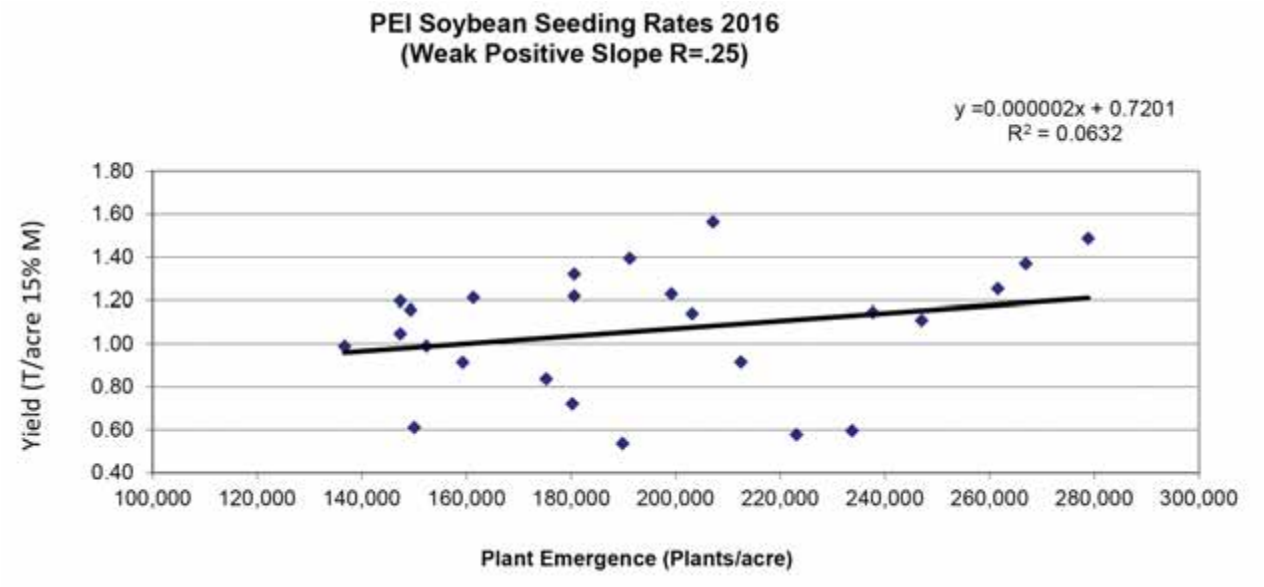


Table 8. Average changes in yield (15% moisture) with increased plant emergence per acre

	2015 Yields T/acre (15% M)			2016 Yields T/acre (15% M)		
Plants/Acre	NB Carleton	NB Kings	NS	NB Carleton	NB Kings	NS
130,000	0.98	0.89		0.94		0.98
160,000	0.99	0.87		0.98		1.04
190,000	1.03	0.88		0.95		1.40

AGC On-Farm Agronomy: Wheat Disease Control & Yield Evaluation

Fungicides were applied to spring wheat to determine the effect on controlling disease for increased yields. Two fungicides (Caramba and Prosaro) were compared against a non-treated control. The fungicide was applied at label rates when the wheat was in the flowering stage. Soil samples were taken from each treatment spring and fall, with detailed results available with AGC's on-line research tool.

The following results show yield, bushel weight, and protein at a moisture level of 15% for each province for 2015 and 2016. These years were relatively low for disease pressure, and there were very little differences between the treatments.

Table 9. PEI Average Results (15% moisture)

	2015				2016			
Treatment	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
Caramba	4	1.44	11.4	55.1	6	1.41	11.1	60.23
Prosaro	4	1.44	12.4	53.31	5	1.38	10.9	60.56
Check	5	1.42	12.2	54.1	6	1.41	11.4	61.29

Table 10. NB (Kent) Average Results (15% moisture)

	2016			
Treatment	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
Caramba	2	0.68	14.30	56.41
Prosaro	2	0.71	14.36	51.32
Check	2	0.70	13.94	55.63

On-Farm Agronomy Research – Plans for 2017

The 2017 field season will be the third year for the On-Farm Agronomy Trials. Much of the information reported on to date represents one or two years of results, and producers need to judge the results and assess the fit for their farm on that basis. It is always best to have at least three years of data to increase the confidence in the results. Atlantic Grains Council is just reaching that stage. For that reason, our plans are to run one more year of the main trials that have been in place for the 2015 and 2016 field seasons. These are:

- soybean seeding rates;
- nitrogen application for barley production;
- nitrogen application for corn production;
- fungicide application for spring wheat production;
- fungicide application for soybean production;
- nitrogen and fungicide application for oat production;
- fungicide application for corn production;
- early and late plantings of winter wheat; and
- herbicide trials for no-till wheat production.

It is expected that there will be close to 80 sites for these trials in the 2017 field season. As in the past, sites will be across the Maritimes, and for the first time, AGC will be coordinating research trials in Newfoundland. Welcome aboard.

A Soybean first for Atlantic Canada – New Market Opportunities

"We pulled it off," the pride and relief shows on Neil Campbell's face. He pulled it off with the partnership of Richardson International and a lot of help from workers and the dock facility in Summerside, PEI, Grain Elevator staff and Maritime soybean growers. As General Manager of the PEI Grain Elevator, all of the weight was on his shoulders.

What did we pull off? The bulk shipment by water of over 22,000 metric tonnes of soybeans grown in Atlantic Canada. Traditionally these beans would be trucked to Halifax to be stored and then exported in shipping containers carrying approximately 20 tonnes each. This represents over 360 truck loads, and 216,000 km of driving.

Mr. Neil Campbell – General Manager of the PEI Grain Elevator Corporation. Backdrop is some of the specialized equipment set up at the Summerside Wharf. (Courtesy of Nancy Russell/CBC)

It turned out that the weather was the biggest challenge. Each of the two ships coming into the port of Summerside had tight time limits for loading. A large warehouse at the port was filled ahead of time to build up inventory. Once the ships arrived, this product was then conveyed onto the ship, while at the same time trucks arriving from fields and other facilities were also being loaded directly on the ship. Enter an unusually long period of wind and rain right at loading time – and more grey hairs all around. Many thanks to Richardson International for being able to adjust their schedule to help make it all work. Both ships travelled from Summerside, PEI to Quebec, where the soybeans were transferred to ocean going ships destined for China.

These shipments represent close to 50% of the 2016 soybean crop on Prince Edward Island and close to 30% of all the soybeans grown in Atlantic Canada.

"Being able to ship in large bulk quantities brings us closer to the global customers for soy – this will be important to our industry in the future and will benefit soybean producers in the long term," reflected Alvin Keenan – Chairman of the PEI Grain Elevator Corporation. Everyone is hopeful that more of this will be in order for the future.

Looking back on our agriculture history in Atlantic Canada, the saying that "we are not big enough to be **bold**, and not **bold** enough to be big" has too often reflected our reality. These shipments, and the accomplishment of everyone who worked on this project proves that this may be a saying of the past. This milestone in our new history strongly shows that Atlantic Canada's grain and oilseed sector is coming of age.

S'side Wharf Warehouse being filled to prepare for the ship (Courtesy Nancy Russell / CBC), and loading the ship

Soybean Response to Nitrogen and Sulphur: 2016 Summary of Dalhousie Trials

Objective

The objective of this trial was to evaluate the response of soybeans to Nitrogen and Sulphur. Questions on the necessity of starter Nitrogen have been asked by many growers. In general, many growers apply some Nitrogen (25-40 kg/ha) as a preplant application with part of a blend to add recommended P & K. There is some feeling that soybeans may be lacking early N until nodulation occurs. A concern with the application of nitrogen is the effect on nodulation. When nitrogen is readily available soybeans can be less likely to form a symbiotic relationship with the Rhizobium bacteria in the soil which colonizes the roots and fixes nitrogen from the atmosphere and makes it available to the plant. The other nutrient being tested in this trial is Sulphur which is becoming a concern in all crops as soil Sulphur levels become depleted in the region. The interaction of nitrogen uptake and utilization in the plant in relation to Sulphur availability is very important.

Design and Methods

The soybean response to Nitrogen (N) and Sulphur (S) trial was carried out in 2014, 2015 and 2016 under the Atlantic Grains Council Agri-Innovation Project - Focused Research for Atlantic Grain and Oilseed Producers, Activity 6 – Soybean Field Trials. The Cereal and Oilseed research group of the Faculty of Agriculture of Dalhousie University Agricultural Campus in Truro, NS was responsible for the design, setup, seed packaging, data analysis and report preparation. Trials were carried out in all three provinces with the assistance of Agriculture and Agri-Food Canada at the Harrington, PEI site and NBDAA for the Hartland, NB site. Information for each site including base soil analysis results, plot size, seeding date, management and harvest date is presented in Table 1. Further information is available at www.atlanticgrainscouncil.ca.

Table 1. 2016 Site Information Soybean Trials

	Truro, NS	Canning, NS	Harrington, PEI	Hartland, NB
Previous Crop	Grass Forage	Winter wheat	Barley	Corn
pH	6.5	6.5	6.2	6.4
Organic Matter (%)	2.8	2.6	2.3	5
P_2O_5 (kg/ha)	1924	1691	626	823
K_2O (kg/ha)	384	289	292	325
S (kg/ha)	22	18		
Seeding Date	June 1st	May 27th	June 3rd	June 2nd
Seeding Rate	55 seeds/m^2	55 seeds/m^2	55 seeds/m^2	55 seeds/m^2
Cultivar	NSC Jaden RR2Y	NSC Jaden RR2Y	NSC Jaden RR2Y	NSC Jaden RR2Y
Harvest Date	Nov.14th	Oct. 20th	Nov. 14th	Oct.4th

Specifically, this trial is comparing the effects of four N levels of 0 to 60 kg/ha N applied as ammonium nitrate and four Sulphur levels of 0 to 30 kg/ha applied as K-Mag (Table 2).

Table 2. Soybean N & S Response Treatments

Factor A – N Level (kg/ha) Applied as AN (34-0-0)		Factor B – Sulphur Levels (kg/ha) Applied as K-Mag(0-0-22-22)	
1	0	1	0
2	20	2	10
3	40	3	20
4	60	4	30

The trial was carried out on a small plot basis as a factorial randomized complete block design. Treatments were applied post planting by hand broadcasting the appropriate rate of fertilizer over the small plots. The 2550 HU variety, NSC Jaden RR2Y, was the variety used in this test. The test was planted at sites in Truro, NS; Canning, NS; Harrington, PEI and Hartland, NB. Data collected at all sites included plant heights, pod heights, yield, hundred seed weight, protein and oil content. Additional data including stand counts, nodule counts, root assessment and nodule assessment was collected at the NS and PEI sites. Root and nodule assessment was completed at the NB site. The 2016 season was the third year of this trial. This summary reports on trial details and summarizes the 2016 data.

Results/Conclusions

In 2016, there was a significant yield response to Nitrogen levels at the PEI and NB sites (Figure 1). There was a significant response to Sulphur at the PEI and Canning NS sites (Figure 2). No significant interaction between Nitrogen and Sulphur was found at any site. At the NB site the yield was significantly higher by at least 350 kg/ha with the application of 20, 40 or 60 kg/ha N, which did not significantly differ, than the 0 N treatment. At the PEI site yields were significantly higher at the 60 kg/ha N rates than with 0 or 20 kg/ha N but not significantly greater than the 40 kg/ha N treatment. The difference between the 0 N treatment and 60 N treatment was 337 kg/ha. At both the PEI and Canning, NS sites yields with the application of 10, 20 or 30 kg/ha S did not significantly differ from one another but were significantly higher than the treatment receiving no Sulphur (0S). The difference was at least 763 kg/ha at the PEI site but only 265 kg/ha at the Canning, NS site. At the PEI, Canning, NS and Truro NS sites where nodule counts were completed on a sample of plants the number of nodules per plant was significantly affected by rate of N application (Figure 3). At the PEI site nodule numbers decreased significantly from the 0 and 20 kg/ha N treatments to the 40 and 60 kg/ha N treatments. At the Canning, NS site the nodule number was significantly less at the 40 and 60 kg/ha N rate than the 0 N treatment but did not significantly differ from the 20 kg/ha N rate. The nodule number decreased significantly from the 0 to 20 and 40 kg/ha N and decreased significantly again at the 60 kg/ha N rate at the Truro, NS site. Sulphur applications resulted in a significant increase in nodule numbers at the PEI and Truro, NS sites. Nodule numbers at 20 or 30 kg/ha S rates were significantly higher than the 0 S treatments at the PEI site and nodule number and nodule size was significantly greater with 10, 20

or 30 kg/ha S than the 0 S treatment at the Truro, NS site. Root mass assessment was significantly affected by S rates at the PEI site. Treatments receiving 20 or 30 kg/ha had a significantly higher visual root mass assessment than the 0 S treatment.

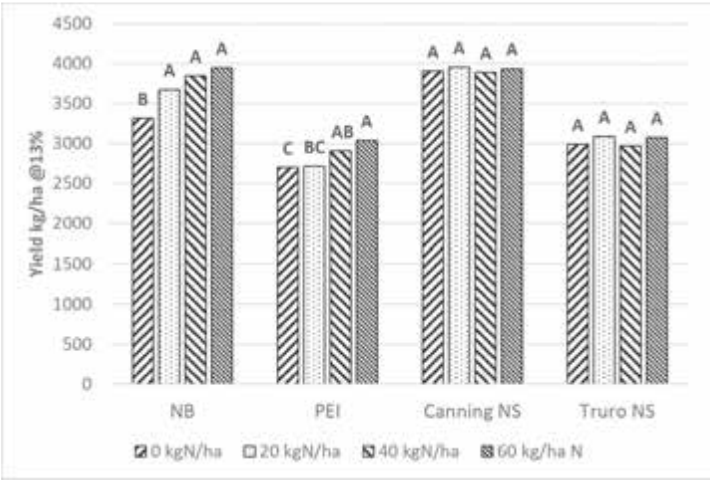


Fig 1. 2016 Soybean Yields at each N level for each Site.

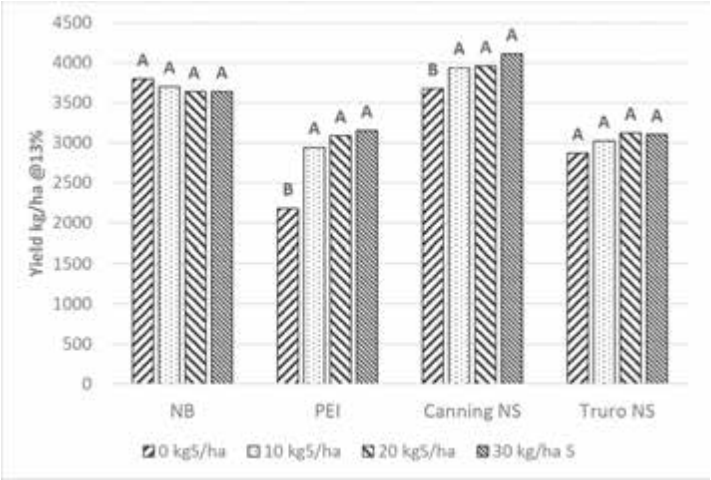


Fig 2. 2016 Soybean Yields at each S level for each site.

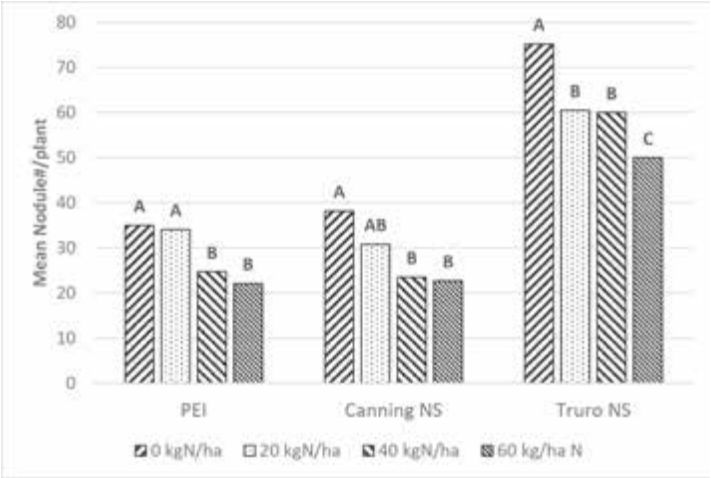


Fig 3. Soybean nodule #'s at each N level for PEI, Canning, NS and Truro, NS sites

Atlantic Grains Council Prepares for the 'Next Policy Framework 2018 - 2023'

Agriculture and AgriFood Canada and the Provinces are developing the framework for the next major round of agriculture research funding for Canada. In the most recent round – Growing Forward 2 (GF2), there were two major streams of funding:

1. Clusters - allows like-minded organizations and research institutions to collaborate on a national basis. AGC is actively involved in several of these clusters relating to grains and oilseeds.

2. Agri-Innovation Program, or AIP. This is where AGC partnered for funding to support the work outlined in this Newsletter, including On-Farm Agronomy, Soybean and Corn Trials led by Dalhousie Agriculture Campus, and Crop Protection and Yield Enhancement Trials and Agri-Climatic Factors led by AAFC Scientists in the Maritimes. In addition to AAFC, the four Atlantic Provinces are also strong partners, providing funding and support for these regional research efforts in grains and oilseeds.

AGC has completed a process of updating producer priorities in the region, holding workshops in various locations as well as receiving input from local scientific experts. This work will provide strong direction for AGC to prepare for the 2018 – 2023 funding framework.

2016 Field Strip Trial Research for Nova Scotia Corn Plant Population & Nitrogen Fertilizer Rate Trial

Summary

Field scale trials comparing two corn plant populations (targeting 30,000 versus 34,000 plants/acre) with either 120 lbs/acre or 150 lbs/acre of total nitrogen fertilizer (133 or 167 kg/ha N) were conducted on three farms in western Nova Scotia. The three sites did not have manure in the previous 12 months, nor produced a legume crop in 2015. Data was collected and analyzed for grain corn yield, grain protein, test weight, harvest moisture & tissue nitrogen at 10th leaf stage (July 21st sampling). The same custom applicator & Kuhn broadcast spreader with Quanton E2 technology was used to apply the nitrogen fertilizer treatments at all three sites. Application rates for the nitrogen fertilizer at each site are listed in Table 1. Rainfall did not occur at these sites for 2 weeks after topdress N fertilizer application. Leaf tissue sampling (for % nitrogen) was done on upper leaf of 20 plants per plot at the 10th leaf stage of corn, which was 30 days after the nitrogen topdress treatment was applied. Grain corn harvest took place in November with the entire treatment plot harvested. All sites had 2 reps and harvested area ranged from 0.5 - 1.0 acre treatment plots.

The results from the combined three site data analysis (Table 2) show there was no significant differences in grain yield or any of the other parameters measured between the two different plant populations or two different nitrogen rates. Grain yields, test weights and % moisture at harvest were all very good in terms of Nova Scotia corn performance. You will note the plant population counts (Table 1) are much higher than the targeted 30,000 & 34,000 plants per acre (these averaged 33,275 & 37,933 plants/acre). The planter was set to drop 10% more than the desired final population with the assumption of 90% emergence. Although the plant populations are higher than wanted the conclusion can still be drawn that there was no yield advantage in having more than 32,000-33,000 plants/acre population or in using the higher nitrogen fertilizer amount (i.e. 150 versus 120 lbs/acre nitrogen). The plan is to repeat this trial in 2017 on five trial sites, and be closer to the targeted 30,000 & 34,000 plants per acre.

Many thanks to the Atlantic Grains Council grower levy research fund, and federal and provincial government funding contributions through Growing Forward 2. Thanks also to participating NS corn growers & for the stats analysis by Melanie Leclerc. Report prepared by Jack van Roestel, Perennia.

Table 1: Nitrogen Fertilizer Rates & Plant Populations used in 2016 AGC-NS Corn Trials

Grower	Soil pH	Pre-Plant (kg N/ha)	Planter (kg N/ha)	Topdress* (kg N/ha)	Total N Applied (kg N/ha)	Plant Population Counts/ acre
Baker	6.4	26	27	80 or 114	133 or 167	31,750 & 35,850
Kinsman	6.6	0	46	88 or 121	134 or 167	35,000 & 39,750
Langelaan	6.2	0	42	91 or 124	133 or 166	33,075 & 38,200
Average						**33,275 & 37,933**

*Topdress fertilizer was applied at all sites with the same Kuhn broadcast spreader & operator.

Table 2: 2016 Combined Data for the three AGC-NS Corn Plant Population & Nitrogen Fertilizer Rate Trials (at Baker, Kinsman & Langelaan field sites)

Treatment	Tissue N at 10th-leaf	Grain Protein %	Test Weight kg/HL	Moisture %	Yield at 15% moisture (kg/ha)
33,000 plants /acre & 120 lbs/ac Nitrogen	3.62 a	8.08 a	73.1 a (56.7 lbs/bu)	21.7 a	**9551 a (3.82 mt/ac)**
33,000 plants /acre & 150 lbs/ac Nitrogen	3.46 a	8.50 a	73.1 a (56.7 lbs/bu)	22.4 a	**9649 a (3.86 mt/ac)**
38,000 plants /acre & 120 lbs/ac Nitrogen	3.56 a	8.09 a	73.1 a (56.7 lbs/bu)	22.0 a	**9475 a (3.79 mt/ac)**
38,000 plants /acre & 150 lbs/ac Nitrogen	3.59 a	8.28 a	72.3 a (56.1 lbs/bu)	22.0 a	**9636 a (3.85 mt/ac)**

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

Table 3: 2016 Combined Data for all the AGC-NS Corn Plant Population & Nitrogen Fertilizer Rate Trials (averaged across the treatments)

Site (Trial Location)	Tissue N at 10th-leaf	Grain Protein %	Test Weight kg/HL	Moisture %	Yield at 15% moisture (kg/ha)
Kevin & Sonia Baker	3.68 a	8.22 a	70.6 b (54.8 lbs/bu)	23.5 a	**7621 b (3.05 mt/ac)**
James Kinsman	3.43 b	8.13 a	74.0 a (57.4 lbs/bu)	21.8 a	**10,335 a (4.13 mt/ac)**
Langelaan Farms	3.56 ab	8.37 a	74.2 a (57.5 lbs/bu)	20.8 a	**10,777 a (4.31 mt/ac)**

*Means followed by the same letter are not significantly different at α = 0.05

Site 1: Kevin & Sonia Baker, West Halls Harbour Rd. (harvest Nov.13th, 1.0 acre plots)

Treatment	Tissue N 10th-leaf	Grain Protein %	Test Weight kg/HL	Moisture %	Yield at 15% (kg/ha)
31,750 plants /acre & 120 lbs/ac Nitrogen	3.78 a	8.23 a	70.5 a (54.6 lbs/bu)	22.9 a	**7733 a (3.09 mt/ac)**
31,750 plants /acre & 150 lbs/ac Nitrogen	3.45 a	8.30 a	71.0 a (55.0 lbs/bu)	24.3 a	**7519 a (3.01 mt/ac)**
35,850 plants /acre & 120 lbs/ac Nitrogen	3.67 a	7.90 a	70.0 a (54.2 lbs/bu)	23.9 a	**7570 a (3.03 mt/ac)**
35,850 plants /acre & 150 lbs/ac Nitrogen	3.83 a	8.44 a	70.8 a (54.9 lbs/bu)	22.9 a	**7663 a (3.07 mt/ac)**

*Means followed by the same letter are not significantly different at α = 0.05

Site 2: James Kinsman, Berwick, Kings Co. (harvested Nov. 12th, with 0.6 acre plots)

Treatment	Tissue N 10th-leaf	Grain Protein %	Test Weight kg/HL	Moisture %	Yield at 15% (kg/ha)
35,000 plants /acre & 120 lbs/ac Nitrogen	3.51 a	7.69 b	73.8 a (57.2 lbs/bu)	21.6 a	**10,019 a (4.01 mt/ac)**
35,000 plants /acre & 150 lbs/ac Nitrogen	3.36 a	8.50 a	73.9 a (57.3 lbs/bu)	22.3 a	**10,503 a (4.20 mt/ac)**
39,750 plants /acre & 120 lbs/ac Nitrogen	3.53 a	7.91 b	75.0 a (58.1 lbs/bu)	21.5 a	**10,259 a (4.10 mt/ac)**
39,750 plants /acre & 150 lbs/ac Nitrogen	3.33 a	8.40 a	73.2 a (56.7 lbs/bu)	22.0 a	**10,559 a (4.22 mt/ac)**

*Means followed by the same letter are not significantly different at α = 0.05

Site 3: Langelaan Farms, Aylesford, Kings Co.(harvested Nov. 25th, with 0.5 acre plots)

Treatment	Tissue N 10th-leaf	Grain Protein %	Test Weight kg/HL	Moisture %	Yield at 15% (kg/ha)
33,075 plants /acre & 120 lbs/ac Nitrogen	3.57 a	8.32 a	75.0 a (58.1 lbs/bu)	20.7 a	**10,902 a (4.36 mt/ac)**
33,075 plants /acre & 150 lbs/ac Nitrogen	3.58 a	8.71 a	74.5 a (57.7 lbs/bu)	20.7 a	**10,926 a (4.37 mt/ac)**
38,200 plants /acre & 120 lbs/ac Nitrogen	3.49 a	8.45 a	74.3 a (57.6 lbs/bu)	20.7 a	**10,597 a (4.24 mt/ac)**
38,200 plants /acre & 150 lbs/ac Nitrogen	3.61 a	8.00 a	72.9 a (56.5 lbs/bu)	21.0 a	**10,685 a (4.27 mt/ac)**

*Means followed by the same letter are not significantly different at α = 0.05

2016 Field Strip Trial Research in Nova Scotia Nitrogen Fertilizer Timing on Winter Wheat

Summary

This trial 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? The three treatments assessed were 90 kg N/ha all applied in one application on April 19th; a split treatment with 30 kg N/ha on March 24th plus another 60 kg N/ha applied on April 19th, and a higher N treatment that had 30 kg N/ha on March 24th plus 90 kg N/ha applied on April 19th. These field trials assessed grain yield response on a harvested area of between 0.5-0.8 acres, with three replicates per field. All three trial fields had ammonium nitrate applied by the same custom operator, using a Kuhn broadcast spreader with the Quantron E2 technology (on-board scales).

When looking at the data from all three sites combined there was no significant difference in yield between any of the treatments. The same can be said for the Beck field site where although the yields were extremely good (6.0-6.3 t/ha) there was no yield differences. At the two Kinsman trial sites, there were some yield differences to the fertilizer timing or overall N rate. At the Somerset area field the 90 kg N/ha split treatment yielded significantly less than either the 90 kg N/ha rate applied all at once on April 19th or the 120 kg/ha N split. This implies that the 30 kg N/ha applied on March 24th wasn't effective at this site. At the Weston area trial field of Kinsman's the 120 kg N/ha site significantly out yielded the other two- 90 kg N/ha treatments. This trial will be repeated in 2017 to achieve more conclusive results.

Many thanks to the Atlantic Grains Council grower levy research fund, and federal and Nova Scotia funding through Growing Forward 2. Thanks also to the participating wheat growers and statistical analysis done by Melanie Leclerc. Report was prepared by Jack van Roestel of Perennia.

2016 Combined Data for all Ammonium Nitrate Fertilizer Timing Trials on Winter Wheat

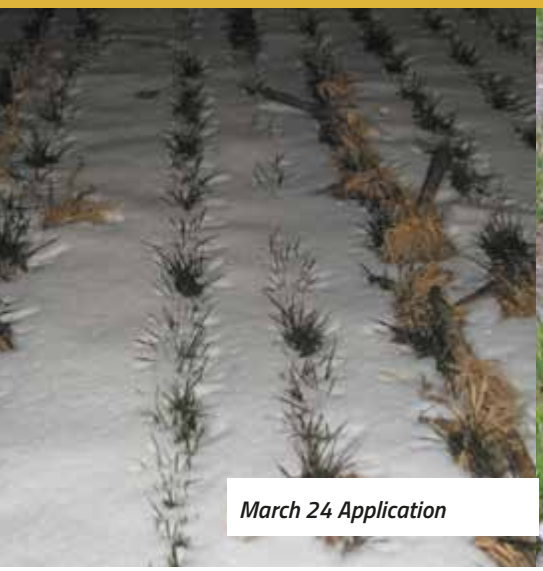
Treatment	% Moisture	Grain Test Weight (kg/HL)	Grain Crude Protein (%)	Yield @ 14.5% Moisture (kg/ha)
0 kg/ha N on March 24 + 90 kg/ha N on April 19	13.3 a	79.5 a	9.9 a	5699 a*
30 kg/ha N March 24 + 60 kg/ha N on April 19	13.5 a	78.5 a	9.3 b	5503 a
30 kg/ha N March 24 + 90 kg/ha N on April 19	13.5 a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

*Means followed by the same letter are not significantly different at α = 0.05.

Field Trial 1: Justin Beck's, Auburn, Kings Co., NS site results (0.55 acre plots & 3 reps)

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	14.5 a	78.6 a	8.99 a	6209 a*
30 kg/ha N March 24 + 60 kg/ha N on April 19	14.8 a	77.0 a	8.16 b	6084 a
30 kg/ha N March 24 + 90 kg/ha N on April 19	14.8 a	78.2 a	9.09 a	6340 a

*Means followed by the same letter are not significantly different at α = 0.05.



March 24 Application

April 19 Application

Field Trial 2: J. Kinsman's, Somerset, Kings Co., NS site results (0.45 acre plots & 3 reps)

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	12.7 a	78.9 a	10.3 a	5648 ab*
30 kg/ha N March 24 + 60 kg/ha N on April 19	12.7 a	79.1 a	9.8 a	5167 b
30 kg/ha N March 24 + 90 kg/ha N on April 19	12.5 a	78.2 a	10.0 a	5796 a

*Means followed by the same letter are not significantly different at α = 0.05.

Field Trial 3: J. Kinsman's, Weston, Kings Co., NS site results (0.98 acre plots & 3 reps)

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	12.7 a	81.0 a	10.3 a	5240 b*
30 kg/ha N March 24 + 60 kg/ha N on April 19	13.2 a	79.3 b	9.9 a	5258 b
30 kg/ha N March 24 + 90 kg/ha N on April 19	13.1 a	81.4 a	10.8 a	5575 a

*Means followed by the same letter are not significantly different at α = 0.05.

Data was analysed using Minitab 17 Statistical Software. ANOVA was performed using General Linear Model. Means Comparison completed with Fisher LSD or Tukey Method @ 90% Confidence.

Additional Crop Management Information

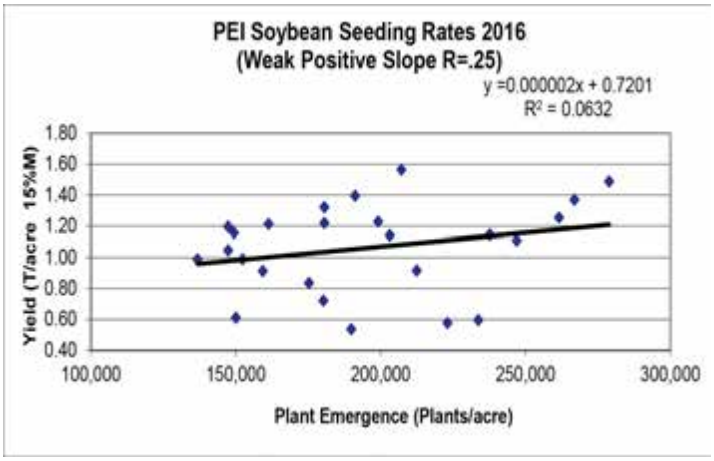
Grower	2015 Crop	Wheat Variety	Planting Date
Beck (Saunders field, Auburn)	Potatoes	Pioneer 25R40*	September 25, 2015*
Kinsman (Best field, Somerset))	Silage Corn	Hyland Branson	September 25, 2015
Kinsman (Chute Rd field, Weston)	Soybeans	Pioneer 25R40	October 9, 2015

*The Beck trial field had 2 kg/ha of tillage radish planted with the winter wheat

Soybeans – do you know how much you are planting?

Taking emergence counts

Soybean planting levels have been a major priority in the On-Farm Agronomy trials. In the trials across the Maritimes, the planting rates targeted were 130,000, 160,000, and 190,000 seeds per acre. In some cases producers identified other seeding rates (as high as 225,000 seeds/acre). A range of planting equipment from corn planters to grain drills were used by producers participating in these trials. Efforts were taken to calibrate all of the equipment used in these trials. Even with this effort and targeting, the following graph for the PEI trials shows the results based on emergence counts taken at each site. Most of the sites on PEI were planted with grain drills which are more difficult to obtain accuracy.



For three targeted seeding rates of 130,000, 160,000, and 190,000 seeds per acre (as well as the other rates used by producers, up to 225,000), the graph shows a range of emergence counts from roughly 130,000 to 280,000 plants per acre in 2016. First, you would hope for better accuracy than what is shown, and secondly you would also expect lower counts factoring in seed germination rates. At initial review, this indicates that what gets seeded is higher than what was intended.

Is this happening on your farm? Are you planting more seed than you need to? One way to find out is to do your own emergence counts and see how accurate you are. To do so, for each field, you:

1. Once you are sure all plants have emerged, using a meter stick, do a running count of the number of plants on the stick. Do this at least 10 times, randomly selecting your sampling sites – similar to collecting a soil sample, and average your answers. This will be the # of plants per running meter.

2. Measure your row spacing in centimeters.

3. Calculate as follows:

$$\frac{4{,}046.9}{\text{(Row Spacing in centimeters / 100)}} \times \#\text{ of plants per meter}$$

Some standard row widths are:

7.5 inches = 19.0 cm	12 inches = 30.5 cm
15 inches = 38.1 cm	30 inches = 76.2 cm

Example:

Planting at 15 inch rows, you did 10 meter stick counts in the field and got an average of 14 plants per count in Step 1.

Your calculation is as follows:

$$\frac{4{,}046.9}{\text{(38.1 / 100)}} \times 14$$

Your result is **148,705** plants per acre.

Current Check-Off Partners

Thank you to all of our partners who support our Council, in return please support them when buying/selling grain.

Biggs Farm Limited
Brennan Farms Ltd.
Cardigan Feed Service's Ltd.
La Coop Fédérée
Clarence Farm Services
Crop Exchange
East Coast Grains
Eastern Grains Inc.
Phillips Feed Service
Mountain Breeze Farms
NB Seed Growers
Nutreco Canada
Parish and Heimbecker Ltd.
PEI Grain Elevator Corp.
Sevita

Atlantic Grains Council

ATLANTIC GRAINS COUNCIL 381 Killam Drive, Moncton, NB E1C 3T1
Telephone: 506.380.9663 ▪ Email: agc@bellaliant.com ▪ www.atlanticgrainscouncil.ca