

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. PEI Average Results (15% moisture)

Treatment	2015				2016			
	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. NB (Kings) Average Results (15% moisture)

Treatment	2015				2016			
	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. NB (Kent) Average Results (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. NS Average Results (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)

Treatment	2015				2016			
	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)

Treatment	2015				2016			
	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)

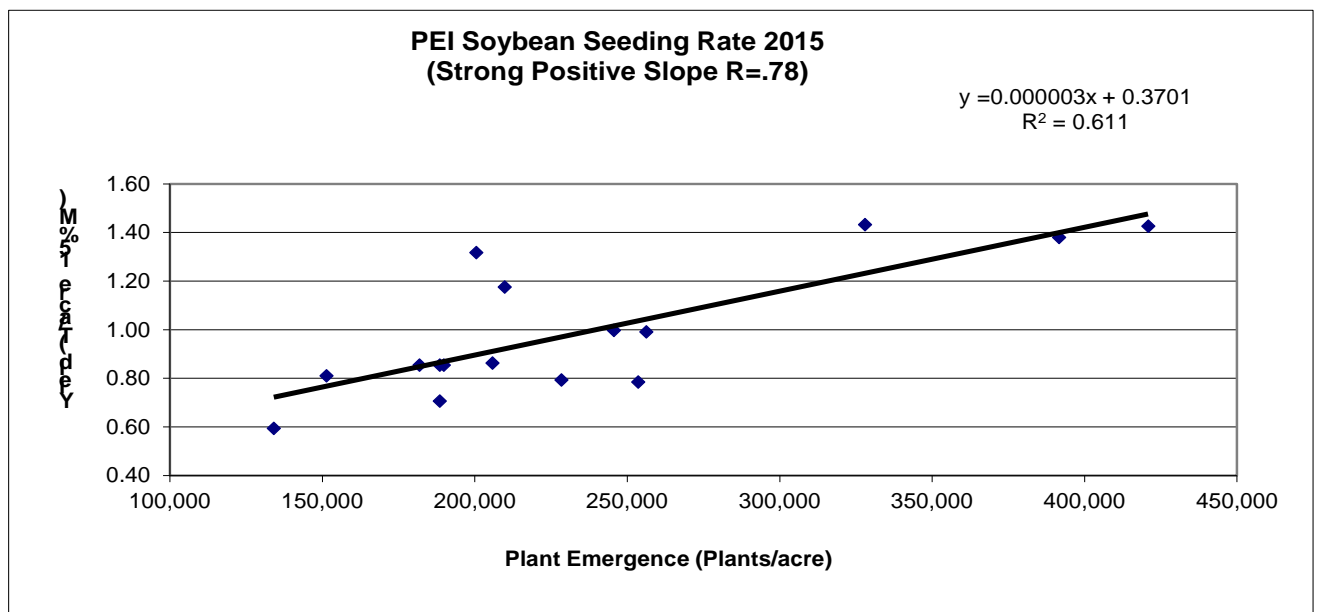
Treatment	2015				2016			
	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)	Sites	Yield (T/ac)	Protein (%)	Test wt (lbs/bu)
85 kg/ha	2	3.68	6.82	45.57	2	2.61	5.94	47.90
120 kg/ha	2	4.67	8.45	45.51	2	2.68	6.52	47.77
135 kg/ha	2	5.29	7.15	45.24	2	2.83	7.00	48.02
155kg/ha	2	5.03	7.99	45.70	2	2.84	7.11	48.01

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:



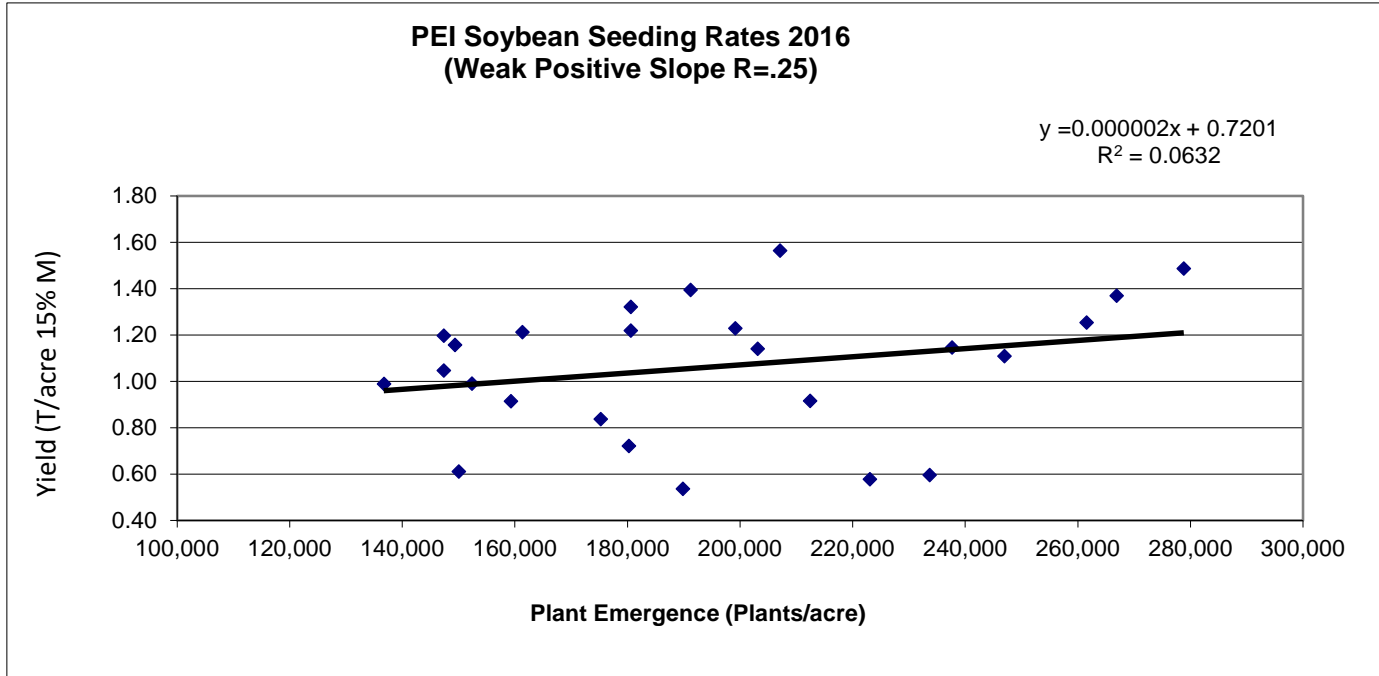


Table 8. Average changes in yield (15% moisture) with increased plant emergence per acre

Plants/Acre	2015 Yields T/acre (15% M)			2016 Yields T/acre (15% M)		
	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)

Treatment	2015				2016			
	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)

Treatment	2016			
	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.