



Atlantic Grain Council (AGC)
Field Strip Trial Research for Nova Scotia
2016 AGC-NS Corn Plant Population & Nitrogen Fertilizer Rate Trial

Funding provided by:



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 10-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 actually 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.

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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 $\alpha = 0.05$



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 $\alpha = 0.05$

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 $\alpha = 0.05$

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 $\alpha = 0.05$



Grower	2014 Crop	2015 Crop	2016 Corn Hybrid	Planting Date	Final Plant Population/acre	Herbicide and Timing
Baker	Soybean	Winter Wheat	Pioneer P7410HR	April 29	31,750 & 35,850	Converge Flex & Roundup (2-leaf)
Kinsman	Grain Corn	Grain Corn	Pioneer P9188AM	May 19	35,000 & 39,750	Converge (pre-emerge)
Langelaan	Soybean	Winter Wheat	Syngenta N18Q-3011A	May 13	33,075 & 38,200	Converge Flex & Roundup (2-leaf)