

Cereal Program Collaboration in Newfoundland and Labrador

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In 2012, the Government of Newfoundland and Labrador (NL) restarted the provincial grain research program with the goal to develop cereal grains (i.e. barley, wheat and rye) as a viable cropping option on the Island. Animal feed is the leading farm expense for the NL livestock industry and all grain requirements (corn, wheat, barley etc.) are imported from mainland Canada. Cereals had previously been grown previously up to the late 1940's; however, the introduction of regular and dependable ferry service connecting NL to mainland Canada meant more feed stocks could be imported and local growing ceased. Over time, this arrangement has not been as economical as it once was, and reliability is still an issue during the winter months or high wind events. Additionally, the quality of the grain that is imported is often inferior to shipments destined for other mainland locations and do not provide as much nutrition as a locally sourced product. As a result, NL farmers have been paying more for a lesser quality product than the rest of Canada in a region where costs are already substantially higher due to the need to import almost all inputs (i.e. seed, pesticides, fertilizers, grain feed (corn, wheat, or barley), protein feed (soy or canola), micronutrients, vitamins etc.).

In the fall of 2012 the program planted the first crops of winter wheat and in the following spring (2013) barley and spring wheat was planted. The purpose of the trials was to determine which varieties were better suited to the variable NL climate and soils using mainland cultivation recommendations. The program has been very successful with winter wheat yields reaching up to 6.18 tonne/ha, spring wheat 3.5 tonne/ha and barley 3.0 tonne/ha. The straw has also been highly valuable and used as a fiber feed or as bedding which is in short supply in NL. The quality of the grain grown locally has been exceptionally high, often exceeding national quality standards. There has also been a consistent increase in milk production when feeding local grain, but this is expected when feeding high moisture versus dry grains. As the trials progressed other factors have been incorporated to establish best management practices specific to NL conditions (i.e. for a Boreal zone). Examining practices from other similar regions in the North Atlantic has been essential and, in 2013, we joined a collaboration with other North Atlantic countries in a Northern Periphery and Arctic preparatory project and later a main project aimed at increasing cereal cultivation in northern regions. This partnership has increased

the efficiency of our program by providing access to researchers who have already answered some of the same questions that we were asking that, while very similar to their experiences, was unique to the rest of Canada.

Collaboration in the NPA has also allowed our program to unexpectedly expand and begin malting barley trials. Although NL is only at the very beginning stages of cereal cultivation, other partners (Norway, Scotland, and Iceland) are already producing grain for feed and for the purposes of the NPP project were looking to increase the use of grain for human consumption, mainly in bakery and beverage products. While we were not in that position initially, a great deal was learned through the production of the farmers manuals and other documents for the NPP project deliverables. The brewing and distilling industries had been requesting a NL feed stock for some time and with the knowledge gained through the collaboration we decided in 2017 that we could try a small scale assessment alongside the feed trials. We partnered with industrial partners, the Newfoundland Distillery Co. (<https://thenewfoundlanddistillery.com/pages/nlc-stores>) and local farm Larch Grove Farm, for the assessment.

Malting barley yields for 2017 was good despite it being a drought year. The grain was harvested and sent to the distillery while the straw was left for the farmer's immediate use. The distillery used the grain to make spirits and to create an entirely novel beverage offering in NL, Aquavit. While popular in Scandinavian regions, Aquavit is virtually unknown in Canada and was not available for purchase. The aquavit has sold very well and the grain has also been incorporated into other product offerings, several of which have just won very prestigious awards at the San Francisco World Spirits Competition. Following use by the distillery, local farmers stop by to pick up the spent wet distillers grains for use as livestock feed. A couple of sacks of un-malted barley were also saved and given to local breweries to try to malt and create their own beverages. Two breweries were able to create unique NL beers with the grain and hope to secure more in the upcoming season to commercialize.

In 2018, the malting barley trial has expanded from one 10 acre plot to three farms and 40 acres. The distillery wants to double the barley they used last year, but there are also other breweries who want to try it and three other distilleries have been approved to begin operations. Additionally, a farmer has applied to open the first malting facility in NL aimed at serving the growing craft brewing industry. To meet these needs more malting barley acreages will be required.

Overall participation in the Northern Cereals program has been very valuable to the grain program in NL. The collaboration has allowed the building of a North Atlantic regional cereal growing expertise that may not have existed otherwise and has provided much needed guidance when needed for all partners. The publications have already been used by farmers in NL for the small scale drying techniques and the malt barley quality and use and others will be distributed as required.