

Recommendations for Growing Grain in Newfoundland (Report # 1)

The following are guidelines for growing grain in Newfoundland

Production Management

Soil Analysis

Soil analysis must be completed prior to seeding grains. The soil should be a minimum of medium fertility with the pH value of 7.0. Soils with pH values of less than 5.8 are considered border line for barley and wheat production and grain and straw yields will decrease significantly if soil pH values fall below 5.5.

Weed Control

Round-up herbicide is recommended to be sprayed prior to ploughing and discing to control couch grass or any other perennial grasses that may be present in the field. Annual broadleaf weeds can be controlled by heavy discing prior to seeding or with a herbicide spray, Target, Refine Extra etc. as recommended in the Guide to Weed Control, Publication 75.

Soil Preparation

Heavy discing is all that may be necessary if grain is following a vegetable crop. If grain follows a perennial forage crop, seedbed preparation should ensure that no sod is lying on the ground restricting plant growth, plant uniformity and ease of combine harvesting. Depending on the fertility of the soil 250-300 lbs. of 17-17-17 is all that is necessary for spring grains. For winter wheat, apply 400-450 lbs. of 12-24-24 in the Fall and 90 lbs. of 36-0-0 in the early spring.

Seeding Dates

Seedbed preparations should be done as soon as the field is able to be worked. Seeding small grain should be done early to late May for best yield results. Seeding grain later than May will usually result in decreased grain yields. Frost will not harm the viability of the seeded grains although it will delay emergence. The main emphasis on spring grain production in Newfoundland is to get the crop in the soil as early as possible. Winter wheat should be seeded late August however in the past it has been difficult to get the seed on time. Seeding winter wheat in early to mid September has given very satisfactory results. The seeding rates of spring barley and oats and for spring is 120 lbs/acre and for spring and winter wheat 135 lbs/acre.

Grain Maturity and Harvest Dates

Among the wheat, barley and oat varieties tested in Newfoundland the earliest crop to reach grain kernel maturity is winter wheat followed by spring barley, spring wheat, oats and naked oats. In the South West Coast and the Avalon Peninsula, winter wheat, spring barley, spring wheat, oats and naked oats will reach maturity. In the Humber Valley winter wheat has matured successfully in 2 consecutively years of testing (1994 and 1995), spring barley has matured in 3 consecutively years of testing (1993, 1994 and 1995), spring wheat has matured in 1995 at The Pynn's Brook Resource Centre and oats and naked oats have not yet been evaluated for suitability as a grain crop in the Humber Valley. In the Exploits Valley Region spring barley and spring wheat have been matured successfully in 1995.

When harvesting the grain crop the combine harvesting should be done on clear sunny days, in the afternoon when moisture content in the grain is lowest. Grain moisture content can drop substantially from early morning to late afternoon. Combine harvest should normally be done in early to late September or when the grain crop has reached 14% moisture content (M.C.). Used pull-type and self propelled combines are available from dealers in the Maritimes. The Department of Fisheries, Food and Agriculture has purchased a pull type and self propelled combine for \$6,000.00 and \$18,000.00 respectively.

Storage and Drying

The cheapest way to store grain is to construct an indoor horizontal wooden bin on a concrete floor with a perforated 6-inch plastic tubing laid on the floor underneath the stored grain so that one end of the plastic tubing is vented to the outside of the bin. This will allow a portable aerator dryer (\$350.00) to dry the grain to a depth of 8 feet with a radius of 15 feet. This type of storage facility is suitable to dry grain harvested up to 18% M.C.

The In-bin drying system is a steel bin storage with perforated floor, unloading chamber and a 5hp natural air blower (\$10,000.00-\$15,000.00). It has the capacity to store large amounts of grain. An 18-inch electric or propane heater and a temperature monitoring device is recommended to be attached to the bulk grain storage in Newfoundland (\$1,000.00 each). This In-bin drying system will allow grain to be dried safely from a moisture content of 20% at harvest.

Feeding Management

Feeding Locally Produced Grains

Grain produced for livestock must be rolled prior to feeding (with the exception of sheep and goats) in order to expose the starch content. This allows enzyme and bacteria activity to act upon the nutritional content of the grain and thus enhancing digestion. An analysis should be done on the grain to determine TDN, Crude Protein, Net Energy, Calcium, Phosphorus, Magnesium and Potassium content. The grain can then be formulated into three feeding techniques as follows:

Ration for Cattle

1. Formulate a balanced ration of locally produced grain oats, wheat, barley and soybean plus a mineral and protein supplement to a desired nutrient level. The amount of a formulated ration fed to a particular group of animals is based on a forage feeding program.

Example 1.

<u>Ingredient</u>	<u>Parts/1000wt.</u>
Barley	485
Oats	485
Di Calcium Phosphate	20
Trace Mineral Salt	10

	<u>1000 lbs</u>
Crude Protein	10.20%
TDN	68.90%
Calcium	0.4%
Phosphorus	0.8%

Example 2.

<u>Ingredients</u>	<u>Parts/1000wt.</u>
Barley	865
Soybean	85
Limestone	20
Di Calcium Phosphate	20
Trace Mineral Salt	10

	<u>1000 lbs</u>
Crude Protein	13.20%
TDN	70.60%
Calcium	1.2%
Phosphorous	0.7%

- Depending upon the nutrient quality of the grain such as barley, you can Top Dress it to silage at the rate of 3lbs per cow and reduce the amount of commercial mix allocated to each cow. This technique can reduce overall feed costs while maintaining optimum production performance in dairy, beef and sheep.
- For feeding heifers mix locally produced oats, barley plus commercial protein supplement ration at various proportions with the aim of satisfying nutrient requirements and reduce the unit cost of the feed.

Example 1.

3 Parts Barley
 2 Parts Wheat
 1 Part Commercial Mix

* To reach a balanced ration the technique used is called "The Pearson Square".

Example 2.

If you have 1.5X more barley than wheat and the protein content of the mix (1 part wheat per 1.5 parts barley) is 10.92%, then you can use "The Pearson Square" to calculate the amount of commercial mix needed to bring the protein content up to the desired 15%.

		[Desired Protein 15%]
Barley / Wheat	10.9% C.P.	$15 - 10.9 = 4.1$
Commercial Mix	22.5% C.P.	$22.5 - 15 = 7.5$
		11.6
		<u>Ration</u>
Barley / Wheat	$4.1 / 11.6 \times 1000$	= 353.4lbs (1)
Commercial Mix	$7.5 / 11.6 \times 1000$	= 646.6lbs (1.80)

Equipment Necessary for Grain Production

- Grain Drill
- Herbicide Sprayer
- Combine
- Portable Auger (necessary for Steel Bin Type)
- Storage Bin with Dryer
 - Horizontal Bin Type
 - Steel Bin Type
- Roller Mill

Newfoundland has at least 4 grain drills, 2 self propelled combines, 2 pull type combines, 3 portable aerator grain dryers, at least 3 roller mills and at least 5 farmers that are committed to making grain production a part of their operation. The grain project is about to step beyond the bulk fertilizer bags lined with plastic as a means to store grain safely after harvest. Farmers must commit themselves to setting up storage and drying facilities for their harvested grains. A horizontal storage bin may easily be constructed in which to use a portable aerator dryer (\$350.00) to dry the grain for storage. The storage of 75 - 120 tonne of grain on one farm may be facilitated by a bulk bin storage with in-bin natural forced air dryer and electric heater attachment (\$15,000.00). These two storage and drying systems are inexpensive and are guaranteed to dry harvested grain with moisture content of 20% for safe storage.

For further information contact your Alternative Feeds Coordinator