



Barley in Newfoundland and Labrador – High Hopes in High Moisture

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Newfoundland and Labrador



- **405,212 km²**
- **~527,000 people**
- **90%+ population lives on Insular NL**
 - **50%+ live on the Avalon**
- **All parts of Island less than 100 kms from ocean**
- **July max/min temp on western coast is 22/13 C and January -3/-10 C**



Mixed Farming in NL

- **Livestock and cropping traditional way to farm in NL – (pre-confederation barriers, importing logistics)**
- **Considered ‘closed cycle’ or ‘fairly closed’ as raise animals, manure feeds crops, crops feed animals, repeat**
- **Some of the largest dairy farms in Canada = some of the largest farm land holders on the Island**
- **Land not considered suitable for most feedstuff production**
- **At one point NL did produce barley and oats for feed**

Island Feed Production

- **West coast self sufficient for forages**
- **No oilseed production, grain cultivation begun**
- **Island imports ~68,000 T of grains & oilseeds each year**
- **One of the highest on-farm costs**
 - Shipping (truck, gulf, truck)
 - Price volatility
 - Quality
- **Opportunity for high quality annual feed crops**
- **Purpose of our research is to expand high quality feeding options in Newfoundland and Labrador (NL), specifically cereals and oilseeds in association with forage researcher counterpart (Richard Tingskou)**



Benefits of growing our own cereals



- **Provides high value and nutritious feed for NL livestock**
- **Minimizes costs to our livestock farmers**
-i.e. transportation costs across the gulf
- **Increases self sufficiency and food security**
- **Decreases reliance on other provinces and countries**
- **Limits exposure to non-local natural or economic events**
- **Get our cake and eat it too! – Grain + Straw**
- **Straw can be used as feed or bedding**

Cereals in Newfoundland – at issue



- **Current commercial cereal production was zero at start of the program in 2012**
- **NL imports about 48,000 tonnes of grain**
- **Cost has become a limiting factor in profits**
 - Fuel prices**
 - Drought**
 - Biofuel diversion**
- **When every \$ counts, we are already feeling the effects:**
 - **6.3% fewer farms in 2011 than 2006**
 - **13.5% decrease in farmed area**

Cereal Feasibility in NL

- **Cereals such as wheat, barley and rye can grow in NL**
- **Requires drying or specialized high moisture system for preservation**
- **High moisture (HM) grain has higher value as feed than dry grain**
- **Less risk in NL to harvest as HM**



Local Cereal Production



- **Renewed on-farm cereal research program initiated in 2012 with planting of winter wheat**
- **Currently researching wheat, barley, oats, triticale and rye**
- **Winter wheat is the most reliable, even when survivability has been poor**
 - **Seed in the fall (no waiting to get on the field in spring)**
 - **Harvest earlier or more time to mature**
 - **Yield bump can buffer survivability issues**
- **Well suited to west coast, more challenging on the east coast due to wetter climate, north showing promise**
- **High Moisture grain is the system of choice**

High moisture grains – Agronomic benefits

- **HM grain can be harvested much earlier: 20-40% MC vs. 12-14% for dry grain**
- **Spoilage is controlled through application of organic acids or other inoculants and specialized storage**
- **Increased yield from earlier harvest**
 - **Less chance of lodging**
 - **Less predation by moose, caribou or birds**
 - **Less risk of loss from late wet season**
- **Wider seeding window**
- **Can leave crop longer if required**
- **Weed control**
 - **Longer window to spray for weeds in the fall**
 - **Can use broad-leaf weed control**



High Moisture Grains – Feed Benefits

- **Can be more palatable to livestock that eat at a more constant rate – reducing risk of scouring and foundering**
- **Cattle tend to go feed easier and faster and stay on feed better**
- **Better gains have been seen in steers when fed a HM barley than when fed dry grain barley**
- **Rolled HM has little dust and fines – reducing risk of bloat**
- **Straw from HM barley has a better feed value (less leaf loss)**





Spring Barley in NL

- **Barley is the most likely cereal in NL to reach required moisture content (MC) for dry grain (13-14%)**
- **Oats, triticale and wheat can take up to 3+ weeks longer**
- **Barley actually reaches maturity at 40% MC**



Barley Small Plot Trials

- **Barley varietal small-plot trials are conducted at Pynn's Brook, NL**
- **Use recommended cultivation practices for Atlantic Canada (suitable?)**
- **High yielding varieties progress to larger on-farm trials**



Barley Varietal Trial Avg Results

Barley Variety	Days to completion of flowering	Harvest Moisture Content	TKW	Grain yield (Tonnes per Acre)	Straw yield (Tonnes per Acre)
Island – 2 row	47	23%	43.93	1.12	1.23
Leader – 2 row	54	27%	45.97	1.05	1.48
Selena – 2 row	47	25%	42.97	1.26	1.25
Legend – 6 row	47	24%	43.30	1.16	1.12
Rhea – 6 row	54	26%	42.55	1.13	1.15
Synasolis – 6 row	54	24%	40.65	1.25	1.10
Var 1 – 6 row	47	29%	36.15	0.73	0.63
Var 2 – 6 row	41	28%	35.85	1.11	0.91
Var 3 – 6 row	41	28%	38.43	0.98	0.87
Var 4 – 6 row	54	27%	38.28	0.69	0.75

- **The top 2 highest yielding varieties were European with 1.34 and 1.11 T/acre**
- **The highest yielding domestic varieties were 6-row**
- **Legend yielded highest grain (1.01 T/acre) and straw (1.78 T/acre)**

Barley Variety	Grain yield (Tonnes per Acre)	Straw yield (Tonnes per Acre)
Selena – 2 row	0.89	1.10
Leader – 2 row	0.41	1.06
Legend – 6 row	1.01	1.78
Synasolis – 6 row	0.94	1.05
Newport – Malting	0.61	1.02
Newdale – Malting	0.50	0.97
Euro Var 1	1.11	0.63
Euro Var 2	1.34	0.94
Euro Var 3	0.95	1.13
Euro Var 4	0.87	1.03

Large On-Farm Trials

- **On farm trials are planted on 20 acre fields (8 Ha)**
- **Plots were ~10 acres/variety and each farm assesses 2 varieties**
- **Different field histories**
 - **Vegetable**
 - **New clear (from forest)**
 - **Forages**
 - **Corn & barley**
- **Yields average ~1.2 T/acre, optimization of cultivation practices required**

Barley advantages and disadvantages



- **Easier to feed vs. other small grains – in dairy can be their entire grain ration**
- **Can be as high in energy as corn and higher protein**
- **HM barley results in easier feed transition than dry**
- **Minnesota report HM barley cattle gained 8.6% faster and required 9.3% less feed per unit of gain than w dry**
- **Late tillering – Desiccant?**

Winter cereals in NL

- **Higher nutritional content than some spring grains**
- **Higher yields**
- **Winter grains more likely to reach dry grain MC than spring grains**
- **Less risk to harvest as HMG**



Winter cereals in NL

- **Planting winter cereals may compensate for NL's shorter growing season – our focus**
- **Planted from late-August to early-September**
- **Harvested early-September the following year**
- **Crops get a jump-start by beginning to grow the year before - Resume growth as soon as snow cover is gone**
- **Snow cover is important but need not be excessively deep**



Farmer Feedback

305 Day Averages (kg)

Year	Herd Milk	National Milk	Herd Fat	National Fat	Herd Protein	National Protein
2006	9360	9274	318	342	302	294
2007	9236	9315	326	345	306	296
2008	9147	9407	320	350	315	299
2009	8862	9382	328	351	301	298
2010	8664	9270	333	347	288	293
2011	9214	9327	354	353	304	296
2012	10324	9283	389	353	339	295
2013	10418	9447	404	362	335	300
2014	10893	9428	444	365	343	300
2015	10902	9573	435	372	354	306



Equipment and techniques

- **No-till Drill Seeder – you will never go back. Outside of grain, overseeding forages is incredibly valuable to our farmers and ploughing isn't most feasible due to our rocky soils**
- **Combine – what do you really need?**
 - **Will a mower and thresher work, it is small scale**
 - **Tow behind (refurbished) most economical and easiest to maintain**
 - **Versatility – combine grain, rapeseed/canola, peas etc.**
- **Processor or dryer? Depends on end use**

lans seeder science



Summary

- **Response from farmers has been very positive with most reporting increase in milk production and fat content when HM grain is fed and more consistent feeding**
- **Barley grows reliably well however grain requires more attention than traditional forages**
- **Problems with late tillering must be overcome**

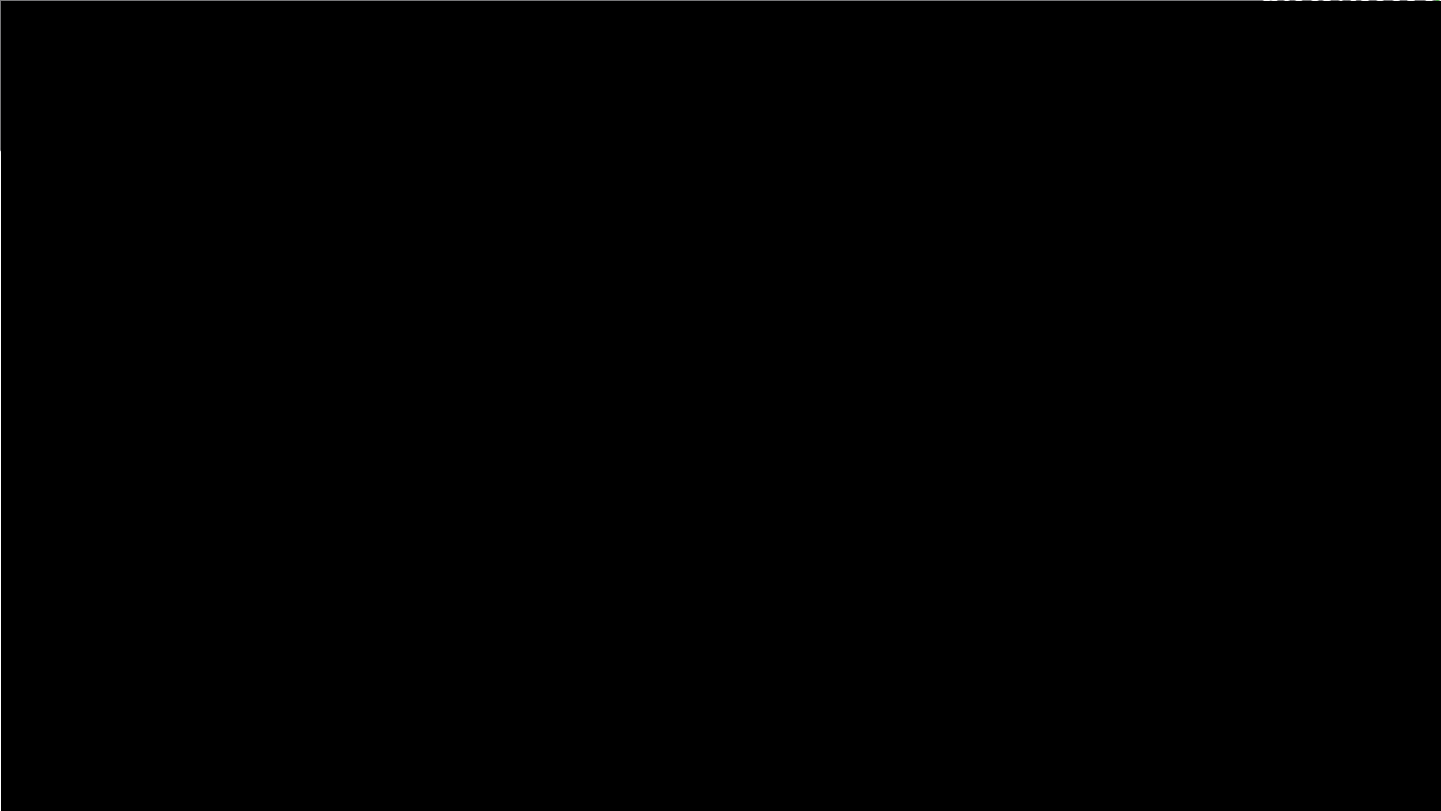
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Newfoundland
Landscape



Thank You

