



T2: Technical developments

Sæmundur Sveinsson

Matís, Reykjavík.

7th March 2018





Northern Cereals

T2: Aims

- Increase the number of high quality cereal producers in the in the NPA region. This will be achieved by the sharing of knowledge regarding:
 - Cultivar selection
 - Timing of sowing and harvesting
 - Suitable drying methods



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Partner roles

- Iceland will produce guidelines for optimizing northern cereal growing.
- Norway, Faroe Islands & Newfoundland will map possible areas for barley cultivation with respect to cultivar selection, sowing and harvest time.
- Iceland will review possible drying methods, with emphasis on environmental aspects and sustainability.
- Iceland will analyze current drying processes and suggest improvements.
- Norway, Faroe Islands & Newfoundland will support SMEs for adapting suitable drying facilities.
- Newfoundland will inform about their Cereal Program and what other partners can learn from it.



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Activity 2.1: Optimisation of northern cereal growing



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Aim: Identify suitable areas for growing barley in underdeveloped cereal production areas: N-Norway, Faroe Island and Newfoundland.

Partners: Iceland, Norway, Faroe Islands, Newfoundland and Orkney.

Main tasks:

- Describe the mapping methodology (report).
Submitted in May 2016
- Describe potential areas for barley production (report). for N-Norway, Faroe Islands & Newfoundland.
Submitted May 2017
- Produce a farmers handbook in English.
Submitted June 2017



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**METHODS FOR MAPPING SUITABLE AREAS FOR CEREAL
PRODUCTION IN THE NORTHERN PERIPHERY REGION**

A Project Report

Deliverable T2.1.1

By

Sæmundur Sveinsson and Sigríður Dalmansdóttir



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**THE SIZE OF SUITABLE AREA FOR CEREAL CULTIVATION IN THE
NORTHERN PERIPHERY REGION**

A Project Report

Deliverable T2.1.2

By

Sæmundur Sveinsson

May 2017





Arable land

Table 1. Current estimates of the size of arable land in the NPA region.

Region	Total area of region (km ²)	Area of arable land (km ²)	Proportion of arable land (%)
N-Norway ^{1,5}	113,093	900	0.8
Orkney ²	990	148	15
Faroe Islands ^{1*}	1,400	NA	NA *
Iceland ⁴	103,000	3,000	3
Newfoundland and Labrador ⁴	405,212	4,052	1

* No data available

¹Reykdal et al. (2014)

²Scottish Government Directorate for Environment and Forestry (2016)

³Statistics Canada, 2016

⁴Sveinsson and Hermannsson (2010)

⁵The Norwegian counties of: Nordland, Troms and Finnmark.





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**A Farmer's handbook for cereal cultivation in
the northern periphery and arctic region**

A Project Report

Deliverable T2.1.3

By

Sæmundur Sveinsson and Ólafur Reykdal

May 2017



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Effects of early sowing on yields



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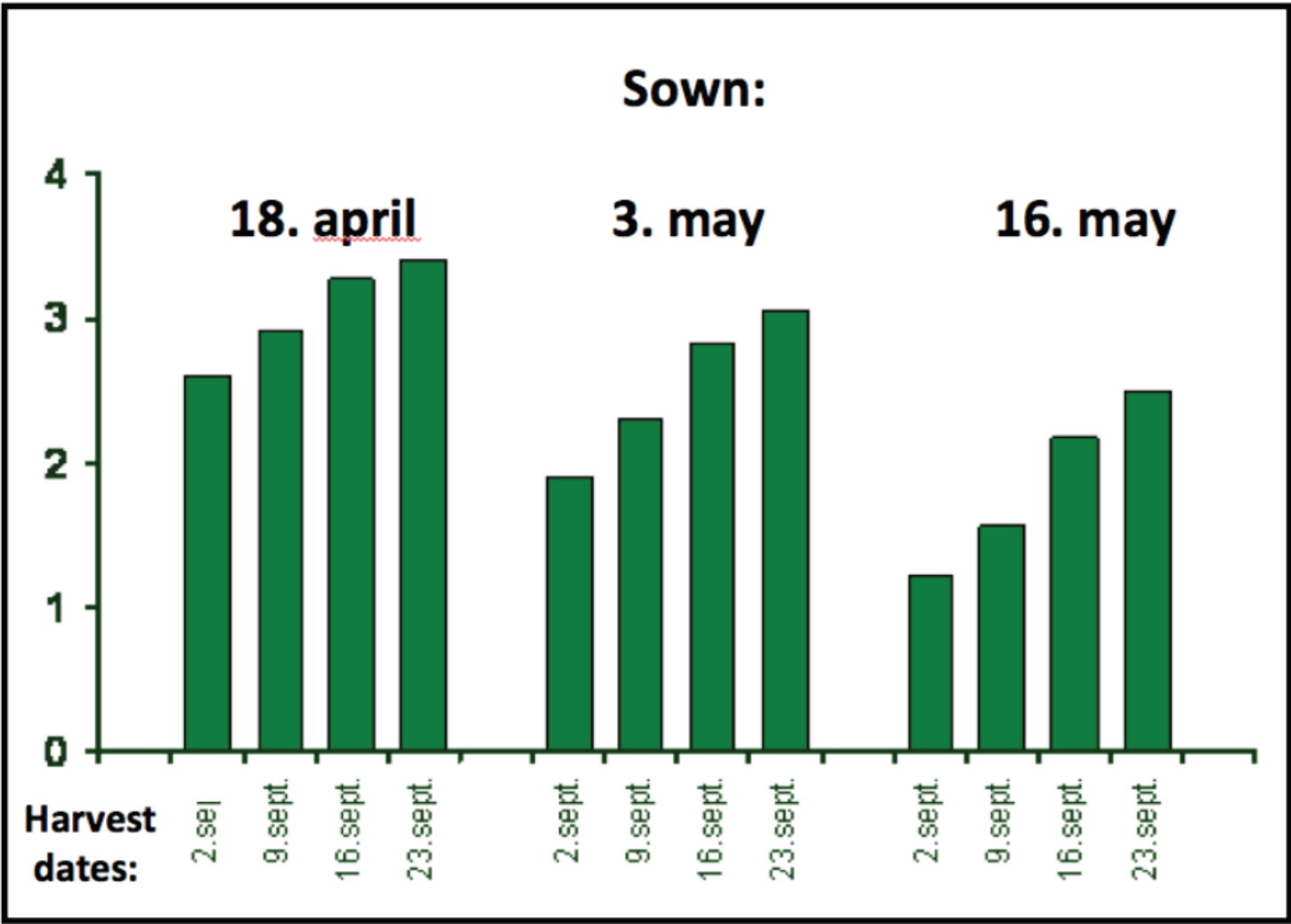


Figure 6. Effects of seeding- and harvesting time on the yield of barley in Iceland (three-year average). Planting and harvesting was executed with a difference of 60 GDD.

Effects of drilling fertilizer with seed



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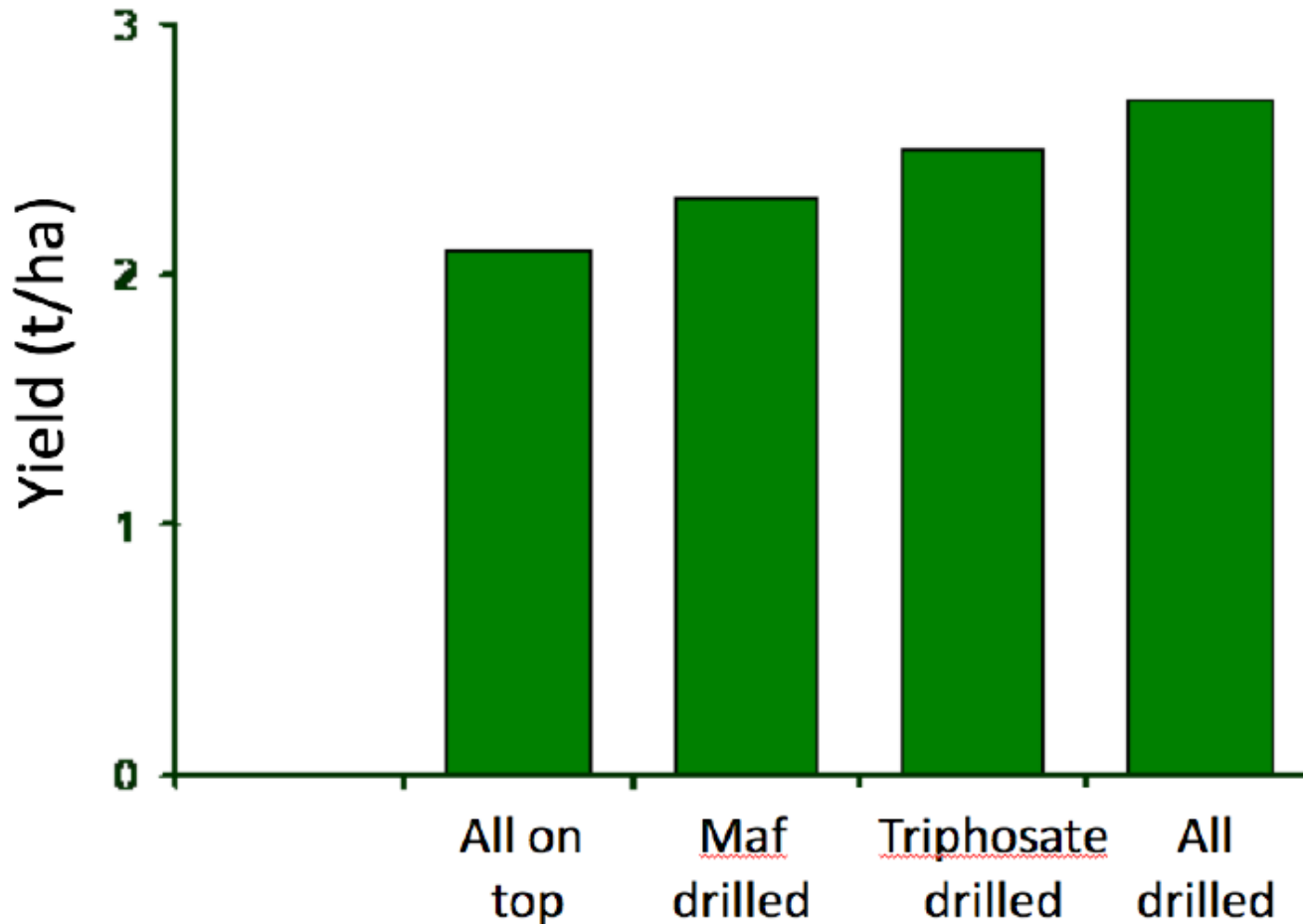


Figure 7. Effects of drilling fertilizer with barley seeds in Iceland. Large differences in yield were observed between treatments. An increase of 23% was observed with drilling all required fertilizer along with the seeds compared with applying it to the top of the field after planting. The two columns in between show the effects of drilling two types of phosphate rich fertilizer along with the seeds.



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Activity 2.2: Drying and storage of harvested grain



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Aim: Provide each region with recommendation for improved grain drying procedures, based on grain quality and costs.

Partners: Iceland, Norway, Faroe Islands and Newfoundland.

Main tasks:

- Review of possible drying methods.
- Estimate condition of cereal at harvest
- Suggestion for improved drying in each region



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Storing the harvest



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Two methods

Make ensiled barley

Dry barley to 85% DM



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Drying and Storage of Harvested Grain

Case Studies

Deliverables T2.2.1 and T2.2.2



Þorlákur Guðjónsson, Snorri Karl Birgisson, Peter Martin, Sigríður Dalmannsdóttir, Ólafur Reykdal

June 2017





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Icelandic farms

Table 1. Grain drying facilities at farms and drying plants in Iceland 2016. The list is not complete.

Farm or location	Region	Farmer or contact person	Energy source and comments
Birtingaholt 4	South	Sigurður Ágústsson	Diesel and geothermal water
Gunnarsholt	South	Björgvin Þór Harðarson	Diesel
Móheiðarhvoll	South	Birkir Arnar Tómasson	Diesel and straw. Straw provides 30-60% of energy.
Sandhólar	South	Örn Karlsson	Diesel
Þorvaldseyri	South	Ólafur Eggertsson	Diesel. Reuse of hot air.
Grund	North	Halldór Örn Árnason	Geothermal water and diesel
Hjalteyri plant	North	Stefán Magnússon	Geothermal water
Vallanes	East	Eymundur Magnússon	Diesel
Belgsholt	West	Haraldur Magnússon	Geothermal water
Jaðar	West	Eiríkur Blöndal	Geothermal water



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Drying and Storage of Harvested Grain

A Review of Methods

Deliverable T2.2.1



Ólafur Reykdal

August 2017



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Temperature for drying



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Table 1. Optimal and maximum grain temperatures during drying processes.

Grain type	Optimal	Maximum	Reference
Malting / seed barley	40 °C	43 °C	CBH Group 2006
Malting barley	35-38 °C		Martin 2015
Malting / seed barley		45 °C	Hjörvar Halldórsson 2004
Food barley		55 °C	Hjörvar Halldórsson 2004
Feed grains	60 °C	65 °C	CBH Group 2006
Feed barley		80-100 °C	Hjörvar Halldórsson 2004
Rapeseed (Canola)	40 °C	43 °C	CBH Group 2006



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Figure 2. Facilities for aeration storage or drying.



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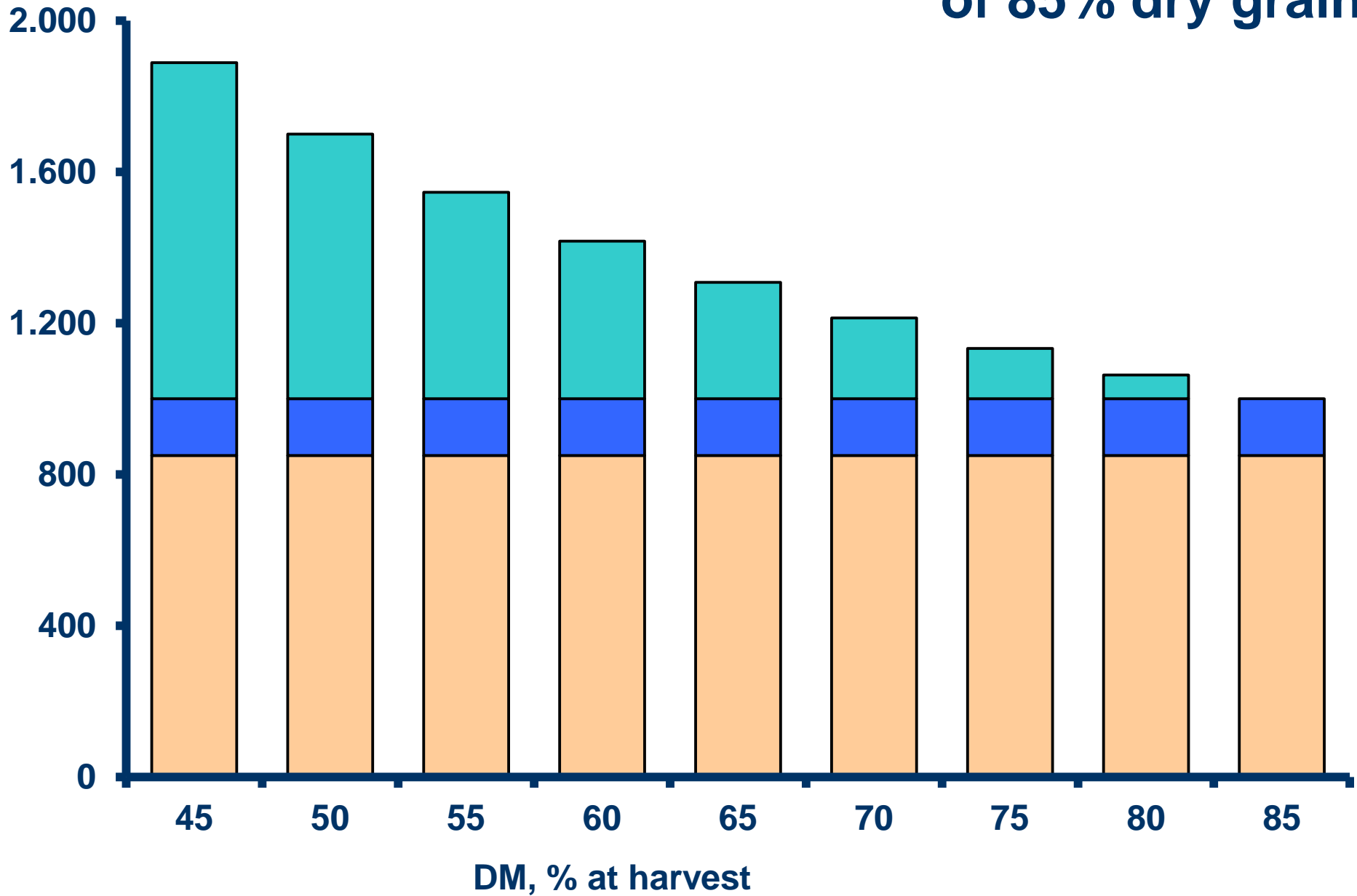


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Water to dry to get one metric ton of 85% dry grain

Harvest (kg)



Activity 2.3: Life Cycle Assessment (LCA) of Þorvaldseyri



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Aim: Identify the environmental impacts and energy use at the farm Þorvaldseyri, which is located on the south coast of Iceland.

Partners: Iceland

Main tasks:

- Collection and compilation of data. Framework of LCA
- Hot spot analysis, material, energy, impacts. (report)
- Incorporate results of LCA into guidelines and case studies.



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Activity 2.4: Knowledge exchange



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Aim: Make knowledge and experiences gained in WP4 available outside the project, especially to partners that are at an early stage in cereal development.

Partners: All partners

Main tasks:

- Exchange of knowledge between countries, 3 conferences, throughout the project.
- Farmers meetings, 15 meetings, throughout the project
- Prepare guidelines and case studies, 4 documents in 4 languages. March 2018



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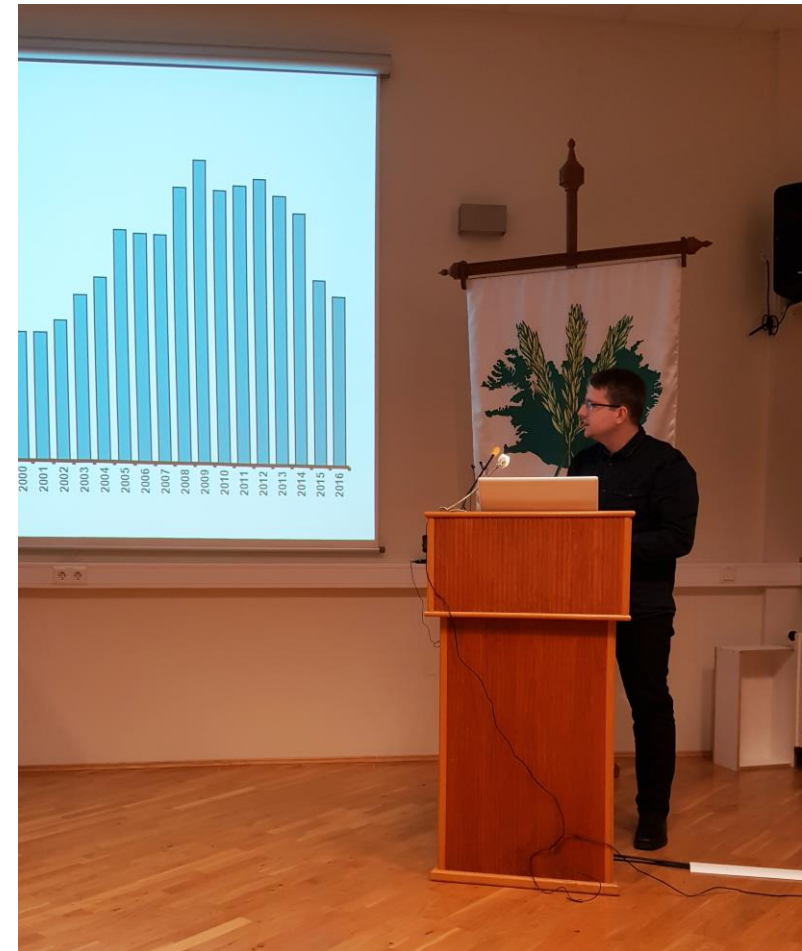
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Activity 2.4: Knowledge exchange

- Meeting with farmers, Gunnarsholt 29. november



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Floor malted IsKria



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- Malting at Keldnaholt, Reykjavík



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Drying malt at Keldnaholt



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- Malting barley at Keldnaholt



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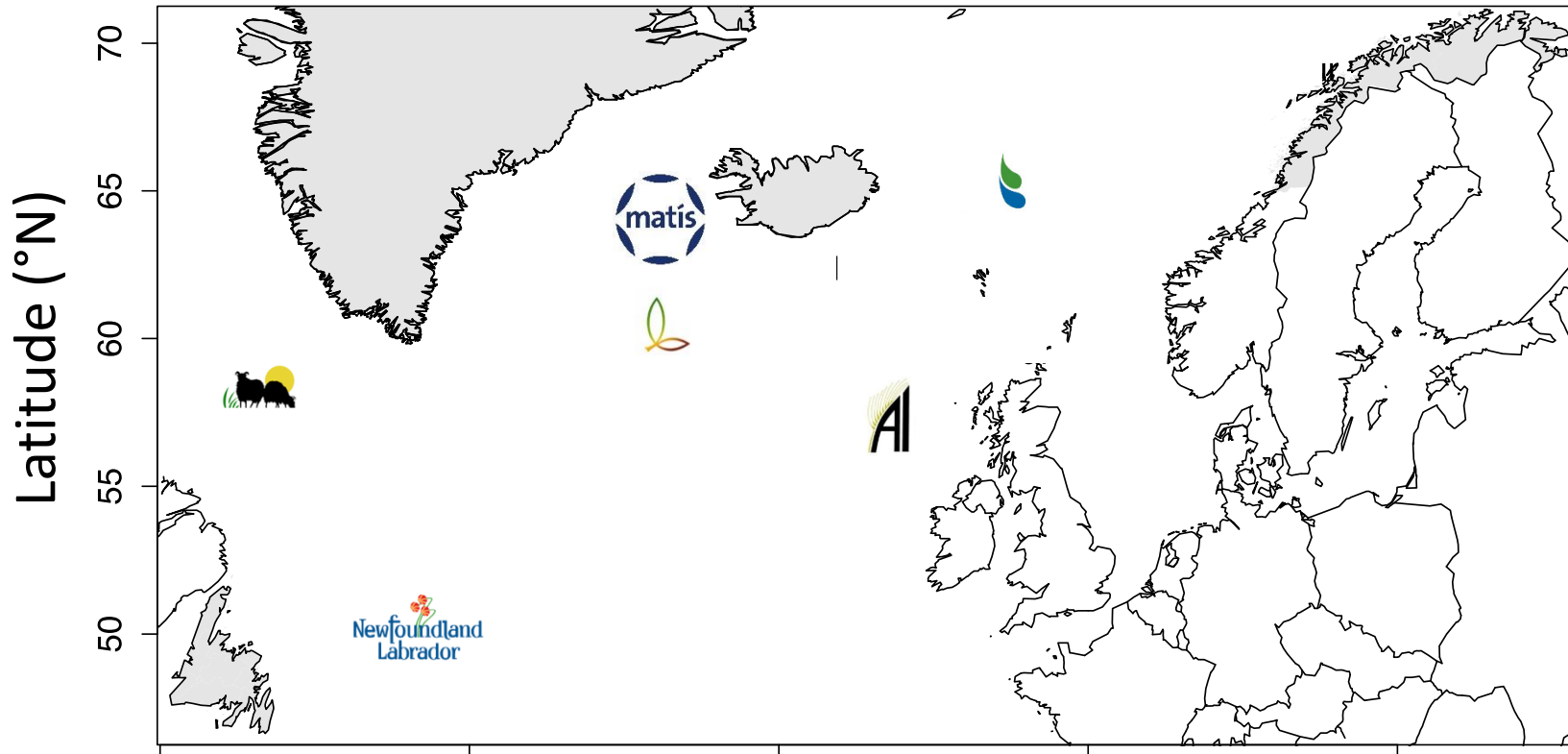
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Any thoughts or questions?

THANK YOU FOR YOUR ATTENTION



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