

Barley growing in Tromsø, northern Norway
Photo: Sigríður Dalmannsdóttir

North Atlantic cereals

Developing cereal production in the North Atlantic region

A project funded by the European Union is helping to promote cereal cultivation in parts of the North Atlantic region. Peter Martin from the University of the Highlands and Islands' Agronomy Institute in Orkney, reports on the first project meeting which focused on the potential for using local cereals for beer and spirit production.

Recent years have seen increased interest in growing cereals, especially barley, in the northern maritime parts of Europe. This region includes Iceland, coastal Norway, the Faroes and the north of Scotland with its associated islands. Interest in cereal production has been driven by several factors but especially a desire for greater self-sufficiency, the potential for developing 'local' food and drink products for a growing tourist market, a trend towards warmer growing

seasons and the development, in some countries (Iceland), of new cereal varieties specifically for local growing conditions.

Across this region, the status of cereal growing is variable. In Scotland's Northern Isles, for example, over 4,000ha of cereals are grown in Orkney (59°N) while 100km further north, in Shetland, less than 200ha are grown. In the Faroes (62°N), cereal growing ceased around the middle of the last century while in northern Norway (between 65°N and 71°N), small-scale cereal growing continues (c. 230ha). In Iceland (63.5°N to 66.5°N) the area grown has expanded from 100ha in 1991 to around 4,800ha today.

Northern Cereals project

With most of the project region tending to have high rainfall, cereals are usually harvested with high moisture content and used for animal feed. Nevertheless, in both Iceland and Orkney, there are successful examples of cereals having been grown for several years for both milling and malting. In order to build on these successes and to develop new cereal markets within this region, the EU's Northern Periphery and Arctic Programme recently started funding a cereals project

(Northern Cereals – New Markets for a Changing Environment) which had its first annual conference in Orkney in October 2015. Orkney was chosen as the venue for this meeting because its main theme was the use of local cereals for beverage production and there are several good examples of this in Orkney.

Among the 40 guests attending were project partners from Iceland (Agricultural University of Iceland; Mátis – the Icelandic Food and Biotech



R&D), Norway (Norwegian Institute of Bioeconomy Research – NIBIO), the Faroes (The Agriculture Centre) and Scotland (University of the Highlands and Islands – UHI) as well as collaborating growers and small and medium sized enterprises (SMEs) with interests in both food and beverage production. This article provides a summary of the cereal growing situation across the

region and of some of the beverage-related information presented and discussed at this meeting.

Icelandic barley

Although barley was grown in Iceland following the Norse settlement (874 AD), deteriorating weather during the Little Ice Age (ca. 1300-1850) resulted in cultivation being abandoned. Attempts to revive this in the 20th century were again challenged by cold weather until 1990, when warmer growing seasons stimulated an expansion in the crop. The development of a modern brewing industry in Iceland was hindered by a prohibition on beers above 2.25% alcohol by volume from 1915 to 1988, but since then several breweries and microbreweries have developed. Today, the main breweries are Ötgerðin Egill Skallagrímsson and Vífilfell. The former also operates a microbrewery called Borg and there are about four others in the country. A major obstacle in the use of Icelandic barley by breweries is the lack of local malting facilities. Although a few microbreweries add some local barley to their beers, only Borg has produced a beer, Snorri, which is made from 100% local barley. For this, the lack of local malt was overcome by brewing with enzymes and the beer is also spiced with Icelandic thyme. Another beer which includes a distinctive Icelandic twist is Borg's Fenrir in which the malt is smoked with sheep dung!

On the distilling side, Eimverk distillery was founded in 2009 and has recently released Vor gin and Flóki Young Malt, a 1- to 2-year-old spirit made from Icelandic barley. A single-malt whisky is scheduled for release in 2016. A second distillery, Thoran, is being established and also plans to make whisky from locally malted barley.

Faroe Isles

Although barley was probably grown in the Faroes from at least the time of the Norse settlement (late 8th century AD) until the mid-20th century, production was always erratic and in poor years, barley for milling had to be imported. With high rainfall at harvest, the crop was usually cut before it was fully mature and had to be brought inside for drying. Restorffs, the first brewery in the Faroes, opened in 1849 and was followed in 1888 by Föroya Björ. Today, only the latter of the two survives and another, Okkara, opened in 2010.

Norwegian Norskøl project

Most of the three counties of northern Norway within the project (Nordland, Troms and Finnmark) are above the Arctic Circle. In the past, barley was more widely grown in this area and dried grain is currently only produced in parts of Nordland, the most southerly county. In Finnmark, in the far north, cereal cultivation is difficult because snow may last until May and early frosts can damage crops late in the summer. The largest brewery in the region is Mack in Tromsø, but there are also several microbreweries and a number of these in Nordland are experimenting with using locally grown barley for brewing. Brewing in northern Norway is also being assisted by the Norskøl project, a pan-Norwegian collaboration between breweries, microbreweries, home brewers and research stakeholders aimed at identifying suitable cultivars of barley, hops and herbs for local growing and brewing.

Orkney Bere

Orkney is an island archipelago 10km (6.4 miles) off the north coast of Scotland. Compared with most of Britain, it has a challenging environment for cereal production, but probably has the most favourable climate of all the project partners! Cereal cultivation in Orkney can be traced back to the Early Neolithic (c. 3000 BC) and by Viking times (from the late 8th century AD) both oats and barley were very important crops. The barley grown was probably Bere, a 6-row landrace, and surpluses were often exported as grain, malt or meal until about the mid-19th century when a strong livestock industry began to develop. This required crops for animal feed and there was therefore little interest in growing malting barley in the 20th century.

However, with two distilleries (Scapa and Highland Park) and two breweries (The Orkney Brewery and Swannay Brewery) jointly importing about 6,000t of grain and malt annually, there is considerable potential for replacement of some of this by local production, even if only for niche market products. Some progress has been made with this and Highland Park supports an Orkney supply chain, managed by the Agronomy Institute, which has produced about 55t of malting barley annually since 2010. This is malted on-site and is being used to produce an 'all-Orkney' single malt whisky.



A six-row barley variety growing near Mödruvellir in Eyjafjörður in northern Iceland Photo: Jonatan Hermannsson



Barley growing in Eyjafjörður in northern Iceland Photo: Jonatan Hermannsson



Winter wheat being harvested at the farm of Thorvaldseyri, located in the south of Iceland Photo: Ólafur Eggertsson



Project partners from Norway, Iceland and the Faroes visiting The Orkney Brewery
Photo: Sigríður Dalmannsdóttir

Swannay Brewery has also been keen to use locally-grown cereals, and has developed beers using both local Bere and Golden Promise barley.

There has also been a successful revival of the export of Orkney Bere which is malted and supplied for brewing and distilling. Since 2006, Valhalla Brewery in Shetland, has produced the beer, Island Bere, while single-malt Bere whiskies have been developed through collaborations between the Institute and both Isle of Arran Distillers and Bruichladdich Distillery. The link with Bruichladdich is of special significance, having lasted for 10 years, and has already resulted in the release of three single-malt Bere whiskies.

Short periods of suitable weather

Across the project region, weather creates similar problems for cereal cultivation. Most areas are dependent on spring barley varieties which can only be planted quite late (April or May), once the land has dried out or the snow has melted. As a result of their maritime or coastal locations, most areas also have cool growing seasons and high rainfall. The latter makes crops particularly prone to lodging after heading, especially if accompanied by strong wind, and also makes harvesting very difficult in some years. In Orkney and Iceland, where grain production for brewing or distilling has been most successful, this depends upon good access to grain drying facilities and machinery so that growers can take advantage of short periods of suitable weather for planting and harvesting.

A major obstacle to the use of local barley by the region's breweries is the lack of local facilities for

malting relatively small quantities of grain (c. 0.5-5.0t). In some cases, this has been overcome by sending grain away for malting, but this would be far too costly in most locations. In Iceland, Borg brewery has successfully employed enzyme technology which has allowed it to use unmalted local barley. Another option being considered by several microbreweries is the possibility of carrying out their own malting. Here the project is being helped by Highland Park distillery which has offered placements to collaborating SMEs, allowing their staff to visit the distillery and learn about the floor malting process. The first placements were taken up in 2015 by Föroya Bjór (Faroes), Thoran Distillery (Iceland) and Hemnes microbrewery (Norway) and further ones are planned for 2016.

Norse heritage

Although the number of inhabitants in each of the partner regions is small (ranging from 21,000 in Orkney to 478,000 in northern Norway), a common driver across the region for the production of local cereals is the growing number of visitors, many of which are keen to experience local food and drink products. Orkney, for example, receives over 140,000 visitors per year and another 80,000 arrive for short visits on cruise ships. Visitors are becoming increasingly discerning and are looking, not just for local products, but for those which contain local ingredients and tell a local story. In this context, successful cereal production in pristine but challenging northern areas can become a powerful marketing story. While the project regions share a common Norse heritage, they each have a distinct identity which makes



Erik Smith, Production Team Leader at Highland Park Distillery, explaining the importance of oak casks in whisky production to project partners

them ideal for developing high-provenance products with potential for sale on international markets. This has been seen, for example, with Bruichladdich's Bere whiskies and will also be the case with Highland Park's all-Orkney whisky when it comes to market.

Across the region, low temperatures and high rainfall during the 2015 growing season provided a salutary reminder that climate change will not deliver ever-improving conditions for growing cereals. Nevertheless, by providing partners with an opportunity to benefit from the knowledge and experience of each other, the project will put the region in a stronger position to take advantage of good years – when they come! We look forward, in the coming years, to the appearance of many distinctive beers and spirits, made from North Atlantic cereals.

The Author

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