

ATLANTBERRY

Expanding berry production in the North Atlantic region

Report project year 3

Reporting period

This report is for project year 3 of the project, for the period July 1st 2012 – June 30th 2013.

Project objectives

The main objective of the project is to form the base for a commercial production of berries in plastic tunnels in Iceland, Faroe Islands and Greenland. The long-term objective is a future supply of the domestic market in these countries with locally produced fresh berries.

Project partners and project organisation

Project partners during third project year has been Njøs næringsutvikling AS (Norway) represented by Dag Røen (project leader), Agricultural University of Iceland, Reykir (Iceland) represented by Jón Kr. Arnarson and Úlfur Oskarsson, Bunaðarstovan (Faroe Islands) represented by Rólvur Djurhuus, Upernaviarsuk Agricultural Station (Greenland) represented by Anne Jensen (until Nov 2012), and Aqqalooraq Frederiksen (from Nov 2012), 3 growers at Iceland (Sigrún Reynisdóttir and Ingólfur Guðnason ; Hólmfriður Geirsdóttir and Steinar Jensen; Gisli Jóhannsson), 1 grower at Faroe Islands (Jákup K. Bærentsen in 2012; ALS in 2013), Farmers Association Iceland (Iceland) represented by Ægir Þór Þórsson and Guðbjörg Helga Jóhannisdóttir, Alvereng gård (Norway) represented by Pål Alvereng, Sognabær DA (Norway) represented by Ola Hopperstad, Sagaplant AS (Norway) represented by Jan Meland, Graminor AS (Norway) represented by Dag Røen and Muath Alsheikh, FMLA Sogn og Fjordane (Norway) represented by Torbjørn Takle and AL Gartnerhallen (Norway) represented by Nina Heiberg.

The project work is organized in 7 work packages (WP's). Below is a report for third project year for each of these work packages.

WP1: Improve plastic tunnel construction

Work package goal: Improved construction of plastic tunnels to withstand stronger wind pressure.

State by end of project year 3: In autumn 2012, strong winds resulted in total damage on the improved plastic tunnels at Faroe Islands and Greenland, and partially destroyed at Iceland. The conclusion is that this type of tunnels are not suitable for use on these locations.

The risk of wind damage is a major challenge when moving berry production in plastic tunnels to areas where strong winds are more frequent. An important part of the project has therefore been to develop further the tunnel constructions to withstand stronger wind pressure.

A workshop was arranged during project year 1 at SINTEF in Trondheim with experts on construction technique, geo-technique and wind load. The workshop came up with several alternative suggestions to improvements to make the tunnels withstand stronger winds. Some of the suggestions were implemented in the tunnels that were put up during 2011 at Iceland (1 tunnel by grower Ingólfur Guðnason and 1 tunnel by grower Gisli Jóhannsson), Faroe Islands (1 tunnel by grower Jákup K. Bærentsen) and Greenland (1 tunnel by Upernaviarsuk Agricultural Station). These tunnels were launched from Hagebutikken AS under the brand name Arctic Extreme Tunnel (<http://www.arctictunnel.com/extreme.html>).

Strong winds completely destroyed the tunnels at Faroe Islands (September 4 2012) and Greenland (October 15 2012). The plastic was still on and the winds were up to 50 m/s at Faroe Islands and at least 30 m/s at Greenland. With this type of tunnels, the plastic is to be taken off during winter, to avoid such problems. Especially at Faroe islands, it can however be difficult to find days in the autumn with sufficient calm weather to be able to remove the plastic. At Greenland, plastic was kept on so long in order to provide better conditions for the plants in autumn. This was also the situation for the tunnels at Iceland, where one of the tunnels was partly damaged by strong wind (gusts 40-60 m/s) in November 2012. A common problem with all the four tunnels have also been that the door construction is not strong enough, with damage on plastic caused by not so strong winds.



Destroyed plastic tunnel by Jákup K. Bærentsen at Faroe Islands.



Destroyed plastic tunnel at Upernaviarsuk Agricultural Station.

The reason for using this kind of tunnels in the first place, is that they are cheaper and thereby reducing the investment costs for the growers. The conclusion after our testing is, however, that stronger constructions are necessary at locations with such strong winds and a cool and short summer season. The system of removing plastic during winter is less applicable in areas where you have frequent strong winds during spring and autumn, and / or need the temperature rise under plastic to give good enough conditions for plant on the edges of the summer season. In all countries, there are experience with stronger and more expensive permanent plastic greenhouses that have withstood very strong winds. In the continuation of the ATLANTBERRY project, we recommend the use of the type of houses that for several years has proven strong enough, although this will give higher investment costs for the grower.

WP2: Develop locally adapted protocol for protected berry production in North Atlantic region

Work package goal: A locally adapted protocol for protected berry production in the North Atlantic region.

State by end of project year 3: Within the project, we have written a protocol for production of raspberries, and translated it to Faroese and Icelandic languages.

Njøs næringsutvikling AS wrote "Production manual for red raspberry production in North Atlantic region – outdoor, polytunnel and greenhouse". It was published in the report series of Njøs næringsutvikling AS. The Agricultural Centre translated the manual to Faroese, and Agricultural University of Iceland made a translation to Icelandic. All three versions can be downloaded as pdf-files from the website of Njøs næringsutvikling AS (www.njos.no).

WP3: Technology transfer of modern berry production through networking

Work package goal: Technology transfer on modern berry production within the region through networking.

State by end of project year 3: A well functioning network of growers, advisors and R&D personnel in Greenland, Faroe Islands, Iceland and Norway has been established. Yearly project meetings are arranged with focus on transfer and exchange of knowledge and techniques.

A berry network in the North Atlantic region has been established, including growers, advisors, and researchers from the four participating countries. The third project meeting was arranged at Iceland in August 2012 with 15 participants. We visited the three participating growers in the project (Dalsgarður, Kvístar and Engi) and a project meeting was arranged at Kvístar. Before the meeting at Iceland, the project board and advisor Torbjørn Takle visited the project partner at Qaqortoq / Upernaviarsuk in Greenland. A project board meeting was arranged at Upernaviarsuk Agricultural Station.



Visit in the raspberry tunnel of Gisli Jóhannsson (in front) at Dalsgarður, Iceland. Behind: Úlfur Óskarsson from Agricultural University of Iceland.



The first strawberries produced at Greenland, in the tunnel at Upernaviarsuk Agricultural Station, presented by (from left) Aqqalooraq Frederiksen, Efa Poulsen and Anne Jensen.

The fourth and final project meeting was arranged in Stavanger area in Norway in May 2013 with 12 participants. For budget reasons it was not possible to arrange a full meeting with all partners, and partners partly paid their own travel to be able to participate. We visited the trials with berries in greenhouse at Bioforsk Særheim, and four growers in the Jæren area with raspberries and / or strawberries in tunnels and greenhouses (Jone Wiig, Jakob Mæle, Kjetil Sola and Geir Joa). A project and project board meeting was arranged at Bioforsk Særheim.



Åge Jørgensen at Bioforsk Særheim informs about trials with Ribes in greenhouse to the participants at the 2013 project meeting.



Faroese members of project group discuss during a visit in the tunnels of strawberry grower Geir Joa. In front from left: Rólvur Djurhuus, and Lív Petersen and Magni á Deild Olsen.

WP4: Establish tunnels and develop berry production in Iceland

Work package goal: Establish test production of berries in tunnels in Iceland

State by end of project year 3: Test production of raspberries established in plastic house and tunnels by three growers, one of the growers with organic production. Commercial production of red raspberries established by two growers at Iceland, as a direct result of the Atlantberry project. One grower has started organic production of strawberries in tunnel. The two other growers have established commercial production of strawberries in plastic greenhouses. Commercial berry production in Southern Iceland is becoming a viable business- The greatest success was accomplished where geothermal heating was used to extend growing season and to salvage plants from frost damage. The project has clearly demonstrated a need for further development of plastic greenhouses and production method for a reliable and profitable berry production.

Local funding

The following grants for ATLANTBERRY project from Iceland has been obtained:

- The Development Centre of South Iceland (Atvinnuþróunarfélag Suðurlands) granted 1.500.000 ISK over a period of three year, with ISK 500.000 per year starting in 2011.
- Icelandic Association of Horticulture Producers (Samband garðyrkjubænda) sponsored the travel for one grower to project meeting in Norway in May 2013. This funding went directly to the grower, and was not included in the project account for this project year.

Tunnels

Two 240 m² test tunnels were put up by growers Ingólfur Guðnason and Gisli Jóhannsson in autumn 2011. The tunnel put up by Gisli Jóhannsson were damaged in a storm in November 2012 with gusts up to 40-50 m/s. The plastic was not removed from the tunnel in the autumn, as the grower wanted to take benefit of the higher temperatures under plastic cover. The tunnel of Ingólfur Guðnason survived this storm (also with plastic on), but there were problems with wind damage to the doors also in episodes with less strong winds.

Plants and production

Raspberry plants and strawberry plants were planted autumn 2011 in the tunnel of Ingólfur Guðnason (Engi). These raspberries were not yet in full production in 2012 season. The plants suffered from a little dieback in spring 2013, as there was a rather cold April with frequent frosts after a mild winter. The raspberry plants by Gisli Jóhannsson were overwintered in a nearby plastic house in pots and put in the tunnel in spring 2012. These plants were damaged by frost when moved to the new tunnel, and the raspberry yield was minimal. The tunnel was not repaired after the storm damage, and raspberry plants did not look good in 2013. This grower will probably not continue with raspberry production. At Kvistar, Hólmfriður Geirsdóttir and Steinar Jensen planted raspberry plants already in 2010 and have now established a commercial raspberry production in plastic house. They expanded the production area to 500 m² in 2012 starting from 125 m². They have now purchased and old garden center nearby with 1800 m² nearby and will established 1200 m² with raspberries there. The production at Kvistar has changed from being solely a forest seedling nursery into the first true raspberry farm at Iceland. This is a direct result of the Atlantberry project.



Raspberries in Arctic tunnel by Ingólfur Guðnason at Engi 16 May 2013. Photo: Jón Kr. Arnarson / Úlfur Óskarsson.



Raspberry plants at Kvistar, Iceland, 16 May 2013. Photo: Jón Kr. Arnarson / Úlfur Óskarsson.

The raspberries planted in 2010 gave a yield of 4 kg/m² in 2012. Installation of geothermal heating system prevented damages due to freezing temperatures in spring and autumn 2012. In winter 2012/2013 the geothermal system was running all winter keeping the temperatures inside house always above -3 °C. By this extra heating, they got flowering from April 2013.



Hólmfriður Geirsdóttir in the newly purchased greenhouse that they plan to use for raspberry production. Photo: Jón Kr. Arnarson / Úlfur Óskarsson.

Ingólfur Guðnason (Engi) and Gisli Jóhannsson (Dalsgarður) harvested the first strawberries in tunnel in 2012. Yields were good and quality of berries high. Ingólfur Guðnason at Engi is now increasing his organic strawberry production. Gisli Jóhannsson at Dalsgarður is continuing their strawberry production in small plastic greenhouses but also in beds outdoor. In some of the greenhouses cut bulb flowers precedes the production of strawberries, thereby increasing the greenhouse efficiency. Cut flowers are the main production at Dalsgarður. At Kvistar a strawberry yield of 5 kg/m² was achieved in 2012 with plants in pots on table-top system in Rovero plastic greenhouses. Average berry size per cultivar varied between 12 and 21 g. They planted new strawberry plants in 5 L containers on table-top system in spring 2013. They plan to change plants annually and plant new plants at different times in order to expand the harvest season throughout the whole summer.

Marketing

The high demand for fresh raspberries and strawberries in Iceland makes marketing easy at the moment. Retail prices in 2012 for raspberries and strawberries from growers direct to customers were for raspberries in 200 gram boxes 700 ÍSK, or 3.500 ÍSK/ kilo (about 160 DKK/ kilo), and for strawberries in 200 gram boxes 600 ÍSK, or 3.000 ÍSK/ kilo (about 135 DKK/ kilo). Icelandic berries in a supermarket were priced a little bit higher.



Starwberries in plastic greenhouse by Ingólfur Guðnason at Engi 16 May 2013. Photo: Jón Kr. Arnarson / Úlfur Óskarsson.



Starwberry plants in table-top system by Hólmfriður Geirsdóttir at Kvistar, Iceland, 15 May 2013. Photo: Jón Kr. Arnarson / Úlfur Óskarsson.

WP5: Establish tunnels and develop berry production in Faroe Islands

Work package goal: Establish test production of berries in tunnels in Faroe Islands

State by end of project year 3: One grower established test production of strawberries in tunnel in 2011. The first strawberries from Faroe Islands production were marketed in summers 2011 and 2012 from the tunnel established in the Atlantberry project. The climate under plastic cover at Faroe Islands seem to suit well for strawberry and raspberry production. Wind is however such a challenge that stronger constructions are needed for a reliable growing system. The tunnel collapsed in a storm September 2012, and the grower then kept the strawberry plants as outdoor production in 2013. A new project partner (ALS) is now running test production of strawberries and raspberries in old greenhouses in 2013.

Local Funding

During the first project year the Faroese partner managed to get the aimed local funding to the project, totally 300.000 DKK. Of this 240.000 DKK were granted by Granskingarráðið (The Faroese Research Council) and 60.000 DKK by Meginfelag Búnaðarmanna (The Farmers Cooperation). The funding is paid in equal rates, one rate per calendar year 2011-2013.

Tunnel

The test tunnel of 240 m² was put up by grower Jákup K. Bærentsen at Sund in June 2011 (project year 1). In 2011 plastic was taken off the tunnel in late September. Due to wind at that time, the plastic was damaged and new plastic was bought and put on in 2012 season. It turned out that the door solution was not optimal, as the plastic on doors were easily damaged by wind during summer. The plastic in the doors were exchanged with a stronger plastic summer 2012. A storm on September 4 2012 with gusts up to 50 m/s completely destroyed the tunnel. The grower did not want to build a new tunnel or plastic house. A new partner, ALS, entered the project with their old greenhouses, and have a test production of strawberries there.

Plants and production

Strawberry and raspberry plants were planted in the tunnel in June 2011. The first strawberry crop was harvested in the test tunnel in summer 2011. All plants survived the winter 2011/2012 well, but many raspberry buds were damaged by frost during a storm in May 2012 before the plastic was put on again. The strawberry plants did not suffer damage from this event. Strawberry harvest in 2012 started 9 July. Strawberry yield was between 170 and 840 g per plants depending on cultivar, with Frida giving the highest yield. Berry size per cultivar varied between 12 and 20 g. Total growth season under plastic was 3 months and 1 week. Berries were still harvested when the tunnel was destroyed by wind September 4 2012. The grower, Jákup K. Bærentsen, kept the strawberry plants outdoor in 2013. The raspberry plants from Jákup K. Bærentsen were moved to the greenhouses of ALS, and will produce the first yield there in 2014. ALS established plants of 4 cultivars in June 2012, and harvested the first yield on May 19 2013.

Marketing

All strawberries from the test tunnel in 2012 were sold to the restaurant at Hotel Føroyar for a price of 150 DKK per kg.



Wind damage to the doors (end of tunnel) by Jákup K. Bærentsen at Sund, Faroe Islands, summer 2012. Photo: Rólvur Djurhuus.



Strawberries produced by Jakup K. Bærentsen, Faroe Islands, 2012. Photo: Rólvur Djurhuus.



Greenhouses by ALS, Sandavagur, Faroe Islands. Photo: Rólvur Djurhuus.



Stawberries in greenhouse of ALS, May 2013. Photo: Rólvur Djurhuus.

WP6: Establish tunnels and develop berry production in Greenland

Work package goal: Establish test production of berries in tunnels in Greenland.

State by end of project year 3: Test production of strawberries established in tunnel at Upernaviarsuk Agricultural Station. The first strawberries from Greenland was marketed in August 2012. Climate under plastic at Greenland seem to be well suited for strawberry production, but we do not yet know whether raspberries can be a potential crop here. The wind is however such a challenge that stronger constructions are probably needed for a reliable growing system. The tunnel collapsed in a storm October 2012, and Upernaviarsuk then kept the strawberry plants as outdoor production in 2013.

Local funding

Grønlandsbankens Erhvervsfond granted 150.000 DKK over 3 years to ATLANTBERRY project. In 2011, 2012 and 2013 Kommune Kujalleq granted DKK 50.000 per year to the project

Tunnel

The test tunnel of 240 m² was put up at Upernaviarsuk Agricultural Station in late summer 2011. Also at Greenland problems with door construction of the tunnel has been experienced after a summer storm in 2012. The tunnel totally collapsed in a storm on October 15 2012. The plastic was still on and the winds were up to at least 30 m/s at Greenland. We did not put up a new tunnel or plastic greenhouse in 2013, and the strawberry plants were kept outdoor in 2013.

Plants and production

Strawberry plants were planted in the tunnel in August 2011. They had snow cover unusually late in spring 2012, and plastic was not put on tunnel until 11 June. Never the less the first strawberry crop was harvested in the test tunnel in summer 2012 (start of harvest early August). June and July were rather hot and dry. In a normal year plastic can probably be put on at least one month earlier, probably shifting the start of strawberry harvest until sometime during July. Strawberry yield was between 140 and 420 g per plants depending on cultivar, with Honeoye and Sonata giving the highest yield. Average berry size per cultivar varied between 7 and 13 g. Survival of raspberry plants after shipment in 2011 was very poor, and growth of the surviving plants was also very poor. Some additional plants of strawberries of raspberries, and some Ribes cuttings, were sent from Norway to Greenland in spring 2012, and raspberry roots were also sent in spring 2013. We still experience problems in getting the plant material of raspberries viable to Greenland, and this represent a challenge to us. We now have contact with a nursery at Iceland (Barri) who regularly export forest plants to Greenland, and which now enter into production of plants of strawberries and raspberries. By using their experience and established transport channel, we hope to be able to increase survival of plants by export to Greenland.

Marketing

The strawberries from the tunnel at Greenland in 2012 were sold locally in Qaqortoq.



Flowering strawberries in tunnel at Upernaviarsuk Agricultural Station, Greenland, summer 2012.
Photo: Anne Jensen / Aqqalooraq Frederiksen.



The first strawberries harvested at Greenland August 2012. Photo: Anne Jensen / Aqqalooraq Frederiksen.

WP7: Project administration

Project seminars were arranged at Iceland in August 2012 with 15 participants, and in Norway in May 2013 with 12 participants (see WP3). Project board meetings were arranged at Greenland 5 August 2012, on Skype 10 December 2012 and in Norway 23 May 2013.

Leikanger, 25 November 2013

Dag Røen