



Monitor Farm Scotland

“The Salome Project”

Virtual Agronomy in Practice

January 2020



Monitor Farm Salome Project

Salome Project Report



Project overview

Scandinavian spring barley variety Salome was grown on four monitor farms across three locations in Scotland in order to ascertain if it is a viable option for commercial use in the malting sector.

The variety was chosen due to its early maturity and was grown at farms in Angus, Lothian and Shetland in order to compare its performance in different regions and climates. The farms grew Salome alongside existing varieties such as Laureate and Concerto and compared the crops in terms of grain yield and spirit yield.

Background

On average over 250,000 hectares of Scotland's arable land is devoted to the production of spring barley, much of which will be used as a base for malt whisky, while a significant proportion will also be used as animal feed. Growing spring barley for the whisky industry is not always easy, but it does pay off, with farmers paid a premium for a high-quality crop. Although barley is a mainstay in Scottish arable rotations, it needs to be profitable and sustainable and maltsters, brewers and distillers are concerned about the long-term sustainability of the barley crop.

Predicted climate change scenarios, such as drought conditions are likely to become more frequent and will affect the spring crop much more than the winter crop, which can escape the worst effects of summer drought through earlier maturity. There is an increasing market for lower Beta Glucan barley which should have a higher spirit yield as a result but also make it easier to achieve the standards for malting barley.



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The project set out to grow Spring Barley variety Salome alongside existing varieties on monitor farms to compare the grain yield and spirit yield at the end of the project. Salome being a week early ripening variety should show an increase in vigour and bring forward the key fungicide timings. At these critical timings it was planned to host a virtual agronomy seminar simultaneously with the other monitor farms who are repeating the trial at different locations in Scotland. This should demonstrate the issues faced up and down the country and should allow us to tailor inputs between timing of growth stages. At a time when product registration is becoming increasingly difficult it allows us to see first-hand what differences in strategies other varieties can bring to the table as well as seeing how they react in different locations across the country. Communication will be transmitted to the wider community by means of logging into a video skype call. Using multi-channel communication tools means the wealth of knowledge from the growers within the monitor farm project and the wider agricultural community can be shared

Project approach

The wider Monitor Farm group collaborated on an arable project led by the AHDB to compare and contrast their experiences of growing a Scandinavian Spring Barley variety at four locations across Scotland. The project provided the host farmers with an opportunity to receive agronomy advice 'virtually' whereby each participant linked via a video call to a shared media platform. Each farmer was able to discuss their individual crops whilst standing in their field on a live video link and also gain agronomy advice from an agronomist based at a central location.



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The project also allowed the wider Monitor Farm Network to experience how a Swedish variety would perform in Scotland and in particular how it would yield in Shetland where growing conditions are closest to those in Scandinavia. It should be noted that the project has been run as an on-farm try-out and has not been run under trial conditions.

The Project Farm Members

Farmer	Farm	Monitor
Bill Gray	Preston Hall Farm	Lothians
Rory Stoddart	Mill of Inverarity	Angus
Kirsty & Aimee Budge	Bigton Farm	Shetland
Jamie Leslie	Scholland Farm	Shetland

Project Management Team

Name	Organisation	Role
Chris Leslie	AHDB	Project Leader
Greg Dawson	Scottish Agronomy	Agronomist
Aiden Monaghan	SOYL	Soils
Colin MacPhail	5Agri	Project Co-ordinator

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Salome

The Salome barley variety was chosen for its early maturity and was grown by Scottish monitor farmers in Angus, Lothian and Shetland, to compare its performance in different regions and climates. Salome should ripen a week earlier than current favoured spring barleys such as Laureate which means that an increase in vigour and yield was expected from the variety being trialled.

The farms grew Salome alongside existing varieties, such as Laureate and Concerto, to compare grain and spirit yields. The seed was sourced from Vaderstad in Sweden and arrived in Scotland on 11 April 2019. It was re-cleaned, bagged and distributed to the farmers. The agronomy input

was coordinated by Chris Leslie, Knowledge Exchange Manager for AHDB and was initially conducted through a project WhatsApp group who shared images, discussion and advice. The Salome plots from each farm were also entered into the Yield Enhancement Network (YEN) which allows more in-depth feedback and provides soil and biomass analysis.

The project was funded through the Monitor Farm Scotland programme which in turn is funded by the Scottish Government, and due to the diverse locations of the farms involved a series of 'virtual agronomy' sessions were held to support crop management.

At the crop critical timings a virtual agronomy seminar with all the farms involved in the trial was hosted. Using tablets and 4G, the hosts were able to walk their fields whilst discussing



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their crop with the other farmers at different locations as well as agronomists from Scottish Agronomy.

Key Dates - 2019

Seed Arrival	11 th April
First Sowing Date (Shetland)	16 th April
Last Sowing Date (Angus)	3 th May
Awns Peeping (Shetland)	18 June
Harvest (Shetland)	3 rd September

Trial sites

The Lothians trial field was sited next to farm buildings at Preston Hall farm as most sowing had been completed by the time the seed arrived. The Salome was sown alongside a crop of Concerto as a comparison and monitored through the growing season.

The Shetland trial fields at Scholland and Bigton were more representative of the normal sowing dates and growing conditions. Jamie Leslie, Chair of the Shetland Monitor Farm Management Group, said: "In Shetland we can grow decent crops of spring barley, our long summer daylight hours mean we can maximise growth during these months.



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“However when autumn appears, harvest can be extremely frustrating with short damp days therefore crop maturity is of the upmost importance. There is no point in growing a record breaking crop if it won't ripen and you can't cut it.

“During a recent AHDB-sponsored study trip to Sweden I was extremely impressed with the trial plots of Salome that were on display, they stood out amongst many other varieties some of which were familiar to us in the UK. I was really keen to try it and I hope it exceeds my high expectations.”

The Angus trial plot was sown later than expected due to the field being recently purchased and access not permitted until late April, this may be reflected in the results and the performance.

Ultimately, the Shetland plots were the most important to the try-out and Angus and Lothians plots were grown for virtual agronomy purposes and to compare and contrast on disease pressure and general performance.

Establishment Shetland

As Shetland is the most relevant location to Scandinavia the photos below show the Salome establishment and growing season in Shetland for the Salome which was sown on 16th April 2019.



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8 days after sowing



14 days after sowing



Sassy on left – Salome on right



Salome 13th May



25th May Scholland

25th May Bigton

25th May Bigton

The Growing Season

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Shetland 7th June 2019

Biomass Measurement

Salome 4190kg

Sassy (same field) 3115kg

Planet after beet 4140kg

Sassy after beet 3965kg

The beet field was sown a week earlier.

Salome has grown biomass 60% faster than sassy in same field.

Salome has grown biomass 15% faster than the beet field.

Jamie Leslie

Salome has gone from 1765kg to 4190kg, 161kg growth per day (huge growth, grass growth of 100kg would be excellent).

Sassy 1590kg to 3115kg, 101kg/day

Beet field 1990kg to 4052kg, 137kg/day

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Shetland Salome – 16th June 2019



Salome Project Report

Shetland Salome – 25th June
2019



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Lothians – 27th June 2019



Top Left – Salome Flag Leaf on left – Concerto on

Top Right– Dead Rhynco on Salome right

Bottom Left - Concerto left Main + 2 - 3 tillers;

Salome right, Main + 5-6 tillers

Bottom Right - Line in distance is headed Salome vs awns showing Concerto. Prob + 3 days

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Lothians 27th June 2019



Bill Gray

“Not the best field I'm afraid. Went in a bit late - not ideal seedbed. Interesting comparisons though. “

“Concerto has a bit of old net blotch and Salome some old Ryncho otherwise pretty clean under a medium Fung input regime.”

“Better comparison might have been with Laureate. I suspect less difference apart from earliness”

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Bill Gray (comment)

“View from top of the drier.
Clear difference in growth
stage. Salome background;
Concerto foreground”

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Virtual Agronomy Session 4th July 2019

Salome - Scholland – Shetland



Salome - Prestonhall – Lothians



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Bigton Shetland 5th July 2019



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Shetland – 5th July 2019

Bigton Salome on the Right

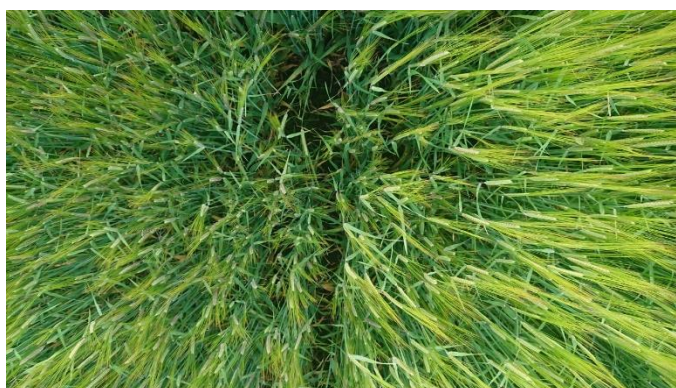


Scholland Salome



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Below – Scholland 8th July all Photos Sassy left – Salome on right



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Comparison 25th/28th July



Lothians 25th July

Chris Leslie (comment)

“Looks good. No green leaf left at all so it is what it is now. It'll be ready in couple weeks”

Right - Scholland Shetland 28th July



Scholland Shetland

Left – Left Salome

Centre Sassy

Right Earlier sown Planet

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Scholland Shetland 13th August 2019



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Scholland Shetland Harvest 3rd September



Jamies Leslie (comment)

“That's it in the shed, rain is about here now to.”

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“Straw was nearly dry but not quite so moisture was 23%. Actual grain if it was a proper day would have been under 20.”

“We had to cut a little sassy to get at the Salome it was at 29% so there's a maturity comparison!”

“Wet yield off 2ha (17ton)”.

“By my calculations that's 7.7ton/ha adjusted to 15%.”

“Lots of straw too”

“It hasn't been the best year up here to give us the full picture but I think it has worked really well.”

“Grain isn't the biggest I've ever seen but I'll look forward to the yen report for more info.”

Scholland Shetland - Harvest 3rd September 2019



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Jamie Leslie (comment)

“no pre-harvest glyphosate on Salome, Sassy had Glyphosate 25th August”

“Straw Yield 11 bales/acre”

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Lothians Results

The results for the Lothians Salome crop were 4.9t/ha but Bill Gray has admitted that this is possibly not representative and a fair assumption of the true performance. Firstly, the field was not ideal for the trial and secondly the sowing date was later than expected. Also, it would appear the crop missed an application of fertiliser due to a mis-understanding/mis-communication with the farm staff.

Bill Gray - Comments

“Late drilled into min-till seedbed. Initially established well but as I have now discovered, we may have inadvertently missed the second N application. Grass weeds in the form of AMG MSY, HSVR caused some crop competition.”

Key Arable Project Outcomes

- Earlier maturing traits of Salome are beneficial to Shetland
- Straw Yield at 11 bales/acre delivers benefits
- Salome would need to be trialled on field scale to establish its full potential
- Salome performed well in Shetland and could be considered an alternative variety
- Markets would need to be established for the variety



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Virtual Agronomy

The virtual agronomy session which was held in early July was the most impressive aspect of the Salome trial. Instead of webinars as previously proposed, it was decided to take the technology to the next level and try out live virtual agronomy on multiple sites across Scotland with live video links.

The session was set up on a virtual media platform where Greg Dawson the Agronomist was in the field in Angus, Chris Leslie (standing in for Bill) at Preston Hall Farms in the Lothians, Rory Stoddart was in the field in Angus and both Kirsty and Aimee Budge plus Jamie Leslie were in their Salome plots in Shetland. Bill Gray was on holiday in Morayshire and Colin MacPhail was on holiday on the Isle of Mull but everyone (including Bill and Colin) were able to tune in to view the individual sites.

The session was led by Chris Leslie and as each member spoke about their crop the camera screen switched to their mobile device and allowed the other members of the group to see exactly what was being discussed. Bill was able to feed into the conversation from Morayshire via Chris's mobile device at Preston Hall. It was quickly established that the technology has the potential to revolutionise the way agronomy is delivered in the field.

The Virtual Agronomy session has been recorded by AHDB and will be available to view through the Monitor Farm Hub.

Key Virtual Agronomy Outcomes

- Ideal for remote farmers
- Excellent for sharing knowledge
- Technology which automatically cuts to the speaker is impressive

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- Efficient for the Agronomist delivering advice
- Less travel and carbon benefit

Conclusions

The Salome project has delivered on its primary objectives of testing virtual agronomy techniques with a group of farmers whilst measuring and gauging the suitability of a Scandinavian Spring Barley in Scotland. There has been significant value for the Shetland farmers given their proximity and latitude to Sweden for growing a similar variety and the early maturing traits, grain yield, disease resistance and straw yield would suggest that Salome is a viable option for both Scholland and Bigton.

The opportunity for Salome in the Lothians and Angus would need to be investigated further as growing conditions are more favourable for other mainstream varieties. Available markets would also have to be investigated as the main grain buyers will not be familiar with Salome.

All farmers and participants in the Virtual Agronomy session were enthused by the opportunity that this could bring and would be interested in investigating further projects whereby the concept could be rolled out.

In summary, although there were challenges at the beginning of the project with seed supply in time for sowing, the project has been a great success in terms of proving the ability to use technology to deliver agronomy remotely. The comparisons in growth stages between Shetland in the North and the Lothians in the South, has been very interesting for everyone in the group and it has proved that Salome may be a viable option for farmers in Shetland.



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The virtual agronomy techniques used on this project have the ability to revolutionise the way agronomy is delivered. Due to the success of this project the AHDB is funding follow-up trials growing Salome in 2020 and running other projects to further test virtual agronomy on its strategic farm network.

In summary the project has been a great success. It has been farmer led and farmer driven and the ability of the technology and success of the virtual agronomy session was unexpected. This project and the virtual agronomy concept demonstrated to farmers the potential technology can offer and was a great example of what may have seemed futuristic is now actually achievable in practice.

Appendices

Additional Reports and Yen Results



SOYL Demo Biomass
Imagery AHDB Salon



Bill Salome
CF01544.pdf



Bigton CF01542.pdf



Angus
CF001543.pdf



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