

# Raspberry Breeding Consortium

Summary Annual Report 2020



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## 1. Introduction

This report summarises the activities during year two (1<sup>st</sup> April 2020 – 31<sup>st</sup> March 2021) of the RBC tranche 2019-2024, presenting results from the breeding plots at James Hutton Institute and a summary of the results from the existing on-farm trials. It also describes knowledge transfer activities undertaken throughout the year.

## 2. Summary

### 2.1. Headlines and Highlights

- New varieties, Lewis, Skye and Glen Mor were launched and promoted during 2020 growing season.
- Step changes are planned in the breeding programme to focus new breeding efforts on pathogen resistance and develop new protocols to progress the project.

### 2.2. COVID 19

The Institute went into a 'restricted access condition' on 23<sup>rd</sup> March 2020 but took steps to mitigate the impact of disruption to the project, only allowing access to staff to do essential work. The breeding programmes were considered essential and the raspberry breeding team had access to carry out field and glasshouse tasks. A reduced team of glasshouse and field staff were on-site to maintain the plants and field trials. Restricted access remained throughout the growing season and this delayed tunnel skinning, otherwise the workplan of the project was completed on schedule thanks to the commitment of Lynne Ferguson, and the soft fruit field and glasshouse teams.

### 2.3. 2020 Fruit Season and Breeding trials

- After a wet February, conditions from March until June gave a prolonged period of warm, dry days with long sun hours.
- We saw frost damage to flowers after several nights of sub-zero temperatures mid-May.
- Tunnels were covered in the last week of June.
- First pick on summer primocanes 26<sup>th</sup> June (Lewis) and floricanes 30<sup>th</sup> June (Glen Mor).
- Weather conditions during the main summer months was cool, dull and damp compared with spring.
- Good productivity, fruit size, flavour and shelf-life were seen, especially in the floricane crop
- There was an early start to the autumn primocane crop on 26<sup>th</sup> August.
- JHI saw the longest raspberry season, with >18 weeks continuous fruit and no gap between the summer and autumn crops.
- Pathogens were plentiful all season: TSSM, continuous aphids (both colonising and non-colonising) and raspberry beetle, natural predators, midge blight and severe powdery mildew.

Figure 1 Mean yield data from floricanne Demonstration Plot in 2020

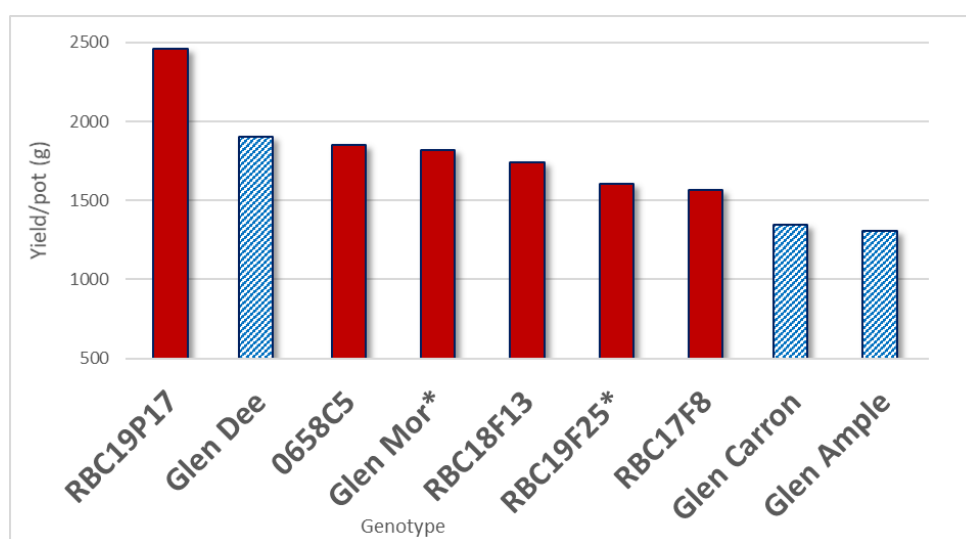
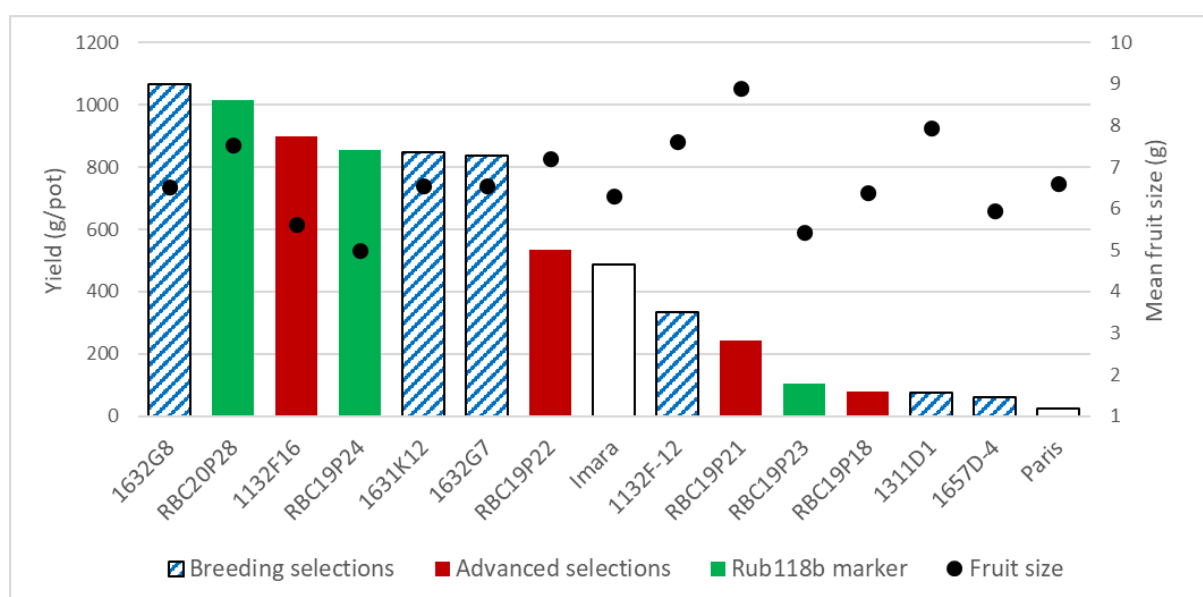


Table 1 Fruit quality data from floricanne Demonstration Plot in 2020

	First pick date	Last pick date	Yield/pot (g)	Fruit size (g)	Brix°
<b>RBC19P17</b>	03/07/2020	24/08/2020	2462	6.0	11.8
<b>Glen Dee</b>	15/07/2020	17/08/2020	1902	6.1	10.8
<b>0658C5</b>	03/07/2020	17/08/2020	1853	6.5	10.9
<b>Glen Mor*</b>	30/06/2020	12/08/2020	1818	5.9	10.9
<b>RBC18F13</b>	08/07/2020	12/08/2020	1742	6.1	10.9
<b>RBC19F25*</b>	30/06/2020	24/07/2020	1605	4.8	9.3
<b>RBC17F8</b>	06/07/2020	12/08/2020	1567	6.7	10.1
<b>Glen Carron</b>	03/07/2020	14/08/2020	1346	5.7	10.4
<b>Glen Ample</b>	06/07/2020	12/08/2020	1306	5.6	10.9

Figure 2 Mean yield and fruit size data from primocane substrate breeding trial



## 2.4. Results and feedback of the new varieties; Lewis, Skye and Glen Mor

### • Lewis (Early primocane)

Lewis performed very well, with exceptional flavour, in the demonstration tunnel at JHI. The summer crop started early on the 26<sup>th</sup> June and produced large fruit with very high brix (>15°) and excellent sweet flavour. The issue of split fruit/receptacle was recorded early and late in the season, but not in excessive proportions. This characteristic was also noted in trials in the UK and Europe. The primocane crop started on 20<sup>th</sup> August, 4 days after Polka and nearly three weeks before Kwanza with stunning fruit appearance.

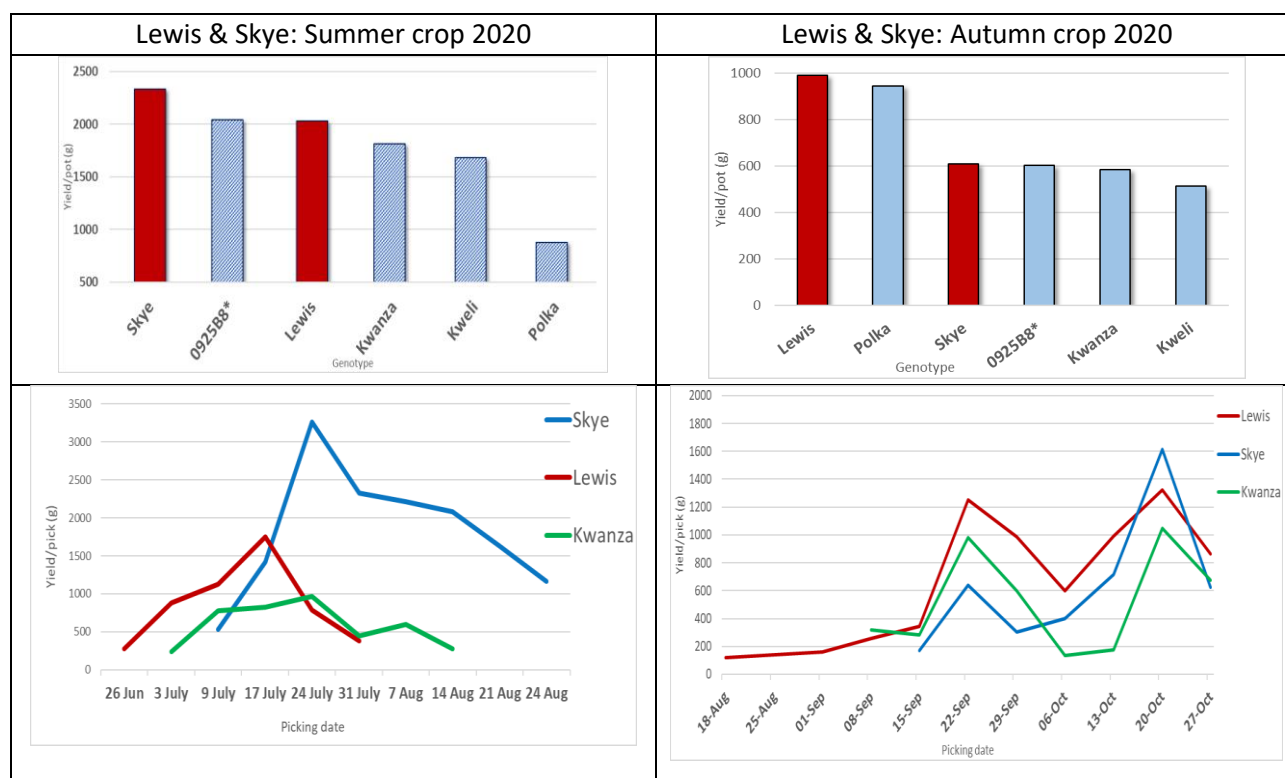
### • Skye (Double cropping, late primocane)

In the breeding plots, Skye was very productive and maintained a uniform, predictable quality in both the summer crop and the primocane crop. Fruit has a very neat appearance and is glossy. The fruit must be picked at a pink stage to achieve a uniform appearance after storage. Skye has very good shelf-life and remains very firm with no bleeding after 10 days. The summer pick had a long cropping period, starting on 10<sup>th</sup> July, two weeks after the summer crop of Lewis and picked until the third week of August, 10 days after Kwanza had finished. The autumn crop started a week later than Kwanza on 15<sup>th</sup> September and green fruit still remained on the primocane once picking had finished at the end of October.

Skye produces long, straight canes with small, dark red spines. Canes have a short internode length. Bud break is complete down the summer cane, producing a high number of laterals/cane and also a high number of fruits/lateral.

In the trials, Skye had the most comprehensive feedback, describing a high yield and firm fruit with a long shelf life. In Portugal (Summer Berry Company Portugal), it performed very well with good fruit quality, productivity and strong rust tolerance compared with Sapphire and Diamond Jubilee. Plants produced impressive long cane which stored well and demonstrated good bud break. Details on performance after different storage periods will be available by summer 2021.

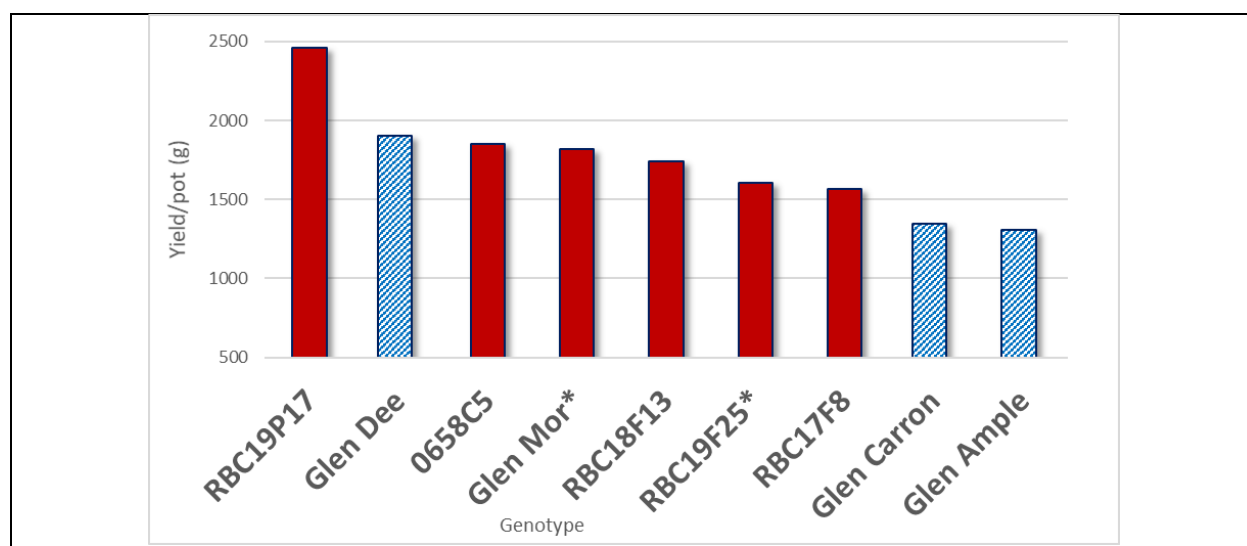
Figure 3 Total yield and pick profile of Skye and Lewis in 2020 season (Demo plot, JHI)



- Glen Mor (Early floricanes with root rot marker *Rub118b*) (presence of marker confers resistance to root rot).

Glen Mor is an early floricanes and is the first variety to be released with the marker for root rot resistance, *Rub118b*, and demonstrates good root rot resistance in an infested field plot. In the breeding plots in 2020, Glen Mor was assessed in coir, showing good productivity and fruit quality. Fruit started early on the 30<sup>th</sup> June and picked over a long season until mid- August. Fruit is easy to pick and is popular with pickers on site since the berries are displayed well and easy to pick off the receptacle. Fruit is sweet with a pleasant acid balance and coconut notes.

Figure 4 Total yield and picking profile of Glen Mor, Demo plot, JHI



## 2.5. Advanced Selections Identified for On-Farm Trials

- Floricane 0658C5

0658C5 is a mid-season floricanes selected initially in 2012 for its outstanding yield, fruit size and flavour. After demonstrating a high proportion of crumbly fruit in on-farm trials in 2015, the micropropagated material was destroyed and trials were conducted at James Hutton with root propagated material only. After three years in soil and coir plots, 0658C5 continued to outperform more modern selections in the breeding and demo trials and was identified for re-trial through root propagation only.

Plants of six selections will be available for planting in trials in spring 2021. These plants are in micropropagation at Iribov, NL

- Floricane RBC18F13

Results from the breeding plots showed a good performance in 2018 with good feedback on flavour when presented at all of the summer events and was top for yield in the Demonstration floricanes plot in 2019. Plants were initially grown in soil and showed very good tolerance to *Phytophthora*, despite not having the Rub118b marker.

- Long canes; RBC19F25 (Rub118b), RBC19F26 (Rub118b) and RBC19F27

These three selections were identified, and the Consortium agreed to progress into on-farm trials after more emphasis was put on selecting types with long cane potential; strong straight cane, short internode length, spinefree, reduced chill requirement, good bud break, prolific propagation. All three have been in a soil plot with primocane grow through for three seasons in the soil and show promise as potential long cane types with excellent fruit quality. These will be assessed in coir in 2021.

- Primocane RBC19P19

Primocane RBC19P19 was identified as early and outstanding in the primocane trial at RW Walpole in 2018 after producing an early autumn crop with large fruit, easy to pick with very pleasant eating quality. This was highlighted again in 2019 and also performed well in the Demo tunnel in 2020 as an immature crop, with early fruit easily plugged.

## 3.6 Fruit Tasting

Distribution of fruit for tasting at events and meetings wasn't possible during the 2020 season, however Laura Paterson, JHL's Marketing Manager, implemented a plan involving the distribution of individual samples for staff to take home and record video footage their family members tasting and comparing four different genotypes, providing blind, unbiased feedback on the cultivars and selections.

## 3. Knowledge Transfer

### 3.1. Conferences and Events

A talk was given at the following events to disseminate results and promote the new varieties:

- SSCR Soft Fruit Winter meeting, 13 February 2020, West Park, Dundee
- AHDB Podcast, 19 June 2020 <https://ahdb.org.uk/podcast>
- Fruit for the Future, 24-28 August 2020. (287 views) [youtube.com/watch?v=wzpjnLp4Zms](https://www.youtube.com/watch?v=wzpjnLp4Zms)
- Fruit Focus, 9-10 September 2020
- GPG Webinar, 7 October 2020
- Berry Gardens Research and Agronomy Conference, 11 November 2020

- New developments of raspberry and blackberry breeding in Scotland, NARBA Conference 23-26 February 2021 (365 attendees, 117 views)
- AHDB Webinar, 18 March 2021 <https://ahdb.org.uk/horticulture-events-archive>

### 3.2. Visits to Trials

- Seaton Farm, Arbroath, 25 May 2020
- Leadketty Farm, Dunning, 24 July 2020

### 3.3. Other Knowledge Transfer

Attendance and promotion of new varieties on a stand at the ISFC, Hertogenbosch, NL, 8 January 2020

### 3.4. Social Media

Laura Paterson, JHL Marketing Manager, has created several videos and maintains a regular stream of news on events and promotion of the new varieties on the following social media platforms:

- LinkedIn JHL [www.linkedin.com/company/james-hutton-limited/](http://www.linkedin.com/company/james-hutton-limited/)
- LinkedIn RBC [www.linkedin.com/feed/update/urn:li:activity:6777136432910786560/](http://www.linkedin.com/feed/update/urn:li:activity:6777136432910786560/)
- YouTube <https://www.youtube.com/channel/UCuoGWNPG1F8vXqGbwqglflg>
- Twitter [www.twitter.com/JamesHuttonLtd](http://www.twitter.com/JamesHuttonLtd)
- Facebook [www.facebook.com/JamesHuttonLtd/](http://www.facebook.com/JamesHuttonLtd/)
- JHL Website [www.huttonltd.com/](http://www.huttonltd.com/)



## 2. Appendix I: Photos



New cultivars and advanced selections picked from Demo, JHI July 2020



Glen Mor, Demo JHI, June 2020



Glen Mor, Demo JHI, June 2020



Lewis floricanne crop, Demo JHI, June 2020



Lewis floricanne crop, June 2020, photo courtesy of Berry Gardens

Skye floricanne crop at Berry Gardens trial, Perthshire, July 2020





Skye picked from Demo tunnel, JHI



RBC19P17 long cane crop, Demo tunnel, JHI



0658C5 florican crop, JHI July 2020



RBC19P19, primocane, JHI September 2020



RBC20P28 primocane crop, Kent, August 2020, photo courtesy of Berry Gardens



RBC20P32 primocane fruit, JHI October 2020