



RASPBERRY BREEDING CONSORTIUM

Summary Annual Report 2022

Contents

1. Introduction.....	1
2. Results and Discussion	1
2.1. Headlines and highlights.....	1
2.2. 2022 Fruit Season and Breeding Trials	1
2.3. Results and feedback of the new varieties	2
2.4. Skye.....	2
2.5. Lewis	2
2.6. Glen Mor.....	4
3. Advanced Selections Identified for On-Farm Trials.....	5
3.1. 0658C5: Recommended for Release.....	5
3.2. Selections in Batch 2	8
4. Knowledge Transfer	11
4.1. Conferences and Events	11
4.2. Visits to Trials 2022.....	11
4.3. Associated Projects	11

1. Introduction

This report summarises the activities during year four of the RBC tranche 2019-2024, and presents the results from the breeding plots at James Hutton Institute and a summary of the results from the existing on-farm trials. It also describes associated projects and knowledge transfer activities undertaken throughout the year.

2. Results and Discussion

2.1. Headlines and highlights

- **Florican selection 0658C5 was outstanding in on-farm trials and is recommended for commercialisation.**
- **An independent trial to optimise fertigation of the new cultivars was conducted by FAST LLP at Brogdale Farm, Kent and includes Skye, Lewis and Glen Mor.**

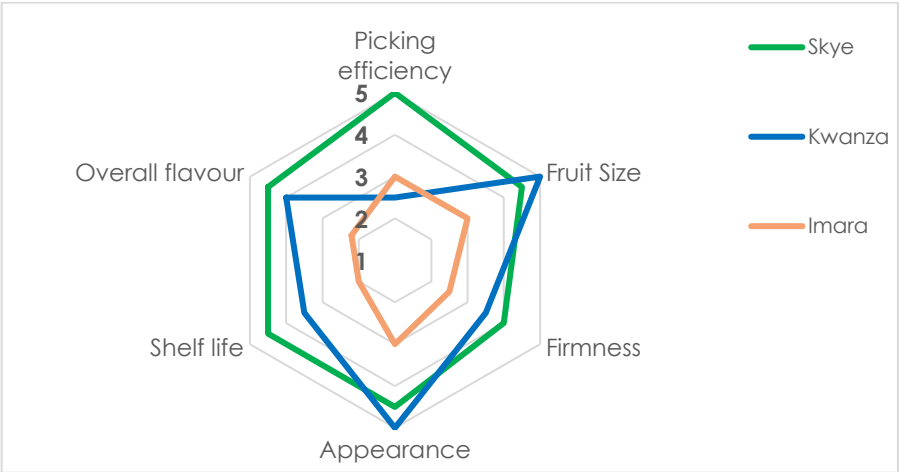
2.2. 2022 Fruit Season and Breeding Trials

- Early winter exhibited mild temperatures through November and December with 15°C on 1st January. The majority of the chilling (below 4°C) was achieved in January and February.
- Conditions through spring and early summer were dry, sunny and cool between February and June.
- There was no obvious frost damage but wind damage to laterals was seen in May.
- Summer was warm and dry with record high temperatures in July of 32°C
- The summer season was early and condensed with the first pick on 17th June and the peak of the crop was over by the middle of July. There was little apparent season difference between the early and late genotypes resulting in similar cropping profiles.
- Yield and fruit size were noticeably less than normal, likely due to persistent aphid infestation during the growing season.
- The primocanes started late summer, with the first pick on 24th August, continuing until 20th October. The primocane fruit had a very large fruit size in contrast to the summer crop.
- Very high pressure from aphids (colonising and non-colonising) and severe powdery mildew was seen throughout the growing season. However, surprisingly a low infestation of two spot spider mite was found.

2.3. Results and feedback of the new varieties

2.3.1. Skye

FIGURE 1 SKYE: SUMMARY OF CHARACTERISTICS 2022



2.3.2. Lewis

FIGURE 2 LEWIS: SUMMARY OF CHARACTERISTICS 2022

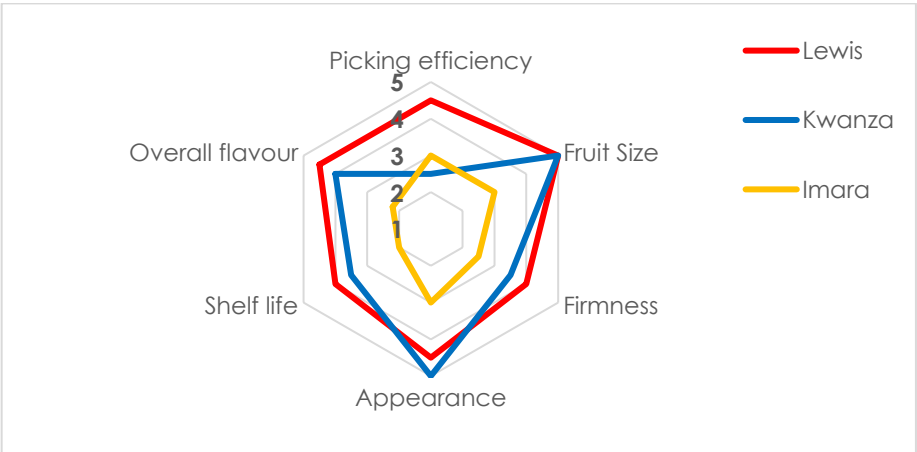


FIGURE 3 SKYE & LEWIS: LONG CANE PICKING PROFILE, SUMMER 2022

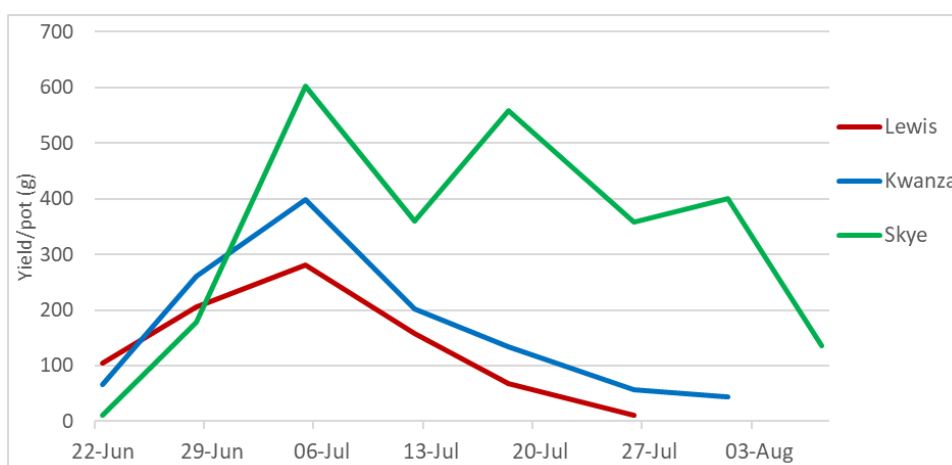


FIGURE 4 SKYE & LEWIS: PRIMOCANE PICKING PROFILE, AUTUMN 2022

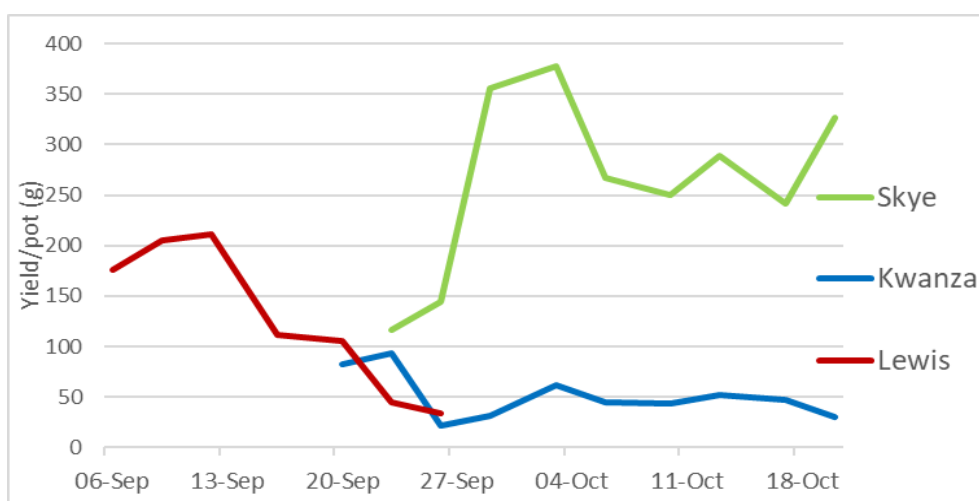
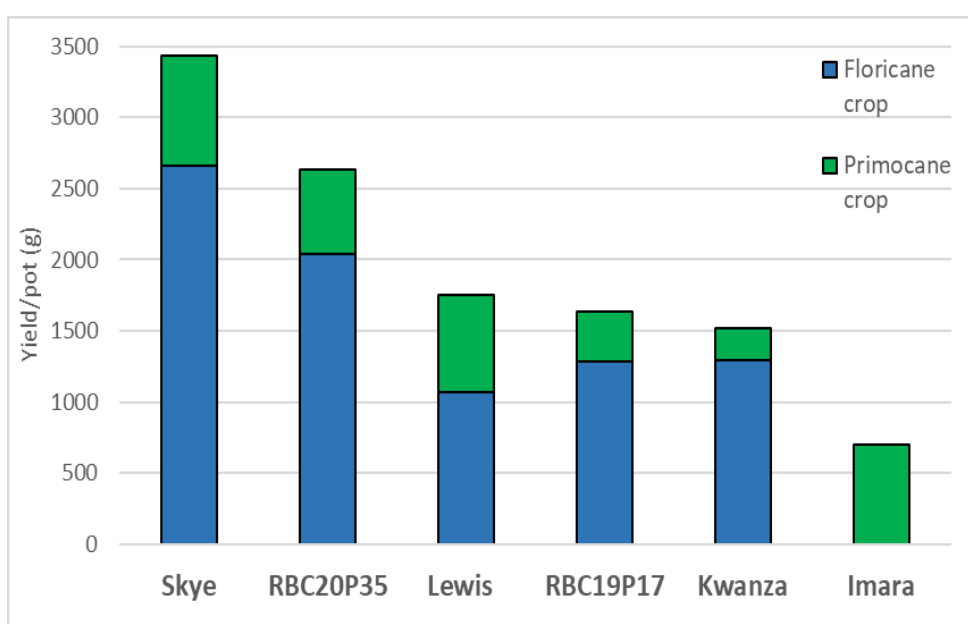


FIGURE 5 SKYE & LEWIS: TOTAL YIELD IN 2022



2.3.3. Glen Mor

Glen Mor performed well in the breeding plots and Demo tunnel at JHI, demonstrating good picking efficiency and fruit quality. The uptake of trial material of Glen Mor.

FIGURE 6 GLEN MOR: SUMMARY OF CHARACTERISTICS 2022

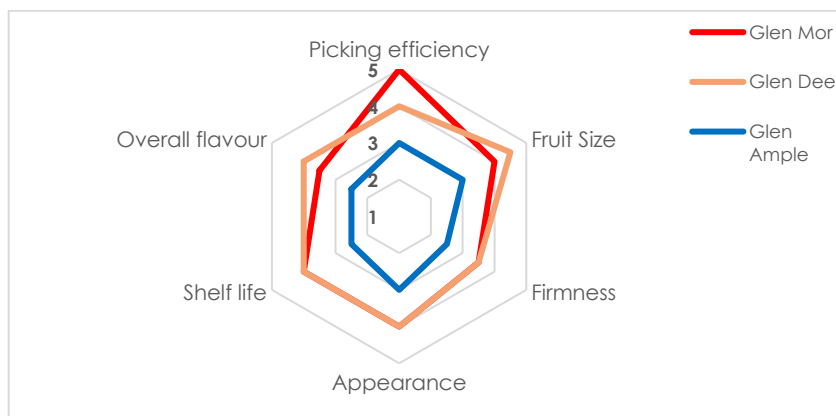


FIGURE 7 GLEN MOR: PICKING PROFILE 2022

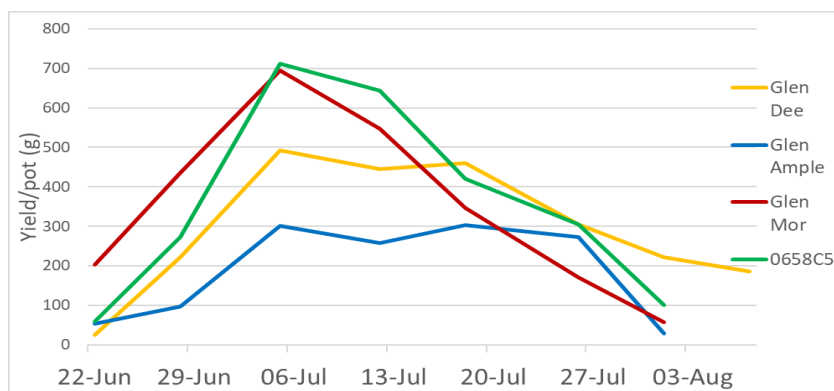
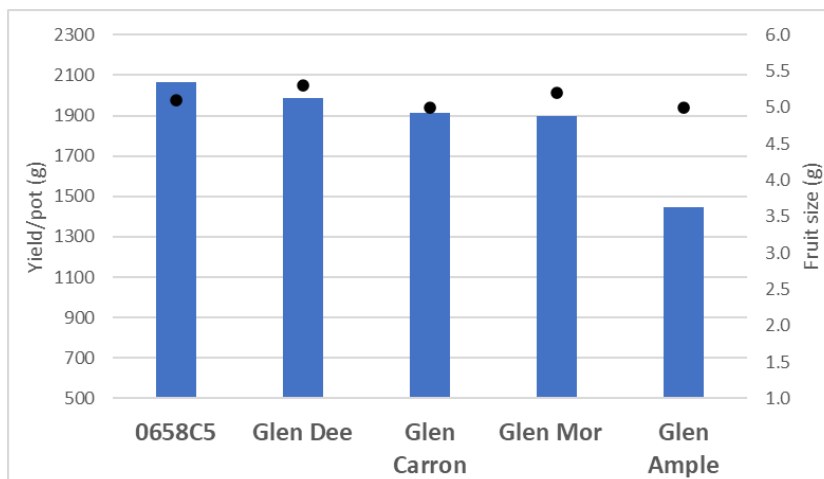


FIGURE 8 GLEN MOR: YIELD AND FRUIT SIZE 2022



3. Advanced Selections Identified for On-Farm Trials

Thirteen selections have been propagated during the project and plants have been offered to triallists (Table 1):

TABLE 1 SELECTIONS PROPAGATED SINCE 2019

	Batch 1	Batch 2	Batch 3	Batch 4	Batch 5
Dispatch	2021/22	2022/23	2023/24	2024	2025
	0658C5	RBC18F13 RBC19F25 RBC19F26 RBC19F27 RBC20F33 RBC19P19	RBC19P17 RBC20P28 RBC20P32	RBC19P24	RBC21P35 RBC21P36
Plug plants	>2,000	>3,000	Trial plants will be produced from root during 2023	Initiated June 2022	Initiation spring/summer 2023
Long cane	1,900	1,400 expected spring 2023			

3.1. 0658C5: Recommended for Release

Florican selection 0658C5 has proven outstanding performance since 2012 and is now recommended for commercialisation and release after on-farm trials feedback was exceptional in 2022.

Summary of 0658C5 in the breeding plots

- A very productive, large-fruited florican
- Early-mid season, fruiting begins 3-5 days before Glen Ample
- Better picking efficiency than Glen Ample and Glen Dee
- Consistent, reliable cropping in soil and substrate for 10 years
- 0658C5 has a popular eating quality and came out top in a flavour project led by Julie Graham in 2019, versus 11 commercial cultivars (Innovate)
- No crumbly fruit from root propagated plants has been reported so far

FIGURE 9 TEN YEARS OF YIELD DATA FROM THE BREEDING PLOTS (2012-2022)

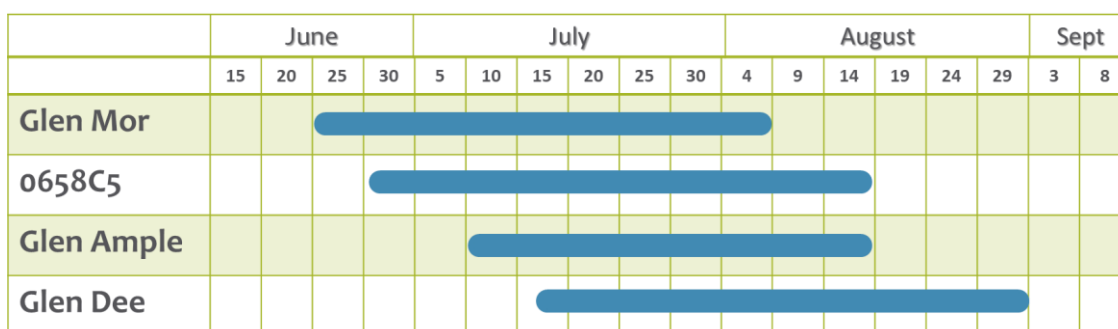


FIGURE 12 0658C5: SUMMARY OF CHARACTERISTICS

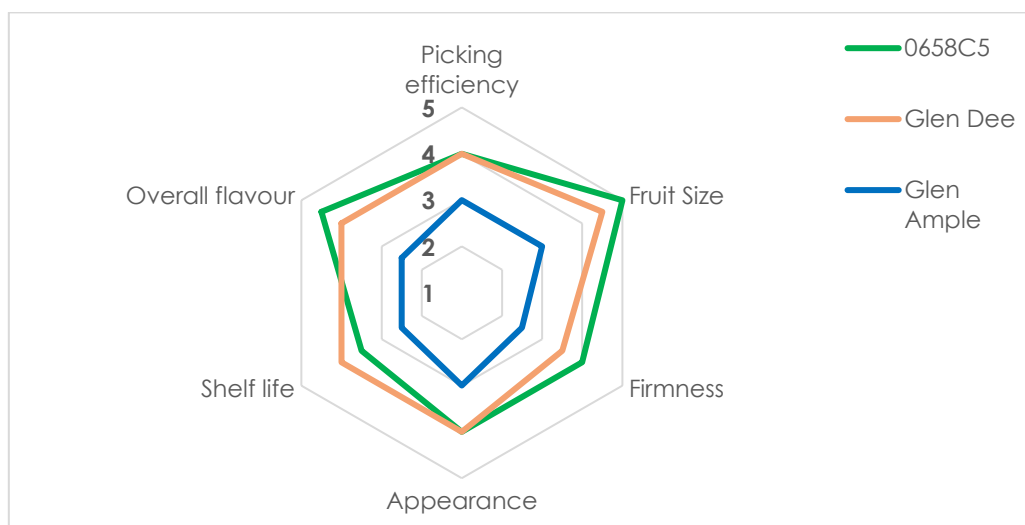


TABLE 2 PHOTOS OF 0658C5



0658C5 Demo plot JHI



0658C5 CLOCKHOUSE, KENT



0658C5 BERRY PLANTS


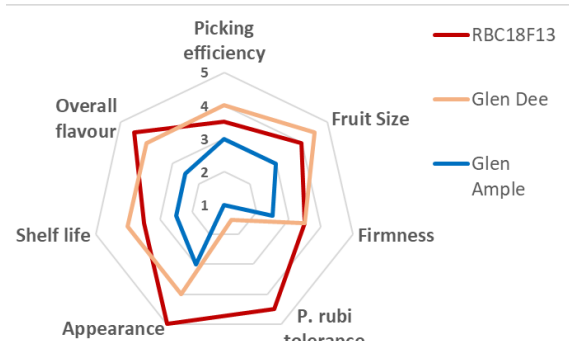


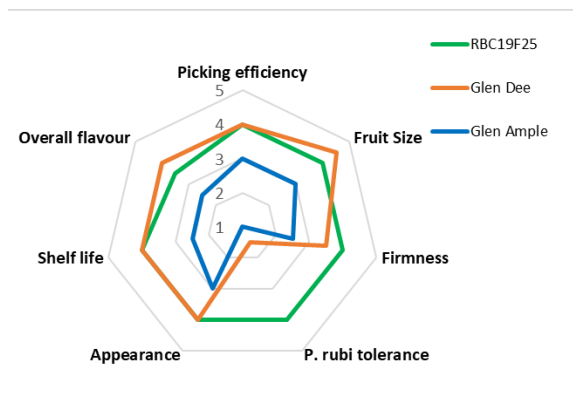
0658C5 BERRY PLANTS

3.2. Selections in Batch 2

Plants from six selections (5x floricanes and 1x primocane) were dispatched in spring 2023 to several triallists. Data below is taken from the JHI Demonstration plot at JHI, which are in replicated 10-plant plots in 10L pots using Kwanza and Imara as controls.

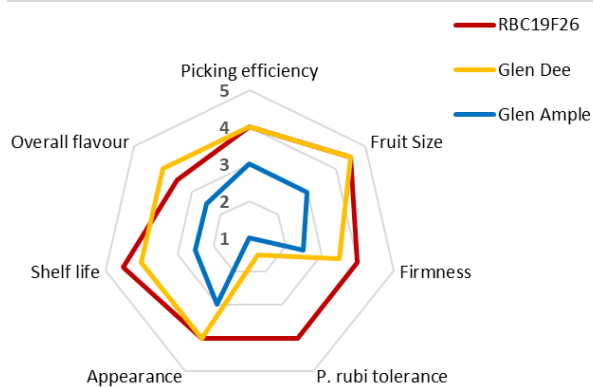
TABLE 3 SELECTIONS IN BATCH 2

<p>Floricanе RBC18F13</p> 	<p>Mid season floricanе with sweet flavour and field tolerance to root rot</p>  <table><caption>Estimated data from Radar Chart</caption><thead><tr><th>Attribute</th><th>RBC18F13</th><th>Glen Dee</th><th>Glen Ample</th></tr></thead><tbody><tr><td>Picking efficiency</td><td>4.5</td><td>4.0</td><td>3.5</td></tr><tr><td>Fruit Size</td><td>4.0</td><td>3.5</td><td>3.0</td></tr><tr><td>Firmness</td><td>4.0</td><td>3.5</td><td>3.0</td></tr><tr><td>P. rubi tolerance</td><td>4.5</td><td>4.0</td><td>3.5</td></tr><tr><td>Appearance</td><td>4.5</td><td>4.0</td><td>3.5</td></tr><tr><td>Shelf life</td><td>4.0</td><td>3.5</td><td>3.0</td></tr><tr><td>Overall flavour</td><td>4.5</td><td>4.0</td><td>3.5</td></tr></tbody></table>	Attribute	RBC18F13	Glen Dee	Glen Ample	Picking efficiency	4.5	4.0	3.5	Fruit Size	4.0	3.5	3.0	Firmness	4.0	3.5	3.0	P. rubi tolerance	4.5	4.0	3.5	Appearance	4.5	4.0	3.5	Shelf life	4.0	3.5	3.0	Overall flavour	4.5	4.0	3.5
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<p>Long cane RBC19F25 Rub118b marker (marker for resistance to root rot)</p>	<p>Spinefree hybrid of (floricanе x primocane) which makes good long cane with lower chill requirement. Easy to harvest and manage</p>																																



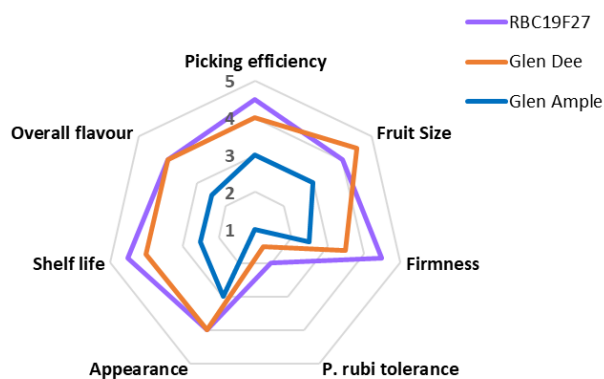
Long cane RBC19F26
Rub118b marker

Spinefree hybrid which makes good long cane with lower chill requirement. Good picking efficiency and easy to manage



Long cane RBC19F27

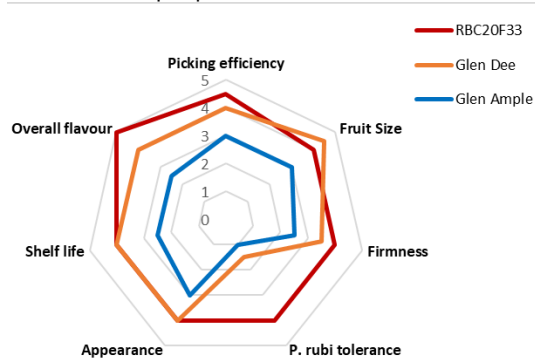
Mid-late summer season, good bud break and very productive



Florican RBC20F33
Rub118b marker



Mid-late summer season, good field tolerance to root rot, good productivity and popular, sweet flavour



Primocane RBC19P19



Mid-late autumn season, large fruit and sweet flavour, good crop on the long cane, spinefree

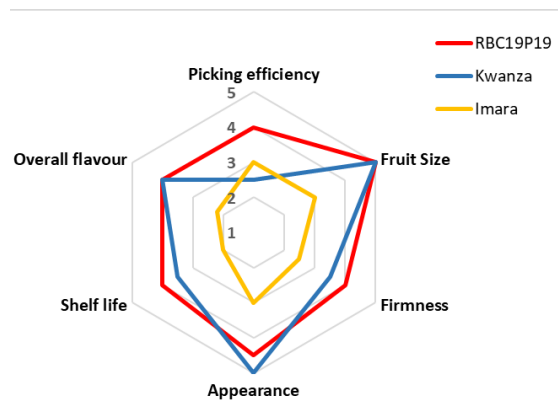
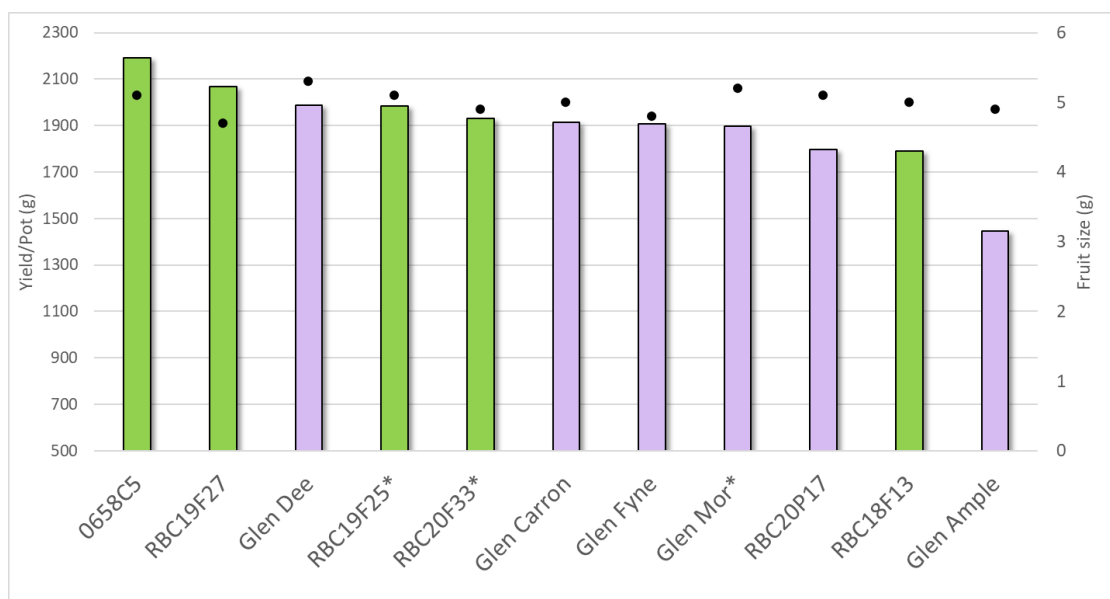


FIGURE 13 YIELD & FRUIT SIZE OF SELECTIONS IN BATCH 2



4. Knowledge Transfer

4.1. Conferences and Events

- Fruit Focus, Kent, 13th July
- Global Plant Genetics grower group, 20th July
- Fruit for the Future, 21st July
- RBC Summer meeting, 22nd July
- FAST Nutrition trial, Brogdale Farm, Faversham, 5th August
- Berry Gardens Technical meeting, Birmingham, 24th November
- RBC AGM, 6th December
- ISFC, Hertogenbosch, NL, 12th January

4.2. Visits to Trials 2022

- Haygrove Farm, Ledbury, 7th June
- Brook Farm, Marden, S&A, 8th June
- Salford Priors, Evesham. Angus Soft Fruits, 8th June
- Star Inn Farm, Invergowrie. 16th June
- Toffhill Farm, Stewarts of Tayside, 22nd June
- Leadketty Farm, Dunning, 28th July
- Family Tree Farms, Stirlingshire, 5th October

4.3. Associated Projects

The following research projects are associated with the raspberry breeding programme and share knowledge and germplasm beneficial to the programme:

- Berry Value, H2020
- Soft Fruit GIN, DEFRA
- Robust Rubus, NIBIO, Norway
- RESAS Research Programme 2022-27
- Mechanisms and genetics of winter dormancy in raspberry, PhD, Mylnefield Trust