



# Progress of the Raspberry & Blackberry Breeding Programme at James Hutton



SSCR Soft Fruit Winter meeting, Dundee, 23rd February 2023

# Current breeding objectives

## Raspberry Breeding Consortium 2019 - 2024

Scottish Government, AHDB and 16 industry partners (UK and EU)

- Select high quality fresh market cultivars suitable for low input systems with reduced labour costs
- Develop robust hybrids with improved P&D resistance, especially to *Phytophthora* root rot
- Active deployment of marker assisted selection strategies to speed up breeding process
- Offers growers a fair royalty rate
- Objectives reviewed annually
- Picking efficiency & yield now high priority



# Routine deployment of Marker Assisted Selection

- Phytophthora resistance marker (*Rub118b*) routinely deployed to screen progeny since 2009
  - 37 promising selections with *Rub118b* marker in breeding plots
  - 9 identified for off-site trials
  - 1 named cultivar (Glen Mor)
- Markers for fruit size and shelf-life life now deployed routinely alongside *Rub118b*



# Recent cultivars

- Commercialisation of 3 new genotypes
  - Lewis
  - Skye
  - Glen Mor
- Long cane and plug plants available



# Double-cropping Primocane Skye

- Late autumn season, ~Kwanza
- Well suited to long-cane cropping
  - Vigorous cane, short internodes
  - Good bud break
- High yield potential
  - Laterals/cane
  - Fruit/lateral
- Quick and easy to pick/plug
- Must be picked pink to achieve storage colour
  - Long shelf-life, 7-10 days
- Sweet, aromatic with low acidity
- Consistent quality in both crops



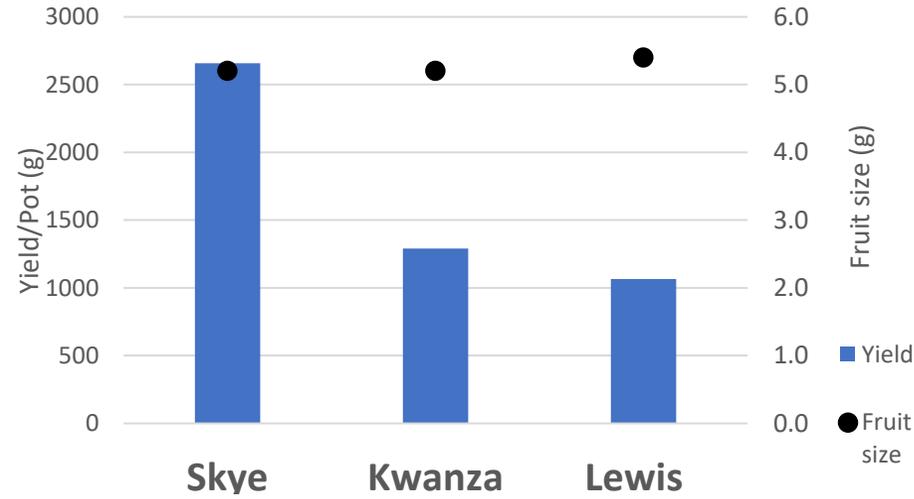
Skye

Kwanza

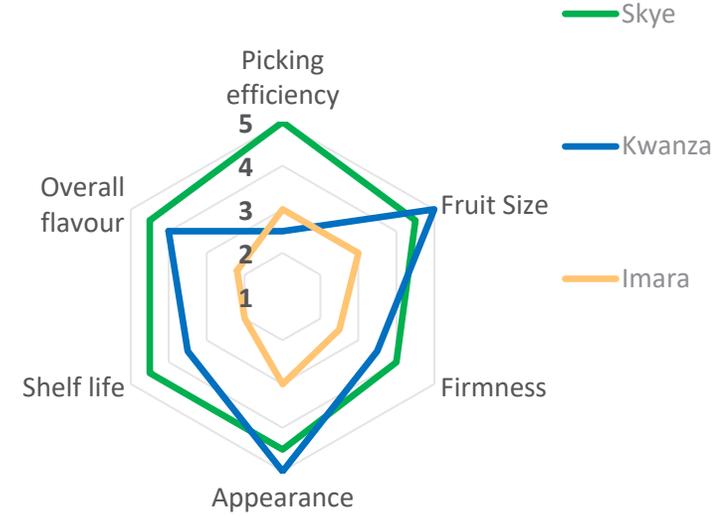
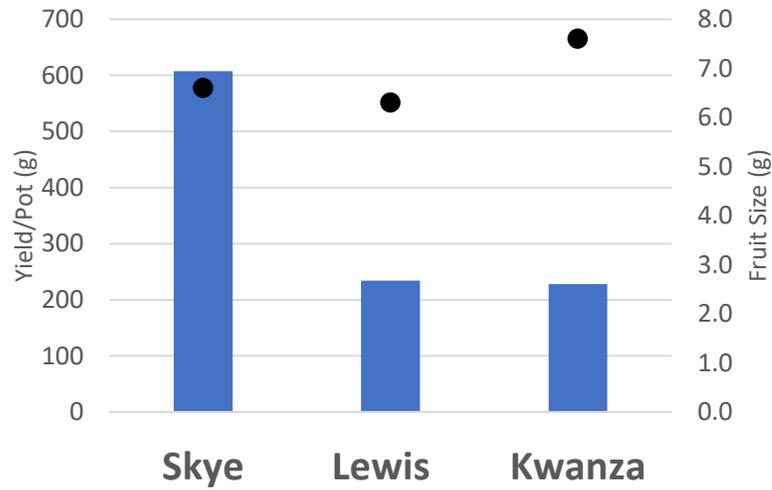
# Skye in 2022

- Data taken from 10-plant plots (2 reps) at James Hutton Institute, 2022
- Planted Spring 2021, 10L pots, 2 canes/pot

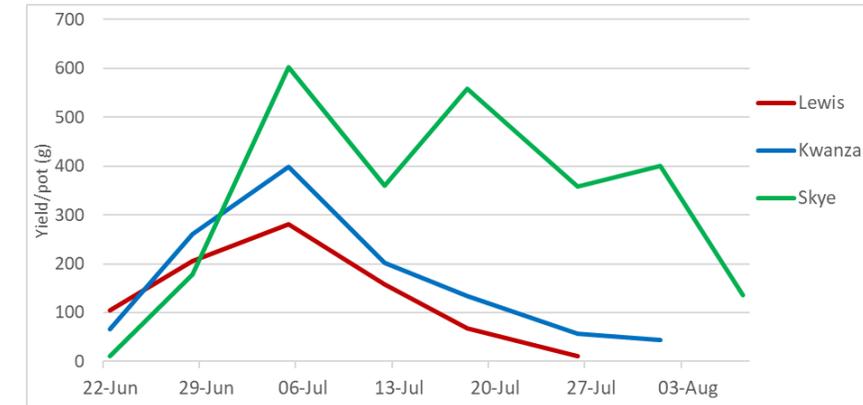
### Yield & Fruit Size, summer 2022



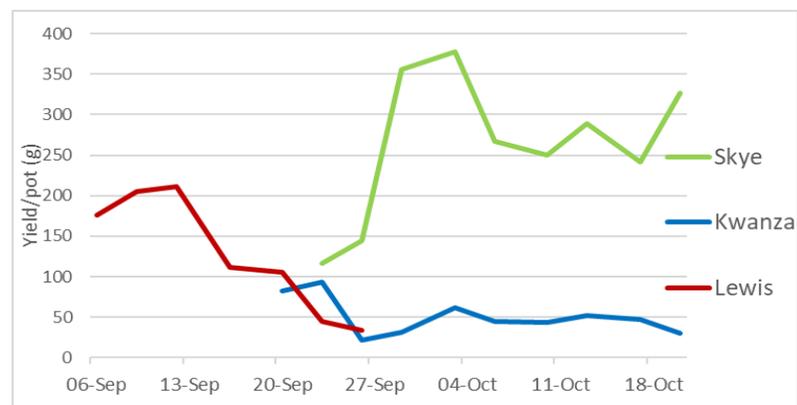
### Yield & Fruit Size, autumn 2022



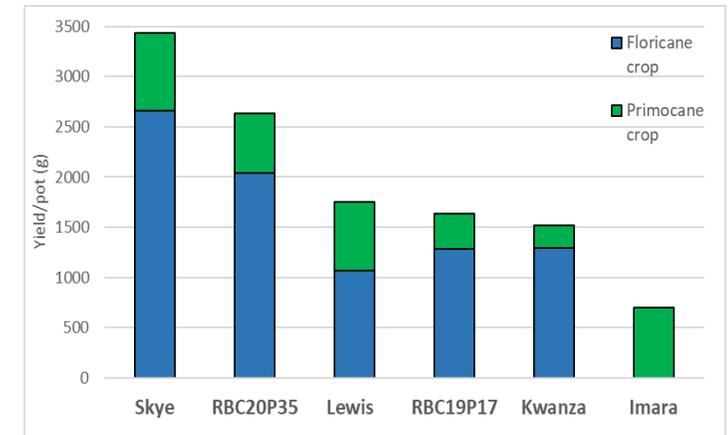
### Picking Profile long cane, summer 2022



### Picking Profile primocane, autumn 2022



### Total Yield 2022



# Skye in Commercial Trials in 2022



Star Inn Farm,  
Scotland, June 2022



Quebec, Canada, September 2022  
*(photo courtesy of Global Plant Genetics)*



Odemira, Portugal October  
2022 *(photo courtesy of Hortifruit)*



## Early Primocane Lewis

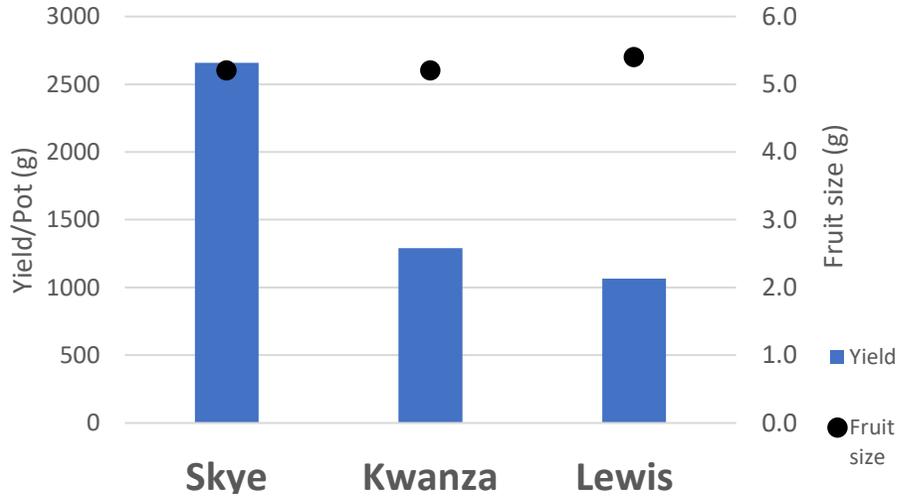
- Late summer/early autumn season, ~Imara
- Large size
- Bright red and glossy in punnet
- Very sweet, aromatic, vanilla notes with low acidity
- Quick and easy to pick/plug
- Moderate vigour with a compact, upright habit



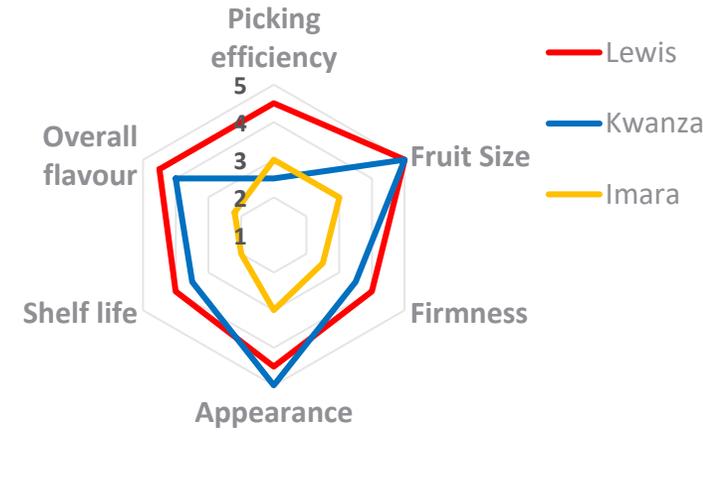
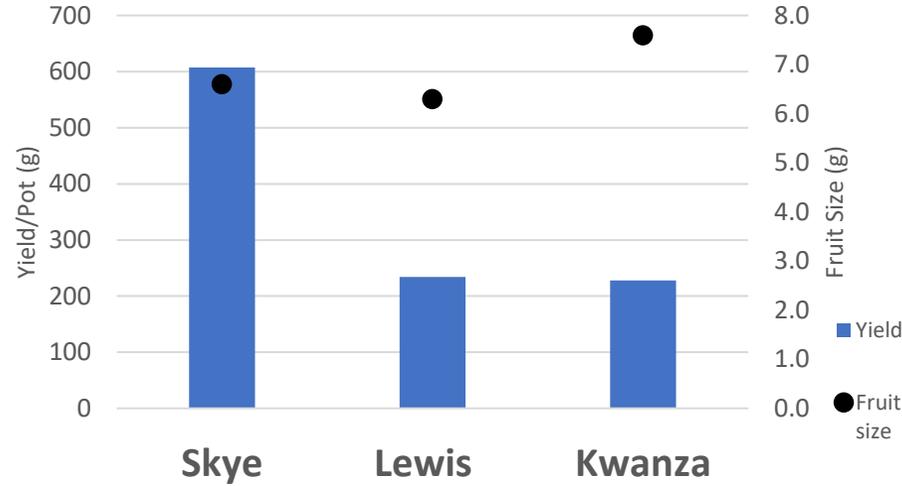
# Lewis in 2022

- Data taken from 10-plant plots (2 reps) at James Hutton Institute, 2022
- Planted Spring 2021, 10L pots, 2 canes/pot

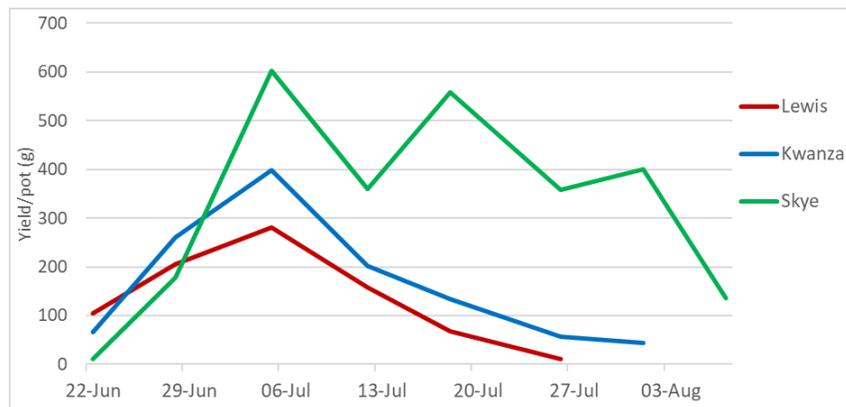
### Yield & Fruit Size, summer 2022



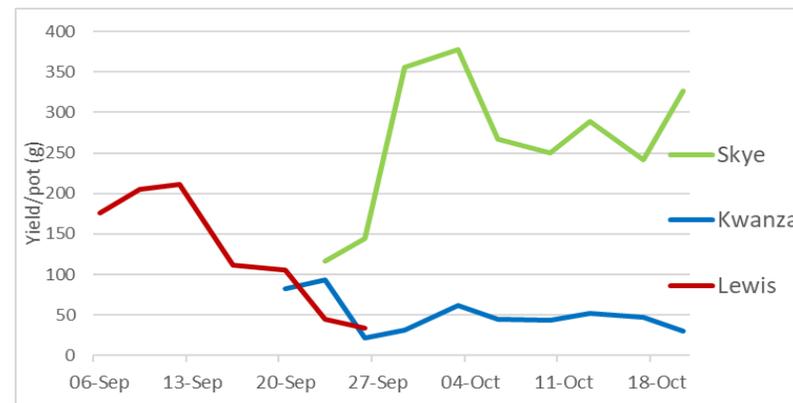
### Yield & Fruit Size, autumn 2022



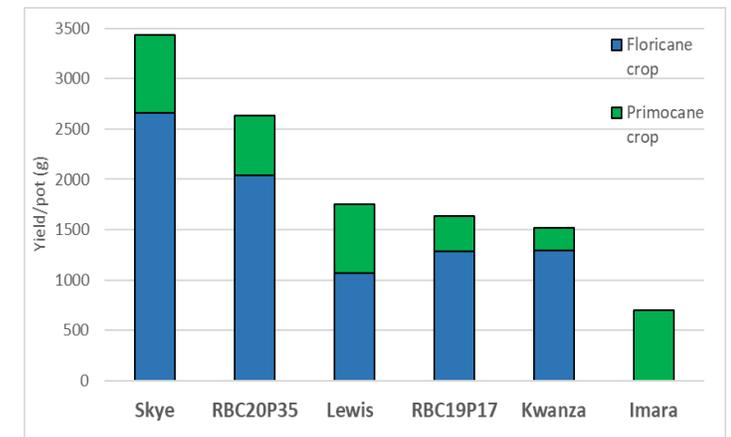
### Picking Profile long cane, summer 2022



### Picking Profile primocane, autumn 2022



### Total Yield 2022



## *Phytophthora*-resistant floricane **Glen Mor**

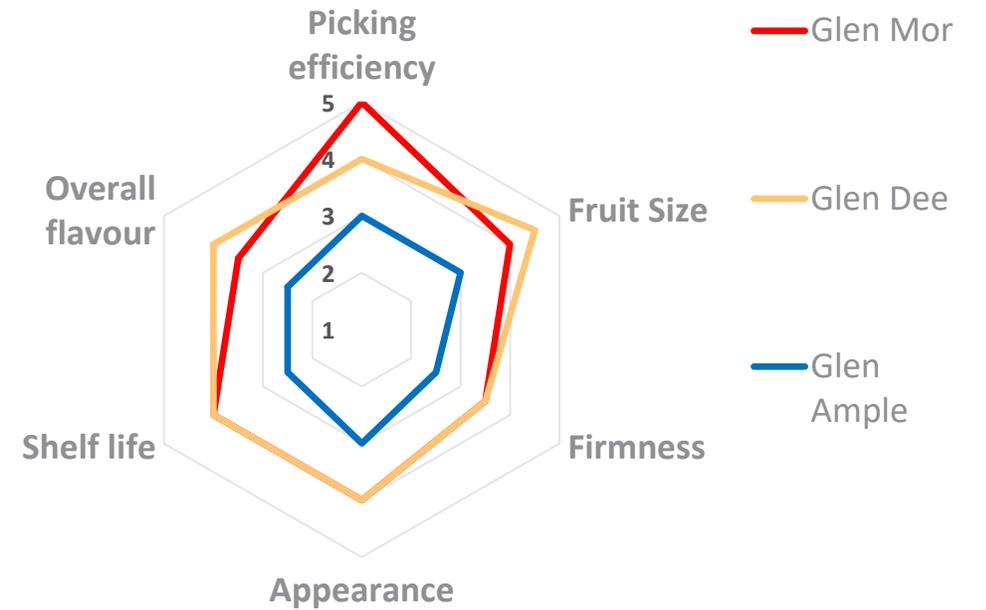


Glen Mor, (substrate) JHI June

- First cultivar with *Rub118b* marker for root rot resistance
- **No symptoms** of *Phytophthora* in soil plot over several seasons
- Early floricane, (Floricane x primocane) tip fruit in autumn
- Lower chill compared with floricane cvs. & good bud break
- Productive, late lower laterals provide large fruit and over a long season
- Maintains fruit size, 'coconut' flavour notes, good shelf-life
- Demonstrates good performance and quality in coir and soil
- Need more triallists!

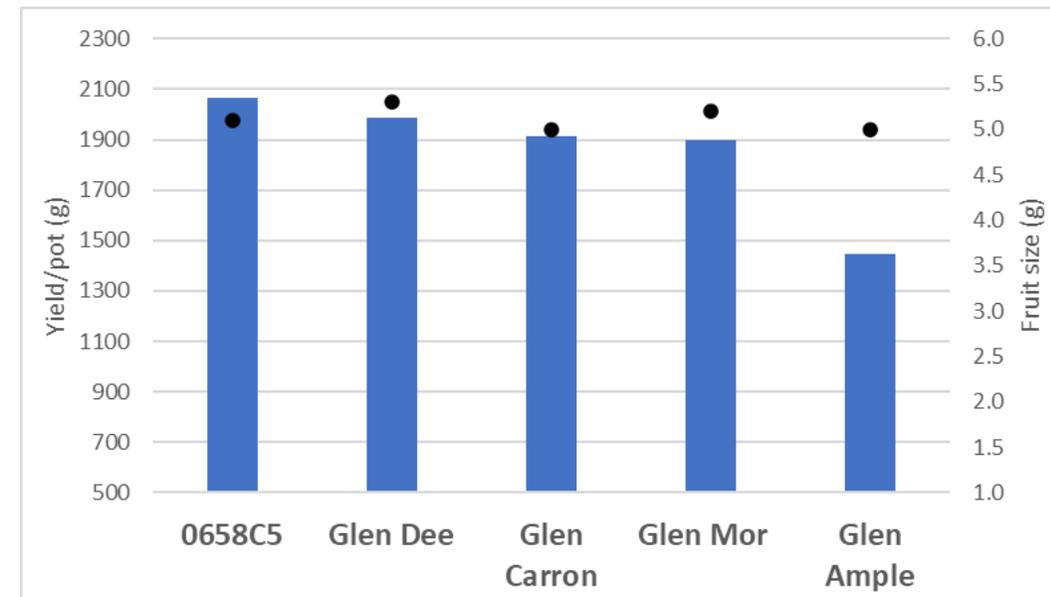


# Glen Mor



	June				July					August					Sept			
	15	20	25	30	5	10	15	20	25	30	4	9	14	19	24	29	3	8
<b>Glen Mor</b>			█	█	█	█	█	█	█	█	█							
<b>0658C5</b>				█	█	█	█	█	█	█	█	█						
<b>Glen Ample</b>						█	█	█	█	█	█	█						
<b>Glen Dee</b>													█	█	█	█	█	█

Total Yield & Fruit Size 2022



## New for commercialisation: 0658C5

- Selected in 2012 for **high productivity & large size**
- Withdrawn from initial on-farm trials in 2015 after ~40 % of crumbly fruit found in micropropagated plants
- Consistent & reliable cropping over 10 years at JHI in root propagated trials (soil & coir)
- Popular in blind tastings and top in Innovate flavour project 2019 (vs. 11 commercial cvs.)
- Fresh plants fruiting in several trials in UK and Europe in 2022
  - **Good picking efficiency** and fruit quality, no crumbly fruit
- Initiate commercialisation in 2023
  - Fresh plants available in 2024
  - Root propagation only

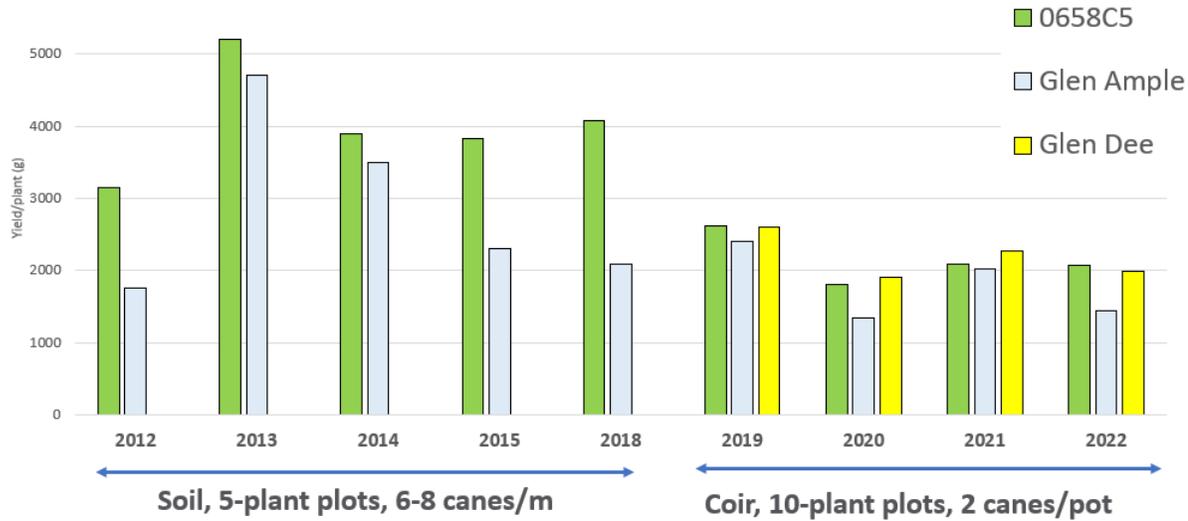


0658C5, JHI Demo plot

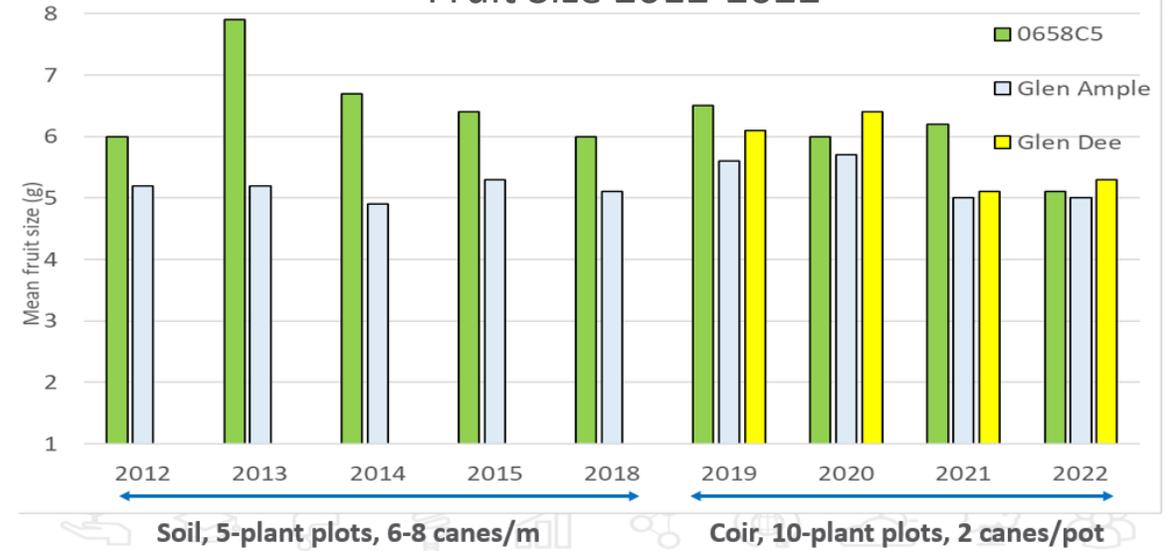


# 0658C5: 10 Years data at James Hutton

## Yield 2012-2022



## Fruit Size 2012-2022



	June				July						August					Sept			
	15	20	25	30	5	10	15	20	25	30	4	9	14	19	24	29	3	8	
Glen Mor			█																
0658C5			█				█												
Glen Ample					█				█										
Glen Dee							█				█								



## 0658C5 in commercial trials



**Berry Plants**  
*(photo courtesy of  
Berry Plants)*

**Clockhouse Farm, October**  
*(photo courtesy of Mirena Miteva-Neagu)*



# Novel selections in 2022



**Primocane 1945-99\***



**Primocane 2051F10**



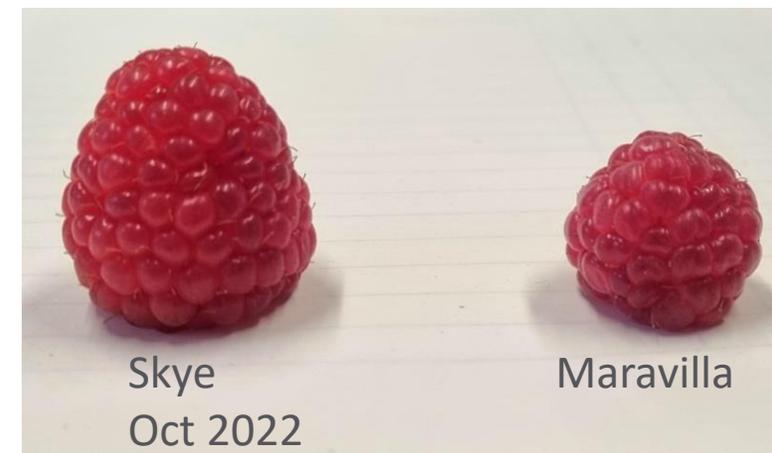
**Long cane 1759F4\***



*\*Selections with Rub118b marker for root rot resistance*

## Progressive & Future Breeding Strategies

- Increased focus on traits to reduce picking costs
  - Fruit size, ease of pick, display of crop
  - Calculate picking speed?
- Select genotypes with resilience to environmental change
  - Assess and compare chill requirement of advanced germplasm
  - Nutrition trial at FAST, Kent, to optimise resource use
    - Skye, Lewis, Glen Mor & controls (+ 0658C5 in 2023)
    - Provide growers with more guidance when planting new cvs
- Increased breeding effort on pathogen tolerance
  - Powdery mildew, Botrytis, two spot spider mite
- New marker development and validation
  - Yield components
  - Crumbly fruit
  - Associated Mapping Population



*Compare fruit size with retailer samples*



*Selecting out mildew susceptibility  
in novel seedlings*

# Blackberry Breeding at James Hutton

- Loch Ness, Loch Tay and Loch Maree
- Increased demand created with new, sweet varieties
- Blackberry Breeding Consortium (BBC)
  - Ten year programme (2018 - 2027)
  - Focus on: flavour, size and thornlessness
    - Yield, colour stability/reversion

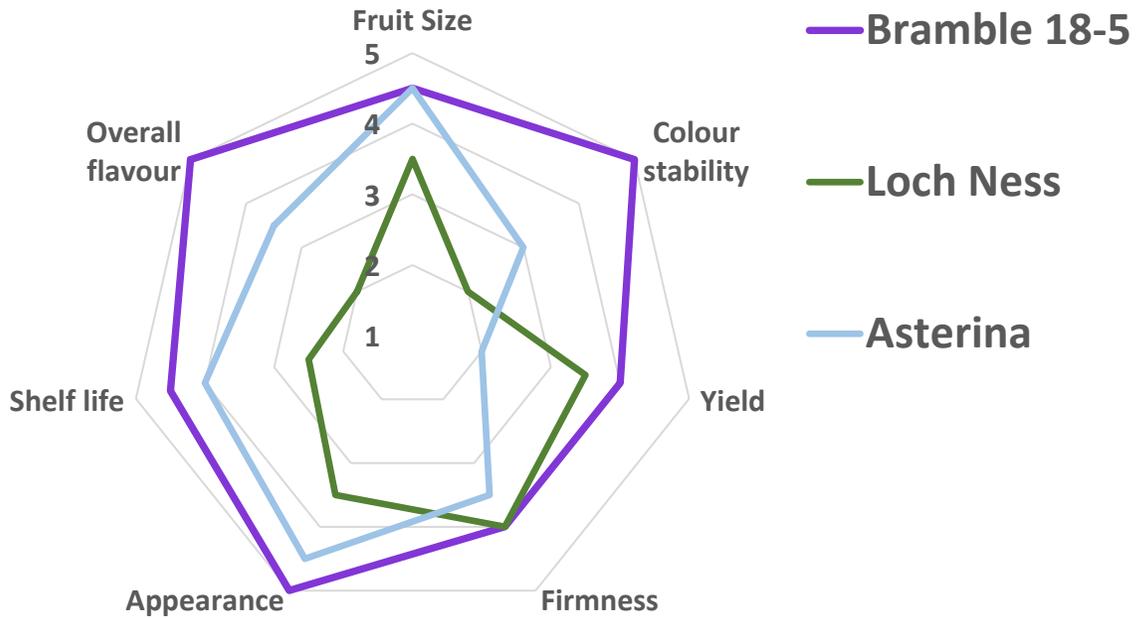


## Bramble 18-5: Outstanding in breeding and on-farm trials

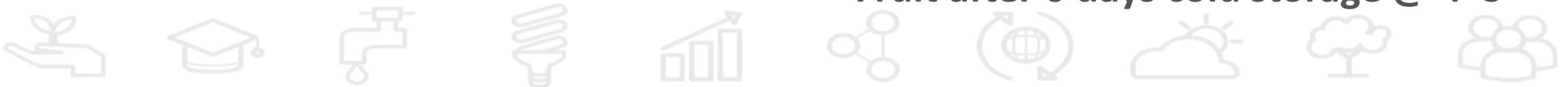
- Thornfree plant, easy to manage
- Picks easily with consistent shape, size and appearance
- Top in blind tasting & shelf-life, best eating quality in 2020-2022
- Trials: Good flavour & size on all trial sites
- Shows little reversion after cold storage
- Initiate wider commercial trials in 2023/24



# Bramble 18-5: Fruit Quality

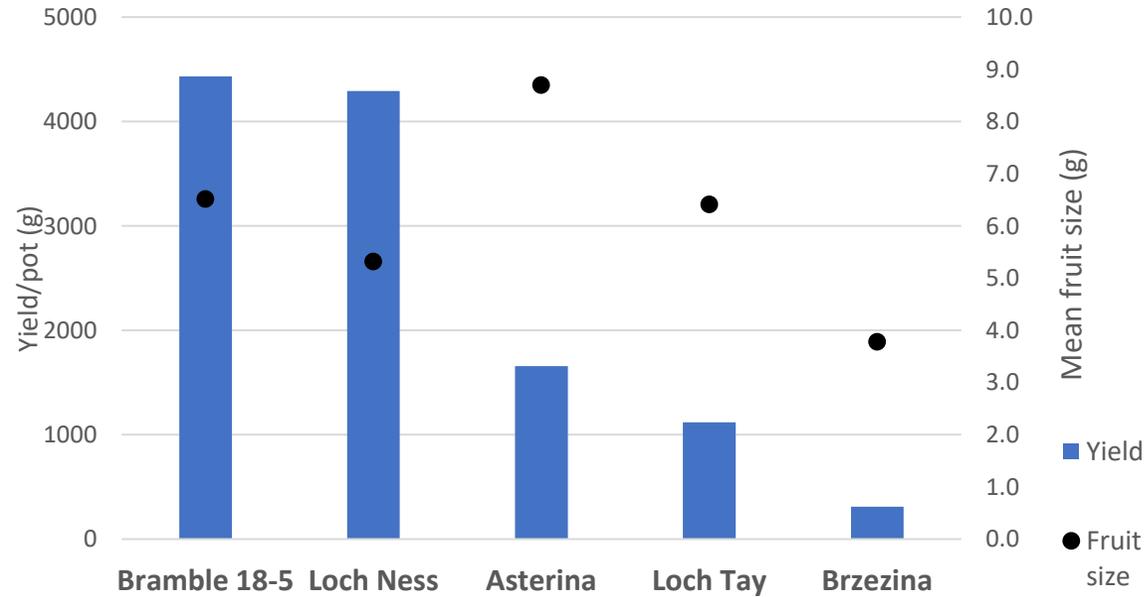


Fruit after 6 days cold storage @ 4°C

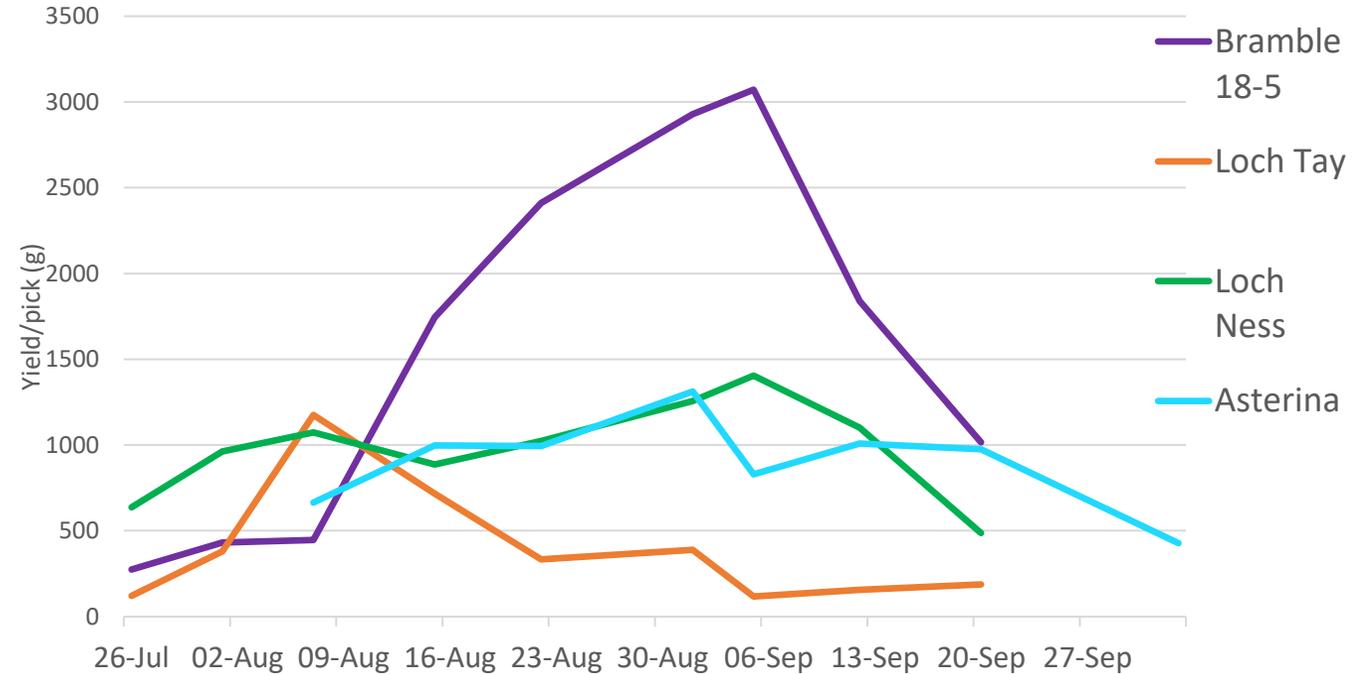


# Bramble 18-5: Yield & Fruit Size

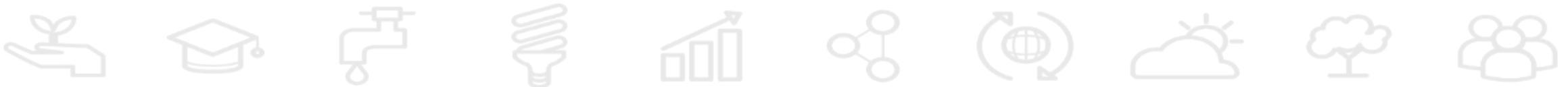
## Yield & Fruit Size 2022



## Picking profile 2022



- Data taken from 3-plant plots (2 reps) at James Hutton Institute, 2022
- Planted Spring 2020, 10L pots, 2 canes/pot



# Blackberry selections in the pipeline



**Bramble 19-11**



**Bramble 19-9**



**Bramble 21-19**



**Bramble 18-6**



**Bramble 21-21**



The James  
**Hutton**  
Institute

# Thank you for listening



**James  
Hutton**  
Limited  
Impact through  
Science

## Fruit Group

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Avril Britten  
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