



# Update from the UKRBC Breeding Programme

Nikki Jennings

**SSCR Soft Fruit winter meeting  
20<sup>th</sup> February 2014**



# Breeding objectives



- UK Raspberry Breeding Consortium 2009-2014
  - Scottish Government, industry partners
- Select cultivars suitable for fresh and processing markets
  - Floricane and primocane types
- Create new hybrids with improved P&D resistance, especially to *Phytophthora* root rot
- Deployment of marker assisted selection

# 2013 Season at James Hutton Institute



- Cold temperatures and dry March-June
- Warm and dry in July and August
- Early genotypes 2 weeks late
- Short condensed season
- Yield and fruit size exceptional
- Flavour and brix average
- Glen Ample very productive but sharp
- *Phytophthora* root rot, raspberry leaf and bud mite, spider mite, raspberry beetle, split fruit, crown gall



# Glen Fyne



**Accepted by Sainsbury's and Asda in 2014**

- Consistently productive
- Superb sweet raspberry flavour
- Large fruit with good shelf life
- Easy and cheap to pick and grow
- Suitable for fresh and processing markets
- Susceptible to RBDV and powdery mildew
- Susceptible to *Phytophthora* root rot



|                  | Mean yield/<br>stool (g) | Mean fruit<br>size (g) | Mean Brix° | First pick<br>date    |
|------------------|--------------------------|------------------------|------------|-----------------------|
| <b>Glen Fyne</b> | 3877                     | 5.4                    | 10.2       | 12 <sup>th</sup> July |
| Glen Ample       | 4751                     | 5.7                    | 9.2        | 15 <sup>th</sup> July |
| Tulameen         | 1589                     | 5.1                    | 11.2       | 19 <sup>th</sup> July |
| Octavia          | 2643                     | 6.3                    | 8.7        | 1 <sup>st</sup> Aug   |

2013 data from JHI



# 0435D-3



- Early season, 2-3 days earlier than Glen Lyon
- Productive over a long season
- Neat, conical fruit, firm with a good shelf-life
- Sweet with low acidity
- Popular at JHI open day
- *Gene H* gives tolerance to cane botrytis and spur blight
- Planted in on-farm trials in 2013
- Tesco's '*Would like to see more fruit next season. Good sweet flavour*'



|                | Mean yield/stool (g) | Mean fruit size (g) | Mean Brix° | First pick date       |
|----------------|----------------------|---------------------|------------|-----------------------|
| <b>0435D-3</b> | 2816                 | 4.9                 | 10.5       | 12 <sup>th</sup> July |
| Glen Ample     | 4751                 | 5.7                 | 9.2        | 15 <sup>th</sup> July |
| Tulameen       | 1589                 | 5.1                 | 11.2       | 19 <sup>th</sup> July |
| Octavia        | dead                 |                     |            |                       |

2013 data from JHI

# 0485K-1



- Early-mid season
- Large, conical fruit, very glossy and attractive in punnet
- Popular at JHI fruit event
- Attracted interest in HDC plot in 2012
- *Gene H* gives tolerance to cane botrytis and spur blight
- No P&D problems thus far
- New trials planted in 2013
- Mixed response from retailers. Tesco '*Good appearance needs further assessment*'



|                | Mean yield/<br>stool (g) | Mean fruit<br>size (g) | Mean Brix° | First pick<br>date   |
|----------------|--------------------------|------------------------|------------|----------------------|
| <b>0485K-1</b> | 2871                     | 5.5                    | 10.9       | 19 <sup>th</sup> Jul |
| Glen Ample     | 4751                     | 5.7                    | 9.2        | 15 <sup>th</sup> Jul |
| Tulameen       | 1589                     | 5.1                    | 11.2       | 19 <sup>th</sup> Jul |
| Octavia        | 2643                     | 6.3                    | 8.7        | 1 <sup>st</sup> Aug  |

2013 data from JHI

# 0019E2



- Mid-late season
- Very large attractive fruit, good shelf-life and sweet flavour
- Consistent yield and quality over several years' trialling
- Vigorous strong cane
- Collapsing laterals maybe a concern
- Good feedback from most triallists
- No P&D problems thus far
- New trials planted in 2013
- Mixed response from retailers. Sainsbury's '*taste excellent. Appearance and firmness good*'



|               | Mean yield/<br>stool (g) | Mean fruit<br>size (g) | Mean Brix° | First pick<br>date   |
|---------------|--------------------------|------------------------|------------|----------------------|
| <b>0019E2</b> | 3612                     | 6.3                    | 10.2       | 22 <sup>nd</sup> Jul |
| Glen Ample    | 4751                     | 5.7                    | 9.2        | 15 <sup>th</sup> Jul |
| Tulameen      | 1589                     | 5.1                    | 11.2       | 19 <sup>th</sup> Jul |
| Octavia       | 2643                     | 6.3                    | 8.7        | 1 <sup>st</sup> Aug  |

2013 data from JHI

# 0447C-5 (Glen....)



- Late season, similar to Octavia but picks for longer
- Large, conical fruit with pleasant flavour.
- High yield over three seasons
- Vigorous cane with a easy to manage habit
- Raspberry beetle damage 2013
- Several trials planted in 2013
- Tesco '*Liked large fruit size, appearance, firmness and consistently good flavour*'
- Morrisons '*Big, firm fruit. Good appearance and flavour*'

|                | Mean yield/<br>stool (g) | Mean fruit<br>size (g) | Mean Brix° | First pick date      |
|----------------|--------------------------|------------------------|------------|----------------------|
| <b>0447C-5</b> | 3008                     | 6.8                    | 10.1       | 1 <sup>st</sup> Aug  |
| Glen Ample     | 4751                     | 5.7                    | 9.2        | 15 <sup>th</sup> Jul |
| Tulameen       | 1589                     | 5.1                    | 11.2       | 19 <sup>th</sup> Jul |
| Octavia        | dead                     |                        |            |                      |

2013 data from JHI



# New trials in 2013



- New HDC floriculture trial SF41d
  - Four selections are main entries
- 0447C-5 large scale trials (>1000 plants)
  - Gaskains
  - Tim Chambers
  - Place UK
  - Kelsey Farms LLP
  - Paul Harrold



# New trials in 2013



- European trials
  - Pcfruit, Belgium
  - DLV Plant BV, NL
  - Van Der Avoird Trayplant, NL
  - Eurosemillas, Spain
  - Klaus Rosenberger, Austria
  - LVWO, Germany



# New selection O658C5



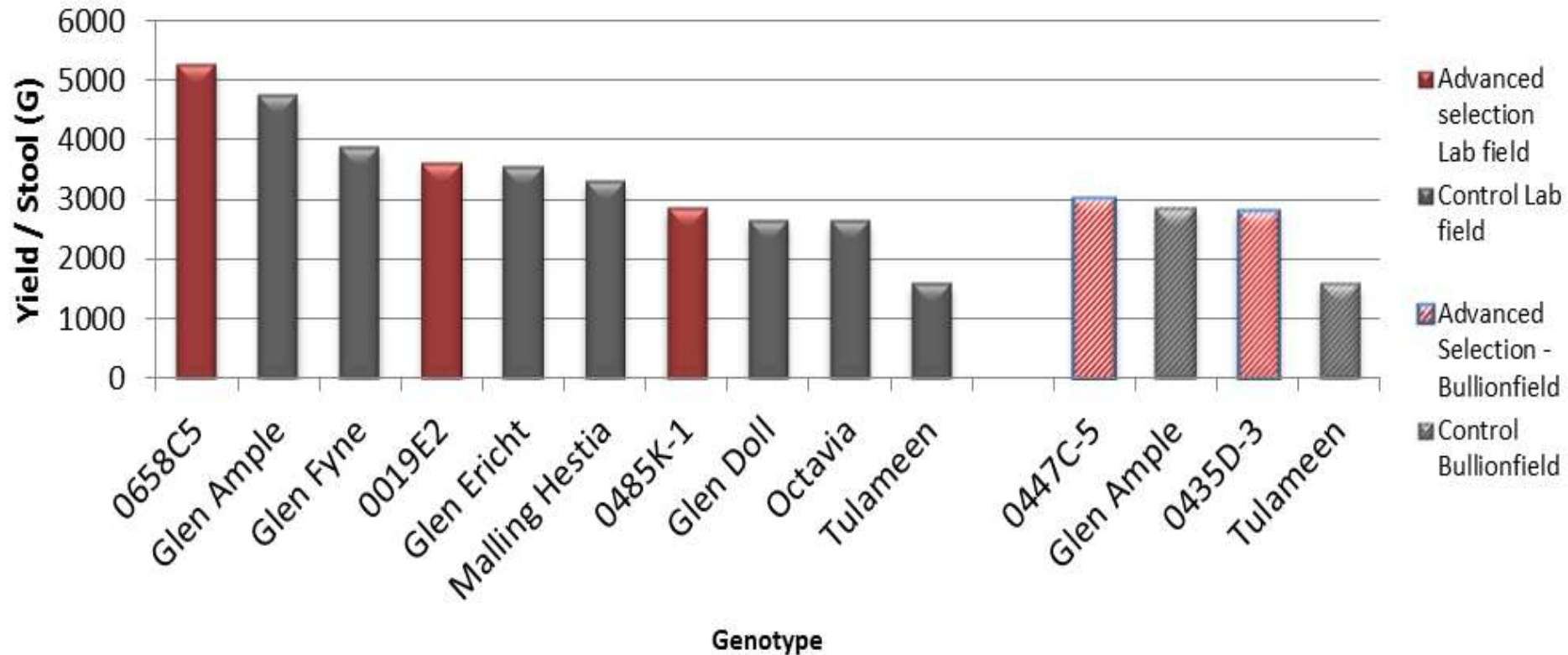
- Fruit size exceptional
  - First pick >12g
  - Mean size 7.9g
- Most productive at JHI in 2013
- Popular with visitors and media
- Identified for trials in 2012
- Plants available for spring planting 2014



|               | Mean yield/<br>stool (g) | Mean fruit<br>size (g) | Mean Brix° | First pick<br>date   |
|---------------|--------------------------|------------------------|------------|----------------------|
| <b>0658C5</b> | 5265                     | 7.9                    | 9.0        | 22 <sup>nd</sup> Jul |
| Glen Ample    | 4751                     | 5.7                    | 9.2        | 15 <sup>th</sup> Jul |
| Tulameen      | 1589                     | 5.1                    | 11.2       | 19 <sup>th</sup> Jul |
| Octavia       | 2643                     | 6.3                    | 8.7        | 1 <sup>st</sup> Aug  |



# 2014 Yield at James Hutton





# Primocane types at James Hutton



- Polytunnel dedicated to primocane types
  - Early
  - Fruit quality
  - Spinefree
  - Easy plugged
- 700 seedlings in 10L pots, segregating for primocane habit
- Fruit from mid-August – late October
- Controls
  - Autumn Treasure, Erika, Polka, Brice, Sugana



# Primocane selections from James Hutton





# Deployment of markers for resistance to *Phytophthora* root rot



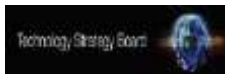
- Markers identified in 2008 (Hortlink 0169)
- Parents with root rot resistance marker identified for crossing in 2009 (25 families)
- Currently >40 selections identified with the marker
- 10 selections fruiting in 5-plant plots in 2013
  - Exceptional root vigour
  - Two selections with good fruit size, quality and yield
  - Resistance holding in infestation plot



# Underpinning support for the breeding programme



- Markers already deployed
  - Root rot marker (HL0169)
  - *Gene H* (cane diseases)
- Markers under validation
  - Fruit size (HL0170)
  - Post harvest softening (HL0195)
- Traits under investigation
  - Physical resistance traits
  - High throughput tools
  - Seasonality
    - Primocane x floricanne mapping population



*Phytophthora* resistance



*Gene H*

Cane pubescence

Generate new high quality cultivars suitable for low input systems that can be grown economically



# James Hutton Institute, Thursday 17<sup>th</sup> July 2014





# Thank you very much!!

## James Hutton Institute

- **Fruit Group**

Lynne Ferguson

Avril Britten

Rex Brennan

Sandra Gordon

Julie Graham

Kay Smith

Alison Dolan

Susan McCallum

Linzi Jorgensen

Carolyn Mitchell

- **Estate and Glasshouse Dept**

## UK Raspberry Breeding Consortium

Scottish Government

HDC

SSCR

Angus Soft Fruits

CPM

Berrygarden Growers

Meiosis

Total Berry

Trade Solutions

GSK

- **Sarah Troop, Meiosis**

- **UK Soft Fruit Growers and trialists**