



Highlights from the raspberry breeding programme

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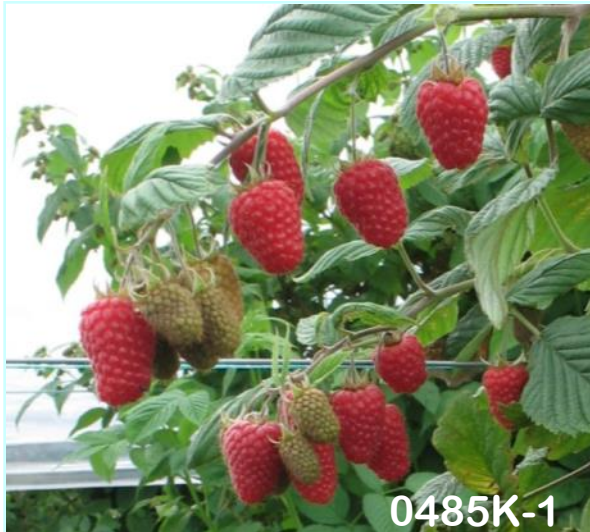
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SSCR Soft Fruit meeting

Thursday 19th February 2015



Current breeding objectives



- Raspberry Breeding Consortium 2014-2019
 - Scottish Government, HDC, SSCR and industry partners from UK and Europe
- Select high quality floricane and primocane cultivars suitable for fresh market
- Machine harvesting types for processing will continue on a small scale
- Create new hybrids with improved P&D resistance, especially to *Phytophthora* root rot
- Deployment of marker assisted selection to reduce timescale



2014 Season at James Hutton Institute



- Mild, dry winter followed by a cool, dry spring
- Early summer warm and dry until early October
- Early genotypes started late June
- Good growing year, most genotypes performed well
- Glen Ample very productive but sharp flavour
- Octavia good size and quality where healthy
- Aphids, raspberry leaf and bud mite, raspberry beetle, *Phytophthora* root rot, crown gall, split fruit
- Many visitors and positive media attention



New cultivar in 2014

Glen Dee (0447C-5)



-  Late season, similar to Octavia but picks for longer
- Large, conical, pale fruit with a superb shelf-life
- Flavour is sweet with an acid bite, creamy texture
- Consistent yield over four seasons
- Vigorous cane with a easy to manage habit
- Several trials fruiting in 2014, earlier season than expected
- Favourable comments from industry and retailers
- Scored as Tesco 'Finest' range
- No *Phytophthora* symptoms in field

	Mean yield/ stool (g)	Mean fruit size (g)	Mean Brix°	First pick date
Glen Dee	3046	5.4	10.2	18 th July
Glen Ample	3593	4.8	9.2	7 th July
Tulameen	2482	4.4	12.0	10 th July
Octavia	2562	5.8	9.0	22 nd July

2014 data from JHI

Shelf-life after 11 days storage at 4°C



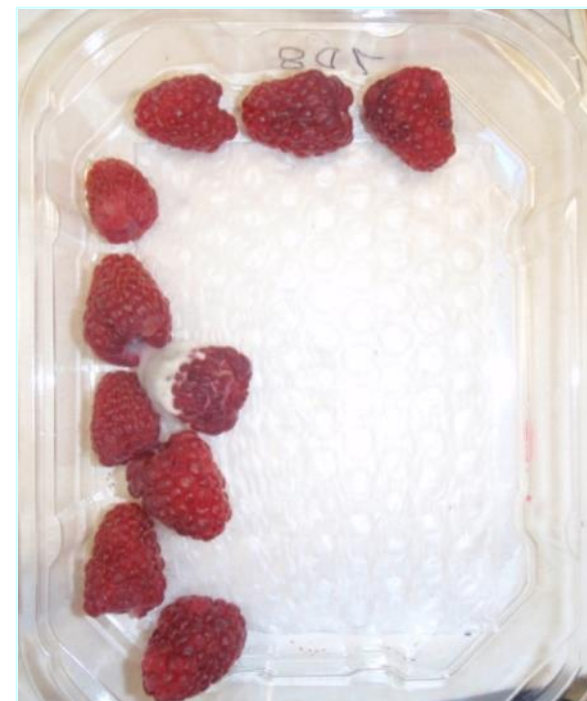
Glen Dee

- Score 9 / 9
- Firm and uniform
- Maintains pale colour



Glen Ample

- Score 5 / 9
- Druplets beginning to soften
- Uneven colour



Tulameen

- Score 1 / 9
- Post harvest rot

Early selection 0485K-1



- Stunning appearance - very glossy and attractive in punnet
- Sweet 'sherbet' flavour, juicy with low acid
- Flavour and appearance were praised by industry and retailers in 2014
 - Clear favourite at FFF
- No P&D problems thus far
- Performs well in Spain
- MRS to name and apply for PVR in 2015



	Mean yield/ stool (g)	Mean fruit size (g)	Mean Brix°	First pick date
0485K-1	2608	5.2	10.6	30 th June
Glen Ample	3593	4.8	9.2	7 th July
Tulameen	2482	4.4	12.0	10 th July
Octavia	2562	5.8	9.0	22 nd July

2014 data from JHI

New selection O658C5



	Mean yield/ stool (g)	Mean fruit size (g)	Mean Brix°	First pick date
O658C5	3934	6.7	10.3	7 th July
Glen Ample	3593	4.8	9.2	7 th July
Tulameen	2482	4.4	12.0	10 th July
Octavia	2562	5.8	9.0	22 nd July

- Exceptional fruit size
 - ~10g at first pick
- Very high productivity at JHI
- Fruity flavour with good sugar/acid balance
- Popular with media and visitors
- Fruiting in UK trials in 2015



Floriscane selections identified in 2014



0658E-1

- Early, large and productive
- Sweet, fruity, juicy, 'raspberry' and 'elderflower'
- Scored highly in taste panels in 2014
- Tesco scored as 'Finest' range



0550E4

- Large fruit, firm with a good shelf-life
- Sweet and slightly floral
- Strong plants with good vigour
- Productive over three seasons

Plants available to trial in 2015

Fruit season 2015



Fruit of the floricane selections available around the UK in 2015:

- JHI Breeding trials, Invergowrie
- HDC floricane raspberry trial (SF41d), Oxfordshire
- Several industry partner trial sites

Fruit samples available at events, Fruit for the Future and Fruit Focus

Fruit to retailers for benchmarking



Primocane types at James Hutton



- Crossing since 2009
- Polytunnel dedicated to primocane types
 - **Early season**
 - Fruit quality
 - Spinefree
 - Easy plugged
- Fruit from mid-August – late October
- Controls
 - Autumn Treasure, Erika, Polka, Kweli, Imara, Kwanza
- 24 early stage selections in glasshouse trials in Norfolk



Primocane selections from James Hutton



1132F-12



0974E1, 7.6g



1259B10

Molecular marker deployment



- Underpinning support for the breeding programme
- First raspberry genetic linkage map developed 2004
- Development of PCR-based markers for *Phytophthora* resistance in 2008
- Parents with resistance marker identified for crossing in 2009 (25 families)
- >40 selections with the marker planted in field trials



Deployment of markers for resistance to *Phytophthora* root rot



- 10 selections fruiting in 5-plant plots in 2014
 - Exceptional root vigour
 - Two selections with good fruit size, quality and productivity
- A further 30 families will be assessed for fruit quality in 2015
- Families combining root rot resistance, advanced selections and primocane-fruiting screened in 2015
 - >100 new selections identified



Underpinning support for the breeding programme



- Markers already deployed

- Root rot marker (HL0169)
- *Gene H* (cane diseases)



- Markers under validation

- Post harvest softening (HL0195)
- Fruit size (HL0170)



- Traits under investigation

- Physical resistance traits
- High throughput tools
- Seasonality
 - Primocane x floricanne mapping population



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

James Hutton Institute, Thursday 16th July 2015

