



Horticultural
Development
Company

Grower summary

SF 35b

Raspberry (*Rubus idaeus*) breeding
consortium for the UK

Annual Report 2009

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Headline

- New selections 0433F2, 0403F6 and 0453C4 performed exceptionally well in SCRI trials and will be trialled on commercial sites in 2010.

Background and expected deliverables

In 2009, the UK raspberry industry formed a consortium to fund the National Raspberry Breeding Programme for five years. The objective of the programme is to produce improved raspberry varieties selected for particular markets and cultural practices.

The expected deliverables from this work will include:

- New potential varieties suitable for both fresh market production (including season extension through protected cropping) and machine harvesting for processing. The programme will be aided by the deployment of marker assisted selection strategies, developed at SCRI, substantially reducing the time required to produce a new variety.
- New hybrids with improved pest and disease resistance, especially to *Phytophthora rubi* (root rot).
- Development of new primocane-fruiting varieties.
- Evaluation of promising selections under commercial conditions in grower trials.
- Generation of high health selections for commercial propagation and release to the industry.

Summary of the project and main conclusions

This year the following plots were evaluated at SCRI:

- 20 genotypes in a protected site of replicated 5-plant plots (plot J24), in its third and final season.
- 20 genotypes in a protected site of replicated 5-plant plots (plot J25), in its second season.
- 30 genotypes in a protected site of replicated 5-plant plots (plot J26), in its first season.
- 18 genotypes in a machine-harvest site of 20-plant plots in its second season.
- Approximately 4000 seedlings from the 2006 crossing programme.
- Approximately 4000 seedlings from the 2007 crossing programme.

A summary of the characteristics of key selections, including those already identified for on-farm trials are summarised in Tables 1, 2 and 3.

Table 1 Summary of characteristics of key selections at SCRI - Plot J24 (third season)

Genotype	Mean yield/stool (g)	Mean fruit size (g)	Mean Brix %	First pick date	Characteristics
9764F-3*	3686.5	5.9	8.6	09/07/09	Mid season. Consistently large fruit, attractive in a punnet, floral and sweet, but little juice.
97134B1*	2601.5	4.7	9.1	09/07/09	Large conical yellow raspberry of good quality, with a sweet raspberry flavour early in season, but deteriorated later in season.
9767RA3	3453.5	5.4	9.0	06/07/09	Early season. Bright and attractive in a punnet, good shelf life, pleasant flavour.
9628E-3*	4836	5.9	10.6	17/07/09	Mid-late season. Large meaty fruit with prominent drupes, consistent size and flavour in 2009.
Glen Ample	4963	5.7	8.8	09/07/09	Very productive with large fruit. Flavour was sharp – considered poor for Ample.

*Selections currently in on-farm trials

Table 2 Summary of characteristics of key selections at SCRI - Plot J25 (second season)

Genotype	Mean yield/stool (g)	Mean fruit size (g)	Mean Brix %	First pick date	Characteristics
9350F3	3776.5	4.7	9.1	09/07/09	Mid-late season. Attractive, large conical fruit, excellent display, flavour sweet and mild in 2009.
0304F6	3835	5.4	9.7	09/07/09	Mid-late season. Large pale meaty fruit, strong sweet flavour with an acid edge, great display on long, strong laterals.
99111B2*	2767.5	5.3	9.2	02/07/09	Early-mid season, dark fruit, slightly soft at end of season, very upright primocane, continues to display strong tolerance to Phytophthora.
Glen Fyne	3932	4.9	10.6	06/07/09	Mid season. Fruit is firm with good cohesion and has a sweet and aromatic flavour. Canes produce a high yield of good quality fruit.
Tulameen	1709	5.0	12.6	06/07/09	Sweet, strong flavour but fruit was rough, lumpy and soft all season.
Octavia	1942.5	5.8	9.3	17/07/09	Very late, enormous fruit size, pale colour, good aroma but sharp flavour. Tendency to tear around lip of fruit.

*Selections currently in on-farm trials

Table 3 Summary of characteristics of key selections at SCRI - Plot J26 (first season)

Genotype	Mean yield/stool (g)	Mean fruit size (g)	Mean Brix %	First pick date	Characteristics
0453C4	3434	4.4	10.6	29/06/09	Very early. Glossy, firm, good shelf-life, great sweet and floral flavour all season, good habit and display, small size at end of season.
0453C5	3502	4.3	9.6	02/07/09	Early. Very attractive in a punnet, good flavour all season, very firm, great display.
0433F2	1932.5	5.0	10.3	06/07/09	Glossy conical fruit – resembles Tulameen, sweet and aromatic.
0433H-3	3901	4.7	8.8	02/07/09	Early season. Sweet and floral flavour, consistent through the season, firm, slightly dull in colour, smaller size at end of season.
9911C-1	5333	5.3	10.0	02/07/09	Early season. Large fruit with prominent drupes, sweet and floral all season, solar damage occurred early in 2009 season.
Glen Ample	2934	5.5	8.5	06/07/09	Very poor example of Ample. Short laterals and petioles, very difficult to pick, flavour more acidic than usual for Ample.
Glen Fyne	5539	5.4	11.3	06/07/09	Mid season, large fruit, sweet and juicy, good yield but exhibited root rot symptoms in plot.
Octavia	2673.5	5.4	9.8	13/07/09	Late season. Fruit clustered on very short petioles, sharp flavour but pleasant aroma, some mildew appeared on primocanes.
Tulameen	2893	4.8	11.5	06/07/09	Variable establishment, 4/5 plants with very poor quality – rough and crumbly, some bleeding in punnet, superb flavour.

***Selections currently in on-farm trials**

The yield from SCRI of the on-farm selections are compared with Glen Ample in Figures 1, 2 and 3.

Figure 1 Mean yield of selections in SCRI plot J24

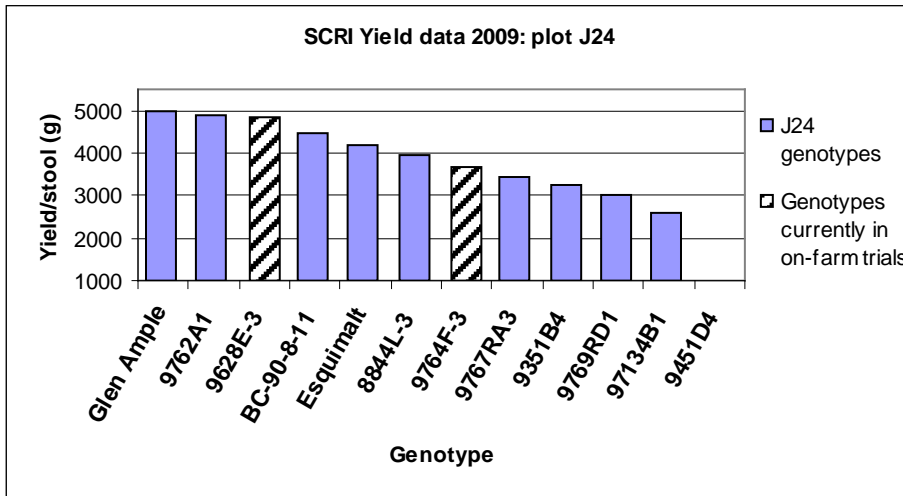


Figure 2 Mean yield of selections in SCRI plot J25

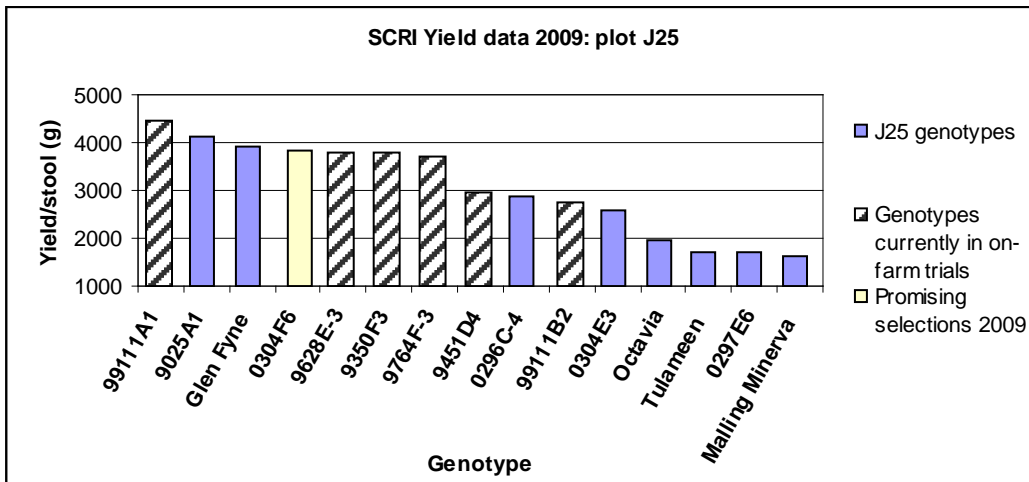
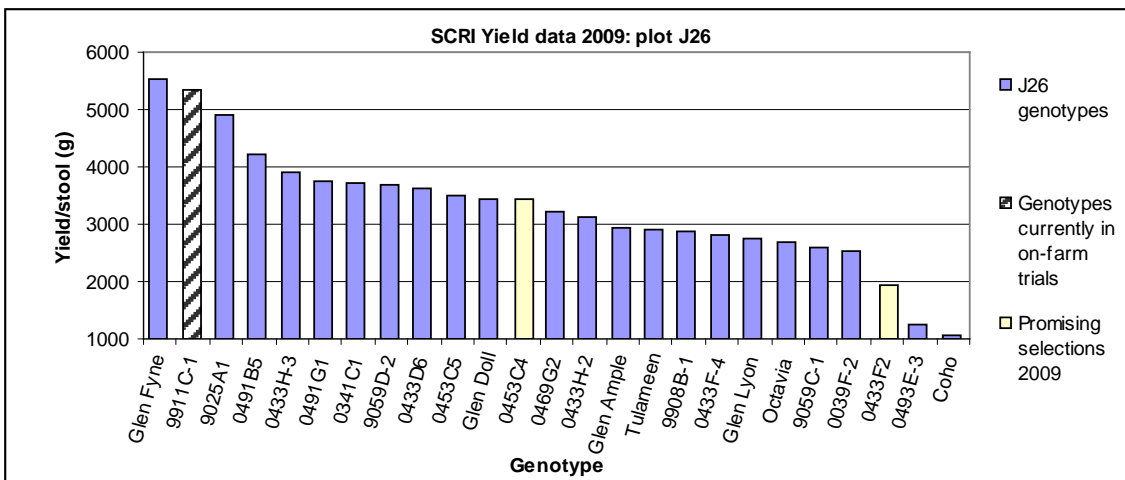


Figure 3 Mean yield of selections in SCRI plot J26



Machine harvested plot

A plot for machine harvesting, consisting of eighteen 20m rows, was planted in spring 2006 at SCRI. This plot is now badly infested with Phytophthora root rot. A summary of the most promising selections is shown in Table 4.

Table 4 SCRI Machine harvest plot - summary of key selections

Selection	Yield/ m (g)	Fruit size (g)	Brix %	First pick date	Characteristics of machine pick
99111B2*	323.5	3.2	9.2	28/07/09	Good machine pick, little green or stalk but poor yield in 2009 and very acidic in flavour. Good primocane growth.
99111A1*	1153. 8	3.2	9.7	21/07/09	Good machine pick, high IQF%*, dry, clean, uniform, long season, high yield, strong primocane growth.
9673E4	512.4	2.4	11.2	21/07/09	Very high proportion of IQF % in pick, low green content, fruit is dry and uniform in the tray.
9451D4*	855.5	2.5	10.4	21/07/09	Dark fruit, firm, uniform, resembling Glen Doll. High proportion of IQF% but obvious green and stalk. Sweet flavour later in season.
9025A1	1250. 3	2.6	9.6	17/07/09	Dark, good quality but wind and beetle damage on fruit. Some tolerance to Phytophthora.
Glen Ample	483.0	2.1	9.2	21/07/09	V. mouldy in second half of season, soft and bleeding throughout season, crumbly fruit, good flavour.

*Individual Quick Frozen: high quality fruit suitable for freezing

Main Conclusions

- Glen Fyne performed very well in SCRI trials producing a high yield of fruit with exceptional flavour. This has been consistent for the last two seasons. First plants became available from propagators in spring 2008.
- Phytophthora-tolerant selections 99111A1 and 99111B2 are continuing to perform well in protected and open-field machine-harvested plots. Both are productive with good fruit quality suitable for processing. Selection 99111A1 appears to be acutely susceptible to RBDV at SCRI, whilst 99111B2 remains RBDV-free. Propagation licences for 99111A1 and 99111B2 have been issued to Trade Solutions. RW Walpole has requested a licence for 99111B2.
- Selection 00123A7 was planted in on-farm trials in six UK sites and produced a small crop in 2009. Plots are still to establish but early results are encouraging.
- Selections 0019E2 and 9911C-1 were planted in farm trials in 2008 and early trial data from one site was very promising.
- One new selection 9350F3 performed well in SCRI trials in 2008 and 2009 and is recommended for on-farm trials in 2010.

- Three new selections 0453C4, 0304F6 and 0433F2 stood out in SCRI plots with good eating quality and generated lots of interest from various visitors to SCRI during the fruit season. These are recommended for on-farm trials in 2010.

Financial benefits

The release of varieties with improved fruit quality and yield will result in increased class 1 percentage, thus increasing growers' productivity. New varieties with pest and disease resistance will lead to a reduction in pesticide applications, reducing production costs. It will also lead to reduction in fruit rejections occurring as a result of pesticide residues. With the possibility of further losses of agrochemicals as a result of EU-led policy changes, it is essential that the industry has access to resistant germplasm in the future.

Action points for consortia members

- Continue commercial propagation of Glen Fyne.
- Propagate new selections 9350F3, 0453C4 and 0433F2 for on-farm trials.

