

Grower Summary

SF 041c

Raspberry: summer fruiting
variety trial

Final 2013

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Headline

Glen Fyne, Cowichan and Tadmor are summer fruiting raspberry varieties which are highly suited to UK commercial production.

Background

Glen Ample, Tulameen and Octavia are the principal summer fruiting raspberry varieties currently grown in the UK. These varieties enable UK growers to produce quality fruit under protection from May to late July.

Problems with susceptibility to pest and or disease and in the case of Tulameen of imperfect fruit quality, highlighted the need to evaluate named varieties and advanced selections of summer fruiting raspberries. The intention is to identify varieties which will provide high quality fruit over extended periods which are high yielding, crop reliably, produce firm berries which look appealing, have a good flavour and texture, have a long shelf-life and are practical to grow, manage and pick.

Results of the variety trial

This Grower Summary provides a précis of the trial results and information about the most promising varieties for the UK. Refer to the Science Section for a comprehensive description of the performance of all the varieties included.

Replicated plots of eight new summer fruiting raspberry varieties were planted in 2009 or 2010 at Rectory Farm, Stanton St John, Oxford. The trial site was located within a commercial south facing planting of raspberries and protected from adverse weather by Spanish tunnels from just prior to the start until the end of harvest.

The soil is free draining and of a light loamy sand texture. These eight trial varieties were compared with three control varieties, Glen Fyne, Tulameen and Octavia over two harvest years. Single guard plots of ten additional varieties were examined and compared to Glen Lyon, which was planted as a standard variety for very early fruit production.

Table 1 (below) lists the main entries to the replicated trial. Table 2 (below) lists the guard entries included in the trial.

Table 1. Main entries of summer fruiting raspberry variety trial (listed according to cropping season)

Variety /Selection	Origin	Cropping season	Planted	Harvest period 2011 season	Harvest period 2012 season
9911C-1	Scotland	Early	June 2010	14 Jun - 1 Jul	18 Jun – 6 Aug
CO9	England	Early	June 2009	14 Jun - 20 Jul	18 Jun – 16 Jul
Korpiko	New Zealand	Early	June 2009	16 Jun - 20 Jul	22 Jun – 30 Jul
Glen Fyne	Scotland	Early - mid	June 2009	14 Jun - 25 Jul	25 Jun – 1 Aug
00123A7	Scotland	Early - mid	June 2009	16 Jun - 22 Jul	25 Jun – 10 Aug
Tulameen	Canada	Early - mid	June 2009	16 Jun - 22 Jul	27 Jun – 8 Aug
Cowichan	Canada	Mid - late	June 2009	16 Jun - 25 Jul	25 Jun – 10 Aug
Glen Doll	Scotland	Mid - late	June 2009	18 Jun - 1 Aug	25 Jun – 6 Aug
CO6	England	Late	June 2009	27 Jun - 1 Aug	22 Jun – 6 Aug
Tadmor	New Zealand	Late	June 2009	18 Jun - 25 Jul	29 Jun - 10 Aug
Octavia	England	Late	June 2009	24 Jun - 1 Aug	29 Jun – 10 Aug

Table 2. Guard entries of summer fruiting raspberry variety trial (listed according to cropping season)

Variety /Selection	Origin	Cropping season	Planted	Harvest period 2011 season	Harvest period 2012 season
0485K-1	Scotland	Very early	June 2010	14 Jun - 15 Jul	22 Jun – 25 Jul
0453C4	Scotland	Very early	June 2010	14 Jun - 25 Jul	22 Jun – 3 Aug
Glen Lyon	Scotland	Early	June 2009	14 Jun - 20 Jul	25 Jun – 18 Jul
0433F2	Scotland	Early	June 2010	14 Jun - 20 Jul	26 Jun – 3 Aug
TulaMagic	Switzerland	Early	June 2009	14 Jun - 25 Jul	18 Jun – 1 Aug
Cascade Delight	USA	Mid	June 2009	14 Jun - 25 Jul	29 Jun – 10 Aug
Chemainus	Canada	Mid	June 2009	16 Jun - 22 Jul	27 Jun – 8 Aug
Jeanne d'Orléans	Canada	Mid	June 2010	16 Jun - 25 Jul	25 Jun – 10 Aug
9764F-3	Scotland	Mid - late	June 2009	16 Jun - 1 Aug	25 Jun – 8 Aug
0019E2	Scotland	Mid - late	June 2009	18 Jun - 25 Jul	2 Jul – 10 Aug
0304F6	Scotland	Mid - late	June 2009	24 Jun - 1 Aug	25 Jun – 8 Aug

Table 3 (below) lists the yields, % marketable fruit and average berry weight of the main entries in seasons 2011 and 2012. Marketable fruit refers to intact, market quality fruit, in contrast to waste which includes damaged, diseased or under-size fruit.

Table 3. Yield (kg/plant), % marketable fruit and average berry weight in 2011 and 2012 for main entries in summer fruiting raspberry trial in order of yield

Variety	Av. yield/plant (kg)		% Marketable		Av. berry weight (g)	
	2011	2012	2011	2012	2011	2012
Cowichan	2.5	2.1	95.0	79.9	5.4	5.6
Tadmor	1.9	2.1	80.7	92.0	4.6	5.1
Glen Fyne	2.0	1.3	93.9	92.0	3.9	4.1
Korpiko	1.4	1.8	97.5	79.9	4.2	4.9
00123A7	1.5	1.6	87.7	89.0	3.7	4.6
Tulameen	1.4	1.4	96.8	83.3	3.5	4.3
CO6	1.3	1.4	95.1	82.0	3.2	3.4
Octavia	1.3	1.3	96.6	81.7	5.1	5.7
Glen Doll	1.3	1.0	75.8	90.1	3.5	3.7
9911C-1	0.5	1.4	94.2	73.8	4.5	4.6
CO9	1.6	1.3	97.8	75.3	2.8	3.1

Cowichan was the highest yielding of the main entries closely followed by Tadmor. However Tadmor produced a much higher percentage marketable fruit. Cowichan, Tadmor and Octavia had on average the highest berry weight. The lowest yielding varieties were Glen Doll, Octavia and Glen Fyne. Lowest berry weight was observed in CO9, Glen Doll and CO6. Lowest % marketable fruit was observed in 9911-C and CO9 and this was mostly due to uneven fruit shape. Glen Fyne, Tadmor and Glen Doll showed the highest proportion of marketable fruit.

Table 4 lists the yields, % marketable fruit and average berry weight of the guard entries in seasons 2011 and 2012.

Table 4. Yield (kg/plant), % marketable fruit and average berry weight in 2011 and 2012 for the summer fruiting raspberry guard entries (single plots) in order of yield.

Variety	Av. yield/plant (kg)		% Marketable		Av. berry weight (g)	
	2011	2012	2011	2012	2011	2012
Cascade Delight	2.1	2.2	94.2	86.5	5.0	5.9
Chemainus	1.4	2.4	97.6	95.2	3.5	4.5
9764F-3	0.8	2.4	93.2	85.8	4.0	4.0
Jeanne d'Orléans	1.4	1.6	99.7	89.9	3.6	3.8
0019E2	0.7	2.1	73.8	83.3	6.3	5.7
Glen Lyon	1.9	0.7	96.8	75.3	2.7	3.5
TulaMagic	1.8	0.7	97.0	76.3	3.9	4.1
0485K-1	1.1	1.1	98.3	91.6	4.4	5.0
0453C4	0.3	1.3	91.8	82.1	3.8	3.9
0304F6	0.3	1.1	98.0	86.2	4.5	4.0
0433F2	0.2	1.0	98.7	91.6	3.6	4.3

Of the guard entries, Cascade Delight (both years), Chemainus, 9764F-3 and 0019E-2 (in 2012 only) showed the highest yields and of those, Chemainus showed the highest

proportion of marketable fruit in 2012. Berry weight was also high in these varieties along with 0485K-1.

Main entries of particular interest based on 2 full cropping years

The following varieties are of most interest to the industry:

<i>Cowichan</i>	<i>Tadmor</i>	<i>0485K-1</i>
		
<i>Cascade Delight</i>	<i>Chemainus</i>	<i>Jeanne d'Orleans</i>
		
<i>0019E2</i>		
		

Figure 1. Varieties of most interest to the industry

Cowichan

Throughout its very long harvest this PARC variety produced large berries of a consistent shape. Berry size is also retained well through harvest. The berries were bright, firm, with a moderate to good flavour and shelf life better than Tulameen. Presentation to the pickers and detachment of fruit was superior to that of Tulameen. However the length of the laterals of this variety when grown under protection can increase the risk of them being damaged by pickers, so lateral supports are recommended for the protected crop which also substantially improves presentation of fruit to the picker. Cowichan produces tall very upright and very easy to manage canes which bear a few but generally unobtrusive spines towards their base. Commercial experience has also indicated that it is far less susceptible to foliar & cane diseases than Tulameen. It also has more winter hardiness and is later to break bud than Tulameen, making it less vulnerable to damage during the winter or by spring frosts. Cowichan exhibits field tolerance to raspberry root rot and its reliability of cropping and production of high yields of good sized fruit make it a useful variety for direct from farm sales.

Tadmor

In 2011 the Tadmor harvest was completed just before Octavia and in 2012 at the same time as Octavia. The performance of this variety was very good. The quality of its fruit, especially the colour, brightness and flavour, was superior to Octavia. Throughout harvest, the shelf-life was good, the fruit was well displayed to pickers and easy to detach. Canes are medium to tall, upright to spreading in habit, bear some spines but are generally easy to manage. So far, Tadmor has not proved vulnerable to cane or foliar diseases, but is susceptible to Phytophthora root rot, so on some sites, substrate production is recommended along with routine fungicide applications. Tadmor has exhibited considerable commercial potential and several growers who have planted it have been very pleased by its performance to date.

CO6 and CO9

The berry quality, size and/or yield of marketable fruit produced by the EMR advanced selections **CO6 & CO9** was poor, so these will not be developed further.

Standard varieties

Glen Fyne performed well in 2011, although the presence of Phytophthora root rot infected plants was confirmed in two plots in the late summer of 2010. The disease spread further resulting in plant losses in all of the plots of this entry by spring 2012, causing a marked reduction in yield and berry size in summer 2012. However overall, the results from this entry were excellent. Its fruit retained size throughout harvest. Berries were bright, attractive, with an excellent flavour, good shelf life, very well presented and easily detached from fruit

laterals. In mid harvest during bright weather, the berries became a little dark, but growers have found that this variety can be picked tight with the benefit of having a berry of the desired appearance at the point of sale. Glen Fyne is vulnerable to powdery mildew, although this disease was not a problem during the life of the trial. It is very susceptible to raspberry root rot so production on many sites would be best in substrate rather than in open field or glasshouse soil. Glen Fyne produces adequate numbers of medium to tall canes, which are spine free and with an upright to spreading habit. They are easy to manage provided that they are kept upright as they grow. The laterals are of medium length, strongly attached and do not require support.

Octavia yields in both 2011 & 2012 were much reduced due by cold injury to lower & mid florican buds during the winter (2010-11) or late winter-early spring (2012). In addition in spring 2012, there was a high infestation of spur blight. During the first 8-10 days of the harvest in 2012, a substantial amount of unmarketable unevenly ripened fruit was picked. As yet the cause has not been identified although the appearance of affected fruit appeared to coincide with a change to hot bright sunshine after a long period of cool overcast and very wet weather.

Tulameen berry quality (i.e. shape, firmness & size) produced in the trial was consistently poor. Cane growth was variable and weak in some plants. The origin of the clone for the plants provided by the commercial propagator for the trial is unknown but was not the Tulameen clone held at Naktuinbouw which in HDC project SF105, was shown to produce the best quality of fruit of this variety.

Guard entries of particular interest

0485K-1

0485K-1 has an exceptionally early fruiting season so could be considered as a replacement for Glen Lyon and Glen Moy. It produces attractive, evenly set, conic, cohesive fruit with a very good flavour. Fruit is well displayed to pickers on medium to very long laterals. The canes are spine free, plentiful in number and upright to spreading in their habit. This selection is known to be susceptible to *Phytophthora* root rot, but in project SF 41c neither this nor any foliar or cane diseases were noted as being a problem.

JHI and the UK Raspberry Breeding Consortium have decided to trial this selection further. It has therefore been proposed as a main entry for SF 41d (the next HDC summer fruiting raspberry variety trial).

Cascade Delight

Cascade Delight has consistently produced high yields of marketable fruit, with very large, bright, attractive and sweet berries. The berries are very cohesive, but soft and easily damaged by wind and rain. This variety is therefore best suited to tunnel rather than outdoor production. Supermarkets have shown some interest in this variety, although it is likely to be of interest mainly for PYO, farm shop and local market sales. Further fruit samples will be submitted to determine their suitability for fresh fruit supermarket sales in 2013.

The primocane is very tall (never less than 1.8m), upright to spreading, with some spines but generally pleasant to handle. Lateral support is recommended for this variety, be it planted in the open or provided with protection during most of its growing season. Because of its strong growth, additional space between rows is recommended to facilitate tractor and picker access in the plantation later in the season.

Cascade Delight can exhibit considerable field resistance to *Phytophthora* root rot, though it can succumb to this disease. In addition the fruit and canes are susceptible to *Botrytis*.

Chemainus

Chemainus is a mid-season variety. Like Cowichan, it was a promising guard entry in HDC project SF 41b. However it proved to be more susceptible to *Phytophthora* root rot and succumbed before the end of the trial. In this trial (SF 41c) it has consistently produced very bright attractive and very firm fruits, of moderate flavour and size. These were of a very regular shape, very cohesive, well displayed to the picker and easily detached.

The plant habit is very similar to that of Cowichan with tall upright canes bearing a few spines, adequate in number and very easy to manage when compared to Tulameen. No foliar, fruit or cane disease problems were noted as affecting this variety during the trial and unlike some other entries, spring frost or winter cold injury did not affect its floricanes, with bud break in both 2011 & 2012 down more or less the whole length of canes.

Jeanne d'Orleans

A mid-season fruiting variety from Quebec in Canada. Berries have very distinct aromatic sweet deep 'raspberry' flavour, are a mid-dark red in colour, and are very bright and attractive on the plant and in the punnet. Texture is slightly soft but fruit has an excellent shelf life which is far superior to that of Tulameen or Octavia and is on a par with that of Glen Fyne. Canes are adequate in number, tall, upright to spreading and bear very noticeable spines. These do not hamper picking but make cane management very unpleasant (particularly on young plants). Fruiting laterals are medium to long, ascending in habit. They are very strongly attached and present fruit well to the picker.

Although unlikely to become a widely planted commercial variety, its exceptional fruit flavour may provide it with a place in niche markets where this attribute is a major consideration. Meiosis has the marketing rights to Jeanne d'Orleans in the UK and has indicated that they may develop it further, at least for fruit production by amateurs.

0019E2

0019E2 has a very late harvest and is being considered as a replacement for Octavia. In addition it consistently produces very large, firm, cohesive, attractive, bright fruit with a moderate flavour (superior to that of Octavia, i.e. no off flavour) and has an excellent shelf life. Canes are upright in habit, spine free, adequate in number, medium to long with ascending laterals which present fruit well to pickers.

In 2012, a high number of buds in the lower–mid region of floricanes failed to break bud. The reason for this is unknown, although cold injury around bud break may be implicated; in trials at JHI it would appear that this selection may require considerable chilling (as per Ample) to ensure even bud break and flower lateral production down the full length of the floricane. At harvest, the laterals were long and susceptible to being broken away from their base by pickers. Lateral support is likely to be required for this variety.

At the SF41c variety trial open day, there was considerable grower interest in this selection and trial results elsewhere have led to JHI and the UK Raspberry Breeding Consortium deciding to develop this selection further. It has therefore been proposed as a main entry for SF 41d (the next HDC summer fruiting raspberry variety trial).

Other guard entries

Although there was some interest in the selection **0453C4**, JHI and the UK Raspberry Breeding Consortium have decided to delist this and the other JHI selections which were guards in this trial. Similarly the trial has shown that ***Tula Magic*** has no commercial value in the UK.

Main conclusions

- The potential of Glen Fyne, Tadmor and Cowichan as suitable summer fruiting raspberry varieties for UK growers was confirmed in this trial.
- Four further guard entries (Jean d'Orleans, Chemainus, 0485K-1, 0019E-2 and Cascade Delight) were identified as promising selections.
- Results achieved by Tulameen, Glen Doll and Octavia in terms of yield and berry quality were disappointing in 2011 and 2012.