



Agriculture & Horticulture
DEVELOPMENT BOARD



Grower Summary

SF 128

To assess the suitability and production of newly released June-bearing strawberry varieties and near-market selections when grown in substrate culture.

Final 2012

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HDC is a division of the Agriculture and Horticulture Development Board.

Project Number: SF 128

Project Title: To assess the suitability and production of newly released June-bearing strawberry varieties and near-market selections when grown in substrate culture.

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Previous report/(s): Annual Report 2011

Start Date: 01 April 2011

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Project Cost: £16,800

Headline

Vibrant, Flair and EM1764 (Malling Centenary) show great promise for protected strawberry production in soilless substrates.

Background

Soilless substrate production is becoming more popular in the UK due to the loss of soil fumigants which control soil borne disease, the increased difficulty in finding clean land for new plantings and the need to use inputs such as water and nutrients more efficiently.

In many cases, new selections and varieties recently released for commercial production have not been assessed for their performance in substrate culture under UK conditions. Providing information on the performance of varieties in substrate culture should help growers to identify those that best suit their growing system and ultimate market outlet, so reducing the risk a grower takes when introducing new varieties.

HDC identified a need for a UK grower trial to bring together all the new and promising varieties on one site where they can be assessed under commercial conditions. Planting material should be as uniform as possible to enable true comparisons to be made between varieties.

Results

The following is a summary of the information provided in the 'SF 128 Full Trial Report', available from the HDC.

Varieties included

The varieties selected for inclusion in this project are mainly from European breeding programmes, which are considered more likely to produce varieties suited to UK production than those from other continents.

Table 1 lists the varieties, breeding programmes, plant suppliers and plant types used.

Table 1: Varieties included in the trial

Variety/ Selection	Breeder	Country	Season	Plant Type
Vibrant	East Malling Research	UK	Early	Tray 9 x 7cm
Flair	Goossens Flevoplants BV	Netherlands	Early	Summer tray 8 x 6.5cm
Wendy	Agriculture & Agri Food Canada	Canada	Early	A+
Anitabis	\AFC) Magnani & Molari	Italy	Early	Tray 9 x 6.5cm
Clery	Centro Innovazione Varietale (CIV)	Italy	Early	Tray 9 x 7cm
Rumba	Fresh Forward	Netherlands	Early	A+
EM1764	East Malling Research	UK	Mid	Tray 7.5 x 6.5cm
Figaro	Fresh Forward	Netherlands	Mid	Tray 8 x 6.5cm
EM1597	East Malling Research	UK	Mid	A+
Joly	Centro Innovazione Varietale (CIV)	Italy	Mid	Tray 8 x 7cm
Elsanta 1	Plant Research International (PRI)	Netherlands	Mid	Tray 9 x 7cm
Elsanta 2	Plant Research International (PRI)	Netherlands	Mid	A+
Elegance	East Malling Research	UK	Mid/late	Tray 9 x 7cm

Production system

The twelve June-bearing strawberry varieties/selections were planted in new Botanicoir bags under Spanish tunnels at New Farm Produce's site at King's Bromley in Staffordshire. The trial was located in the centre three beds of a five-bed tunnel, one row of bags per bed, and was managed in terms of fertigation and agrochemical inputs the same as the surrounding commercial Elsanta crop. Planting took place on 30 June 2011 (week 26) at a spacing of eight plants per metre bag (53,328 per hectare); four replicates were planted. The aim was to use tray plants of all the entries but three varieties, namely Rumba, Wendy and EM1597 were only available as A+ plants. As a consequence both tray and A+ plants of the control, Elsanta, were included in the trial.

Yields

Yield data from the 60-day crop in 2011 and full main crop in 2012 is listed in the Tables 2 and 3.

Table 2: 2011 60-day Fruit Yield data (listed by 50% harvest date)

Variety	50% harvest date	Class 1 Yield (g/plant)	Class 1 Yield (tonnes per hectare)	Berry Size %			
				% Class 1	Extra large >45	Large 35-45 mm	Medium 25-35 mm
Vibrant	22/08/11	233	12.43	92.3	2.5	58.4	39.1
Flair*	16/09/11	282	15.04	85.8	3.7	46.7	49.6
Anitabis	23/08/11	163	8.69	81.3	1.1	48.9	50.0
Clery	25/08/11	334	17.81	92.5	0.3	37.5	62.1
EM1764	02/09/11	440	23.46	96.8	2.2	62.6	35.2
Figaro	04/09/11	294	15.68	88.4	5.6	50.6	43.8
Joly	27/08/11	256	13.65	87.7	4.3	49.6	46.1
Elsanta 1	09/09/11	360	19.20	86.0	2.2	42.7	55.1
Elegance	13/09/11	356	18.98	90.8	1.3	44.8	53.8
A+ plants:							
Wendy	22/08/11	176	9.39	78.0	0.0	36.4	63.6
Rumba	28/08/11	347	18.50	94.2	1.8	51.8	46.4
EM1597	31/08/11	242	12.91	94.3	1.6	56.0	42.4
Elsanta 2	03/09/11	201	10.72	83.8	0.6	25.7	73.7

* Flair was planted as a summer tray plant, which delayed fruit production. A true representation of the performance of Flair will be available from the spring 2012 harvest.

Table 3: 2012 Main crop Fruit Yield data (listed by 50% harvest date)

Variety	50% harvest date	Class 1 Yield (g/plant)	Class 1 Yield (tonnes per hectare)	Berry Size %			
				% Class 1	Extra large >45	Large 35-45 mm	Medium 25-35 mm
Vibrant	26/05/12	659	35.14	90	5	62	33
Flair	27/05/12	746	39.78	78	0	34	66
Wendy A+	29/05/12	395	21.06	57	2	39	59
Anitabis	29/05/12	357	19.04	68	4	52	43
Clery	30/05/12	461	24.58	71	1	42	57
EM1764	04/06/12	717	38.24	89	1	51	48
Rumba A+	08/06/12	461	24.58	65	16	54	30
Figaro	08/06/12	347	18.50	68	1	50	49
EM1597 A+	13/06/12	578	30.82	73	11	54	35
Joly	17/06/12	366	19.52	53	7	55	38
Elsanta 1	17/06/12	435	23.19	48	2	49	48
Elsanta 2 A+	18/06/12	395	21.06	50	1	47	52
Elegance	19/06/12	535	28.53	68	7	54	39

The following varieties/selections are of most interest to the industry. Full information on all varieties can be found in the 'SF 128 Full Trial Report'.

*The plants of **Flair** used in the trial were summer trays, which delayed fruit production in year one in comparison to the other plant types used. A true record of Flair's season is shown in the main crop pick in 2012.*

Vibrant was one of the earliest varieties in trial; the 60-day crop produced a class 1 yield of 233g per plant, which was made-up of 61% large fruit (>35mm) and 92% class 1. The main crop yield of 659g (class 1) also had a high proportion of large fruit (67% >35mm) and maintained an excellent 90% class1, despite the cool damp weather experienced at flowering and fruiting.

Flair, with a similar early season to Vibrant, gave the highest main crop yield (746g/plant) with a class 1 percentage of 78%. The class 2 consisted mainly of misshapen and small fruit, suggesting that this percentage could be lowered in a more normal season and if the plants had been crown thinned to reduce the flower numbers. Flair had on average 8.5 crowns per plant. The proportion of medium size fruit in the class 1 sample was the highest in trial at 66%, which would lead to higher picking costs than Vibrant.

As a 60-day plant **Clery** produced a good class 1 yield of 334g per plant, but of this only 37.8% was large fruit (>35mm). In the main crop year there was more medium (57%) than large fruit (43%). The 50% harvest date was only slightly later than Vibrant and Flair with picking commencing at a similar time but the total and class 1 yields achieved were considerably lower in the main crop season.

In the 60-day season the highest yielding entry was **EM1764 (Malling Centenary)** with a class 1 yield 22% higher than Elsanta, 64.8% of fruit in the large size category (>35mm) and a high class 1 percentage of 96.8%. In the main crop year, class 1 yield was good at 717g per plant with a high class 1 percentage of 89. Like Vibrant the poor weather conditions did not unduly affect class 1 percentage showing that these varieties reliably produce good quality fruit in such adverse conditions.

Rumba was of note for producing a high yield of 347g class 1 per plant from an A+ plant in the 60-day season, 73% higher than the Elsanta A+ in trial. 53.6% of the fruit fell into the large size category (>35mm). Rumba had a significantly higher total and class 1 yield than the other three cultivars in the A+ trial, whereas Elsanta had significantly smaller berries. In the main crop year it again produced the highest proportion of large fruit (70%), 16% of

which was extra large (>45mm). Misshapen fruit reduced the class 1 percentage to 65. Class 1 yield was only moderate and the 50% harvest date was at least a week later than Vibrant and Flair.

Elegance gave a reasonable 60-day class 1 yield of 356g per plant, very similar to Elsanta. In the main crop season Elegance produced a class 1 yield of 535g per plant. It is a variety with quite vigorous growth and under the high feed regime in substrate culture produced very dense foliage, which hampered pollination and led to a higher percentage of misshapen fruit that was small in size. However, despite this the class 1 had a good proportion of large fruit (54%). Elegance would benefit from crown thinning to improve fruit quality. On average, 5.3 crowns per plant were produced.

Fruit quality

The fruit quality records are listed in Table 4 (below).

Table 4: Fruit Quality

Variety	External berry colour 1 = light orange 8 = dark wine-red	Uniformity of berry shape 1 = irregular 9 = uniform	Skin firmness 1 = soft 9 = firm	Berry Appearance 1 = poor 9 = excellent	Fruit flavour 1 = poor 9 = excellent	Shelf life 1 = poor 9 = excellent	Mean Brix (sugar content)
Vibrant	7.0	8.0	7.0	8.0	7.0	7.0	7.1
Flair	5.5	7.0	7.0	7.0	6.5	6.5	7.9
Wendy	7.5	6.0	6.5	5.0	7.0	5.0	6.8
Anitabis	6.5	6.5	7.0	5.5	3.0	5.0	7.4
Clery	5.0	5.5	6.0	7.0	7.0	7.5	7.4
EM1764	5.0	8.0	7.5	8.5	7.5	8.0	7.9
Rumba	7.0	6.5	4.5	8.5	6.5	5.5	6.9
Figaro	5.0	7.0	7.0	6.0	7.0	8.5	8.6
Joly	5.0	5.0	6.5	4.5	7.0	7.5	7.7
EM1597	3.5	6.5	5.0	6.0	5.0	6.5	7.2
Elsanta	5.5	3.0	5.5	5.0	7.0	7.5	6.6
Elegance	5.0	7.0	7.5	9.0	6.5	8.0	6.4

In terms of fruit quality **EM1764 (Malling Centenary)**, **Elegance** and **Rumba** all stood out for their exceptionally good appearance. **EM1764 (Malling Centenary)** scored well in all quality categories having a uniform conic berry shape, orange-red colour with good shelf life and skin firmness. In tastings, EM1764 (Malling Centenary) scored well through the season with a mean Brix reading of 8.4 in year one and 7.9 in the duller conditions experienced in year two.

The high gloss and bright red colour of **Rumba** gave it a desirable quality in the punnet. In storage, the berries darkened slightly and bruises became more prominent. Flavour and Brix levels were similar to Elsanta. **Elegance** had exceptional storage qualities and performed well in all other fruit quality assessments.

Vibrant scored well for flavour and texture in most tastings and Brix readings were consistently higher than Elsanta. The berries were uniformly conic, large in size with a good gloss and a slightly darker skin colour than Elsanta.

Joly produced a long conic berry with a white elongated neck and reflex calyx. However, flavour and Brix readings were good and in storage the white neck did colour-up to some degree. **Clery** also had a white berry top but this was partially hidden by the calyx.

Anitabis produced long conic fruit with an elongated neck that was found to be susceptible to splitting; the flesh was also quite soft. Both Anitabis and **Wendy** were darker in colour than Elsanta; Wendy also had an irregular shape and fruit from both varieties tasted quite acidic.

Main conclusions

- The early season varieties Flair and Vibrant have good potential to perform well in substrate culture in terms of both fruit yield and fruit quality with the significant financial benefits this could potentially bring. Both varieties are already commercially available to all growers.
- The early/mid season selection EM1764 (Malling Centenary) produced a higher class 1 yield than the industry standard, Elsanta, with a high percentage of large berries making it potentially more cost efficient to harvest. The good fruit quality attributes should make it a desirable addition to the marketplace. EM1764 (Malling Centenary) is expected to be available for commercial production in 2013.
- Clery with its early season and Rumba, which produces a high proportion of large fruit, may not have sufficient yield required for profitable production in high cost UK production systems.
- To reach their full potential, Elegance with a slightly later season than Elsanta and mid season Joly may be better suited to less intensive production systems.