



Grower Summary

SF 096a

East Malling Strawberry

Breeding Club

Annual report 2018

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The results and conclusions in this report are based on an investigation conducted over a one-year period. The conditions under which the experiments were carried out and the results have been reported in detail and with accuracy. However, because of the biological nature of the work it must be borne in mind that different circumstances and conditions could produce different results. Therefore, care must be taken with interpretation of the results, especially if they are used as the basis for commercial product recommendations.

AUTHENTICATION

We declare that this work was done under our supervision according to the procedures described herein and that the report represents a true and accurate record of the results obtained.

Adam Whitehouse
Programme Leader
NIAB EMR



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Date 14th May 2018

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GROWER SUMMARY

Headline

Nine new selections, six June-bearers and three everbearers, were selected from the 2017 East Malling Strawberry Breeding (EMSBC) preliminary trials to go forward to UK growers' trials. Of the six June-bearers; two were early selections, one was mid-season and three were late season types. All will be trialled on UK growers' sites in 2019/20. In addition, 14 advanced selections were trialled on growers' sites, with five of these progressing to further trials, one selection, an everbearer (EMR639), is being considered for commercialisation.

Background

The main objective of the East Malling Strawberry Breeding Club (EMSBC) strawberry breeding programme is to develop improved strawberry varieties, both June- and everbearing with increased yield, larger fruit size, an extended season of production and greater resistance to fungal diseases. Funding for the programme was renewed in 2013 to follow on from the first tranche of the EMSBC breeding programme which had started in 2008 and that delivered the June-bearer variety Malling™ Centenary. AHDB continues to contribute to the EMSBC via project SF 96a. In 2017 it was agreed that AHDB would continue to remain a member of the EMSBC and continue funding the programme until May 2023.

This report covers three preliminary trials held at NIAB-EMR in 2017 that are part-funded by the AHDB membership of the EMSBC (June-bearer main crop, 60-day and everbearer trials), as well as a brief summary of more advanced selections that have been assessed on offsite EMSBC growers' sites.

Results of selection trials

Descriptions and results from the most promising selections in each of the 2017 trials are shown in the following below, accompanied with tables of results for each preliminary trial:

June-bearer (main crop) NIAB EMR trial

Six selections were considered for assessment in growers' trials in 2019/20; descriptions and data for each selection appear below in season order (earliest to latest), and in Tables 1 and 2:

EM2541 has a higher Class 1 yield than Malling Centenary, Elsanta and Flair with large

average fruit size (86% >35mm) and a high percentage of Class 1 (86%). However, average size can vary large with 32% of fruit being greater than 45mm in the NIAB EMR trial. EM2541 has an early season of production, with 50% harvest date between Flair and Vibrant. Plants are vigorous and may be too leafy for tunnel production.

EM2544 has an average Class 1 yield similar to Elsanta, but with larger average fruit size (86% >35mm) and higher percentage of Class 1 fruit (89%). Cropping season is slightly earlier than Elsanta, and nearer to Vibrant season. Berries are uniform, firm and attractive with good colour with high overall average Brix scores (9.1°). However plants are vigorous and may be too leafy for tunnel production.

EM2248 is a midseason selection that has a Class 1 yield similar to Elsanta but with better fruit size (75% >35 mm) and a higher percentage of Class 1 fruit (87%). Plants have moderate vigour with well-displayed fruit. Berries are glossy with good colour and uniform shape; with average Brix scores similar to Elsanta but with better scores for sensory flavour.

EM2588 is a high-yielding, late season selection with a high percentage of Class 1 fruit (83%) and moderate fruit size. Harvest date is similar to Florence but with a different yield profile and with a long season of production. Plants have moderate vigour with the fruit very well displayed on long trusses. Berries are attractive and glossy with good shape, with high average Brix (11.3°) and good sensory flavour scores.

EM2434 is a late season (10 days later than Elsanta), very high yielding (1.7 kilograms per plant) selection, with large fruit-size (78% >35mm) and with a high percentage of Class 1 fruit. Berries have a uniform shape and high average Brix (9.4 °) but sometimes have uneven colour (Figure 2.a.).

EM2622 has a late fruiting season, with a high Class 1 yield (1.3 grams per plant) and fruit size similar to Florence (69% >35mm). Plants are tall and vigorous but with a very erect habit and good fruit display. Berries are firm and attractive with a good, regular shape, and an average Brix score (8.8°) slightly higher than Florence and Elsanta, and the sensory flavour was liked by visitors at trial walks in 2017.

Table 1 . June-bearer selections. Main crop yield, fruit size and season

Selection	Class 1 yield (g/plant)	% Class 1	% large fruit (>35mm)	50% pick date
EM2248	747	87	75	5 Jun
EM2434	1681	89	78	15 Jun
EM2541	898	86	86	30 May
EM2544	821	89	86	1 Jun
EM2588	1300	83	61	12 Jun
EM2622	1307	82	69	15 Jun
<i>Elsanta</i> ¹	739	80	67	5 Jun
<i>M. Centenary</i>	643	89	80	5 Jun

¹Mean of three plots

Table 2. June-bearer selections. Main crop fruit quality scores

Selection	Appearance (1-9)	Skin firmness (1-9)	Flesh firmness (1-9)	Flavour (1-9)	Shelf life (1-5)	Mean Brix
EM2248	5.5	5.8	5.8	5.7	3.3	8.4
EM2434	5.0	5.4	5.6	5.6	3.5	9.4
EM2541	5.4	5.9	6.1	5.4	3.0	8.2
EM2544	5.7	5.9	5.9	5.9	3.0	9.1
EM2588	5.7	6.1	5.9	6.1	3.8	9.9
EM2622	5.8	6.1	5.9	5.2	4.0	8.8
<i>Elsanta</i> ¹	4.7	5.4	5.0	5.0	3.2	8.7
<i>M. Centenary</i>	6.6	6.1	6.1	5.6	4.0	7.7

¹Mean of three plots

Full descriptions of the fruit quality scoring system can be found in Appendix I of the main report, but as a guide 1=poor, 9=excellent, shelf life comparison 1=worse, 3=same, 5 better than standard

June-bearer (60-day) NIAB EMR trial

This trial included five selections (EM2181, EM2448, EM2464, EM2483, EM2494) that have progressed for assessment in growers' trial in 2018/19. Summarised data from the trial is shown in Table 3. Exceptionally hot weather during establishment and at cropping led to the trial plants performing atypically and therefore it was difficult to draw meaningful conclusions from the trial. All five selections will however continue for assessment in offsite growers' trials in 2018/19.

Table 3. June-bearer selections. 60-day yield, crown size and season

Selection	Marketable yield ¹ (g/plant)	% marketable yield	Mean crown diameter (mm)	Marketable (g/plant) yield per mm crown diameter	50% pick date
EM2181	64.2	62.1	10.1	6.3	6 Jul
EM2448	82.5	57.3	9.8	8.4	3 Jul
EM2464	85.0	48.3	8.9	9.6	29 Jun
EM2483	105.1	77.8	8.3	12.7	3 Jul
EM2494	74.2	52.0	8.3	9.0	3 Jul
<i>M Centenary</i>	<i>144.4</i>	<i>77.8</i>	<i>9.4</i>	<i>15.4</i>	<i>3 Jul</i>

¹ >28 mm

Full descriptions of the fruit quality scoring system can be found in Appendix I of the main report, but as a guide 1=poor, 9=excellent

Everbearer NIAB EMR trial

Three new selections were considered for assessment in growers' trials in 2019. Data (Table 4 & 5) and descriptions are shown below:

EMR773 is an exceptionally high yielding selection with excellent fruit size and high percentage of Class 1 fruit. Fruit is attractive with very good shelf life, but some uneven ripening has been seen on early and late picks in the season. Berries are very firm, with a 'watery sweet' flavour and a good average Brix score (8.1°).

EMR794 produces a high Class 1 yield with a high percentage of large fruit. Fruit is glossy, with a bright, orange-red skin colour, and very firm, often with a crunchy texture. Flavour is often juicy, with watery sweet flavour. In shelf-life tests, EMR794 is noted for retaining its glossy appearance.

EMR797 produces a high yield of Class 1 fruit, with moderate fruit size. However, berries are very attractive with a glossy skin and a very regular conic shape. Flavour is consistently good and often described as sweet, being noteworthy in retailer sampling for its sweetness and high average Brix score (8.8°). Fruit is held on long trusses giving an excellent fruit

display.

Table 4. Everbearer selections. Yield, fruit size and season

Selection	Class 1 yield (g/plant)	% Class 1	% large fruit (>35mm)	50% pick date
EMR773	1769	81	71	10 Aug
EMR794	1704	78	75	21 Aug
EMR797	1358	70	48	21 Aug
<i>Evie 2</i>	1295	68	61	21 Aug
<i>Finesse</i>	1326	67	38	7 Aug
<i>Murano</i>	1014	63	22	4 Sept

Table 5. Everbearer selections. Fruit quality scores

Selection	Appearance	Skin firmness (1-9)	Flesh firmness (1-9)	Flavour (1-9)	Shelf life (1-5)	Mean Brix
EMR773	5.3	6.7	7.4	5.3	4.0	8.1
EMR794	5.5	5.9	6.4	5.6	3.5	8.5
EMR797	5.7	6.1	6.0	5.8	3.0	8.8
<i>Evie 2</i>	5.4	5.6	5.6	4.8	2.8	6.7
<i>Finesse</i>	5.1	5.9	5.8	5.1	3.5	7.7
<i>Murano</i>	5.1	6.2	6.1	5.4	2.7	8.0

Full descriptions of the fruit quality scoring system can be found in Appendix I of the main report, but as a guide 1=poor, 9=excellent, shelf life comparison 1=worse, 3=same, 5 better than standard

Offsite main crop (June-bearer) growers' trial

Three advanced selections (EM2056, EM2157 and EM2192). EM2056 and EM2192 were considered to have been superseded by later selections and will not progress for further trialling. EM2157 has already been put forward commercialisation in 2016 and will be released in 2018/19 as the variety Malling Allure.

Offsite 60-day (June-bearer) growers' trial

Three advanced selections, EM2199, EM2380 and EM2421, performed sufficiently well in the 60-day trial to progress to main crop growers' trials in 2018.

EM2199 is an early season selection, with attractive fruit, with good skin and flesh firmness scores across sites and good flavour with a mean Brix score across sites. Initial disease screening assessments indicate that EM2199 has intermediate resistance to crown rot, moderate resistance to Verticillium wilt, but moderate susceptibility to powdery mildew.

EM2380 is an early, high-yielding selection, with a high percentage of Class 1 fruit, and fruit size comparable to Elsanta. Fruit quality is judged to be very good, with good scores for appearance, skin and flesh firmness and Brix (mean 8.6°). Initial disease screening assessments indicate that EM2380 does not have strong resistance to the major strawberry diseases.

EM2421 is a large-fruited, mid-season selection. It has good scores for appearance, firmness and a high average Brix (9.3°). Initial disease screening assessments indicate that EM2421 has intermediate resistance to crown rot and moderate resistance to powdery mildew, but shows moderate susceptibility to Verticillium wilt.

Offsite everbearer growers' trial

Two advanced selections, EMR693 and EMR704 will progress forward for further trialling in large-scale trials in 2019. EMR639 which was being trialled in large-scale trials is currently being considered for commercialisation.

EMR639 yields a moderate Class 1 yield of glossy and attractive berries. Flavour is pleasant with a good mean Brix score of 8.8° from growers' trials. EMR639 has good disease resistance based on initial tests carried out at NIAB EMR, with good resistance to crown rot and powdery mildew, and moderate resistance to powdery mildew.

EMR693 has a good Class 1 yield of moderately-sized berries. Fruit is very attractive with a uniform shape and colour, good skin and flesh firmness and pleasant, often sweet flavour. Retailer and visitor feedback was also excellent, with triallists suggesting that it had clear cultivar potential. Initial disease screening assessments indicate that EMR693 moderately susceptible to Verticillium wilt, intermediate resistance for crown rot and moderately resistant to powdery mildew.

EMR704 is a high yielding everbearer with excellent fruit size. Appearance and firmness are good, with berries having a pleasant flavour combined with a high mean Brix score (9.0°) in growers' trials. An early season of production was reported with some triallists. Initial disease screening assessments indicate that EMR704 has intermediate resistance to Verticillium wilt, but good resistance to crown rot and powdery mildew.