

**Project title:** East Malling Strawberry Breeding Club

**Project number:** SF 96a

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**(or expected completion date):**

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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 (Plant Breeder)

NIAB EMR



Signature

Date 31<sup>st</sup> May 2021

Katie Hopson

Specialist (Plant Breeder)

NIAB EMR



Signature

Date 31<sup>st</sup> May 2021

**Report authorised by:**

Signature .....

Date .....

[Name]

[Position]

[Organisation]

Signature .....

Date .....

## ***GROWER SUMMARY***

### **Headline**

Six new selections; four June-bearers and two everbearers were selected from the 2020 East Malling Strawberry Breeding (EMSBC) preliminary trials to go forward to UK growers' trials. Of the four June-bearers there were three mid-season and one mid-late season types. All these selections will be trialled on UK grower sites in 2022-23. In addition, fourteen advanced selections were trialled on growers' sites in 2020, with five being retained for further trialling in 2021, 2022 and 2023 (EM2622, EM2696, EM2721, EM2723 and EMR796).

### **Background**

The main objective of the East Malling Strawberry Breeding Club (EMSBC) is to develop and improved strawberry varieties, both June and everbearing with increased yield, larger fruit size, 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 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 two preliminary trials held at NIAB EMR in 2020 that are part-funded by the AHDB membership of the EMSBC (June-bearer main crop 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 2020 preliminary trials are shown below, accompanied with tables of results for each trial:

### NIAB EMR June-bearer trial

Four selections from the 2020 EMSBC trials showed sufficient potential to progress to small-scale growers' trials in 2022-23. A description of each selection appears below, listed in order of season (earliest to latest), with accompanying data show in Tables 1 and 2:

**EM2818** a midseason selection with a high percentage of Class 1 fruit. Sensory flavour was judged to be sweet and this was reflected in a high mean Brix<sup>o</sup> score.

**EM2836** is a high-yielding selection, with large fruit size (86% >35 mm). Berries are firm with very glossy and uniform appearance.

**EM2859** is a good all-rounder with class 1 yield, fruit size and Brix<sup>o</sup> were all superior to the standard, Malling™ Centenary.

**EM2883** is a midseason selection with excellent fruit size (76% >35mm). Berries are very glossy and bright and had very good shelf-life scores.

**Table 1.** June-bearer selections: yield, fruit size and season

| Selection                        | Class 1 yield<br>(g/plant) | % Class 1 | % large fruit<br>(>35mm) | 50% pick date |
|----------------------------------|----------------------------|-----------|--------------------------|---------------|
| EM2818 <sup>1</sup>              | 484                        | 91        | 68                       | 15 June       |
| EM2836 <sup>1</sup>              | 650                        | 96        | 82                       | 15 June       |
| EM2859 <sup>1</sup>              | 573                        | 91        | 67                       | 15 June       |
| EM2883 <sup>1</sup>              | 625                        | 93        | 76                       | 15 June       |
| <i>M. Centenary</i> <sup>2</sup> | 582                        | 90        | 53                       | 11 June       |

<sup>1</sup>Mean of two plots <sup>2</sup>Mean of eight plots

**Table 2.** June-bearer selections: mean fruit quality scores

| Selection                        | Appearance<br>(1-9) | Skin<br>firmness<br>(1-9) | Flesh<br>firmness<br>(1-9) | Flavour<br>(1-9) | Shelf<br>life<br>(1-5) | Mean<br>Brix <sup>o</sup> |
|----------------------------------|---------------------|---------------------------|----------------------------|------------------|------------------------|---------------------------|
| EM2818 <sup>1</sup>              | 5.5                 | 6.3                       | 6.0                        | 6.0              | 3.0                    | 9.5                       |
| EM2836 <sup>1</sup>              | 6.6                 | 6.7                       | 7.9                        | 5.6              | 3.8                    | 8.5                       |
| EM2859 <sup>1</sup>              | 5.5                 | 6.2                       | 6.7                        | 5.8              | 3.4                    | 9.3                       |
| EM2883 <sup>1</sup>              | 5.4                 | 6.2                       | 6.2                        | 5.0              | 3.5                    | 7.4                       |
| <i>M. Centenary</i> <sup>2</sup> | 6.0                 | 6.3                       | 5.9                        | 5.8              | 3                      | 7.7                       |

<sup>1</sup>Mean of two plots <sup>2</sup>Mean of eight 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.

### NIAB EMR Everbearer trial

Two new selections progressed to small-scale growers' trials to be held assessed in 2022. Descriptions of these selections and associated trial data (Tables 3 & 4) are shown below:

**EMR919** is an early cropping selection, with a good yield, produced fruit throughout the season. Attractive fruit with a uniform conic shape, and good eating texture.

**EMR925** is a high yielding selection, with peak of production later in the season. Good all round fruit characteristics.

**Table 3.** Everbearer selections: yield, fruit size and season

| Selection                       | Class 1 yield<br>(g/plant) | % Class 1 | % large fruit<br>(>35mm) | 50% pick<br>date |
|---------------------------------|----------------------------|-----------|--------------------------|------------------|
| EMR919 <sup>1</sup>             | 886                        | 67        | 54                       | 3 Aug            |
| EMR925 <sup>1</sup>             | 1111                       | 84        | 59                       | 10 Aug           |
| <i>M. Champion</i> <sup>3</sup> | 884                        | 69        | 40                       | 23 July          |
| <i>Murano</i> <sup>4</sup>      | 644                        | 66        | 49                       | 27 July          |

<sup>1</sup>Mean of two plots <sup>3</sup>Mean of twelve plots <sup>4</sup>Mean of four plots

**Table 4.** Everbearer selections: fruit quality scores

| Selection          | Appearance<br>(1-9) | Skin<br>firmness<br>(1-9) | Flesh<br>firmness<br>(1-9) | Flavour<br>(1-9) | Shelf life<br>(1-5) | Mean<br>Brix <sup>o</sup> |
|--------------------|---------------------|---------------------------|----------------------------|------------------|---------------------|---------------------------|
| EMR919             | 5.8                 | 5.7                       | 5.3                        | 5.4              | 3.5                 | 7.8                       |
| EMR925             | 5.5                 | 6                         | 6.3                        | 5.5              | 3.5                 | 7.0                       |
| <i>M. Champion</i> | 5.6                 | 6.5                       | 6.9                        | 5.0              | 3.0                 | 7.4                       |
| <i>Murano</i>      | 5.1                 | 5.8                       | 6.0                        | 5.4              | 2.8                 | 7.6                       |

<sup>1</sup>Mean of two plots <sup>3</sup>Mean of twelve plots <sup>4</sup>Mean of four 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, and for shelf life comparison: 1=worse, 3=same, 5 better than standard

### **Offsite main crop (June-bearer) growers' trial**

One advanced selection (EM2622) that had been overwintered on growers' sites from the 60-day trials in 2019 was main-cropped in 2020.

EM2622 is a late season selection, with a similar season to Florence (10-14 days later than Malling™ Centenary). Plant yields were variable, but with a good fruit size. Fruit is attractive, uniform conic, with good skin and flesh firmness. Sensory flavour was judged as sweet, with a high average Brix° of 9.5° in the main crop. EM2622 also performed well in shelf life testing at PCH. Plant type is dense, but with a good stand and upright habit. Fruit was well displayed on long trusses for easy picking. EM2622 is moderately susceptible to Verticillium wilt and powdery mildew and intermediate resistance to crown rot.

EM2622 will now progress to large-scale trials in 2022-2023.

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

Nine selections had previously been selected for 60-day trialling in 2020 (EM2547, EM2591, EM2617, EM2628, EM2656, EM2674, EM2696, EM2721, and EM2723). Three selections, EM2696, EM2721 and EM2723, performed sufficiently well in the 60-day growers' trials to be overwintered and will be trialled as main crop in 2021.

**EM2696** a mid-season June-bearer. Produced a high yield and percentage Class 1 fruit. Berries were slightly smaller than other selections in trial, but scored well for all round fruit quality characteristics, with a glossy, regular conic shape. Plants had an open habit with a good fruit display. Mean Brix° scores were high. Initial pathogen screening at NIAB EMR suggests that EM2696 has moderate resistance to crown rot and moderate susceptibility to powdery mildew.

**EM2721** is a moderate yielding selection with good percentage of Class 1 fruit. Plant habit was open with a good fruit display. Fruit on average was smaller than Malling™ Centenary but was attractive, with good flavour, sweet with aromatics. Firmness was variable, and fruit sometimes suffered with green tips. Initial pathogen screening at NIAB EMR suggests that EM2721 has moderate resistance to crown rot and resistance to powdery mildew.



**EM2723** is a mid-late season selection. Yields were high with a good percentage of Class 1 fruit. Fruit was well displayed and plants had an open habit. Berries were attractive, with a uniform shape, with good sensory flavour and high mean Brix°. Initial pathogen screening suggests that EM2723 has moderate susceptibility to crown rot, moderate susceptibility to powdery mildew and intermediate resistance to Verticillium wilt.

#### **Offsite ever bearer growers' trial**

Two advanced selections were trialled in small-scale growers' trials: EMR727 and EMR745 with two advanced selections in large-scale trials: EMR721 and EMR796. One selection will progress: EMR796, and this will be taken forward for commercialisation and additional agronomy trials in 2022.

**EMR796** is a very productive selection that has an extended fruiting season. In trials it produced a high percentage Class 1 fruit with excellent fruit size. Berries had an attractive appearance that was glossy, uniform, with good colour. Fruit consistently scored well for sensory flavour, however Brix° scores could be variable, but the overall mean score was high. Skin and flesh scores were good on average, but under very warm conditions, the skin could become fragile and suffered damage when exposed to high winds. Plant habit is upright, with moderate vigour and well displayed fruit on long trusses. Powdery mildew susceptibility was noted on some sites, but incidence was very variable between site locations and spray programmes. Initial pathogen screening suggests that EMR796 has moderate resistance to crown rot.



# **Grower Summary**

**SF 96a**

**East Malling Strawberry Breeding Club**

Annual report 2020-2021