

STRAWBERRIES

**STAGE 0 TRIALS
EAST MALLING**

Report for 1992-1994

**Horticultural Development Council
Project SF21**

**REPORT TO THE HORTICULTURAL DEVELOPMENT COUNCIL
FOR THE PERIOD 1992 to 1994**

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RELEVANCE TO GROWERS AND PRACTICAL APPLICATION

Application

The lines tested in these trials were mostly numbered selections. These are not yet available to growers but five are now in grower trials and a further ten scheduled for planting in Spring 1995 (SF40 and SF40a). Two from the group EM208, EM341, EM372, EM396 & EM426, planted on growers' farms in spring 1994, will be released following the 1995 season, provided that the trial results are favourable.

The selection EM220 was re-trialled in 1991-92 and the result from this trial, combined with the findings from grower trials in 1993/94, led to a decision to release with the name 'Eros' in autumn 1994. Eros is now available for commercial planting and it is recommended that growers should test the variety as an alternative to Elsanta.

Of the overseas named varieties tested in the short-day trials Marmolada (1991-92) showed good adaptation to UK conditions, particularly in the maiden year, but the yield was inferior to Elsanta and the flavour poor. Vicoda and Kama (1993-94) were productive but lacked quality while Earliglow had excellent flavour but was poorly adapted with very low yield. Idea was the best overseas variety in the 1994 trial but still did not match the standard, Elsanta, for either overall quality or yield. None of the overseas short-day varieties can be unequivocally recommended to UK growers on the basis of these trials, but Marmolada may be worth testing on a small scale.

In the everbearer trials (autumn planted) several Californian day-neutral varieties were tested, along with some older everbearers from Europe and North America. Muir (1994) performed well, with better fruit quality and less waste than Rapella. It seems better adapted to UK conditions than the other Californian varieties, which all performed poorly. Growers should consider testing this variety on a small scale. Evita (1994) was more productive than Rapella and Calypso, with better overall fruit quality but the size was smaller than expected from results of spring-planted trials at HRI Efford (SF18).

Summary

In the short-day (June bearer) trials 318 HRI seedlings, 30 foreign seedlings and 28 overseas varieties were evaluated. In the everbearer trials 61 HRI seedlings, three foreign seedlings and 15 overseas varieties were evaluated.

As a result of these trials five HRI selections are now in grower trials, ten will be planted in spring 1995 and a further five are currently being multiplied for grower trials to be planted in 1996. It is anticipated that two new varieties will be released to the industry in winter 1995 and others are likely to follow in 1996 and/or 1997. The trials also confirmed the commercial potential of the new varieties Eros (EM220) and Evita but of 43 overseas varieties tested only Marmolada and Muir were considered worth testing by growers.

INTRODUCTION

The strawberry breeding programme at HRI East Malling is jointly funded by MAFF and NSA Plants Ltd. The overall objective of the programme is to produce improved varieties for all sectors of the UK industry, which will have good local adaptation and improve the competitiveness of home-produced strawberries. MAFF funding is for the strategic underpinning research and includes work on resistance to pests and diseases in addition to genetic studies related to extension of the season and factors affecting fruit quality. The aim of this work is to produce improved breeding lines which can then be used as parents in the variety development programme, which is funded by NSA Plants Ltd. The objective of this part of the programme is to produce a succession of high quality dessert varieties with overlapping seasons, which will give the longest possible season of production. The varieties should have good agronomic features and incorporate resistance to pests and diseases.

Since 1991 the preliminary stage of trialling of new selections from the breeding programme (stage 0) has been done at HRI, with the bulk of the funding provided by NSA Plants Ltd but with a significant contribution from the HDC to pay for extra staff needed during the recording period (contract SF 21). Until 1994 stage 1 trials were funded by HDC at Brogdale. However, the HDC Soft Fruit Variety Trials Sub-Committee decided that from 1994 onwards the best selections from stage 0 should be 'recycled'. Instead of eight to ten selections going forward each year to stage 1 at Brogdale, these would be re-trialled at stage 0 and subsequently a small number (two to four) would go directly to trials on growers' farms. Additionally, it was decided that a small number of foreign varieties and seedlings could be included at stage 0 each year to test their adaptation to UK conditions.

The objective of the new system for the early stages of variety trialling is to ensure that all new seedlings from HRI and overseas varieties are tested quickly and effectively, using a growing system comparable with the best industry practices. This streamlined system will save an average of two years in comparison with the earlier system and will result in a steady flow of high quality, locally adapted new varieties becoming available to UK growers. Growers will have confidence that the results from both the HRI and grower trials are objective and are directly relevant to their own circumstances.

The aim of this project is to identify promising seedlings from the HRI breeding programme which have the right fruit quality, shelf life, yield and agronomic characteristics to be potential new varieties for any sector of the UK industry. These will then go forward for trials on growers farms (SF40 & SF40a). The adaptation of new varieties from overseas will also be tested and recommendations made to growers on their suitability for the UK.

MATERIALS & METHODS

Culture & Schedule

Two trials are planted each year using module-raised plants propagated from mother plants held in the insect-proof gauze houses at East Malling. The trial of short-day (June bearing) varieties is planted during the last week of July into raised beds with a polythene mulch and sub-polythene trickle irrigation. White-on-black and blue polythene are used in alternate years and the soil is fumigated with either chloropicrin or methyl bromide to eliminate *Verticillium* wilt, which is widespread at East Malling (for trials planted before 1994 formalin was used

but this was found to be ineffective in some years). A base dressing of fertiliser is applied pre planting, in accordance with ADAS recommendations, but no fertiliser is applied through the irrigation system. The short-day trials are kept for two seasons and a pesticide regime similar to that used on commercial farms is used (Appendix 1).

For the everbearer trials a similar system is used except that the modules are planted in late August and a liquid feed is supplied through the irrigation between June and September.

Experimental Design

Ten-plant plots are used with the following replication:

New, previously untested selections:	One ten-plant plot
Recycled selections*	Two ten-plant plots
Selections in concurrent grower trials*:	One ten-plant plot
Untested overseas varieties or selections*:	One ten-plant plot
Promising overseas varieties*:	Two ten-plant plots
Main standard variety:	Three ten-plant plots
Other standard varieties:	Two ten-plant plots

* Since 1994 only

A typical short-day trial comprises 60-80 new selections from the breeding programme and six standard varieties. Under the new system (from 1994) there will be additionally an average of six new overseas varieties or seedlings, ten recycled selections, and four selections in concurrent grower trials. A typical day-neutral trial comprises c. 20 new selections and 5 standard varieties. From 1994 there will also be an average of 2-3 new overseas varieties, 2-3 recycled selections, 1-2 selections in concurrent grower trials.

Records

All fruit was harvested on Mondays and Thursdays, graded, weighed and a detailed evaluation of fruit quality made for each harvest (Appendix 2). Agronomic characteristics of the plants were also recorded (Appendix 3). In 1994 only, shelf life evaluations on the more promising selections were done by taking a sample of fruit from at least two harvests during the season, and maintaining it in a controlled environment cabinet for four days at 18°C before assessing the quality and degree of deterioration of the fruit (Appendix 4). All subjective evaluations were done by, or under the supervision of, experienced staff but to avoid bias all assessments were done blind so that the recorder knew only the plot code for each sample of fruit. Data capture and analysis were fully computerised so that codes were translated to selection numbers or variety names by the computer.

RESULTS

1991-92 Trial.

New selections recommended for further trials.

- EM344** Dessert type with season a few days later than Pegasus. The plants are productive and have good size in the maiden year but are smaller in year 2. Berries are firm with a glossy appearance and orange colour. Plants are moderately vigorous and susceptible to mildew. *EM344 will be planted in grower trials in 1995.*
- EM359** Mid-season dessert type. Productive plants with a high proportion of large berries (>35mm). Berries are attractive but slightly dark and only moderately firm. Plants are moderately vigorous and susceptible to mildew.
- EM372** A late season dessert type with 50% harvest mid way between Pegasus and Bogota. Overall yield was similar to Bogota but EM372 maintained fruit size well in the second year and had firmer berries with a better shape. Flavour is good but the fruit is less bright than Elsanta. Plants are resistant to mildew and the fruit is well displayed. *EM372 was planted in grower trials in 1994.*
- EM383** Mid-season dessert type. Plants are productive with orange-red berries which are slightly softer than Elsanta. Vigorous plants which are slightly sensitive to mildew.
- EM424** An early season dessert type with the same 50% harvest date as Honeoye. Plants are productive and maintain size well in the second year. Berries are firm with a regular shape but darker colour than Elsanta. Plants are compact and slightly sensitive to mildew.
- EM426** Very early season dessert type. Approximately five days before Honeoye for 50% harvest. Very productive plants with a high proportion of large berries (>35mm) in the maiden year. Berries are attractive and firm with a glossy appearance but can be rather dark. *EM426 was planted in grower trials in 1994.*
- EM463** A mid-season dessert type with productive plants which are moderately vigorous and resistant to mildew. Berries are firm with a regular shape and orange-red colour. Pleasant flavour.
- EM470** A mid-season dessert type. Productive plants which are vigorous and resistant to mildew. Berries attractive but softer than Elsanta.
- EM478** A mid-season dessert type with productive plants which maintained fruit size exceptionally well in the second year. The berries are firm with a glossy skin finish. Moderately vigorous plants which are susceptible to mildew.

1991-92 Trial (cont).

Selection being re-trialled

EM220 (now named Eros)

Yield slightly lower than Elsanta over two years but had less waste and a higher proportion of large fruit. Berries were considered to be slightly firmer and had better flavour than Elsanta. *EM220 was planted in grower trials in 1993.*

Overseas varieties

Marmolada A mid season dessert type from CIV, Italy. Fair yield and good size in year 1 but average fruit size was small in the second year. Attractive, firm berries with regular shape and good skin finish but weak flavour.

Sella A mid season dessert type also from CIV, Italy. Very good fruit size but yield was less than Elsanta and overall quality inferior.

Gardena Also from CIV, Italy. Similar performance to Sella but the average fruit size was smaller. Seems to have no real merit.

1991/92 TRIAL. SUMMARY OF CUMULATIVE RESULTS OVER BOTH YEARS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
80-52-1	505	782	144	261	1287	1433	5	7	8	5	5
80-67-3	463	911	128	223	1372	1500	6	7	7	5	6
82-82-1	1100	790	176	526	1889	2065	5	5	5	5	5
83-23-3	661	584	111	345	1245	1356	4	7	7	5	4
83-23-6	722	723	145	365	1445	1591	4	5	6	5	4
83-28-5	947	1111	218	471	2059	2277	5	5	6	5	5
85-224-4	563	851	233	438	1412	1645	5	7	7	5	5
85-AO-47	697	788	88	183	1488	1575	6	6	5	5	5
85-CA-1	660	1224	162	331	1880	2039	6	6	6	5	5
85-FB-9	736	738	40	178	1471	1508	5	5	6	5	5
BOGOTA-1	382	833	265	493	1213	1474	4	4	4	5	3
BOGOTA-2	485	1148	326	583	1630	1956	4	4	5	5	4
CAM FAV-1	329	955	224	385	1285	1507	4	4	4	5	4
CAM FAV-2	451	1393	232	297	1844	2077	4	3	4	5	3
ELSANTA-1	1090	1184	155	422	2274	2428	7	7	6	5	6
ELSANTA-2	1105	1237	128	410	2344	2472	6	7	7	5	6
ELSANTA-3	927	1530	251	399	2461	2709	6	6	7	5	6
EM0011	772	708	96	196	1479	1576	5	6	7	5	6
EM0220	998	994	119	227	1993	2113	6	7	7	6	6
EM0227	759	1249	290	299	2007	2297	6	5	5	5	5
EM0332	540	1343	413	360	1881	2295	6	6	7	4	5
EM0333	254	375	121	206	629	749	5	6	6	5	5
EM0340	284	1062	386	192	1344	1731	6	6	6	5	6
EM0342	619	648	111	622	1264	1374	5	5	6	5	5
EM0349	778	1078	124	490	1854	1978	6	6	5	5	5
EM0351	1262	1120	123	818	2382	2507	5	4	6	5	4
EM0357	1372	974	71	488	2344	2414	6	5	6	5	5
EM0365	414	1240	359	265	1653	2013	5	6	6	5	5
EM0371	567	1041	130	222	1606	1736	5	6	7	5	4
EM0372	908	751	48	196	1657	1705	5	6	6	6	6
EM0383	810	1022	185	437	1832	2018	5	6	6	5	6
EM0387	1604	255	22	1104	1859	1880	3	4	5	5	3
EM0391	500	626	105	1026	1127	1231	4	3	4	5	3
EM0417	883	696	56	351	1578	1635	5	7	6	5	5
EM0418	663	556	61	489	1221	1282	5	6	7	5	5
EM0420	856	577	69	269	1432	1502	6	5	6	5	5
EM0424	1077	651	79	367	1728	1808	6	7	6	5	6
EM0425	825	1054	268	244	1877	2147	6	6	7	4	5
EM0426	1136	1124	299	250	2260	2555	6	6	6	5	7
EM0429	536	635	165	170	1173	1336	6	5	6	6	5
EM0430	671	1390	459	410	2060	2520	6	5	6	5	6
EM0436	409	918	175	526	1326	1500	5	6	7	5	6
EM0438	637	793	131	207	1431	1562	5	5	6	5	5
EM0442	871	1183	199	465	2050	2250	6	6	6	5	6
EM0443	709	1050	236	329	1758	1994	6	6	6	5	5
EM0444	657	836	118	234	1495	1611	6	5	6	5	6
EM0445	537	974	83	235	1509	1593	5	6	6	5	5
EM0446	514	764	108	183	1279	1388	6	6	6	6	6
EM0447	400	590	37	156	992	1030	6	5	6	6	5
EM0448	773	1133	180	457	1908	2088	5	5	6	5	5
EM0451	576	736	41	320	1311	1350	6	5	7	5	6
EM0456	815	749	147	246	1566	1711	5	5	6	5	4
EM0460	616	1150	180	485	1767	1946	5	5	6	6	5

1991/92 TRIAL. SUMMARY OF CUMULATIVE RESULTS OVER BOTH YEARS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
EM0461	1031	1051	150	376	2082	2230	5	4	5	5	4
EM0463	851	1043	121	424	1892	2011	6	6	7	5	6
EM0470	963	1050	99	279	2011	2111	5	5	6	5	5
EM0474	1289	795	84	533	2085	2170	5	6	5	5	5
EM0475	1236	1003	254	472	2237	2492	6	5	5	5	5
EM0476	770	1104	136	173	1873	2009	6	6	6	5	5
EM0477	1864	747	59	451	2609	2671	5	5	5	5	4
EM0478	1023	645	85	208	1668	1751	6	6	6	5	6
EM0479	853	1191	296	330	2042	2341	5	7	7	5	5
EM0483	908	944	158	1176	1849	2008	4	6	6	4	4
GARDENA	772	711	63	198	1484	1545	5	6	6	5	5
GARIGUETT	335	698	129	209	1034	1161	6	5	5	6	5
GORELLA-1	434	879	172	344	1312	1482	5	4	4	4	4
GORELLA-2	600	764	134	287	1363	1497	5	4	4	5	3
HAPIL-1	724	714	94	359	1439	1531	4	4	4	5	3
HAPIL-2	942	881	123	342	1820	1942	5	4	4	5	3
HONEOYE-1	938	1029	116	224	1966	2083	6	4	5	6	5
HONEOYE-2	810	992	81	193	1800	1879	6	5	5	5	5
LA0582-1	1136	1479	188	530	2617	2805	5	4	4	5	4
LA0582-2	1211	1203	129	540	2413	2543	4	4	4	4	3
MARMOLADA	708	883	174	390	1588	1763	6	6	6	5	6
PANDORA-1	647	982	269	494	1628	1897	6	5	5	5	6
PANDORA-2	720	1121	188	314	1842	2031	6	5	6	5	6
PEGASUS-1	1096	1166	107	276	2260	2368	6	5	5	5	6
PEGASUS-2	751	1224	98	164	1971	2069	7	6	5	5	6
SALVI 15	359	577	64	132	936	1000	5	6	6	5	5
SELLA	1128	373	26	195	1502	1529	5	6	6	5	5

1992-93 Trial.

New selections recommended for further trials

- EM 497** A productive mid-season dessert type which produced consistently high quality fruit through both years. Berries are of regular shape with orange-red colour and glossy skin finish. Firm flesh but skin is softer than Elsanta. Vigorous plants which are moderately resistant to mildew.
- EM 502** A second-early dessert type which was less productive than Elsanta but had comparable fruit quality and very little waste. Berries are firm and very attractive with regular shape and glossy appearance. Plants are less vigorous than Elsanta, particularly in year 1, and could be planted at a higher density. Moderately susceptible to mildew.
- EM 503** A second-early dessert type which consistently produced fruit of superior quality to Elsanta but was 33% less productive over the two seasons. Berries are firm and attractive with regular shape, glossy skin finish and good flavour. Plants are moderately vigorous and susceptible to mildew. Produces very little waste.
- EM 505** A mid-season dessert type which had a light crop in the maiden year but was very productive as a two-year-old. Produced an unusually high proportion of large berries in both seasons and these were of very regular shape. Fruit has a glossy appearance but darker colour than Elsanta and a slightly acid flavour. *May have potential for niche marketing of large berries.* Plants are moderately vigorous and susceptible to mildew. *EM505 will be planted in grower trials in 1995.*
- EM514** Early season dessert type with 50% harvest date 7-9 days before Elsanta. Fruit is very firm and quality was consistently good in both years. Yield less than Elsanta and berry size was rather small in year 2. Plants are compact and slightly susceptible to powdery mildew.
- EM 518** A mid-season dessert type producing firm, regular berries with orange-red colour and shiny appearance. Good yield but the average fruit size is less than Elsanta, although the proportion below 25mm is equivalent. Moderately vigorous plants.
- EM521** Mid-season dessert type which produced a higher yield and consistently better quality than Elsanta over both years, but the fruit size was inferior in year 2. Berries are very firm with regular shape, attractive appearance and good flavour. Plants showed no symptoms of powdery mildew in 1992 but became infected in 1993 - the reason for this is unclear as there were severe epidemics in both years. The plants have a rather dense habit and poor fruit display, particularly in year 2.

1992-93 Trial (continued).

- EM 531** A mid-season dessert type which was very productive but fruit size deteriorated in the second year. Fruit is firm and glossy with a regular shape but slightly darker than Elsanta. Plants are moderately vigorous and susceptible to mildew.
- EM 537** A mid-season dessert type which is productive with good fruit size, particularly in the maiden year. Berries are very firm and glossy with good flavour and regular shape but darker colour than Elsanta. Plants are moderately vigorous and susceptible to mildew.
- EM555** The outstanding selection in 1992/93 with class 1 yield 45% higher than Elsanta over the two years with comparable quality. A mid-season type with firm berries which are very attractive with good colour and regular shape but rather weak flavour. The fruit size is large - 80% of class 1 fruit was over 35mm diameter on maiden plants and 62% on two-year-olds. This compares to 69% and 36% respectively for Elsanta. Plants have moderate vigour and are susceptible to powdery mildew. *EM555 will be planted in grower trials in 1995.*
- EM 557** A late double-cropping type (2-4 days earlier than Bogota) which produced a higher class 1 June yield than Elsanta over two years with the added bonus of a further 500 grams per plant in August/September. Berries are attractive with good colour but the primaries can be ribbed and firmness is less than Elsanta. Quality was better on the spring crop. Plants are vigorous and slightly susceptible to mildew.
- EM 568** A second-early dessert type with very attractive, firm berries which have good colour and glossy appearance. Yield was lower than Elsanta. Plants are moderately vigorous and resistant to mildew with a good fruit display.

Selections also trialled at Brogdale

- EM290** Productive dessert type with a season similar to Pegasus. Berries are attractive and firm with pleasant flavour. Susceptible to mildew. *EM290 will be planted in grower trials in 1995.*
- EM317** Had been the outstanding selection in the 1989/90 stage 0 trial. Dessert type with yield similar to Elsanta but less waste and season approximately five days later on two-year-old plants (equivalent to Elsanta as maiden). Berries are very firm with an attractive, shiny appearance and easy picking. Aromatic flavour was liked by some tasters but disliked by others. *EM317 will be planted in grower trials in 1995.*

1992-93 Trial (continued).

EM319 High quality dessert type with yield and fruit size similar to Elsanta but season approximately five days later on two-year-old plants (equivalent to Elsanta as maiden). Berries very firm and attractive but flavour only moderate. *EM319 will be planted in grower trials in 1995.*

Overseas varieties

Canoga A mid season variety from the USA. Berries were firm and glossy with good flavour but let down by dark colour, similar to Honeoye.

Lester A mid season variety, also from USA. Good fruit quality but poorly adapted with yield only 30% that of Elsanta.

1992/93 TRIAL. SUMMARY OF CUMULATIVE RESULTS OVER BOTH YEARS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
BOGOTA-1	378	564	246	344	942	1188	4	3	5	5	4
BOGOTA-2	303	652	346	418	954	1300	4	4	5	5	4
CAMFAV	355	493	79	316	847	924	4	4	4	5	3
CANOCA	402	586	100	306	988	1087	5	6	7	6	5
ELSANTA-1	805	729	71	153	1534	1604	5	6	6	5	5
ELSANTA-2	690	724	48	217	1414	1462	6	6	6	5	5
ELSANTA-3	602	465	25	112	1067	1094	6	6	6	6	6
EM0017-1	456	424	84	481	879	963	4	6	7	5	4
EM0017-2	729	693	101	257	1423	1520	5	6	7	5	5
EM0227-1	751	673	69	238	1425	1491	5	4	5	5	4
EM0227-2	636	577	49	131	1213	1262	6	4	5	5	4
EM0271-2	890	890	150	230	1776	1925	6	6	6	5	5
EM0290-1	635	625	129	393	1257	1386	6	6	6	5	6
EM0290-2	566	562	96	96	1129	1223	6	6	6	6	6
EM0317-1	580	506	39	161	1086	1124	6	6	7	6	7
EM0317-2	683	646	22	93	1328	1353	7	6	6	5	6
EM0319-1	695	688	65	400	1384	1446	6	7	7	5	6
EM0319-2	887	824	88	344	1712	1800	6	7	7	5	6
EM0422	253	203	15	193	454	469	5	5	7	6	4
EM0494	477	456	57	270	931	988	5	6	6	5	5
EM0495	518	518	159	335	1036	1192	6	5	6	5	5
EM0496	255	250	38	120	505	545	6	6	6	5	6
EM0497	636	691	120	185	1331	1450	6	6	7	5	6
EM0502	550	485	50	80	1035	1085	6	6	7	5	7
EM0503	567	434	52	79	1001	1054	7	7	8	6	7
EM0504	447	286	24	136	729	752	6	5	7	5	5
EM0505	863	294	30	183	1156	1185	7	6	6	5	6
EM0506	353	608	142	306	958	1101	5	7	7	5	5
EM0507	484	528	77	316	1012	1086	6	6	7	6	6
EM0510	116	260	142	44	373	512	5	6	7	6	6
EM0511	481	395	64	199	875	937	5	7	7	5	5
EM0512	474	287	27	148	763	789	6	7	7	5	6
EM0513	757	1309	438	307	2066	2501	4	6	7	5	4
EM0514	385	578	179	124	962	1141	6	7	7	5	7
EM0516	370	289	68	113	659	728	6	7	8	5	6
EM0518	454	803	96	142	1257	1354	6	6	7	5	6
EM0519	346	686	162	302	1034	1194	5	6	7	5	5
EM0520	216	358	67	95	569	637	6	7	7	6	7
EM0521	469	1147	351	226	1619	1966	7	6	7	6	7
EM0522	250	422	163	116	671	831	6	6	7	5	6
EM0524	416	340	55	117	755	809	6	7	7	5	6
EM0527	439	527	141	301	967	1106	6	6	6	5	6
EM0531	564	1040	203	211	1606	1805	6	6	7	5	6
EM0533	960	465	42	222	1423	1464	6	6	7	5	6
EM0537	635	505	79	57	1139	1217	6	7	7	6	6
EM0538	442	228	35	116	669	705	5	5	5	5	4
EM0540	300	384	65	97	682	748	6	5	5	5	5
EM0542	372	477	51	183	850	899	5	5	6	5	5
EM0544	586	503	47	303	1089	1138	5	6	7	5	5
EM0547	615	920	120	262	1536	1656	6	6	6	5	5
EM0551	363	468	61	90	829	889	5	6	6	5	5
EM0552	608	431	56	218	1040	1097	6	6	6	5	6
EM0553	503	293	35	126	797	836	6	6	6	5	5

1992/93 TRIAL. SUMMARY OF CUMULATIVE RESULTS OVER BOTH YEARS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
EM0555	1521	699	46	259	2219	2265	6	6	7	5	7
EM0557	688	980	154	293	1668	1819	6	5	6	5	5
EM0560	888	440	39	315	1329	1369	5	6	6	5	5
EM0566	379	514	52	164	898	949	5	6	7	5	5
EM0568	496	551	48	150	1048	1096	7	6	6	5	6
EM0570	525	184	19	52	708	728	5	7	7	5	5
GORELLA	347	313	49	85	657	706	5	4	4	5	3
HAPIL-1	663	328	30	296	992	1021	4	4	4	5	3
HAPIL-2	761	417	34	176	1180	1214	4	4	4	5	3
LA0969-1	325	681	157	186	1006	1162	6	6	6	6	6
LA0969-2	202	652	196	190	853	1049	5	6	6	6	5
LESTER	126	295	92	61	418	512	5	6	6	6	6
PANDORA-1	432	810	142	272	1242	1381	6	5	5	5	5
PANDORA-2	505	1115	188	302	1620	1807	6	6	6	5	5
PEGASUS-1	761	630	178	165	1388	1565	6	6	5	5	5
PEGASUS-2	721	420	32	133	1139	1169	7	5	5	5	5

1993-94 Trial.

Selections also trialled at Brogdale in 1993

- EM208** Season equivalent to Pegasus in this trial. Let down by lack of firmness and some wilt was evident in both plots. Poor shelf life. *EM208 was planted in grower trials in 1994.*
- EM235** Excellent quality, as in earlier trials, but mostly medium fruit. Very little waste, regular shape, good shelf life and excellent flavour. Yield less than Elsanta but quality and shelf life is better. Susceptible to wilt which may account for more small berries in plot 2, as this is not typical. *EM235 will be propagated for grower trials.*
- EM284** More productive and larger than Elsanta. Quality is similar but occasionally marked down for skin strength. Good shelf life. Plot 2 showed signs of wilt which may explain inferior performance. *EM284 will be planted in grower trials in 1995.*
- EM316** Over vigorous and too soft.
- EM321** Very large fruit, a lot over 45mm, but not very productive. Skin strength is suspect and colour can be slightly brown. Highly resistant to *Verticillium* wilt.
- EM341** Very productive in 1994 due to less blossom weevil damage than previously observed. Probably not supermarket quality but later and more productive than Bogota. Very vigorous plants. Bruises easily and hence poor shelf life. *EM341 was planted in grower trials in 1994.*
- EM344** The best of the advanced selections in this trial. Very productive both as a maiden and two-year-old plant. Same season as Pegasus. Good overall quality. Good shelf life. *EM344 will be planted in grower trials in 1995.*
- EM359** Exceptionally high yield but it is a mid season type with very poor shelf life.
- EM396** Yield good and very late season but appearance much worse than expected. Wilt was a problem in this trial and although this selection did not show any of the classic symptoms the disease may have caused the fruit to be dull and pitted. *EM396 was planted in grower trials in 1994.*
- EM415** Too soft.
- EM426** Early, productive plants with more small berries than Elsanta but similar proportion of large to medium. Waste was due to a mixture of misshapes and withered fruit from odd plants with wilt. Darkens post harvest so shelf life rather poor, like Honeoye. Resistant to mildew but susceptible to wilt. *EM426 was planted in grower trials in 1994.*
- LA1047** Too soft. Poor shelf life. Too vigorous.

1993-94 Trial (continued).

New selections recommended for further trials

- EM398** Later than Bogota. Firm, glossy berries but appearance not outstanding as seeds are sunken and colour can be slightly brown. Good yield and size with very little waste. Shelf life varied between samples. Nice compact plants which runner well. *EM398 will be propagated for grower trials.*
- EM517** Excellent quality, better than Elsanta, but low yield . Very good shelf life. Little waste. Nice plants. *EM517 will be propagated for grower trials.*
- EM574** Second early with good quality and shelf life but lower yield than Elsanta. Nice, compact, healthy plants which may suit a high density planting.
- EM575** Very early, 7 to 10 days before Elsanta. Excellent overall quality and particularly good flavour. Shelf life similar to Elsanta but darker colour. Let down only by yield but plants were uneven in size. *EM575 will be propagated for grower trials.*
- EM577** Good quality and fair shelf life. Yield and size a bit disappointing but plants may have been affected by wilt.
- EM580** Good quality overall although slightly hairy appearance. Darkens a little post harvest but fair shelf life. Yield only moderate but little waste (mostly due to slugs) and very nice compact plants.
- EM603** Late - same season as Bogota. Good quality for a late season type and good shelf life. Plants are dense and vigorous but produce runners very late.
- EM605** Very large berries. Excellent shelf life but rather bland flavour and dry texture. Very susceptible to mildew. Shy runner producer.
- EM612** Plant similar to Pandora but later season and firmer fruit. Fertile.
- EM621** Later than Bogota with very good yield and size. Better quality than most late season types - firm and attractive. Plants large and vigorous.

Overseas varieties

- Earliglow.** An early season variety from Maryland, USA. Very pleasant flavour but extremely poor yield.
- Kama** A mid-season dual purpose type from Poland. High yielding as a maiden plant but soft berries. Eliminated after year 1.
- Vicoda** A late season variety from Holland. Good yield and the same season as Pandora but ugly berries with a fragile skin. Eliminated after year 1.

1993/94 TRIAL. SUMMARY OF CUMULATIVE RESULTS OVER BOTH YEARS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
BOGOTA-1	401	907	467	272	1306	1770	4	4	4	5	3
EARLIGLO	7	305	107	87	312	420	3	4	4	7	3
ELSANT-1	635	690	101	182	1328	1427	6	7	6	5	6
ELSANT-2	667	893	93	208	1561	1653	6	7	7	5	6
ELSANT-3	649	788	124	157	1438	1563	6	7	7	6	6
EM0208-1	659	622	74	174	1278	1352	5	6	5	5	5
EM0208-2	817	791	89	171	1608	1697	5	5	4	5	4
EM0227-1	564	873	33	137	1436	1470	6	5	5	5	4
EM0227-2	523	478	62	144	1001	1063	6	5	5	5	5
EM0235-1	382	982	86	80	1361	1450	7	6	7	6	7
EM0235-2	351	977	279	110	1328	1607	6	6	6	5	6
EM0284-1	900	854	158	157	1751	1911	6	6	6	6	6
EM0284-2	711	682	168	240	1393	1560	6	5	6	5	5
EM0316-1	724	705	29	154	1428	1457	7	4	5	6	5
EM0316-2	394	429	87	178	823	908	6	4	5	5	5
EM0321-1	660	195	17	99	855	870	5	6	6	5	5
EM0321-2	823	170	8	161	994	1002	6	6	6	5	6
EM0341-1	951	982	136	140	1931	2071	6	6	6	5	6
EM0341-2	942	954	118	269	1897	2013	5	5	6	5	5
EM0344-1	1163	1203	67	327	2365	2433	7	6	6	5	6
EM0344-2	918	1340	108	339	2257	2363	6	6	6	5	6
EM0359-1	1328	967	57	385	2296	2352	6	5	6	5	4
EM0359-2	1376	1219	100	348	2596	2696	5	5	6	5	5
EM0396-1	1002	1174	184	285	2182	2363	4	5	6	5	5
EM0396-2	642	1150	287	491	1798	2082	4	6	6	5	4
EM0398	870	748	68	73	1618	1686	5	6	7	5	6
EM0415-1	695	350	31	166	1042	1073	6	5	5	5	4
EM0415-2	948	582	13	164	1531	1542	6	5	5	5	4
EM0419	1457	1654	239	649	3105	3349	5	5	5	5	5
EM0426-1	603	996	230	190	1596	1826	6	6	6	5	5
EM0426-2	698	1265	267	254	1963	2228	6	6	6	5	6
EM0493	437	710	100	114	1145	1246	5	4	5	6	5
EM0517	368	697	59	77	1063	1121	7	7	7	6	7
EM0550DC	705	641	28	154	1345	1373	6	6	5	5	5
EM0573	795	386	41	149	1179	1218	6	5	5	5	5
EM0574	498	815	77	118	1311	1388	6	7	7	6	6
EM0575	474	435	39	92	908	948	7	7	7	7	8
EM0576	436	484	23	83	920	941	6	7	7	5	6
EM0577	533	642	72	124	1177	1248	7	6	6	6	7
EM0578-2	700	777	49	190	1479	1525	6	6	5	5	6
EM0579	301	494	20	64	796	814	5	7	7	6	6
EM0580	401	605	40	73	1011	1051	6	6	6	6	6
EM0581	451	711	127	138	1160	1286	5	7	7	5	6
EM0583	1293	868	71	242	2160	2230	5	7	7	5	6
EM0584DC	499	924	271	247	1423	1689	5	5	6	5	5
EM0585	686	760	161	128	1445	1605	6	5	6	5	5
EM0586	1256	883	88	132	2140	2227	6	6	7	5	5
EM0587DC	1069	794	77	233	1863	1941	5	5	6	5	5
EM0588	1092	1578	286	263	2668	2954	6	6	5	5	5
EM0589DC	944	1241	78	109	2186	2263	6	5	5	5	5
EM0596	343	437	60	94	780	838	7	6	6	6	7
EM0600	888	690	102	297	1577	1678	6	7	6	5	6
EM0602F	474	832	223	168	1303	1524	6	6	6	5	6

1993/94 TRIAL. SUMMARY OF CUMULATIVE RESULTS OVER BOTH YEARS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
EM0603	890	630	87	131	1521	1607	6	7	6	6	6
EM0605	1391	555	19	333	1946	1965	7	6	6	4	6
EM0608P	133	857	417	251	990	1406	4	4	3	5	3
EM0609BL	0	357	336	79	357	694	6	5	5	6	5
EM0610P	606	1491	472	339	2093	2564	5	4	5	5	4
EM0612	527	596	70	171	1122	1192	6	5	6	5	5
EM0619	1273	1396	215	551	2669	2883	5	6	6	5	5
EM0621	945	1390	189	362	2336	2525	5	6	7	5	5
EM0624	475	494	64	59	968	1035	7	5	6	5	6
HAPIL-1	861	564	53	226	1423	1477	5	4	4	5	3
LA1047-1	754	397	17	161	1150	1166	7	6	5	5	6
LA1047-2	991	387	38	228	1377	1414	7	5	5	5	5
PANDORA	746	950	130	369	1696	1826	5	5	5	5	4
PEGASU-1	650	252	19	134	900	916	6	6	5	5	5
PEGASU-2	855	567	41	131	1423	1466	6	5	5	6	5

1994 Maiden trial.

Recycled selections (also in Stage 1 at Brogdale)

- EM372** Good yield. Season the same as Bogota in this trial. Firm but slightly hairy which detracts from appearance. Darkens a bit post harvest. Some primary berries are hollow. Plants a bit dense. *EM372 was planted in grower trials in 1994.*
- EM383** Quality good but not outstanding. Probably too vigorous.
- EM424** Let down by poor appearance and poor shelf life.
- EM463** Disappointing yield compared to earlier trial. Quality is good on average but a bit inconsistent between harvests. Poor shelf life.
- EM470** Very good quality but disappointing yield in this trial. Excellent flavour. Calyx withered in shelf life tests.
- EM478** Yield inferior to Elsanta and similar problem with cat-faced fruit. Showed bruising badly in shelf life tests.
- EM514** Same season as Honeoye and with better quality but smaller fruit. Shelf life similar to Elsanta. Low yield in plot 2 which was partially shaded by windbreak.
- EM521** Very good quality and shelf life equivalent to Elsanta but fruit is probably too small. Dense plant.
- EM555** Good fruit size and yield good despite many flowers having aborted. Large amount of waste due to misshapes caused by same factor as the flower abortion. Circumstantial evidence that this was due to phytotoxicity of Dursban, which was applied to control blossom weevil. Fruit quality not as good as in previous trial suggesting it may be adversely affected by high temperatures. Fair shelf life. Weak flavour. *EM555 will be planted in grower trials in 1995.*

Promising new selections

- EM556** A genuine double cropper with good quality on first crop but low yield and size is a bit small.
- EM601** Very productive plants with good fruit quality but mostly medium sized berries (25-35mm). Same season as Bogota. Vigorous plants and fruit rather tangled amongst foliage. Resistant to mildew.
- EM625** Mid season type with good yield, fruit quality and shelf life. Plants may be too vigorous.

1994 Maiden trial (continued).

- EM633** Good yield and quality but petals tend to hang on below calyx. Shelf life varied with sample. Nice plants.
- EM634** Good fruit quality but only moderate yield. Good shelf life but calyx tends to wither. Quite large plants.
- EM642** Productive plants but more medium than large fruit. Good colour but slightly hairy. Fair shelf life. Fairly compact plants but a suspicion that they may have been affected by wilt. Well liked by growers on the HDC trial walk.
EM642 will be put into the fast track and multiplication will begin immediately for recycling and grower trials at the earliest opportunity.

Varieties and selections from overseas

84-191-6 (Italy)

Most productive of the Italian selections but with an excessive amount of waste (mostly hollow berries).

84-322-4 (Italy)

Good overall fruit quality and large size but plants not very productive.

84-50-13 (Italy)

Best overall fruit quality of all the Italian selections and good fruit size but plants not very productive.

Idea (Italy)

Berries were attractive with good colour but slightly seedy appearance. Reported to have a late season in Italy but this was not the case in this trial. Relatively low yield suggests that the variety may not be well adapted to our environment.

The other overseas varieties and selections were not promising and will be eliminated from the trial.

1994 MAIDEN TRIAL. SUMMARY OF RESULTS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
79-202-1	121	130	5	59	250	254	4	5	5	5	4
83-109-2	304	99	0	71	404	404	5	7	7	5	5
83-44-3	140	28	0	57	166	166	6	5	6	5	4
84-191-6	598	179	5	328	779	783	6	6	6	5	6
84-226-1	306	192	33	78	498	529	5	5	5	5	4
84-317-8	93	152	14	142	243	257	4	7	7	4	4
84-322-4	259	86	1	34	344	347	6	6	7	5	6
84-50-13	251	112	6	98	362	368	6	7	7	5	6
86-258-1	131	49	2	104	181	183	6	6	6	6	5
BOGOTA-1	98	346	80	93	443	522	4	4	4	5	3
BOGOTA-2	67	243	87	56	309	396	3	3	5	5	3
CACAKEAR	10	194	138	141	205	344	4	2	3	4	2
CAMFAV	173	435	40	39	608	648	5	4	4	5	4
CORNWALL	31	334	71	43	365	437	5	4	5	6	4
CRUSADER	33	713	154	141	745	899	5	3	3	6	3
DUKAT	88	453	142	136	542	683	4	3	3	5	3
DYBDAHL	33	229	90	109	262	353	4	2	2	5	3
ELISTA	91	261	38	56	352	390	4	3	4	5	3
ELSANT-1	347	462	56	80	810	865	6	6	6	5	5
ELSANT-2	348	363	33	70	711	742	5	6	6	6	6
ELSANT-3	368	350	15	63	716	732	6	6	6	5	6
EM0336-1	289	358	50	57	648	699	5	6	6	6	5
EM0336-2	342	489	54	69	831	885	5	5	5	5	5
EM0372-1	452	298	36	90	749	784	5	7	7	5	6
EM0372-2	532	347	15	103	879	894	5	6	7	5	6
EM0373	436	379	68	65	814	880	4	4	6	5	4
EM0383-1	494	302	64	44	796	860	6	5	6	6	6
EM0383-2	331	317	76	59	647	724	5	6	6	5	5
EM0390	187	393	134	146	582	714	4	3	4	4	2
EM0407	231	482	114	42	713	827	5	5	6	5	5
EM0424-1	189	182	23	47	372	395	4	6	7	6	5
EM0424-2	218	178	13	65	397	409	5	7	7	5	6
EM0463-1	222	216	14	31	437	450	6	6	7	6	6
EM0463-2	289	266	10	93	555	565	5	6	7	5	5
EM0470-1	158	208	14	12	365	379	6	6	7	6	6
EM0470-2	155	127	9	17	281	289	6	6	6	6	7
EM0478-1	306	126	6	61	431	437	6	6	6	5	6
EM0478-2	216	116	3	31	333	336	6	6	5	6	6
EM0514-1	242	385	110	36	626	736	7	8	8	6	7
EM0514-2	103	156	43	35	261	303	6	7	8	6	6
EM0521-1	227	598	223	33	825	1050	7	7	7	5	7
EM0521-2	222	596	178	51	818	996	6	6	6	5	6
EM0526	268	246	27	35	516	540	5	6	7	6	5
EM0536P	188	476	62	56	662	724	6	5	5	6	4
EM0545DC	72	154	6	85	224	231	5	6	6	5	5
EM0555-1	595	341	14	253	935	948	5	6	7	5	6
EM0555-2	386	372	35	122	758	793	6	5	7	5	6
EM0556DC	138	254	12	88	393	405	6	6	7	6	7
EM0559DC	380	216	13	210	597	608	5	4	5	5	4
EM0566DC	261	181	8	98	442	450	5	6	7	5	5
EM0601	309	893	99	231	1202	1300	7	6	7	5	6
EM0606	318	191	23	70	508	529	6	7	8	5	6
EM0616	322	477	48	71	801	849	6	6	5	5	5

1994 MAIDEN TRIAL. SUMMARY OF RESULTS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
EM0617	473	340	43	209	812	855	4	6	6	4	4
EM0620	114	348	136	87	460	596	4	7	6	5	4
EM0625	403	298	8	100	701	708	6	6	6	5	6
EM0626	305	290	11	37	593	604	5	7	7	5	5
EM0627	286	275	9	128	558	566	5	6	6	5	5
EM0631	371	144	1	73	516	518	5	7	7	5	6
EM0633	454	569	74	58	1022	1095	6	7	7	5	6
EM0634	338	226	23	32	564	588	6	7	8	6	7
EM0635	217	257	63	63	474	537	5	5	5	4	4
EM0636	265	225	12	36	490	502	5	7	7	5	6
EM0637	249	402	47	121	650	699	5	6	7	6	5
EM0638	336	180	10	17	517	528	6	7	7	5	6
EM0641	341	532	23	206	875	898	5	6	6	5	6
EM0642	495	627	74	53	1121	1195	6	6	7	5	6
EM0644	380	286	32	189	664	698	5	7	7	5	5
EM0645	424	516	115	58	939	1054	6	6	7	6	5
EM0650	223	241	25	36	459	484	5	6	7	6	6
EM0654	688	387	30	102	1074	1105	4	5	5	4	3
EM0658	660	484	32	59	1142	1174	5	6	6	5	5
EM0661	389	158	4	139	548	551	5	5	6	5	4
EM0664P	131	281	86	44	409	495	4	6	6	5	4
EM0667	175	364	11	70	539	550	6	7	7	5	6
EM0668F	395	261	8	82	658	666	5	3	3	5	3
EM0670P	377	262	7	40	638	645	6	4	5	6	5
EM0678	136	122	1	82	257	257	5	6	6	5	5
EM0680DC	157	246	18	58	401	419	6	6	6	5	5
EM0684	494	457	92	114	951	1044	5	5	5	5	5
FAIRFAX	71	422	147	47	493	639	4	3	4	5	3
FAVETTE	116	159	20	35	275	296	6	5	5	6	5
FREJA	13	154	47	109	166	212	3	2	2	4	2
FRIGG	29	481	360	80	511	870	5	5	5	5	4
FRUCTARI	209	752	157	65	961	1118	6	5	5	5	4
GLIMA	34	345	254	41	379	634	5	5	5	5	4
GLOOSCAP	133	445	148	91	578	724	5	5	4	6	4
GORELLA	136	155	18	55	291	307	4	5	4	4	4
HAPIL-1	345	265	10	71	610	621	5	4	4	5	4
HAPIL-2	381	234	16	91	615	630	4	4	4	4	3
HARUNOKA	2	41	0	49	43	43	4	4	5	5	3
HONEOY-1	398	280	5	33	677	684	6	4	5	6	4
HONEOY-2	343	359	17	43	700	717	7	5	5	6	4
IDEA	245	146	6	67	392	397	6	6	6	6	6
JEWEL	99	342	112	19	440	553	5	7	6	6	5
KOURIL	170	153	12	240	322	335	4	4	4	4	3
LA1044	227	264	14	54	488	501	5	6	6	5	5
PANDORA	253	402	39	104	654	693	6	5	5	6	5
PEGASU-1	355	192	11	47	548	558	7	5	5	5	5
PEGASU-2	409	197	5	48	606	609	7	6	5	5	6

1992 Everbearer trial.

New selection recommended for further trials

EMR63 Late season everbearer which may be of interest for August production as an alternative to 60-day plants. Produced 1400 grams per plant over a four week period, a cropping pattern normally only seen in short-day types, so picking costs should be lower than with most everbearers. Fruit is very firm and had consistently good shape, but the bulk was in the medium size category (25-35mm) and the flavour is weak. Resistant to powdery mildew. Fair runner production (good for an everbearer). *EMR63 will be planted in grower trials in 1995.*

Selection being re-trialled

EMR62 Yield and quality were both good but the plants were considered too susceptible to mildew.

Overseas varieties

Mrak From California. Higher yield than Rapella but smaller fruit on average. Berries are attractive but not firm enough.

Yolo From California. Poor yield. Not adapted to UK conditions.

1992 EVERBEARER TRIAL. SUMMARY OF RESULTS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
84145-14	2	1	0	0	3	3	5	5	5	5	5
84-355-2	43	89	18	8	134	149	5	5	5	5	5
CALYPS-1	121	149	34	32	270	303	5	5	5	5	5
CALYPS-2	104	200	58	55	301	357	5	6	6	5	5
EM0067	218	289	88	45	507	597	6	5	6	5	6
EMR022	234	115	10	46	348	358	5	6	6	5	6
EMR026	392	430	90	57	820	909	6	6	6	5	6
EMR048	435	263	51	279	697	748	4	6	5	4	4
EMR051	224	50	2	74	274	277	4	6	6	4	3
EMR057	86	166	41	43	251	292	5	5	5	5	5
EMR059	36	44	2	6	79	81	5	4	4	5	5
EMR085	13	41	11	17	54	67	5	5	5	5	5
EMR086	4	3	2	6	7	8	5	5	5	5	5
EMR088	9	16	6	11	25	30	5	6	6	5	5
EMR089	2	10	11	9	12	24	5	5	5	5	5
EMR090	38	56	16	47	94	108	4	6	6	5	5
EMR092	49	70	12	36	119	131	5	6	6	5	5
EMR093	41	52	28	31	92	120	5	5	5	5	5
EMR095	124	82	8	8	203	213	5	7	6	5	6
EMR096	184	465	80	32	649	726	7	6	6	5	6
EMR097	89	166	45	13	256	303	5	6	6	5	5
EMR098	175	274	98	51	452	549	4	6	6	5	4
EMR099	117	76	18	18	192	209	5	6	6	5	6
EMR100	40	77	27	26	115	140	5	6	6	5	5
EMR101	320	216	34	87	532	565	4	4	5	5	4
EMR103	107	216	22	54	321	343	5	5	6	5	6
EMR104	178	151	13	44	327	336	5	6	6	5	5
EMR105	574	418	51	56	991	1040	5	6	6	5	6
IRVINE-1	144	189	24	23	337	360	6	6	6	5	6
IRVINE-2	171	260	46	46	431	475	6	6	6	5	6
MOUNT EV	36	56	12	58	90	102	4	4	4	5	4
OGALLALA	0	4	2	4	4	6	4	5	5	5	4
OSTARA	91	336	145	115	428	573	5	4	4	5	4
OZARK BE	9	26	10	59	35	46	3	4	4	4	3
RAPELL-1	77	244	86	67	319	410	4	4	4	5	4
RAPELL-2	60	122	67	93	182	246	4	5	5	5	4
RAPELL-3	152	206	64	151	356	421	4	5	4	5	4
SANS RIV	7	105	111	120	111	220	4	3	3	5	2
SELVA	165	134	12	8	296	310	5	6	7	5	6

1993 Everbearer trial.

New selections recommended for further trials

- EM67** Originally selected as a June-bearer so may have potential as a double cropper. More productive than Rapella, with better average fruit size. Attractive, moderately firm berries with regular shape and glossy skin finish. Season equivalent to Rapella. Moderately resistant to mildew.
- EMR96** Attractive, firm berries and more productive than Rapella but fruit mostly medium size (25-35mm). Resistant to mildew. Slightly later season than Rapella.
- EMR105** Good yield and fruit size but primary berries often irregular in shape. Slightly later season than Rapella. Resistant to mildew.

Re-trialled selection recommended for grower trials

- EMR26** Early everbearer with a season slightly later than Tango. Performance is better from a spring planting (at HRI Efford), when yield and fruit size are similar to Rapella but the berries are firmer and more regularly shaped. Poor runner production. *EMR26 will be planted in grower trials in 1995.*

Overseas variety

- Irvine** From California. Attractive, firm berries but plants lacked vigour and although the yield was comparable with Rapella it was significantly less than the best selections in the trial. Irvine is a strong day-neutral and behaves in a similar way to the older Californian variety, Fern.

1993 EVERBEARER TRIAL. SUMMARY OF RESULTS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
84145-14	2	1	0	0	3	3	5	5	5	5	5
84-355-2	43	89	18	8	134	149	5	5	5	5	5
CALYPS-1	121	149	34	32	270	303	5	5	5	5	5
CALYPS-2	104	200	58	55	301	357	5	6	6	5	5
EM0067	218	289	88	45	507	597	6	5	6	5	6
EMR022	234	115	10	46	348	358	5	6	6	5	6
EMR026	392	430	90	57	820	909	6	6	6	5	6
EMR048	435	263	51	279	697	748	4	6	5	4	4
EMR051	224	50	2	74	274	277	4	6	6	4	3
EMR057	86	166	41	43	251	292	5	5	5	5	5
EMR059	36	44	2	6	79	81	5	4	4	5	5
EMR085	13	41	11	17	54	67	5	5	5	5	5
EMR086	4	3	2	6	7	8	5	5	5	5	5
EMR088	9	16	6	11	25	30	5	6	6	5	5
EMR089	2	10	11	9	12	24	5	5	5	5	5
EMR090	38	56	16	47	94	108	4	6	6	5	5
EMR092	49	70	12	36	119	131	5	6	6	5	5
EMR093	41	52	28	31	92	120	5	5	5	5	5
EMR095	124	82	8	8	203	213	5	7	6	5	6
EMR096	184	465	80	32	649	726	7	6	6	5	6
EMR097	89	166	45	13	256	303	5	6	6	5	5
EMR098	175	274	98	51	452	549	4	6	6	5	4
EMR099	117	76	18	18	192	209	5	6	6	5	6
EMR100	40	77	27	26	115	140	5	6	6	5	5
EMR101	320	216	34	87	532	565	4	4	5	5	4
EMR103	107	216	22	54	321	343	5	5	6	5	6
EMR104	178	151	13	44	327	336	5	6	6	5	5
EMR105	574	418	51	56	991	1040	5	6	6	5	6
IRVINE-1	144	189	24	23	337	360	6	6	6	5	6
IRVINE-2	171	260	46	46	431	475	6	6	6	5	6
MOUNT EV	36	56	12	58	90	102	4	4	4	5	4
OGALLALA	0	4	2	4	4	6	4	5	5	5	4
OSTARA	91	336	145	115	428	573	5	4	4	5	4
OZARK BE	9	26	10	59	35	46	3	4	4	4	3
RAPELL-1	77	244	86	67	319	410	4	4	4	5	4
RAPELL-2	60	122	67	93	182	246	4	5	5	5	4
RAPELL-3	152	206	64	151	356	421	4	5	4	5	4
SANS RIV	7	105	111	120	111	220	4	3	3	5	2
SELVA	165	134	12	8	296	310	5	6	7	5	6

1994 Everbearer trial.

New selections recommended for further trials

EMR107 Consistently good quality fruit with a very regular shape and attractive colour. Good shelf life but most of the fruit came in the medium size category. The relatively large waste figure was due to some cat-faced fruit on the first two harvests - probably due to capsid damage, and mildew on some berries from mid August. Not resistant to mildew, although the level of susceptibility could not be assessed in this trial due to low disease pressure.

EMR87 Attractive, firm berries with good size and little waste. Resistant to mildew. Let down by poor flavour.

Recycled selection.

EMR63 Disappointing yield in this trial but very good quality, as expected. Berries mainly in the medium size category but this is partly due to an elongated conic shape. Resistant to mildew. Good shelf life. Later season than Rapella. *EMR63 will be planted in grower trials in 1995.*

New variety from UK

Evita Good size and little waste but skin firmness less than expected. Resistant to mildew. Shelf life tests showed it to be unusually susceptible to post harvest rots, mainly *Botrytis*.

Overseas varieties (all from California)

Capitola Not adapted to autumn planting. Plants were vigorous and healthy but there had been no yield by mid September, although the plants were flowering prolifically at that time.

Irvine Performed less well than in 1993. Fruit quality was good but the plants lacked vigour and the yield was low.

Muir Attractive berries with good fruit size and yield equivalent to Rapella in this trial. Merits further trialling.

Note. None of the selections was significantly earlier than Rapella. Harvesting began in mid July but by mid August all plots were showing signs of 'thermodormancy' and thereafter the picks were very small. There was much less mildew than had been seen in earlier trials which made it difficult to assess accurately the levels of susceptibility.

1994 EVERBEARER TRIAL. SUMMARY OF RESULTS

YIELDS PER PLANT AND WEIGHTED MEANS FOR FRUIT QUALITY

23/03/95

	LARGE (>35mm) grams	MEDIUM (25-35mm) grams	SMALL (18-25mm) grams	WASTE grams	CLASS 1 YIELD grams	TOTAL YIELD grams	APPEARANCE	SKIN FIRMNESS	FLESH FIRMNESS	FLAVOUR	SELECTION INDEX
CALYPSO-1	129	218	49	106	347	392	4	6	5	5	4
CALYPSO-2	78	152	47	98	229	278	4	6	5	5	5
CAPITOLA	10	8	4	18	18	22	5	5	5	5	5
EMR041	150	306	122	180	455	577	4	4	5	5	4
EMR042	76	223	60	199	300	357	4	5	6	5	4
EMR063	93	261	67	74	353	423	7	7	6	5	7
EMR079	108	117	31	95	224	254	4	5	5	5	3
EMR087	214	236	48	79	449	494	6	7	7	4	6
EMR107	170	536	112	160	707	822	6	7	7	5	6
EMR111	148	288	84	151	434	518	5	5	6	5	5
EVITA	177	281	46	75	458	504	6	5	6	5	5
IRVINE-1	114	138	15	51	250	263	5	6	6	5	5
IRVINE-2	73	124	33	33	195	232	6	6	6	5	5
MUIR	199	162	24	54	358	381	6	6	5	5	5
OSTARA	37	222	164	106	258	425	5	4	3	6	3
RAPELLA-1	93	214	65	182	308	371	4	5	5	5	4
RAPELLA-2	78	183	59	113	262	321	4	5	5	5	4
RAPELLA-3	102	254	108	128	355	461	4	4	5	5	4
SEASCAP-1	81	109	13	87	193	205	4	6	7	4	4
SEASCAP-2	71	58	8	93	127	134	4	6	6	5	4
SELVA	154	79	3	43	234	237	5	6	6	4	4

CONCLUSIONS

During the period covered by this report the Stage 0 trialling system successfully underwent a transition from being solely the preliminary trials for the breeding programme to also including recycling of the best selections and testing of overseas varieties. This was achieved without any disruption or delay in the trialling schedule of any promising lines.

The 1991/92 trials reinforced the promising earlier results for EM220 and following grower trials in 1993/94 this selection has now been released to the industry with the name 'Eros'.

As a result of these and earlier trials the following selections are now planted in grower trials or scheduled for them in the near future.

Planted in grower trials in 1994

EM208, EM341, EM372, EM396, EM426. Two from this group are likely to be released in winter 1995/96.

To be planted in grower trials in 1995.

EM258, EM284, EM290, EM317, EM319, EM344, EM505, EM555, EMR26, EMR63.

Scheduled for grower trials in 1996.

EM235, EM398, EM517, EM575, EM642

PUBLICATIONS AND PRESENTATIONS TO GROWERS

SIMPSON, D.W. (1992). New varieties and seedlings. In: Proceedings of The Strawberry Conference 1992, ADAS Publication.

SIMPSON, D.W. and BELL, J.A. (1993). New strawberry varieties and seedlings from Horticulture Research International. In: Proceedings of the First European Berry Fruit Conference, January 1993. pp 69-79. Published by The Fruit Grower.

SIMPSON, D.W. and BELL, J.A. (1994) New strawberries to extend the season of production. In: Proceedings of 'New Developments in the Soft Fruit Industry' Cambridge, 22 February 1994, HRI/ADAS Publication. pp 1-8.

SIMPSON, D.W. (1994). A new system for strawberry variety trialling. HDC Project News.

SIMPSON, D.W. and BELL, J.A. (1995). Strawberries for the future. In: Proceedings of 'Growing for Profit'. National Agricultural Centre, Stoneleigh, January 25th 1995, NSA Plants Ltd Publication. pp DS1-DS5.

Appendix 1. Pest and disease control measures

Early March

DSM 21 DHI	560 ml	aphid
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March

Elvaron 14 DHI	200 g per 100 lts apply as a drench	<i>Botrytis</i>
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Early April

Contingency Thiodan 20 42 DHI	250 ml per 100 lts	tarsonemid mite
Morestan 14 DHI or Apollo 50 SC	50 g per 100 lt HV 0.4 lt (Off label use)	red spider

April

Contingency Dursban 4 7 DHI	1.0 lt	tortrix
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Mid April

DSM 7 DHI	560 ml	aphid
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Early May

DSM 7 DHI	560 ml	aphid
Rubigan 14 DHI	330 ml	powdery mildew
Dursban 4 7 DHI	1.5 lts (Apply when damage first seen. Do NOT apply when in flower)	blossom weevil

White bud

Elvaron 14 DHI	4.5 kg	<i>Botrytis</i>
Rubigan 14 DHI	330 ml	powdery mildew

Elvaron & Rubigan are compatible. Repeat twice at 10 day intervals

Contingency. Two weeks after last DSM

Phytoseiulus 25,000 per/ha red spider

Contingency
Aphox 560 g aphids
3 DHI

Prior to harvesting

Methiocarb pellets slugs, seed beetles

Applied prior to strawing down or 7 days prior to picking on raised beds.

Harvesting

Rovral WP 1.5 kg *Botrytis*
1 DHI
Nimrod 1.4 lt powdery mildew
1 DHI (Only 3 applications of Nimrod & 4 of Rovral permitted)

alternate with

Bravo 6.0 lt *Botrytis*
3 DHI
Systhane 1.1 lt powdery mildew
3 DHI
Max.dose of Systhane = 9.0 lts
Max. applications Bravo = 4

Post picking in Autumn

Aliette 3.75 kg in red core
1000 lts
apply as a drench

All planting times except Autumn

Ridomil Plus 50 WP 8.25 kg *Phytophthora* spp
Apply as a drench. Do NOT use if to be cropped same year.

Additional treatments for everbearing & day-neutral types

Contingency mid-late July

Repeat @ 2-3 weeks due to repeat invasion from host plants.

MTM Malathion	190 ml per	aphid
4 DHI	100 lts	(lygus)
or		
Ambush C	280 ml	
0 DHI		
or		
Cyperkill 10		
0 DHI		

Contingency August

Thiodan 20	1.5 lt	tarsonemid mite
42 DHI		

Contingency Mid August

Aphox	560 g	aphids
3 DHI		

Childion	4.5 lt	red spider
7 DHI		strawberry mite

NB. The high numbers of Metasystox/DSM sprays are included to stop aphids from spreading the Crinkle virus, the use of Metasystox precludes us using *Phytoseiulus* until 2 weeks after the May application.

Appendix 2. Recording system for fruit quality characteristics

Appearance		Colour
1 2 3 4 5 6 7 8 9		1 2 3 4 5 6 7 8 9
Poor	Excellent	Pale
		Dark
Skin Firmness		Flesh Firmness
1 2 3 4 5 6 7 8 9		1 2 3 4 5 6 7 8 9
Soft	Firm	Soft
		Firm
Flavour		Selection index*
1 2 3 4 5 6 7 8 9		1 2 3 4 5 6 7 8 9
Unpleasant	Excellent	
Comments		

*Selection index is an overall appraisal of fruit quality of the sample being recorded. An average score of 5 or more would normally be necessary over the whole season for a selection to go forward for further trials - the higher the score the better. For a mid season June-bearer, where the requirement is to beat Elsanta, an average selection index of 6 or 7 (or higher) is desirable.

Appendix 3. Recording system for vegetative plant characteristics

Mildew symptoms	Other disease symptoms	Vigour
1 2 3 4 5	1 2 3 4 5	1 2 3 4 5 6 7 8 9
None	None	Weak
Severe	Severe	Excessive
Stand	Habit	Density
1 2 3	1 2 3	1 2 3 4 5
Uneven	Spreading	Open
Even	Erect	Dense
Display	Ease of picking	Runnering
1 2 3	1 2 3	1 2 3 4 5
Poor	Easy	Few
Good	Difficult	Many
Comments		

Appendix 4. Recording system for shelf life evaluations

Overall appearance

1 2 3 4 5 6 7 8 9
Poor Good

Colour

1 2 3 4 5 6 7 8 9
Pale Dark

Bruising

1 2 3 4 5 6 7 8 9
None Lots

Rotting

1 2 3 4 5
None Lots

Calyx

1 2 3 4 5
Fresh Withered

Shine

1 2 3 4 5
Dull Glossy

Seediness

1 2 3 4 5
OK Very seedy

Comments