ANNUAL REPORT - 16/12/93

HDC PROJECT - SF/18c

STRAWBERRY: ORGANISATION AND ASSESSMENT OF GROWER TRIALS

Project Leader: R.P. Jones

Location: Grower Sites

Co-ordinators: D.W. Simpson; NSA Plants Ltd.

Project commenced 01.02.93

Project completion 01.02.95

Key Words: strawberry, trial, grower

Practical Section for Growers.

Application:

To evaluate EM 224, EM 227(early season), EM 220 (mid-season) and Tango (everbearer) as potential varieties under commercial conditions.

Results:

EM 224 and EM 227 were not considered significantly earlier than Elsanta and were softer. There might be a niche for the PYO market as fruit size was good and appearance was good on the plant.
EM 220 trials were established as 60-day plants and yield fruit quality looked as good as Elsanta.
Tango outyielded and had better fruit quality than Rapella, but was a little softer than Calypso. Appearance was better than Caypso.

Summary:

EM 224 and EM227

Yield.

Overall the sites Elsanta yielded 350 g/plant, EM 227 302 g/plant and EM 224 260 g/plant.

Fruit Quality.

EM 224 had good fruit size and a regular shape. On site 6 there were fewer misshapes than Elsanta.
It had a glossy, medium red skin. Flesh and skin firmness was not quite as firm as Elsanta but considered good.
Flavour was pleasant.

EM 227 had a similar fruit size but shape to EM 224 but was a more pointed conic. It was also seedier.
On site 5 many of the early primaries were double fruit with hollow centres.
Skin and flesh were softer than EM 224 and it felt a little spongey.
Flavour was weaker and generally thought to be bland.

Comments.

1. Yields of both selections less than Elsanta on all sites except for 3 where Elsanta was affected by *Verticillium.*
2. Fruiting season on most sites were very similar to Elsanta.
3. Primaries of both selections were larger than Elsanta, particularly EM 224 which is allright for PYO but was considered too large for supermarket.
4. On site 4, Elsanta fetched a higher price in the farm shop than the selections.
5. A lot of the primaries were either ribbed or double fruit and had hollow centres which made them spongey. This was more noticeable on the Northern sites.
6. Generally EM 224 was liked for its flavour which was sweet; EM 227 was more bland. Both selections had a rather soft, slightly woolly texture.
7. EM 224 was bright and glossy, and was attractive at its best, but it did darken when full ripe; EM 227 was slightly paler.
8. Both had softer skin and flesh than Elsanta so shelf-life was not good. Also they needed picking over more often than Elsanta.
9. On site 1 fruit became seedy and also blotchy for one or two picks.

EM 220

Yield.

The trial was established in 1993 as 60-day plants so yields were low; Elsanta Averaged 174 g/plant and EM 220 137 g/plant.

Fruit Quality.

1. Generally fruit was very similar to Elsanta in appearance though slightly more seedy and with a more pronounced neck. The fruit was glossy but skin colour was slightly less bright than Elsanta.
2. Fruit size was similar to Elsanta
3. Some splitting occurred around the neck on site 3 and was a little worse than Elsanta. This could possibly be a problem in wet seasons.
4. Skin and Flesh firmness varied from slightly softer to slightly firmer than Elsanta but overall was thought to be good.
5. Shape was regular with very few mishapes.
6. Flavour was pleasant but not as good as Elsanta.
7. Overall the fruit quality of EM 220 was considered as good as Elsanta.

Comments.

All sites thought EM 220 has potential. Fruit quality and size was almost as good as Elsanta and if fruit shape is consistently better and yields similar than Elsanta on the maincrop next year then it could have commercial potential.

Tango

Yield.

Both of the official sites had problems with picking so results are not reliable. However in a larger scale trial Tango cropped at 6.19 tons/acre compared to Rapella at 5.92 tons/acre.

Fruit Quality.

1. It would seem that there might well be a pollination /fruit set problem with Tango and it would be advisable to avoid planting large blocks without another variety to provide supplementary pollination.
2. Deflowering needs to be carried out at planting to make the most of the larger early yields that Tango is capable of producing.

Science Section.

EM 224 and EM 227

Objective.

To evaluate both selections as potential second-early varieties; they are seen as competitors for the Hapil and Gorella season rather than Elsanta and their outlets for PYO and the wholesale markets rather than the supermarket trade.

Materials and Methods.

Four sites were chosen in the the main growing areas of England, one in Scotland and one in Northumberland. The two northern sites were chosen to see

whether the selections' performance imitated that of other early varieties which often perform better than in the south, particularly Honeoye which is a parent of both selections.

Sites

Site	Location	Grower
1	Kent	D. Pascoe
2	East Anglia	H. Duncalfe
3	Somerst	P. Parris
4	West Midlands	S. Smith
5	Northumberland	W. Dickinson
6	Scotland	P. Thomson

Establishment and Plant Characteristics.

Site	Plant Origin		No Plants		Planting	Cropping	
	EM 224	EM 227	EM 224	EM 227	Date	EM 224	EM 227
1	CS	CS	1700	1700	29 May	Yes	Yes
2	CS	CS	1700	1700	1 July	No	No
3	CS	FD	1700	1700	6 May	No	No
4	CS	CS	1600	2100	14 May	Yes	Yes
5	CS	CS	1700	1700	5 March	Yes	Yes
6	CS	FD	1700	1700	1 May	Yes	No

CS - cold stored runners FD - Fresh dug runners
Only site 1 planted into fumigated beds.
Plants on all sites established well. EM 224 was more vigorous than EM 227; up to 50% greater when cropping started. Cropping was light and no detailed records were kept but on site 5 it was estimated that EM 224 had a heavier yield than EM 227 and on site 4 EM 224 had nearly twice the yield of EM 227.

Results.

	Yield g/plant 1993		
Site	EM 224	EM 227	ELSANTA
1	398	315	441
2	214	320	574
3	204	172	114
4	246	237	270[*]
5	558	447	No yield
6	298	324	347

[*] Pegasus was the control variety.

Season - Days earlier than Elsanta.

Site	EM 224	EM 227
1	3	1
2	0	0
3	3	3
4	5	2
5	1	2
6	3	2

Fruit Quality.

Site	Fruit Size		Firmness flesh/skin		Flavour/ Texture		Shape		Appearance	
	224	227	224	227	224	227	224	227	224	227
1	-	-	-/--	-/--	0/-	0/-	+	+	+/0	+/0
2	+	0	-/--	--/-	0/-	-/-	0	0	0	-
3	0	-	-/-	-/-	0/-	-/--	+	-	0/+	0
4	+	+	-/--	-/--	0	-	-	0	-	+
5	+	+	--/-	--/-	-/-	0/-	-	-	--	--
6	+	0	-/-	-/-	0/-	-/--	--	-	--	--

All quality ratings compared with Elsanta :

++	noticeably better
+	
0	no difference
-	
--	noticeably worse

Pest and Disease.

1. On site 4 problems with nematodes put EM 224 and EM 227 under noticeable stress. Plants of Pegasus adjacent to them were less affected.
2. On site 2 EM 224 required an extra spray of nimrod to control mildew.
3. On site 3 some tolerance to *verticillium* was observed for both selections compared to Elsanta.

Conclusions.

None of the growers were enthusiastic about either of the selections mainly due to poor shape and poor fruit quality. Because they were not sufficiently early the fruit quality was inevitably compared to Elsanta rather than Honeoye. However it was thought that they were suitable for PYO, though there was a divergence of agreement by the growers as to which selection was better.

Objective.

To evaluate EM 220 as a potential replacement for Elsanta as a mid-season, supermarket variety.

Materials and Methods.

Sites.

Site	Location	Grower
1	Kent	S. Brice
2	Kent	M. Alley
3	East Anglia	H. Duncalfe
4	South West	M. Butterley
5	West Midlands	A. Davison
6	Scotland	P. Thompson

Establishment.

2000 cold-stored runners graded to 10-15 mm crowns were planted on all sites as 60-day plants.

Site	System	Fumigation	Plant Date
1	Flat/straw	No	16 June
2	Raised bed/black poly	Yes	22 July
3	Raised bed/white poly	No	20 May
4	Raised bed/black poly	No	19 May
5	Raised bed/black poly	No	7 May
6	Raised bed/black poly	No	2 June

Results.

	Yield g/plant	
Site	EM 220	ELSANTA
1	No yield★	No yield★
2	Deblossomed†	Deblossomed†
3	119	No Yield*
4	120	110
5	No yield‡	No yield‡
6	173	238

★ Data corrupted

* Waiting-bed Elsanta were used as control
† Plants deblossomed due to late planting
‡ Poor establishment resulted in very poor yields. Data not taken.

Fruit Quality.

Appearance, firmness, shape and size were very similar to Elsanta. A more detailed analysis of fruit quality will done on the maincrop in 1994.

Pest and Disease.

There were no obvious differences in occurrence of pest/disease though one site thought there was less mildew after harvest.

Though not part of the official trial, Darby West Dereham undertook trials of EM 220 mainly to assess fruit quality. Rooted tips were planted out in September 1992 on raised beds/black polythene for maincrop and into peat bags for growing under polythene and glass.
A summary of their results are:

1. Yields; Maincrop 101 g/plant, poly 185 g/plant, glass 229 g/plant. There was no equivalent Elsanta to compare yields.
2. EM 220 Started cropping between 3 and 7 days later than Elsanta.
3. The fruit was very large (possibly too large for supermarket), conical and glossy.
4. The shoulders of the fruit tended to ripen 2-3 days before the tip.
5. Flavour was moderate to poor.
6. Fruit was a lot softer than Elsanta particularly under glass and polythene and in the open when it was very hot. Shelf-life was consequently much poorer than Elsanta.
7. Plants were very vigorous and produced a lot of runners.
8. EM 220 had moderate resistance to red spider and mildew but was more suscepible to botrytis.

TANGO - 1993

Objective.

To assess Tango as a potential everbearing variety by comparing it with Calypso, Rapella and Evita.

Materials and Methods.

Due to limited plant material 2000 potted plants each of Tango and Calypso were planted on 2 sites. In addition 15000 plants were grown in a solid block adjacent to a similar size plot of Rapella by E. Vinsons Ltd.

Sites.

Grower	Location	System	Plant date
W. Hudson	Essex	Flat/straw	28 April
P. Cragg	E. Sussex	Raised bed/Black poly	Late April
E. Vinsons Ltd	Kent	Raised bed/Black poly	Late April

None of the sites were fumigated.

Results.

E. Vinsons Ltd.

	Yield tons/acre (up to 4/10/93)		
Variety	Supermarket	Market	Total
Tango	4.35	1.84	6.19
Rapella	3.90	2.02	5.92

Trial Sites.

	Yield g/plant	
Site	Tango	Calypso
P. Cragg	No Yield	No Yield
W. Hudson	No Yield	No Yield

It was very disappointing that yield figures were not available from both of the grower sites. Both had problems establishing the plants after planting and the trials did not reflect the true yield potential of Tango. However useful information on fruit quality and shelf-life was obtained.

Fruit Quality.

1. Tango had better fruit shape than Calypso and Rapella.
2. Fruit size was similar for Calypso and Tango.
3. Skin and flesh firmness was in the order Calypso > Tango > Rapella. Tango had hollow centre making it a little spongey
4. The flavour of Tango was pleasant but the texture was considered rubbery and not pleasant by P. Cragg.
5. Tango had a better appearance than Calypso or Rapella.
6. Skin colour was brighter and more glossy in Tango than Calypso.
7. Shelf-life of Tango was 3-4 days at ambient and 4-5 days at 5^{0}C compared to 4-5 and 6-7 days respectively for Calypso. The apppearance of the fruit of Tango was the main reason for discarding rather than botrytis.

Pest and Disease

On one site Tango had mildew quite badly but not on the other site or on E. Vinson's.

Conclusions.

1. Tango outyields Rapella and has better fruit quality.
2. Evita was also grown on an adjacent site at E. Vinsons and the fruit was firmer, had better shape, equal flavour and better overall appearance than Tango.
3. At E. Vinsons site, Tango initially had good shape and pollination did not seem a problem. However in early September there was a lot of mishapes and a noticeable amount of flower abortion. This seemed to be worse in one corner of the field so there other factors may have been involved in the variable fruit shape. In addition there did seem to be an edge effect with fruit shape improving on the plants that were nearer Rapella. A possible explanation could

be that the pollen viabilty may have been affected by the cold nights experienced at the end of August. The shape improved again during September.
4. Both trials sites experienced poor conditions at planting and both growers thought that Tango suffered and consequently established poorly.

Contract between R Jones (hereinafter called the "Contractor") and the Horticultural Development Council (hereinafter called the "Council") for research/development project.

PROPOSAL

1. TITLE OF PROJECT

Contract No: SF/18c
Contract date: 2.4.93

STRAWBERRY: ORGANISATION AND ASSESSMENT OF GROWER TRIALS

2. BACKGROUND AND COMMERCIAL OBJECTIVE

Since the closure and reorganisation of the ADAS Experimental Horticulture Stations, multicentre trials of strawberries is not now possible. Consequently larger scale trials now have to be conducted on grower sites and this requires close monitoring to get the maximum information from them.

The objective of this work is to assess the commercial potential of new selections arising from Stage 0 and Stage I trials at HRI and Brogdale respectively.

3. POTENTIAL FINANCIAL BENEFIT TO THE INDUSTRY

There is now a constant flow of potential varieties emerging from the HRI breeding programme. The quicker these are assessed under commercial conditions the sooner the best ones can be identified and introduced to the industry.

4. SCIENTIFIC/TECHNICAL TARGET OF THE WORK

The purpose of this work is to provide growers with detailed information on the performance of promising new strawberry selections under commercial conditions in a range of geographical locations.

5. CLOSELY RELATED WORK - COMPLETED OR IN PROGRESS

There is no other independent evaluation of new selections under commercial conditions in the UK.

6. DESCRIPTION OF THE WORK

To organise appropriate grower sites for the material under trial (eg early, main, late season or everbearers; supermarket or PYO). To consult with growers and propagators to try and achieve uniformity of planting material, conditions and recording of the results. All sites to be visited at least once during fruiting (twice for everbearing varieties). A detailed report to be sent to HDC for each trial.

Approximate schedule for year 1

Feb/March - Organise 3 sites for the everbearer variety Tango and 6 sites for the maincrop variety EM 220.

June/September - Visit the 6 sites with EM 224 & EM 227 (established 1992). Visit the 3 Tango and the 6 EM 220 sites.

7. COMMENCEMENT DATE AND DURATION

Start date 01.02.93; duration 3 years (6 months p.a.). Detailed reports of the trials will be produced at the end of each year (ie September 93, September 94 and September 95).

8. STAFF RESPONSIBILITIES

Project Leader: R P Jones in collaboration with Dr D Simpson and NSA Plants Ltd.

9. LOCATION

Grower sites around the country.

10. COSTS

Costings 1993

1. EM 224 and EM 227	
Visit 6 sites @ £250 per day	£ 1500
2. Tango	
Visit 3 sites (each site twice) @ £200 per day	£ 1200
3. EM 220	
Visit 6 sites @ £250 per day	£ 1500
All daily rates include mileage and subsistence	
Organise sites and produce reports	£ 1000
Total	£ 5200
Year 2	£ 5304
Year 3	£ 5410
Total cost	£15914