

APRC Project Report

Project SP 117: Maximise the potential of A931/15 and E11/20 for UK conditions

Contractor: Horticulture Research International – East Malling

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Assessments of Optimum Harvest Date and Storage Regime

A trial was begun with the objective of ascertaining the optimum picking date and storage regime for A931/15 (to be named Meridian in October 1999). Fruiting trees of this variety are still in short supply and it was essential that sufficient fruits were available for the planned launch of this new variety at The National Fruit Show in October 1999. After estimation of the potential cropping of the A931/15 plantings, two sites were chosen to supply fruits for this trial. One of these was in East Kent and the other in Suffolk. The trees used were 3 years old and planted in single rows on M.9 rootstock.

The plan was to harvest fruits at three dates on each site at timings spanning the likely optimum maturity dates. Harvesting began in early September and the last pick was made on the East Kent site at the end of the month. Insufficient fruits were available at the Suffolk site to facilitate a third pick from the three-year-old trees. Fruits from 20 four-year-old trees were, therefore, sampled from this site at the third occasion. A fourth harvest was undertaken at the East Kent site.

A sample of the fruits from each harvest was examined and measurements were made of their size (diameter), firmness, soluble solids, starch and internal ethylene. Four storage regimes are being tested. Two of these are air storage, at either 0°C or 3°C, and the other two are CA regimes. One of these is a Cox regime, 1.3% O₂ + <1.0% CO₂ at 3.8-4.0°C and the other a Bramley regime using 1.0% O₂ + 5.0% CO₂ at 4.0-4.2°C. One bushel box of fruits from each site at each harvest date was then put into each storage regime. The air-stored fruits will be examined prior to Christmas, 1999. It is hoped to retain the CA-stored fruits in store until March 2000.

Results of the pre-storage fruit quality assessments on representative samples of 10 fruits are shown in the Table below.

By 1st September 1999, fruit size on the A931/15 trees at both sites was very good with average diameters of 73 mm. Two weeks later, the average diameters had increased slightly to 76 mm. Levels of starch remained very high in fruits from the young trees and not until the fourth pick at the East Kent site did levels fall to below 90%. However, by this time the harvested fruits were already showing signs of greasiness. The levels of internal ethylene remained very low in all the samples harvested. Fruits from the older trees at the Suffolk site did show reduced starch levels

at the third harvesting date and it will be important to repeat these studies on older trees in future years.

Pre-storage size and quality assessments made on A931/15 fruit samples harvested from two sites during September 1999.

| Site | Pick date | Fresh Weight (g) | Fresh Diameter (mm) | Pressure (N) (mean of two sides) | Soluble Solids (%) | Starch (%) | Internal ethylene (ppm) |
|---------|-----------|------------------|---------------------|----------------------------------|--------------------|------------|-------------------------|
| Suffolk | 03/9 | 169 | 74 | 70.7 | 11.5 | 95 | 46 |
| | 10/9 | 171 | 75 | 74.8 | 12.2 | 88 | 93 |
| | 17/9* | 179 | 75 | 66.6 | 11.9 | 61 | 86 |
| E. Kent | 01/9 | 169 | 73 | 70.9 | 12.7 | 97 | 86 |
| | 08/9 | 182 | 76 | 68.8 | 13.2 | 91 | 89 |
| | 15/9 | 195 | 77 | 69.4 | 14.0 | 90 | 25 |
| | 22/9 | 209 | 79 | 65.7 | 13.8 | 76 | 91 |

* Trees sampled at third pick were one year older than those sampled at first two picking dates

Mineral analyses on extension leaves

Samples of A931/15 extension leaves were collected from trees on four of the grower sites in late August or mid September. This was achieved with the collaboration of Dr. Martin Luton of Fruition. The samples were analysed at HRI-East Malling by Dr. Tim Samuelson. The preliminary results of these mineral analyses are shown below. Levels of nitrogen in the leaves were similar or slightly higher than those recommended for Bramley and Cox. Leaf phosphorus, potassium and magnesium were also similar to those usually recommended for Cox. The levels of boron were within the 20-40 ppm range usually recommended for Cox in the UK.

Plans for future work

Observations made on A931/15 trees growing in the UK and abroad indicate that the variety has a tendency to produce bare wood. Work in subsequent seasons will address this problem in pruning trials.

The trees of E11/20 planted at HRI-East Malling in the spring of 1999 will be used in subsequent years for development work on this promising new selection

Mineral¹ analyses on extension leaves of A931/15 collected from young trees at four sites in the UK

| Site | Sampling date | N ¹ (%) | P (%) | K (%) | Ca (%) | Mg (%) | Mn (ppm) | Na (ppm) | Zn (ppm) | Cu (ppm) | Fe (ppm) | Bo (ppm) |
|------------|---------------|-----------------------|----------|----------|-----------|-----------|-------------|-------------|-------------|-------------|-------------|-------------|
| Hem. | 24/8 | 3.3 | 0.22 | 1.7 | 1.3 | 0.22 | 30 | 131 | 13.0 | 8.7 | 78 | 26.1 |
| Old Hs. | 24/8 | 3.2 | 0.22 | 1.4 | 1.3 | 0.25 | 88 | 82 | 16.9 | 10.0 | 127 | 27.0 |
| Suffolk 3y | 24/8 | 3.1 | 0.19 | 1.6 | 1.8 | 0.22 | 52 | 177 | 13.2 | 9.2 | 89 | 26.4 |
| Suffolk 4y | 24/8 | 3.0 | 0.19 | 1.7 | 1.9 | 0.18 | 64 | 178 | 13.1 | 8.7 | 93 | 28.1 |
| Suffolk 3y | 10/9 | 2.7 | 0.15 | 1.6 | 1.6 | 0.17 | 47 | 120 | 10.6 | 7.3 | 96 | 22.8 |
| E. Kent 3y | 15/9 | 2.7 | 0.17 | 1.4 | 1.9 | 0.21 | 85 | 286 | 15.4 | 9.0 | 114 | 25.3 |
| E. Kent 4y | 15/9 | 2.7 | 0.18 | 1.4 | 2.0 | 0.24 | 80 | 225 | 14.8 | 9.0 | 121 | 23.6 |

- ¹ N = Nitrogen
P = Phosphorus
K = Potassium
Ca = Calcium
Mg = Magnesium
Ma = Manganese
Na = Sodium
Cu = Copper
Fe = Iron
Bo = Boron

