30/5/91

REPORT TO THE NEW ZEALAND BUTTERCUP SQUASH COUNCIL

Summary of 1990-91 research findings and recommendations

Research results

1. **Regionally based penetrometer assessments of crop maturity at harvest**

   Penetrometer readings moved steadily upwards with age and correlated well with flesh colour changes but not with skin colour or stem corking. Crops in Sth Auckland and Canterbury had very similar readings at commercial harvest (mean readings of 8.0-8.5). Corking of the stem as a guide to harvest maturity was too variable to be useful.

2. **Harvest/handling/storage practices which reduce rots during storage**

   Two factors were of overwhelming importance - age of fruit at harvest and storage temperature. Rot incidence was lowest for fruit harvested early (soon after maximum expansion, mean penetrometer reading, 7.8) and stored at 12-15 C. Susceptibility of fruit to artificial inoculation with fungi increased greatly during storage at 33 C but did not increase during storage at 12-15 C.

3. **Changes in quality characteristics during simulated shipping regimes**

   The results suggest that early harvest fruit will continue to 'develop' firmer skin and flesh during shipment to Japan if they are carried at higher temperatures. If they are carried at 12-15 C there will be little change from the levels at harvest.

   Flesh colour darkened steadily after harvest and the rate was independent of storage temperature and appeared similar to that for fruit still on the vine.

   Soluble solids continued to increase after harvest. Higher levels were obtained at the 33 C storage temperature than at 12-15 C.

   Changes in skin colour occurred only slowly at 12-15 C, but at 33 C colour changes after harvest were quite marked and involved a lightening and yellowing which gave the skin an "old and tired" look.

Recommendations

1. Penetrometers should be adopted by the NZ squash industry to determine optimum commercial harvest maturity.

2. Fruit must be handled very carefully after harvest and stored at 12-15 C to reduce storage rots to a minimum. Fruits harvested when older than normal commercial harvest maturity are markedly more susceptible to rotting and correct handling and storage is even more critical.

3. Quantifiable, objective household consumer maturity standards need to be determined for the Japanese market. There were quite significant changes during storage in attributes of squash often associated with (NZ) perceptions of maturity but they may not be the only ones of interest to the consumer.

On behalf of the DSIR and MafTech squash research investigators:

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