

ARTIFICIAL RIPENING OF AVOCADO FRUIT

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OPSOMMING

Na aanleiding van oorsese proewe met die kunsmatige rypmaking van avokado's is proewe plaaslik onderneem om avokado's kunsmatig ryp te maak vir plaaslike verspreiding. Aansienlike sukses is behaalmet die rypmaking en bemarking van Fuerte, Edranolen Mass avokado's. Etileen teen 'n konsentrasie van 1 000 dpm is vir 24-uur toegedien by 'n vrugtemperatuur van 16 °C waarna vrugte rypgemaak is teen 16 °C — 20 °C afhangende van die kultivar en tyd van die seisoen.

Die reaksie van die kleinhandel ten opsigte van kunsmatige rypgemaakte avokado's was belowend.

SUMMARY

As a result of overseas experiments with artificial ripening of avocados, experiments were undertaken locally to ripen avocados artificially for local distribution. Considerable success was achieved with the ripening and marketing of Fuerte, Edranol and Hass avocados, Ethylene was applied at a concentration of 1 000 ppm for 24 hours at a fruit temperature of 16 °C after which the fruit were ripened at 16 °C — 20 °C depending on cultivar and stage of the season. Response from the retail trade regarding artificially ripened avocados was promising.

INTRODUCTION

The artificial ripening of avocados with the purpose of supplying the retail trade with a choice of so-called "ready-to-eat" and "eat-when-soft" fruit has been investigated in the U.K. during the past few years. Several firms amongst them Geest Foods were already promoting Carmel "ready-to-eat" and "eat-when-ready" avocados during 1979. The idea was introduced to the U.K. as a result of research information which proved that sales of avocados could be increased by at least 50 percent if consumers were offered "ready-to-eat" avocados rather than just "eat-when-ready". It was however found that the concept of selling "ready-to-eat" avocados could only be promoted successfully with the support of the trade.

The artificial ripening of avocados is not without its problems however. Picking maturity, oil content, time of the season and the period of cold storage all play a role in the normal and artificial simultaneous ripening of avocados. Fruit temperature control during ripening also plays an important role in artificial ripening of fruit. To illustrate the

problems involved with the artificial ripening and handling of avocados some items from the minutes of a meeting held between East Kent Packers, Saphir, Marks and Spencers and Woolworths (S.A.) during 1978 can be quoted.

- a. Problems are being encountered largely due to inadequate cooling after treatment. The fruit is not being ripened evenly and it is possible to find avocados in stages 1—4 in one box. The situation is not helped by constant movement of fruit in the holding cold store, and variable temperature conditions as a consequence.
- b. As a result of inconsistent ripening, sales of "ready-to-eat" avocados were suspended. It was thought that the Fuerte avocados coming into E.K.P. were immature and variable, probably because they were too early.
- c. More scientific methods for assessing maturity and ripeness must be investigated and established.
- d. E.K.P. are appointing a technologist who will be able to investigate methods, including pressure testing.
- e. A new Code of Practice for ripening avocados is to be agreed.
- f. A number of improvements in procedure requiring follow-up was decided upon:
 - i). Mature avocados are needed with adequate oil content. Temperature checks to be made on arrival in the U.K.
 - ii) Avocados should be labelled ("ripe and ready-to-eat") prior to ripening. They should be handled by the "unbroken" cold chain technique.
 - iii) To minimize pressure damage and softening of ripe avocados and to improve display — nest packs will have to be investigated.
- g. It was emphasized that it is unwise to try to ripen immature and variable fruit; ripening should not be attempted until reasonably mature fruit is available. It is important to keep to the normal ripening period and not to extend it to ripen immature fruit.

METHODS AND RESULTS

As a result of the results overseas the Sentrale Vervoeren Bemarkingskoöperasie Bpk. also started trials on the ripening of avocados and the marketing thereof during this year. Unfortunately experiments could not be started at the very beginning of the avocado season but only during May 1980 when 150 boxes of Fuerte avocados from Westfalia were put in a commercial ripening room together with bananas. Fruit temperature was raised to 16 °C after which ethylene (Gasmix 4 consisting of 5% ethylene and 95% N₂) was applied to a concentration of 1 000 ppm. The fans and refrigeration's were switched off for 24 hours after which the room was opened and ventilated. After the gassing period a normal banana ripening schedule was followed at a temperature of 16 °C — 18 °C. The avocados were removed from the ripening room

24 hours after the gassing period and placed at ambient temperature. After another day the avocados were inspected and it was found that the stage of ripeness varied between soft and just turned. This variation could be attributed to variations in maturity as was also found overseas. The ripened avocados were marketed to the retail trade through a wholesale distributor, Sentrale Vervoeren Bemarkingskoöperasie Beperk. The trade was satisfied with the product and found that in spite of the variation in stage of ripeness, that the fruit could all be sold over a period of 3 days.

A portion of the ripened fruit was placed in a cold-room at 1 °C. It was found that the fruit could be kept for one month although the fruit became overripe quickly when exposed to ambient temperature after cold storage.

Between 10 and 24 July a further 1 200 boxes of Fuerte avocados from Westfalia were ripened and marketed without problems. Towards the end of this period it was found that the avocados were ready for distribution within 24 hours after the gassing period and that ripening became more even probably as a result of this variety becoming more mature as the season progressed.

At the end of July 258 boxes of Edranol and 42 boxes of Mass avocados were ripened experimentally. It was found that in this case successful ripening was achieved only after a period of 3 days after gassing and by maintaining fruit temperature at 18 °C — 20 °C as compared to 16 °C — 18 °C with Fuerte avocados. Towards the end of September another 500 boxes of Mass avocados were ripened; 200 boxes together with bananas and 300 boxes separately.

DISCUSSION

From the experiments it can be concluded that the ripening technique will have to be varied from the beginning of the season towards the end of the season for a particular variety. Further experiments will have to be conducted to determine exact ripening programmes for different varieties and for different times in the season.

The marketing of the ripened avocados posed no problems so far. The comments by retailers, even those that did not receive ripened avocados were positive. Their view was that the trade would always prefer the ripened product provided that it is available regularly. The current practice in the retail trade is to buy for instance 40 boxes of unripened avocados and leave them on the shelf for a fortnight until they soften. It is unpredictable to tell when such avocados will be ready and furthermore these avocados had an unacceptable appearance after this storage period of uncontrolled temperature and low humidity during winter whereas the ripened product has a far superior appearance. There are indications, especially regarding the Mass variety that pulp discoloration takes place during the period of natural ripening whereas the pulp of artificially ripened avocados has a natural appearance. Further investigations in this respect are necessary however.

It can be concluded that the artificial ripening of avocados has distinct advantages provided that it is properly co-ordinated with distribution and retailing.