

Analysis of transit temperature and fruit condition of South African export avocados

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ABSTRACT

The condition of South African avocados on the overseas market in 1991 was not as good as in previous seasons. The relevant factors responsible for this are the following:

- *Greater fruit age between picking and arrival overseas.*
- *Deviations of temperature control on some of the ships.*
- *The unselective picking of fruit as a result of blackspot, which has led to a greater variation in the maturity.*

Suggestions have been made to improve the condition of fruit arriving on the overseas market.

INTRODUCTION

The purpose of this research was to obtain a comparison between the condition of avocados delivered to the overseas market over the past four seasons and to measure the importance of fruit age and the deviation in temperature control.

Relevant factors were identified and their relative importance placed in perspective in order to achieve the improvement of the quality of the fruit delivered overseas.

RESULTS

Comparison between seasons

Figure 1 illustrates the firmness of Westfalia fruit over the past four years. The system of declining temperature management was applied on a commercial scale for the first time in 1989. In 1988 there were a considerable number of vessels found to have fruit which was softer than the acceptable standard of 35 firmometer units.

In 1991 however, only two such incidents were reported, namely the very first ship and ship 11 (City of Durban). In the case of ship 11, technical problems occurred on board which led to ineffective temperature management. In general, an improvement was found in the firmness of fruit after the implementation of a declining temperature management system. However, in spite of this system, the firmness of the fruit on the first three vessels was not satisfactory.

One of the most detrimental factors which can occur in the marketing of avocados is cold damage. However, the considerable decline in cold damage since 1989, as shown in Figure 2, is very encouraging.

Factors of importance in fruit condition

Fruit age

A highly significant correlation is found between fruit age (time between picking and arrival overseas) and the firmness of fruit overseas. Table 1 illustrates the interaction between fruit age and temperature deviation regarding firmness.

Some remarks in connection with fruit age are:

*Fruit which is fresh, as opposed to older fruit, has a greater chance of arriving firmer overseas.

*The South African avocados which arrived overseas in 1991 were on average two days older than fruit from previous seasons.

TABLE 1 The influence of fruit age and temperature deviations on fruit firmness on arrival overseas

Fruit age (days)	Temperature deviation	Firmometer reading
22	0 °C/d	25
22	1 °C/d	35
28	0 °C/d	32
28	1 °C/d	46

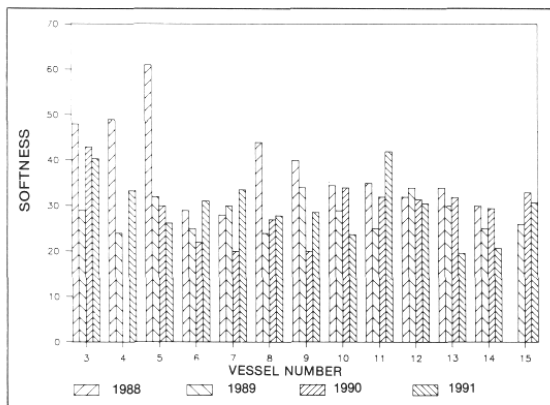


Fig 1 The firmometer reading for Westfalia export avocados on arrival overseas between 1988 to 1991.

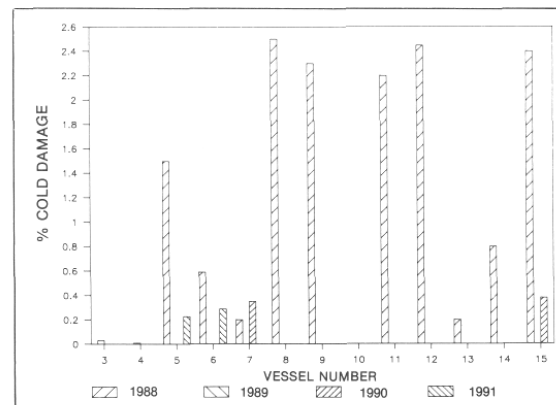


Fig 2 The incidence of cold damage on Westfalia avocados on arrival overseas between 1988 to 1991.

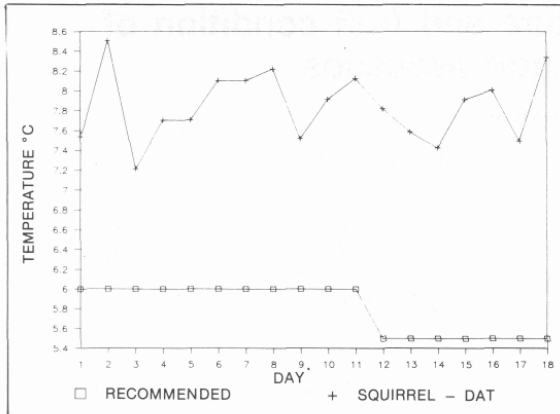


Fig 3 The actual recorded air delivery temperature and the recommended temperature for vessel 937.

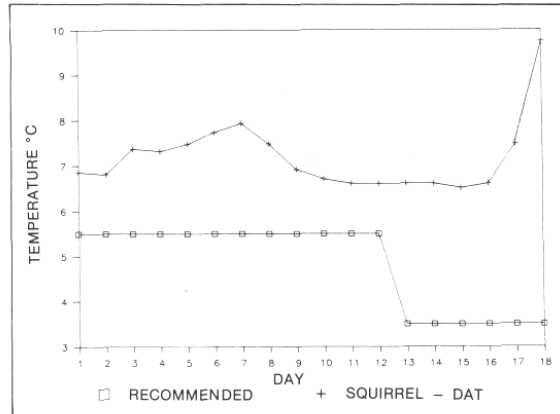


Fig 4 The actual recorded air delivery temperature and the recommended temperature for vessel 947.

Selective picking

The 1991 season was characterised by a higher than normal occurrence of blackspot. Fruit from orchards with blackspot were picked earlier in the season, while fruit from orchards without blackspot were picked later. This picking programme led to a large variation in fruit maturity which hindered optimal temperature management.

Temperature deviations

Information obtained in co-operation with PPECB, whereby temperatures during transit were electronically monitored, indicated that gross deviations from the recommended temperatures did occur during the 1991 season. Figures 3 and 4 show these deviations, which were found on two vessels, both of which arrived with soft fruit.

This underlines the importance of sending fresh fruit to the market for it to arrive firm on the overseas market.

RECOMMENDATIONS

1. Research and implementation to refine the present temperature regime to ensure that the fruit on the first three ships arrive relatively hard without cold damage at its overseas destination.
2. Advise producers and packhouses of the importance of fresh fruit. Should packhouses ignore this regulation, they must be notified accordingly and made known to the farmers. This must be strictly adhered to.
3. In a survey conducted by SAAGA, 13 types of export cartons were found, all with different ventilation characteristics. At the end of the season exporters and packhouses agreed on a standard carton which, at this stage, offers maximum strength and ventilation. Research to increase ventilation, reduce packing costs and still retain carton strength, must continue. Compliance to environmental requirements should also be borne in mind.

4. Monetary incentives must be considered for better fruit quality and condition.
5. The close co-operation with PPECB must continue, to identify and rectify problems with road transport and containerisation on the ships.
6. Blackspot must be effectively controlled during the growing season, for fruit to be picked according to maturity and not pathological characteristics.