

QUALITY AND OIL CONTENT OF EARLY SEASON FUERTE AVOCADO ORIGINATING FROM THE LEVUBU REGION

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OPSOMMING

Daar was 'n betekenisvolle verskil in die persentasie vog tussen groot en Mein vrugte gedurende die begin van die seisoen, maar dit het verdwyn namate die seisoen vorder. Vrugte gepluk teen 81,8% vog het binne 6 — 7 dae normaal ryp geword by kamer temperatuur en daar was geen verswakking in vrugkwaliteit nie. Naoes probleme was hoofsaaklik toegeskryf aan antraknrose en stingelendverrotting. Die voorkoms van fisiologiese naoes probleme was laag.

SUMMARY

A significant difference in the percentage moisture between large and small fruit was found during the early part of the season, but this disappeared as the season progressed. Fruit picked at a 81,8% moisture ripened normally within 6 — 7 days at room temperature and did not appear to have an adverse effect on quality. Anthracnose and stem-end rot constituted the major postharvest problems. The incidence of physiological disorders was low.

INTRODUCTION

The Division of Inspection Services of the Department of Agriculture and Fisheries allowed a special dispensation where fruit from the Levubu region, with a minimum moisture content of 81,8% (8% oil) could be exported. A restriction was placed on the counts allowed viz. 10, 12, 14 and 16 only — and the dispensation was applicable only up to the 15th March 1981. Oil content and the influence this has on fruit quality at ripening was monitored for each consignment.

METHODS

Samples were drawn (one carton/count) from every producer packing fruit and exporting under the experimental consignments (EXLE). This constituted four shipments namely:

Waterberg on 17th February 1981

Winterberg on 25th February 1981

Sederberg on 4th March 1981

Ortelius on 11th March 1981

A sample was drawn for moisture content determination for each individual sample. Five fruit/carton/count was regarded as a representative sample for an oil determination and this sample was replicated six times, (three in a conventional draught oven and three in a microwave oven). The method used for moisture content determination was one advocated by CSFRI, Nelspruit (Swarts 1976).

The remaining fruit was stored at 5,5°C for ± 30 days, (simulated sea freight conditions), ripened at 21°C and evaluated for internal and external quality. Fruit was regarded as ripe when found to give under light pressure exerted by hand.

Symptoms caused by anthracnose, (*Colletotrichum gloeosporioides*) stem-end rot (*Thyronectria pseudotrichia*, *C. gloeosporioides*, *Dothiorella aromatica* and *Phomopsis perseae*) and the Dothiorella Colletotrichum complex, were the only postharvest diseases monitored (Darvas and Kotzé, 1981) pulp spot and lead discolouration (Swarts, 1979) were the only two physiological disorders monitored during the course of the investigation.

Condition of fruit was expressed in percentage surface area covered both internally and externally with lesions caused by pathogenic organisms and physiological disorders. A rating of 1 — 10 was used where 1 represents 10% and 10 a 100% of total surface area of fruit covered by the lesions. Ratings were converted to percentages by using the following formula:

$$\% \text{ Surface area} = \frac{\text{Total rating}}{\text{No. of fruit rated}} \times \frac{100}{10}$$

A very subjective test for the determination of taste was done. A small sample from each fruit was tasted by a panel of three people. Taste was rated on a scale of 1 to 3 where

1 = mediocre

2 = good

3 = excellent

Prior to sampling fruit for oil etc. the mass of each carton was determined.

RESULTS AND DISCUSSION

Although difficult to generalize as the variability in results between different growers in the region is high, certain trends could be determined.

The majority of fruit exported during February (17/2/1981 and 25/2/1981) had an oil content below 10%. (Table 1). It is obvious that for these two early shipments, the larger fruit, i.e. counts 12 and 14 had a considerably higher oil content than the smaller fruit (counts 16 and 18). This trend appears to stop in fruit shipped subsequently, e.g. fruit shipped on the 4/3/1981 and 11/3/1981 does not show this marked differentiation in oil content between respective counts (Table 1 and 2). There is a definite tendency during the early part of the season for a marked differentiation in the percentage moisture (Table 3) between the short and long counts, which then disappear during the latter part of the season (Table 1 and 3). Thus to avoid

picking fruit with a low oil content, selective picking should be done during the early part of the season.

TABLE 1: Summary of results for fruit quality/count/shipment of fruit originating from Levubu

SHIP	DATE PICKED AND NO. OF DAYS KEPT AT 5,5	COUNT	% OIL CONTENT		AVERAGE DAYS TO RIPEN AT 21°C	% FRUIT WITH NO LESIONS	% AREA EXTERNAL				% AREA INTERNAL				TOTAL % AREA OF FRUIT IN CARTON COVERED WITH LESIONS	TASTE	% INTERNALLY GOOD FRUIT	
			RANGE	MEAN			ANTHRACNOSE	STEM END ROT	ANTH/DOTH. COMPLEX	COLD DAMAGE	ANTHRACNOSE	STEM END ROT	PULP SPOT	VASCULAR BROWNING				LEAD DIS-COLOURATION
Waterberg	17/2/1981 24 Days	12	11-12	12	7	62	1	3	0	0	0	3	0	1	0	8	2	95
		14	7-9	8	6	43	3	1	1	2	0	1	0	0	0	8	2	100
		16	7-8	8	7	15	4	6	0	3	1	13	0	0	0	27	1	75
Winterberg	25/2/1981 30 Days	12	8-13	11	6	42	7	4	0	4	1	14	0	1	0	31	1	81
		14	7-12	10	7	28	8	7	1	10	2	15	0	1	0	44	1	72
		16	7-11	9	7	18	7	6	0	4	1	13	0	1	0	32	1	71
Sederberg	4/3/1981 30 Days	12	9-16	11	5	46	6	4	0	4	1	5	0	0	2	22	2	98
		14	7-10	9	6	40	5	4	0	4	0	7	0	0	0	20	1	98
		16	8-11	10	6	39	4	4	0	5	1	7	0	2	1	24	2	97
Ortelius	11/3/1981 30 Days	12	9-10	10	7	65	3	3	0	2	0	4	0	1	0	13	2	64
		14	8-13	11	6	54	1	0	0	5	0	1	0	0	0	7	3	98
		16	8-13	10	6	70	1	1	0	2	0	2	0	0	0	6	2	98
		18	8-14	12	6	54	2	1	0	3	1	3	0	0	10	2	91	

TABLE 2: Means of ratings representing fruit quality for each experimental shipment from Levubu

Ship	Date Picked	% Oil Content		Average days to ripen at 21°C	% Fruit with no lesions	% Surface area with mechanical damage	% Area External				% Area Internal				Total % area of fruit in carton covered with lesions	Taste	% Internally good fruit	Total carton mass (kg.)	
		Range	Mean				Anthracnose	Stem end rot	Anth./Doth. complex	Cold damage	Anthracnose	Stem end rot	Pulp spot	Vascular browning					Lead dis-colouration
Waterberg	17/2/1981	7-12	9,3	7	40	0,3	3	3	0,3	2	0,3	6	0	0,3	0	14	2	90	-
Winterberg	25/2/1981	7-13	9,8	7	29	0,0	6	6	0,3	5	1,3	16	0	1,5	0	36	1	68	3,8
Sederberg	4/3/1981	7-12	10,3	6	40	0,0	5	5	0,0	4	1	7	0	0,8	0,6	30	2	97	4,0
Ortelius	11/3/1981	8-14	10,8	6	61	0,5	2	1	0,0	3	0,3	3	0	0,3	0	9	2	89	4,0

TABLE 3: Percentage moisture for respective counts (size) of fruit during course of 1981 season

Date picked	Count			
	12	14	16	18
21/1/1981	81,3	81,6	82,0	83,4
10/2/1981	82,0	83,5	83,2	*
17/2/1981	77,8	81,8	81,8	*
25/2/1981	78,8	79,8	80,8	80,8
4/3/1981	78,8	80,8	79,8	78,8
11/3/1981	79,8	78,8	79,8	77,8

From moisture tests done during the course of the past season, it is indicated that Fuerte fruit in the Levubu Valley do not ripen earlier than fruit in the Letaba region, but they might be earlier than fruit in the Nelspruit region (Fig. 1).

It is, however, wrong to generalize, because fruit from individual farms in the Levubu Valley ripens much later than others. The time of maturity is also determined by climate conditions during flowering and fruit set. If fruit set is late due to a cold winter, fruit maturity will be delayed. More observations are needed before a region can be classified as "early". There are too many variations within a region.

All the fruit monitored irrespective of oil content or date of picking, took 6 — 7 days to ripen at 21 °C after approximately 30 days storage at 5,5°C (Tables 1 and 2). No correlation could be found between oil and incidence of postharvest diseases. With minor exceptions fruit ripened normally and texture of flesh was normal.

A high incidence of pathogenic problems were recorded for fruit exported on the 25th February (Water berg) and the 4th March (Seder berg) (Table 2). Anthracnose and stem end rot were the two most important postharvest problems monitored. This could possibly be due to the fact that during this period, high rainfall prevailed and the majority of the fruit shipped was packed under extremely wet conditions. Cold damage was generally low and no pulp spot monitored throughout the trial period (Table 2).

Cartons varied in mass from 3,8 to 4,2 kg.

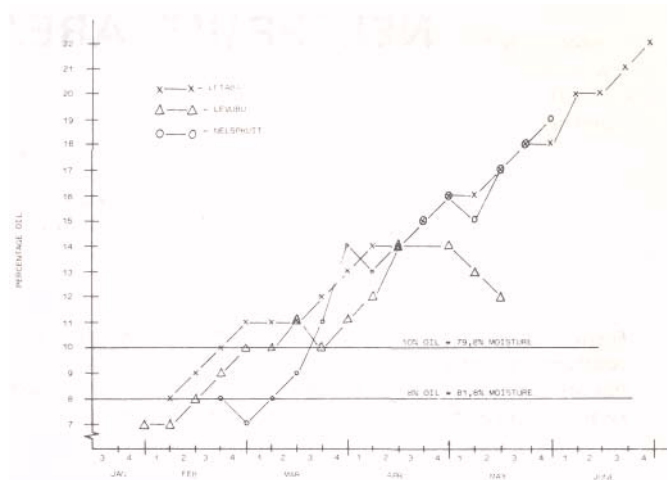


FIG. 1: Comparison of % oil content of Fuerte avocados in Letaba, Levubu and Nelspruit for the 1981 season

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