

AN INVESTIGATION INTO THE CAUSES OF CARAPACE SPOT

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Progress Report

OPSOMMING

Skilpaddopvlek is 'n tipe vrugbeskadiging wat 'n uitvoeroesverlies van 9% en 33% op Fuerte en Edranol onderskeidelik veroorsaak het. Die oorsaak van die verskynsel is ondersoek, Skulpaddopvlek kan veroorsaak word deur meganiese beweging van takkies of blare gedurende windperiodes of deur Insekte, 'n Onge'identifiseerde kewer is in HL Hall se boorde gevind, wat grootliks verantwoordelik was vir Skilpaddopvlek.

SUMMARY

Carapace spot is a fruit lesion that accounted for a crop loss of 9% and 33% on Fuerte and Edranol respectively. The cause of this phenomenon was investigated. Carapace spot can be caused by mechanical abrasion during windy periods or by insects. An unidentified beetle was found to be the major cause of carapace spot at HL Hall & Sons.

INTRODUCTION

During the 1977/78 season many farmers in the Nelspruit region sustained damage commonly known as "carapace spot" to their avocado fruit. At H L Hall and Sons, this damage alone accounted for 9% of the Fuerte crop, and 33% of the Edranol crop not being suitable for export. Wind is often blamed as being the cause of carapace spot, but it was felt that other factors could play a role. An investigation was, therefore, done into the roles played by insects, fungi, mites and mechanical rubbing in inflicting such damage.

PROCEDURE

Three separate procedures were undertaken —

- (a) Clean fruit were dipped in either an insecticide (Decamethrin), Fungicide (Benlate) or Acaricide (Acarol) in November, and the dipping was repeated later. If the damage inflicted was not mechanical it should, therefore, have been possible to establish whether the cause was insect, fungus or acarid. All fruit were analyzed for blemishes on 1979-05-22.
- (b) Wind damage was simulated by rubbing the fruit against leaves, twigs or other fruit. Three sizes of fruit were rubbed, namely pea, walnut or golf ball size.
- (c) Orchard inspections were done, and activities of insects etc. noted.

RESULTS

(a) Avocado fruit which had been dipped in the various chemicals were analyzed for external damages on 1979-05-22. Results are shown in Table 1.

Originally 200 fruit were dipped in each chemical. However, as a result of fruit drop considerably fewer fruit than this remained to be examined. An analysis of the results shows that the incidence of carapace spot was very low, and, therefore, it was not possible to ascertain whether it is caused by insects, fungi, acarids or by mechanical damage.

TABLE 1: Effects of chemical dipping of avocados on incidence of various external blemishes

External Symptoms	% Fruit affected			
	Un-treated control	Deca-methrin	Benlate	Acarol
Abrasion marks	11,3	10,9	42,0	43,0
Beetle damage	1,3	2,2	2,0	2,0
Other insect damage	1,3			
Carapace spot	0		10,0	10,2
Carapace line (twig)	1,3	1,1		
Sooty Mould	7,5	8,7		
White Scale	15,0	14,1		
Fruit Fly	7,5	5,4	4,0	4,1
Anthracnose	2,5			
Stem end rot	2,5			
F.C.M. eggs	1,3	1,1		
Unknown eggs		1,1		
Mite damage?	1,3	1,1		
Thrips damage?			4,0	2,0
Mealy Bug damage?			2,0	4,1
End burns	6,3	3,3	2,0	2,0
Sunburn	1,3	4,3		
Calyx damage	3,7	1,1		
No symptoms	37,5	45,6	32,0	32,0
Total No. fruit examined	80	92	50	49

- b). Fruit were photographed at various stages after being rubbed with leaves, twigs or with other fruit. It was found that with leaf or fruit rubbing, there was a dark speckled appearance on the fruit. Only with severe rubbing did the marks coalesce and exhibit slight cracking which was vaguely similar to carapace spot. With twig rubbing the symptoms were far more severe, and a definite cracking appeared in the lesions which was very typical of carapace spot. The lesions were light coloured in the cracks, and dark on the protruding surface which was very smooth.
- c) During the month of January a small black beetle was noted on the avocados. This beetle was eating away the surface skin. Areas which had been eaten showed up as a corky appearance and developed cracks. It appeared similar to carapace spot. However, it could be distinguished from damage caused by twig rubbing in that whereas the upper surfaces of the lesions where rubbing had taken place, were smooth, these surfaces had concentric rings in them which were probably associated with the insect's eating habits. Close examination is necessary to distinguish between the two types of lesion.

DISCUSSION AND CONCLUSION

It was concluded that Carapace Spot could be caused either mechanically, whereby avocados abraded against twigs, or by insect damage. The two types of damage could be distinguished from each other in that the surface of lesions abraded by twigs tended to be very smooth, whereas where this resulted from beetle damage there were concentric rings on the surface which are probably associated with the eating habits of the beetle. This beetle has not as yet been identified. The beetle was only seen for a few weeks, and greatest damage to fruit seemed to be on trees closest to the natural bush. Further studies need to be undertaken on the incidence of this beetle. More information is required on packhouse culls of fruit with carapace in order that the relative importance of wind and insect damage be ascertained.