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FUNGI ASSOCIATED WITH POST-HARVEST DISEASES OF AVOCADOS

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INTRODUCTION

Although post-harvest diseases of avocados received much attention in other countries such as the U.S.A. and Israel, they remained fairly neglected in South Africa. The importance of post-harvest diseases is now recognised by the avocado industry since serious losses occurred on the export markets during the last few years. According to Jacobs (1974) losses to avocados caused by anthracnose can be as high as 80%. Brodrick, Pretorius & Frean (1974) reported that anthracnose caused up to 10% losses when very rainy summers were experienced.

This report deals with the causal organisms and their relative importance.

Causal organisms were determined by applying Koch's postulates. Isolations were made from the edge of lesions and placed on V-8 agar medium. Pure cultures of the isolated fungi were used in inoculation studies and re-isolation was made again on V-8 agar.

In this way the following organisms have proved to be pathogenic to stored Fuerte fruit:

1. Anthracnose: *Colletotrichum gloeosporioides*
2. Stem-end rot:

Table 1

Fungi isolated from avocado fruit

Fungi	% Frequency of occurrence Early season (Arpil)	Later season (June)
Nectria sp.	81	38
Phomopsis sp.	5	41
C. gloeosporioides	3	4
Dothiorella sp.	–	10
Pestalotia sp.	3	4
Fusarium solani	–	3
Undetermined	8	–

An experiment was conducted to test the pathogenicity and virulence of *Nectria* on Fuerte avocado fruit.

The various infection routes in the experiment were simulated by the following inoculation techniques:

1. Conidial suspension of *Nectria* injected in the fruit stem approximately 1 cm under stem attachment.
2. Stem removed and conidial suspension smeared at the point of attachment and then covered with sticky tape.
3. Stem cut to 0,5 cm long and inoculated on the cut surface with conidial suspension and covered with tape.

The spread of fungi in the fruit was also studied to see if there is a relationship between the stem-end rot causing organisms and vascular bundle browning. Fruit with slight and severe stem-end rot symptoms and with advanced anthracnose symptoms were cut open. Isolations were made from the rotten tissues at the centre of infection and from the discoloured vascular bundles at various distances of the site where infection started.

(PLEASE NOTE TABLE 2 AND 3 WERE MISSING IN THE ORIGINAL YEARBOOK)

Table 4

The pathogenicity of Nectria *sp. 7 days after inoculation*

Inoculation technique	Flesh rotting depth (cm)	Penetrometer reading ($\frac{5}{16}$")
Injection into fruit	1,0	0,0
At detached stem point	1,7	0,3
Through stem	0,1	4,5
Uninoculated	0,0	5,2

DISCUSSION

Investigations on casual organisms involved in post-harvest diseases revealed that at least 6 different fungi are capable of causing stem-end rot of avocados. Most of them have been described in other parts of the world but the occurrence of the most common fungus, *Nectria* sp. as a disease causing agent of avocado fruit is new.

Phomopsis seems to be of considerable importance in stem-end rot later in the picking season, while *Colletotrichum gloeosporioides, Dothiorella* sp. *Pestalotia* sp. and *Fusarium solani* do not occur as frequently. Bacteria isolated out of stem-end rot were not pathogenic when inoculated into fruit. It is noteworthy that *Diplodia natalensis* was not isolated during this study, though it is often considered to be one of the most common stem-end rot pathogens.

Anthracnose is caused by the fungus *C, gloeosporioides* and it was frequently seen in

its perfect stage, *Glomerella cingulata.* From the various infection routes for stem-end rot caused by *Nectria* sp. the most effective was when inoculum was added to the point of stem and fruit attachment, to a somewhat lesser extent when injected into the fruit and fairly ineffective when inoculated through the stem. There appeared to be a correlation between the severity of stem-end rot and ripeness of fruit. The more severe the disease, the earlier fruit soften.

Nectria stem-end rot moves in vascular bundles much faster than in flesh. The browning of bundles, however, takes place before actual invasion by the organism.

C. *gloeosporioides* grows fast in vascular bundles and in the opposite direction as *Nectria* in stem-end rot. Here again, browning occurred before invasion. The bacterium isolated from the bundles proved to be nonpathogenic in subsequent inoculations.

References

BRODRICK, H.T., PRETORIUS, W.J., *&* FREAN, T.R., 1974. Avocado diseases. Farming in South Africa Avocado series No. H.1. 1974: 1 - 8.

JACOBS, C.J., 1974. Probleme by die koelopberging van avokados. The Citrus and Sub-Tropical Fruit Journal, May, 1974: 16 - 21.