

Host status of Hass avocado fruit for the False Codling Moth, *Cryptophlebia leucotreta* (Meyrick) (Lepidoptera: Tortricidae)

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ABSTRACT

The false codling moth, *Cryptophlebia leucotreta* (Meyrick) (Lepidoptera: Tortricidae) is a known pest of avocados, although the larvae do not develop fully inside the fruit. In this study, the host status of Hass avocado was established for *C. leucotreta*. Late hanging Hass fruit were artificially infested with eggs of *C. leucotreta* and covered with bags. The fruit were shed and started to rot in the material bags. In all the avocado fruit investigated, live larvae were found. Nine pupae were found in the bags, indicating that *C. leucotreta* can develop inside the fruit of the avocado. Penetration of *C. leucotreta* larvae in Hass fruit was superficial and larvae were mostly found in the area just below the skin. However, it still has to be determined if *C. leucotreta* can develop inside hard mature fruit.

OPSOMMING

Die valskodlingmot, *Cryptophlebia leucotreta* (Meyrick) (Lepidoptera: Tortricidae) is 'n bekende plaag op avokado alhoewel die larwes nie ten volle kan ontwikkel in die vrugte nie. In hierdie studie is die gasheerstatus van Hass avokados vir *C. leucotreta* vasgestel. Laat hangende Hass vrugte is kunsmatig met eiers van *C. leucotreta* besmet en met sakke bedek. Die vrugte het afgespeen en in die sakke begin vrot word. In alle vrugte wat ondersoek is, is lewende larwes gevind. Nege papies het in die sakke voorgekom wat aandui dat *C. leucotreta* in die vrugte van die avokado kan ontwikkel. Indringing van die larwes was baie oppervlakkig en larwes het meestal onder die skil voorgekom. Dit moet egter bepaal word of *C. leucotreta* in harde volwasse vrugte kan ontwikkel.

INTRODUCTION

The false codling moth, *Cryptophlebia leucotreta* (Meyrick) (Lepidoptera: Tortricidae) has been known as a pest of citrus since the beginning of the century (Fuller 1901). *C. leucotreta* has a very wide range of host plants. Schwartz (1981) reviewed some 21 cultivated and 14 indigenous host plants in Southern Africa. In cultivated crops it is particularly severe on citrus, but it also attacks many other deciduous, subtropical and tropical fruits, which includes the avocado. Eggs are laid on the fruit of avocado.

Larvae that develop from these may gnaw through the skin but are unable to develop in avocado fruit (Schwartz, 1978). Lesions are caused which reduce the marketability of the fruit. The damage caused by *C. leucotreta* develops into a raised crater with an inconspicuous hole in the middle where the larva of *C. leucotreta* has entered (Du Toit *et al.*, 1979). Granular excreta can also be seen. Of the moth pests that damage avocado fruits, *C. leucotreta* was found to be the most important (Erichsen & Schoeman, 1992). A survey conducted in the Nelspruit/Hazyview region during 1991 indicated that *C. leucotreta* was responsible for damage of 1.32% of fruit (Erichsen & Schoeman, 1992). The cultivars Edranol, Hass and Pinkerton were the most susceptible to attack by *C. leucotreta*.

The South African avocado industry is striving to gain access to USA markets with Hass fruit. *C. leucotreta* is one of the main pests of major concern to the United States Department of Agriculture. Therefore, it is essential to establish the host status of avocado for *C. leucotreta*. In this study Hass fruit were artificially infested with eggs and the development of the larvae monitored.

MATERIALS & METHODS

Eggs of the false codling moth were obtained from the Goede Hoop Citrus Co-operative at Citrusdal. Eggs were sent by courier service to the Institute for Tropical and Subtropical Crops at Nelspruit. The wax paper with the eggs was cut into approximately 100 mm² pieces. Each paper was attached to the fruit with a small piece of Prestic. Eggs were attached to 42 Hass avocado fruit on 26 August 1998 in orchard no. L9 at the ITSC. Each fruit was covered with a gauze bag to avoid parasitoids and ants destroying the eggs. Eggs were also attached to four soft citrus fruit in orchard no. I9 and covered with gauze bags. Eight soft citrus fruit were also picked, eggs were attached and the fruit were kept in the laboratory.

Fruit with the bags were removed from the avocado and citrus orchards on 5 October 1998 and inspected for the presence of larvae and pupae. Fruit in the laboratory were inspected on 18 September 1998 because they were invaded by green mould, *Penicillium digitatum*, due to punctures made by fruit fly females. Each bag and fruit was investigated for the presence of live and dead larvae and pupae.

RESULTS & DISCUSSION

Six avocado fruit found on the ground were rotten and could not be investigated further for the presence of larvae. The rest of the avocado fruit were shed and started to rot in the material bags. In all the avocado fruit investigated live larvae were found and in most cases larvae were also found in the bags (Table 1). Nine pupae were found in the bags indicating that *C. leucotreta* can develop inside the fruit of the avocado. One citrus fruit was found on the ground and one live larva was found in one of the bags (Table 2). Live larvae were recovered from the citrus fruit kept in the laboratory.

Table 1. Avocado fruit exposed to *C. leucotreta* eggs in the orchard.

	Number of larvae in bag		Number of pupae in bag		Number of larvae in fruit	
	live	dead	live	dead	live	dead
1	4	0	0	0	8	2
2	1	0	0	0	21	0
3	12	0	0	0	8	1
4	4	0	1	0	9	1
5	0	0	0	0	4	0
6	1	0	0	0	1	0
7	1	0	0	0	7	0
8	0	1	3	0	5	0
9	2	0	0	0	6	1
10	0	1	0	0	18	0
11	0	0	0	0	2	0
12	0	0	0	0	5	0
13	1	0	0	0	6	1
14	5	0	0	0	17	0
15	0	0	0	0	7	0
16	1	0	0	0	1	0
17	2	0	1	0	1	0
18	2	0	1	0	9	0
19	2	0	0	0	1	0
20	1	1	0	0	3	0
21	7	0	1	0	4	0
22	1	0	0	0	5	0
23	0	0	0	0	13	0
24	4	0	0	0	4	0
25	1	0	0	0	2	0
26	2	0	0	0	4	0
27	2	0	0	0	3	0
28	2	0	0	0	5	0
29	9	0	0	0	9	0
30	4	0	0	0	12	0
31	4	0	0	0	9	0
32	1	0	0	0	2	0
33	3	1	1	0	6	0
34	0	0	0	0	8	0
35	4	1	1	0	6	0
36	0	0	0	0	5	0

Penetration of *C. leucotreta* larvae in Hass fruit was superficial and larvae were mostly found in the area just below the skin. This is in contrast with citrus where larvae penetrate deep inside the fruit. It is known that *C. leucotreta* infested citrus fruit may be shed (Newton, 1998). In the case of the avocado it also seems to cause fruit drop of late hanging fruit. However it still has to be determined if *C. leucotreta* can develop inside hard mature fruit.

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Table 2. Citrus fruit exposed to *C. leucotreta* eggs in the orchard.

No.	Number of larvae in bag		Number of pupae in bag		Number of larvae in fruit	
	live	dead	live	dead	live	dead
1	0	0	0	0	0	1
2	0	0	0	0	0	0
3	1	0	0	0	0	0

Table 3. Citrus fruit exposed to *C.leucotreta* eggs in the laboratory

No.	Number of live larvae
1	0
2	0
3	1
4	18
5	1
6	0
7	1
8	17

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