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COMPARISON OF AND SCOUTING FOR BEETLE AND LOOPER DAMAGE TO AVOCADO LEAVES AND FRUIT

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Damage by the avocado beetle, *Monolepta apicalis* (Sahlberg) (coleoptera: Chrysomelidae), to avocado leaves and fruit was reported from Westfalia Estate and farms in the Kiepersol region during the 1992/3 season (Erichsen & Schoeman, 1993a; Erichsen, McGeoch & Schoeman, 1993). Damage by looper, *Ascotis reciprocaria reciprocaria* (Walker) (Lepidoptera: Geometridae) has been described for the fruit (De Villiers & Van den Berg, 1989; Du Toit & De Villiers, 1989; Erichsen & Schoeman, 1993b). Economic losses as a result of damage to fruit by these two pest species was established for the Nelspruit/Hazyview region by Erichsen & Schoeman (1992; 1993b). Beetle and looper damage to leaves and fruit can easily be confused. This paper serves to help distinguish between damage by the two pests and scouting procedures are suggested.

NATURE OF DAMAGE

The avocado beetle has been found to damage avocado fruits of all cultivars grown in the Kiepersol region but only to a limited extent (Erichsen & Schoeman, 1992). Feeding was primarily restricted to tender flush, and fruits, when fed upon, exhibited less than 10% surface area damaged (Erichsen & Schoeman, 1992).

The beetles remove the lower epidermis of the leaves, resulting in a skeletonized appearance, although larger individuals feeding on fresh flush may eat small, irregularly-shaped holes directly through the leaf (Fig. 1). This damage can easily be confused with looper damage (Fig. 2), and in most cases the damage is indistinguishable. When beetles attack young trees (1 -2 yrs), growth points may literally be "ring-barked", as a result of which the growth tip dies and side branching may occur.

The damage on the fruit by the avocado beetle (Fig. 3 & 4) is different to that by looper. The beetles eat short, sausage like grooves packed tightly against one another that make up the lesion on the fruit (Fig. 5). The lesion is shallow and only the epidermis is removed. Looper damage, in contrast, is continuous with no distinct feeding trails (Fig. 6) and the epidermis is removed to a greater depth than that by beetles. Characteristically associated with looper damage are deep potholes where the larva has eaten into the flesh of the fruit (Fig. 7).

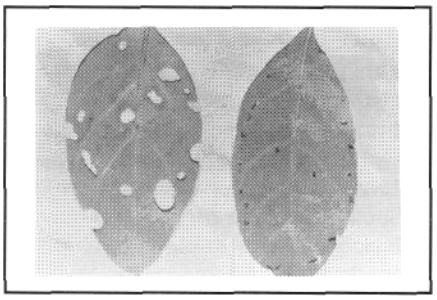

FIG. 1 Damage by *Monolepta apicalis* adults to Hass avocado leaf flush (left - "skeletonized" appearance; right - feeding holes).

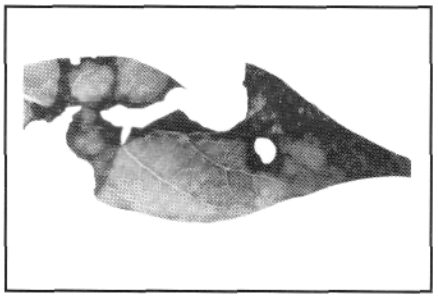

FIG. 2 Damage by *Ascotis reciprocaria reciprocaria* larva to a Hass avocado leaf.

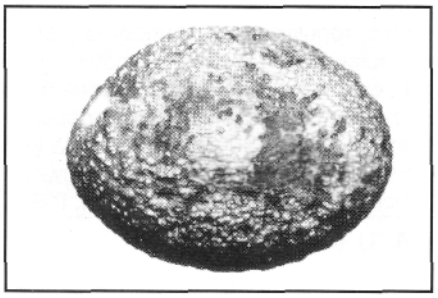

FIG. 3 Damage by *Monolepta apicalis* to a Hass fruit (± 80g).

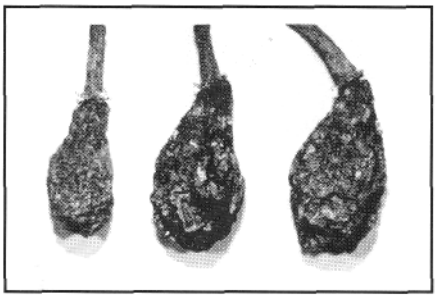

FIG. 4 Damage by *Monolepta apicalis* to Hass fruitlets (< 40g).

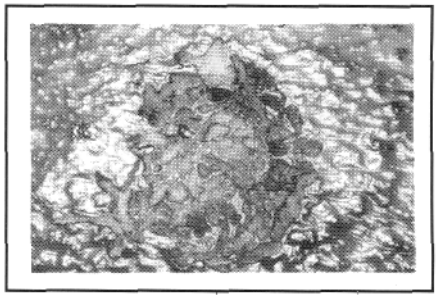

FIG. 5 Short, sausage-like grooves of epidermis removed by *Monolepta apicalis* from the surface of a Hass fruit.

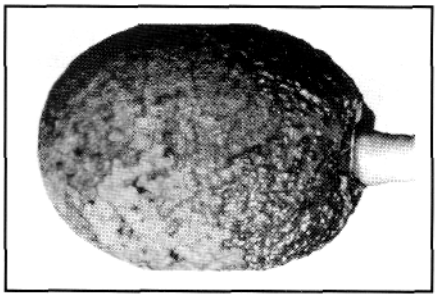

FIG. 6 Continuous removal of epidermis from the surface of a Hass fruit by *Ascotis reciprocaria reciprocaria*.

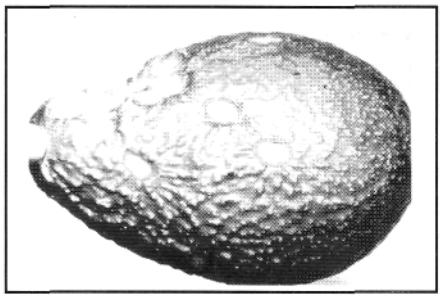

FIG. 7 Characteristic potholes eaten into a Hass fruit by *Ascotis reciprocaria reciprocaria*.

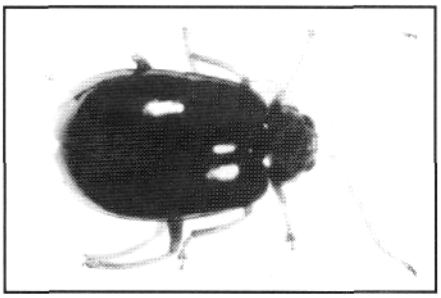

FIG. 8 The adult avocado beetle, *Monolepta apicalis* (Sahlberg).

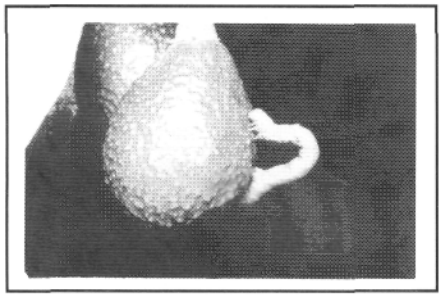

FIG. 9 Fifth larval instar of *Ascotis reciprocaria reciprocaria* feeding on an avocado fruit.

SCOUTING

When scouting for damage, growers should be aware of damage to the flush ("skeletonized" leaves, feeding holes etc.) (Fig. 1). Trees should be approached carefully and silently for the beetles are easily disturbed. Beetles will react in two ways when disturbed:

a) the insect will disappear onto the underside of the leaf so that it is not visible when one is looking at the leaves from above; or

b) it will drop from the leaf, opening it's wings within the first 20 cm, and fly into any dark or shadowed and secluded region of the tree. The latter reaction is most commonly encountered and can be used to one's advantage when catching specimens for identification.

By holding an open bottle a few centimeters below the beetle, the insect will, when disturbed, drop straight into the container before it opens it's wings to fly.

Scouting for beetles should preferably take place in the early morning or late afternoon during cool conditions when the beetles are more likely to sit on, rather than under, the leaves. Scout for damage to leaves and fruit and for the presence of beetles on the same tree. If no damage to fruit and no beetles are found, then the holes in the flush (Fig. 2) are most likely a result of feeding by looper. Careful observation might lead to looper larvae being found on the flush.

LIFE HISTORY

The avocado beetle is 3-5 mm in length, has shiny black wings, a bright red head, red legs and red under parts (Fig. 8). It is a strong flyer as indicated by its tendency to swarm when in search of food. The life history of *M. apicalisbas* not been studied in South Africa and very little is known of its biology, even on host plants other than avocado.

The five larval stages of looper have been discussed by Schoeman (1971) on citrus. The first instar ranges 1.75-4 mm in length and the fifth instar 25-50 mm. A detailed study of this pest on citrus was completed by Schoeman (1960). On avocados, the first two instars restrict their feeding primarily to flush, and it is the remaining instars that are responsible for damaging the fruit (Fig. 9).

Other *Monolepta* species are known to have a life cycle lasting approximately 60 days (Murray, 1982). It is probable that *M. apicalis* populations may peak approximately every 2-2.5 months (i.e. October, end December / begin January, and end February / begin March). Which peak will pose the greatest threat to avocado production is not certain, although damage by beetles during end December / begin January in the Kiepersol region was most significant (Erichsen & Schoeman, 1993a). Growers are advised to scout their orchards regularly from October to March, especially if the beetle is known to be present on the farm. Investigations have shown that damage to fruits may escalate from 0% to over 90% per tree within four days of the arrival of a beetle swarm (Erichsen, McGeoch& Schoeman, 1993).

NATURAL ENEMIES

Parasitism of *M. apicalis* has not been recorded in South Africa, although a tachinid fly and an ascomycete fungus have been isolated from adult beetles in other regions (Balazuc, 1988; Murray, 1982). The rate of parasitism was very low, however, and did not lend to any significant control of the beetle population.

There are no eggs or pupal parasites of looper (Schoeman, 1971). A number of wasp and fly parasites attack the larval instars and play an important role in controlling looper on citrus. Their activity in avocado orchards has not been studied. The larvae are also attacked by a parasitic fungus, but are not an important controlling factor (Schoeman, 1971).

ACKNOWLEDGEMENTS

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