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The role of ants on avocado pests

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ABSTRACT

The role of the brown house ant, Pheidoli megacephala *(F), on the population of the heart shaped scale,* Protopulvinaria pyriformis *(Cockerell), was investigated in a field trial on Ryan avocado trees. Five trees were skirted and treated with sticky trunk barriers to keep the ants out. The control trees were left untreated. No significant differences in the number of scale insects on the leaves were observed between the two treatments over a period of nine months.*

INTRODUCTION

The ant is one of the most successful and competing organisms in the world, mostly due to its social behaviour, constant search for food and polyphagous diet (Wilson, 1971). There are approximately 10 000 ant species in the world, of which about 1 160 occur in the Ethiopian region and 590 species occur in Southern Africa (Skaife, 1961).

Ants are commonly found in subtropical orchards, but are not necessarily harmful to the biological control of insect pests. For instance, more than 120 ant species have already been noted in citrus orchards (Samways & Täte, 1984) of which only a few are the so-called honeydew searchers. These species are constantly searching for insects like aphids, soft scales and mealy bugs on the new growth of trees. They stimulate these insects to produce larger amounts of honeydew, on which the ants feed. At Letaba Estate, Steyn (1954) found that one-third of the body weight of the pugnacious ant, *Anoplolepis custodiens* Smith, could consist of honeydew. At the same time, these ants disturb the natural enemies of the honeydew producing insects. An important fact is that these ants, especially those which follow fixed routes in the tree, can cause serious infestations of other pests, such as the red scale, *Aonidiella aurantii* (Mask), on citrus. The biological control of this pest on citrus cannot be successful, unless the pest ant species are controlled (Bedford, 1978). Of the 15 pest ant species on citrus which Prins *et al* (1979) discussed, the pugnacious ant, *A custodiens* and the brown house ant, *Pheidoli megacephala* (F), are the most common and are also found in other subtropical orchards. Various ant barriers and skirting are the ideal control methods to keep these indirect pests out of the trees (Prins *et al,* 1979; Samways, 1982; Samways & Buitendag, 1986). These predators can indeed be beneficial, because they feed on the larvae of various species, such as fruit flies and the false codling moth, *Cryptophlebia leucotreta* Meyr.

During this study the possible effect of ants, especially on the heart-shaped scale, *Protopulvinaria pyriformis* (Cockerell), which produces large amounts of honeydew,

were investigated.

MATERIAL AND METHODS

The trial was done in the Kiepersol area in a five-year-old avocado orchard, of which two rows of Ryan trees were seriously infested with heart-shaped scale, as well as the brown house ant, *P megacephala.* The surrounding Fuerte trees were only slightly infested with scale. Ten trees with a high ant activity on the trunks were selected in the two rows of Ryan trees. Five of these were left as an untreated control, the other five were skirted and the leaves on the ground were raked 500 mm from the trunk. Sticky bands of Bidim/Gladwrap with Reverant (Samways & Buitendag, 1986) were applied around the trunks, to keep the ants out of the trees. Ant bait (Amdro) was applied at 2 kg/m^2 under each of the treated trees, to kill the ant colonies. Eight leaves of each of the ten data trees were labelled and the numbers of live heartshaped scale on these leaves were counted every three weeks, over a period of nine months.

The ant barriers on the trunks were checked regularly and the bait replaced once during this period. Low-hanging branches and weeds were removed regularly, to prevent the ants from getting into the trees. The data of the two treatments were compared statistically with a T-test.

RESULTS AND CONCLUSIONS

The effect of the brown house ant on the heart-shaped scale population is summarised in Figure 1. The average number of scale per leaf of trees with ant control and the untreated control was compared, but no significant difference was found in the scale population at the 5% level, from six weeks after treatment to the end of the experiment. It can therefore be assumed that ants do not affect the build-up of the heart-shaped scale.

The most important reason why ants like *Pheidoli* do not cause repercussions of pests, such as the heart-shaped scale, is ascribed to the micro-habitat under an avocado tree. The thick layer of dry and rotting leaves is an ideal habitat for soil organisms, including other ants. Steyn stressed in 1955 that mixed ant populations in a citrus orchard can be beneficial because the interspecific competition prevents the pest species from becoming dominant. The grass covering between trees in a orchard contains its own micro-fauna, and can also serve as food for the ants (Samways, 1981).

It appears that the brown house ant and possibly other pest ant species do not play a significant role in the build-up of honeydew producers, like the heart-shaped scale, as long as the leaf coverage beneath and the grass between the trees are left undisturbed.

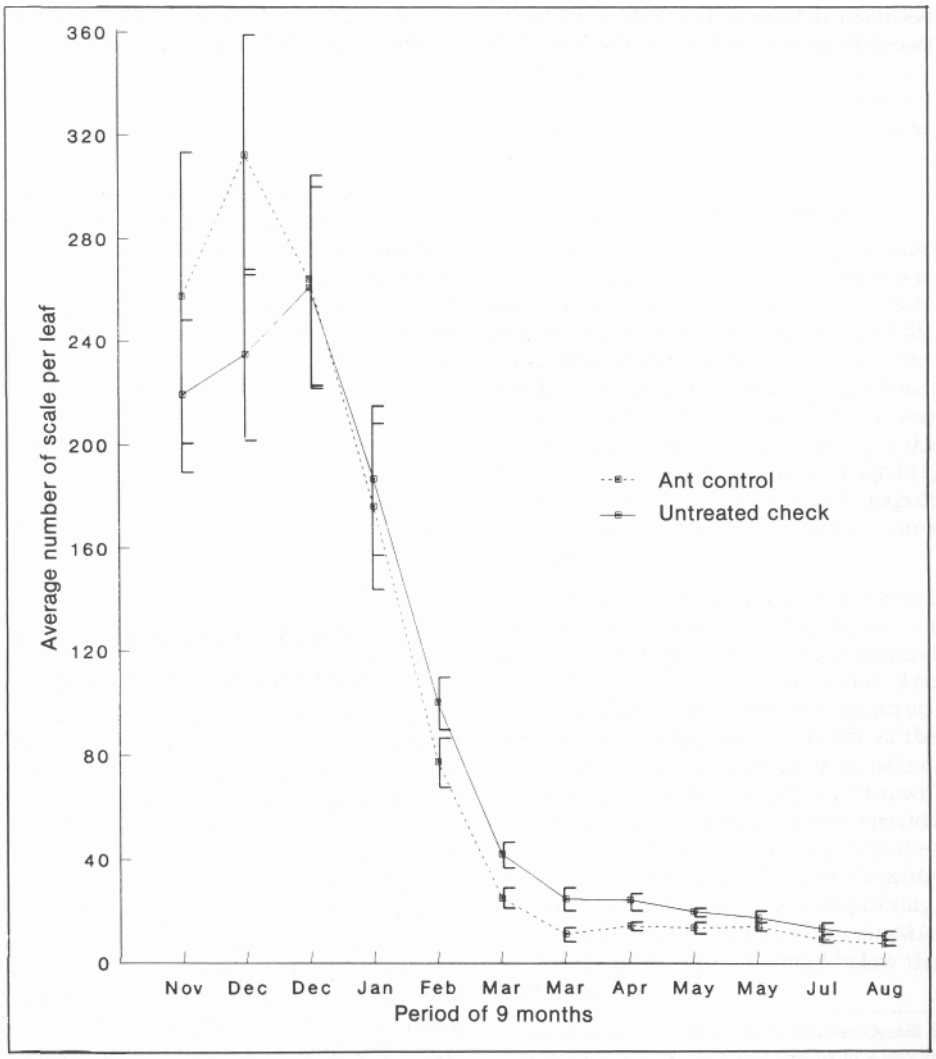

Fig 1 The effect of ants on the heart-shaped scale on avocados.

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