

Dustywings on Citrus

these natural enemies of mites and scales may be helped by miticides but are killed by insecticides

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Dustywings—natural enemies of citrus mites and scales—need their prey as well as honeydew-secreting insects to survive.

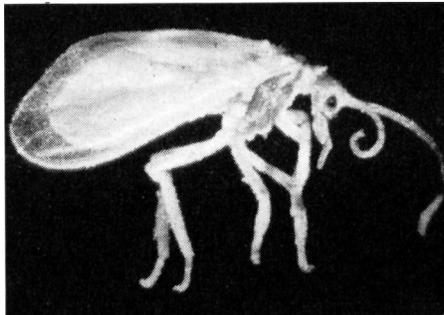
In the insectary adult dustywings live for weeks on a diet of certain sugars alone. These sugars may be in the form of honey, plant nectar or honeydew, the latter being secreted by such insects as scales, mealybugs, or aphids. Dustywings restricted to such a diet, however, rarely produce eggs. But when mites or scales are added to this honey diet, egg production soon begins. Adult dustywings fed honey and mites, or honey and scale insects, live and produce eggs for a period of several months in the insectary. When fed on mites or scale alone, with no honey available, the adults will die within a few days.

The dustywing is a delicate, whitish, humpbacked insect, little more than $\frac{1}{8}$ " long. It has a dusty appearance, its wings and body being covered with a powdery, wax secretion. Dustywings belong to the Coniopterygidae, a family related to the brown and green lacewings. They may be found on citrus trees throughout the year wherever citrus is grown in California. All their life stages inhabit the citrus trees. About dusk the adults may be seen actively flying about in the groves.

Active in California

At least four different genera—*Parasemidalis*, *Conwentzia*, *Coniopteryx*, and *Malacomysa*—are active predators in California citrus groves. Individuals of the different genera are fairly similar in their general reactions and their food habits.

Larval and adult stages of dustywings are predaceous. The larvae, with piercing mouth parts, suck the body juices from



The dustywing, *Parasemidalis flaviceps*, adult. Actual size 3.7 millimeters.

their prey. The adults consume whole individuals of the prey, legs and all. Adults are probably more effective as predators since an adult consumes more prey daily than a larva and the greater portion of the life span of an individual is spent in the adult stage.

Prey on Scale Insects

Dustywings on citrus have been generally thought of only as mite predators; however, in the insectary the adults prey more readily on the crawlers and young stages of armored and unarmored scale insects than on mites. Attempts to raise dustywing larvae to maturity on a diet of citrus red mites alone have proved unsuccessful. Larvae fed a pure diet of young stages of scale insects readily develop to maturity. Dustywing larvae also develop readily on a diet consisting only of citrus rust mites.

In the insectary dustywings were reared by using red scale crawlers produced on potato tubers. The diet of the adults was supplemented with honey.

Field Experiments

To maintain a population of dustywings in the field, some source of nectar or honeydew as well as mites or scales must be available. For this reason dustywings are apt to do poorly in groves treated with materials which destroy the honeydew-secreting insects. On the other hand, dustywings may be active in groves

which are free of mites if honeydew-secreting insects are present. Thus, it is possible to treat citrus trees with mite toxicants which do not kill insects and still allow a dustywing population to exist in the grove.

Field experiments in co-operation with the Division of Entomology have shown that when noninsecticidal sprays and dust materials, such as Ovotran and Aramite, are used for mite control, existing dustywing populations are sustained by low populations of the various species of insects remaining alive in the grove. The predaceous activity of the dustywings thus maintained serves to prolong the period of effective mite control brought about by the toxicant.

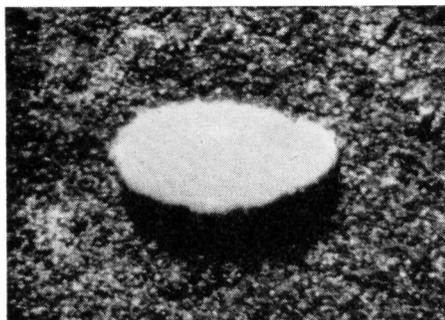
Best Control

The very best examples of biological control of the citrus red mite have been found in groves which receive no insecticidal or acaricidal treatment whatsoever. These groves have low populations of both citrus mites and scale insects—well below the threshold of economic importance—and relatively high populations of dustywings.

Adults of the dustywings are, in general, very sensitive to insecticides. For example, DDT field residues over eight months old killed 100% of adult dustywings exposed to them for a period of 12 hours. This is doubtless one of the factors contributing to the increase of citrus mite populations following the use of DDT.

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The above progress report is based on Research Project No. 1495.



Left, *Parasemidalis flaviceps* egg, actual size .7 millimeter. Right, *Parasemidalis flaviceps* Bank larva, actual size 3.5 millimeters.

Photographs by Metta McD. Johnson

