

BIOLOGICAL CONTROL OF GREENHOUSE THRIPS AND AVOCADO MITES

J. A. McMurtry
Department of Entomology,
University of California,
Riverside

Greenhouse Thrips

Research on the imported parasitic wasp, Thripobius semiluteus, as a biological control agent of greenhouse thrips included (1) surveys to detect establishment and spread of the parasite; (2) attempts to evaluate the impact of the parasite on thrips populations; and (3) laboratory studies on the biology of the parasite.

(1) Surveys: Thrips parasitized by T. semiluteus have been recovered in most release plots except those which subsequently have had very low numbers of thrips, precluding adequate sampling. Parasitization was evident two, and in one case, 3 seasons after the parasite releases. These surveys indicate that this natural enemy is established in southern California and that it has survived both cold and hot weather extremes of the region. Extensive surveys in one orchard indicate spread of the parasite throughout the orchard and into an adjacent one by the third season. In another instance, up to 60% parasitization was noted throughout an orchard within 2 years, resulting from an initial release of fewer than 10,000 parasites.

(2) Two orchards (UC South Coast Field Station, Irvine and Lindsay, Rice Canyon, and San Diego Co.) were sampled at 2-3 week intervals in an attempt to determine the ability of T. semiluteus to suppress greenhouse thrips populations. The former orchard consisted of experimental cultivars, on which greenhouse thrips reached high numbers on leaves; therefore leaves were sampled. The latter orchard was the Hass variety, on which thrips occur mainly on the fruit; therefore only fruit were sampled. The South Coast Field Station study showed a marked reduction of thrips populations coincident with an increase to ca. 60% in estimated parasitization. In comparison, the control area (few or no parasites present) had continually high thrips populations. Thrips numbers also declined in the Lindsay orchard as estimated % parasitization increased to 50-60%, although no control was available because parasites invaded the area intended for the control. Our results to date indicate that T. semiluteus can suppress greenhouse thrips populations, although this natural enemy probably will not always maintain thrips numbers below the level at which some fruit scarring occurs.

(3) The mean generation time of T. semiluteus was 23.6 days at 23 °C compared to 35.6 days for the greenhouse thrips. Thrips larvae from newly hatched first instar to early second instar were satisfactory for development of the parasite. The adult wasp deposits an egg inside the thrips and the developing larvae eventually fills the body

cavity of the thrips which develops to a full-grown larva before being killed. T. semiluteus larvae did not develop in late second stage thrips larvae or later stages. These biological studies will aid in interpreting field data and give insight into the potential of T. semiluteus to suppress thrips populations.

Avocado Mites

Typhlodromus rickeri, a predaceous phytoseiid mite introduced from Asia, was found to be established on avocado in San Luis Obispo County as well as parts of Santa Barbara County. Its major role appears to be as a predator of six-spotted mite. Surveys are needed to determine the extent of its distribution in California. Morphological analysis and hybridization tests on a phytoseiid mite from avocado in San Luis Obispo County indicate that it is a new species of Euseius.