

Section VI
Biological and Cultural Controls

BIOLOGICAL CONTROL OF GREENHOUSE THRIPS

W. B. Strong

23551 - 50 Ave, RR #7, Langley, BC, Canada V3A 4R1

Historically, control of thrips in cucumber greenhouses has been effected with floor sprays of diazinon or malathion. This application kills thrips pseudopupae resting cryptically in the soil or sawdust, without upsetting biological control programs against whiteflies or 2-spotted spider mites. Recently, a pesticide-resistant strain of the Western Flower Thrips (WFT) *Frankliniella occidentalis* (Thysanoptera: Thripidae) appeared, causing economic leaf and fruit damage. Control with phytotoxic sprays was necessary, often resulting in flare-up of whitefly or spider mite populations.

A biological control program against WFT which was compatible with other biocontrol programs was designed and laboratory tested, using the phytoseiid mite *Amblysus cucumeris*. A trial commercial implementation of this program is reported here.

Materials and Methods

Three commercial cucumber greenhouses with histories of WFT infestations participated. In each, *A. cucumeris* were released on or before transplanting from the seedbed to the greenhouse. Releases of ca. 100 predators/plant continued on bi-weekly intervals from February through early September, when crops were pulled. Adult WFT were monitored with yellow sticky traps; WFT nymphs and *A. cucumeris* were monitored by picking leaves, washing them with a jet of water, and sieving the water through a 100-mesh screen to catch the insects.

Results and Discussion

Population trends are shown in Fig. 1. Control of WFT was successful on farms A and C, but not on B. The major reason for success was lack of pesticide use. *A. cucumeris* has a high acute susceptibility to most insecticides, and is probably adversely affected by sub-acute doses of most other pesticides. Farms A and C used no pesticides until late August, at which time biocontrol broke down. Farm A introduced the predator before a WFT population was established, preventing any buildup of WFT. Farm C had a high WFT population before predator release, resulting in the oscillations observed.

Farm B used pesticides starting in mid-June, resulting in a collapse of biocontrol and immediate rise of WFT numbers. Fungicide and insecticide use continued through summer, preventing re-establishment of biocontrol.

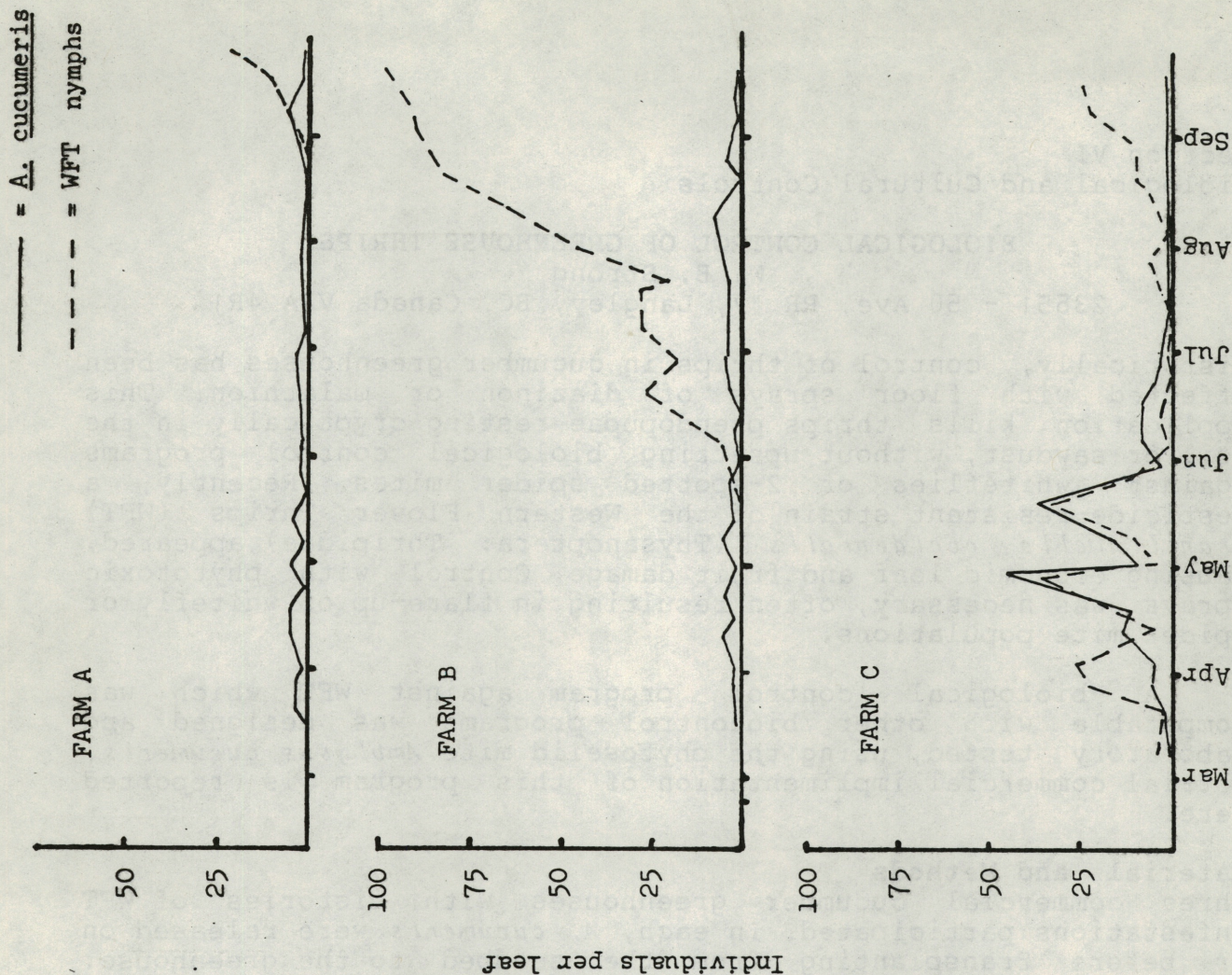


Fig. 1: populations of *A. cucumeris* and WFT nymphs on three cucumber farms in 1986.

A. cucumeris is a successful biocontrol agent for several reasons. The predator prefers thrips, but can survive on other prey, and accumulates in spider mite colonies during low WFT populations. Regression analyses indicate a strong numerical response to WFT; previous laboratory studies also indicate a functional response. Predator dispersal is rapid, and it survives ca. 1-2 weeks in the absence of the host. The only disadvantage is its extreme susceptibility to pesticides.

PREDATOR
 SUSCEPTIBLE
 TO PESTICIDE

50¢/1000
 100/PLANT