

Pome Fruits—Chemical Control

Effect of One-Tenth Field Rates of Asana Applied at Various Times During the Season on
Typhlodromus occidentalis

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In the past, the use of pyrethroids on apple has been discouraged in Washington because of their extreme toxicity to the primary mite predator, *Typhlodromus occidentalis*. Not only was initial mortality high, the suppressive effect extended through the season of application and sometimes into the following season. This caused a resurgence of various phytophagous mite species, including the European red mite, twospotted spider mite and the McDaniel spider mite. However, past tests were performed at either full or half rates, whereas efficacy against target pests can be achieved in some cases at lower rates. Increasing problems with resistance development in two of the major lepidopteran species attacking apple (codling moth and pandemis leafroller) have led to the re-exploration of pyrethroids as a possible means of insect control. This, plus its efficacy on leafminers, may provide some flexibility for the early season program.

This experiment was conducted in a mature 'Delicious' orchard. The trees were ca. 2 to 2.5 m in height and were irrigated with undertree impact sprinklers. The experimental design was a randomized complete block, with blocks assigned on the basis of pre-treatment populations of *T. occidentalis*. There were four single-tree replicates per treatment. Each set of 16 trees used for each timing was separated from another set by at least one buffer row. Each tree used within the row was separated by at least one buffer tree from another treated tree, with the exception of the half-inch green treatments. Treatments were applied with a handgun operated at ca. 250 psi. The spray solution was applied to the point of drip. The half-inch green treatments were applied on 24 March; the pink treatments were applied on 4 April; the first cover treatments were applied on 13 May; and the mid-June treatments were applied on 16 June. Mite samples were taken within 24 hours before the treatments were applied and at ca. weekly or bi-weekly intervals thereafter. Twenty leaves were selected randomly from throughout the canopy (10 buds/tree before leaves expanded), up to the point which could be reached from the ground.

There were essentially no tetranychid mites on the experimental trees, either before or after treatment. The only phytophagous mite species present was the alternate prey of *T. occidentalis*, apple rust mite (*Aculus schlechtendali*). Apple rust mites were present at low to moderate levels throughout the test and provided sustenance for substantial numbers of *T. occidentalis* during the test. Asana applied at half-inch green resulted in *T. occidentalis* populations that were significantly lower than the check from the time of treatment until 22 June. However, recovery of the *T. occidentalis* population was substantial by mid-June (>1/leaf), even though the peak population was lower than the check. Asana applied at pink resulted in *T. occidentalis* populations that were suppressed (in comparison to the check) until late August,

although they exceeded 0.20 *T. occidentalis*/leaf from 22 June to 3 August. In the first cover timing, the total post-treatment period of suppression by Asana extended through 10 August. *T. occidentalis* populations were ≤ 0.4 /leaf during the entire season. However, the peak population in the check was lower than in the first two sets of treatments (ca. 2/leaf). Pretreatment populations of *T. occidentalis* in the mid-June timing were high in all plots and declined after treatment, even in the untreated check, although they declined to a greater degree in the Asana and Lorsban plots. *T. occidentalis* populations in the Asana treatment never reached 0.1/leaf after treatment; however, the means for the Asana treatment were not significantly different than those for the standard material, Lorsban.

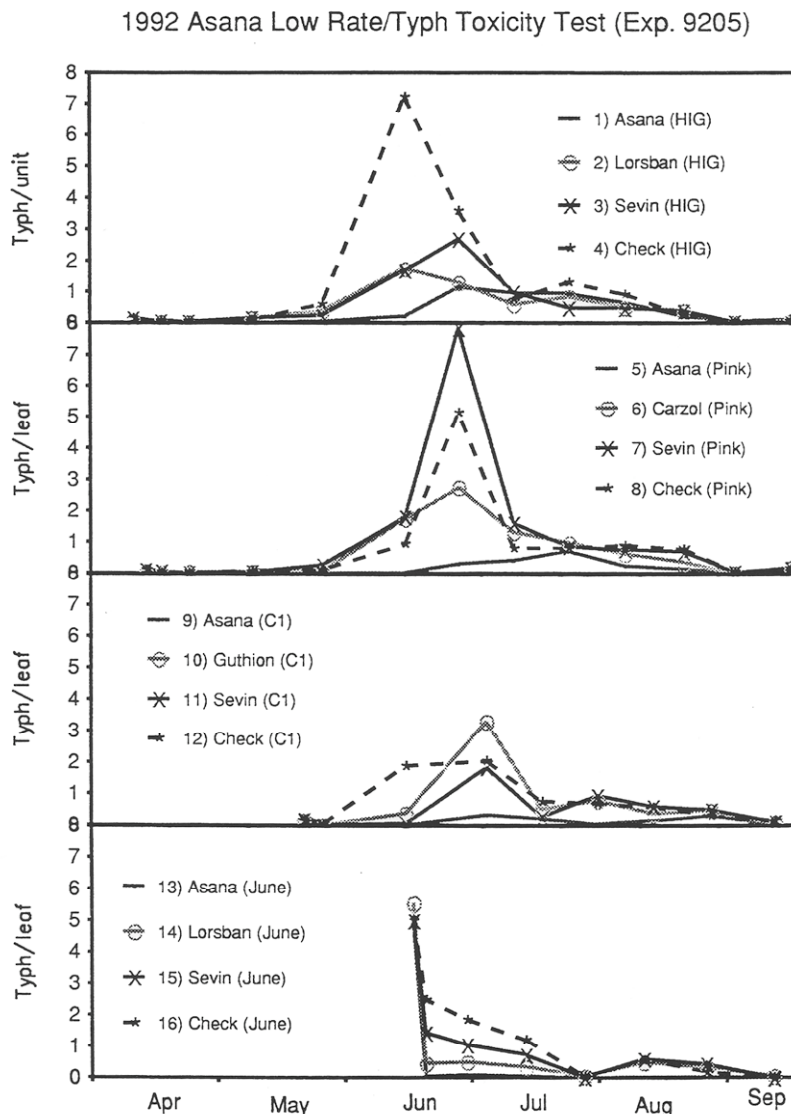


Fig. 1. Populations *T. occidentalis* after treatment with one-tenth rate of Asana, 1992.