

II. Pome Fruits

d. Chemical control

1. Twospotted spider mite (*Tetranychus urticae*) and apple.

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Investigation of the Effect of Leaf age on the Efficacy of Adjuvants Applied with Agri-Mek as Determined by Twospotted Spider Mite Mortality.

Site and method description.

The study was performed in a mature 'Delicious' orchard at the Tree Fruit Research & Extension Center in Wenatchee, Washington. The four treatments (Agri-Mek 0.15EC 11 g ai/acre; Agri-Mek 0.15EC 11 g ai/acre plus 0.25% Volck Supreme Oil; Agri-Mek 0.15EC 11 g ai/acre plus 0.25% Sylgard; and an untreated check) were applied to four large trees on 16 June, and then to a different set of trees on 28 July. Treatments were applied with a handgun sprayer at 350 psi to the point of drip.

The residues were bioassayed weekly or biweekly starting 1 week after treatment through 17 Sept. One leaf from the middle portion of 10 shoots was collected from each treatment on each bioassay date. A 2-cm leaf disk was cut from each leaf and floated with the bottom surface uppermost in a jelly cup with distilled water and cotton. Ten adult female TSM were transferred to each leaf disk and evaluated for mortality after 72 h at 24°C. Dead and moribund mites were classed as dead, and mites that were not found on the leaf disk were not included in the analyses. Replicates with less than five mites found on the disk at time of evaluation were also excluded from the analyses. Treatment mortality data were corrected for check mortality with Abbott's formula.

Effects of timing of application.

The residual activity on leaves sprayed with Agri-Mek without any adjuvant stayed high (above 85%) until 5 weeks post-treatment for the early application. For the later application the initial TSM mortality for Agri-Mek without any adjuvant was low (60%) and decreased rapidly in the succeeding weeks.

There did not appear to be any significant difference in the residual activity of Agri-Mek when oil or a silicone surfactant was used as an adjuvant. Mortality remained high (over 80%) for 93 days when applied at the early timing, but dropped below this level after 35 days at the later timing.

Our 1992 bioassay comparing Volck Supreme Oil and Sylgard as adjuvants for Agri-Mek showed a slightly better residual effect late in the season when Sylgard was used as the adjuvant. The 1992 growing season was characterized by hot, dry weather conditions, where as in 1993 the weather conditions were cooler and more humid. The latter conditions may aid in absorption of Agri-Mek into the foliage. This may be a possible reason for the lack of difference in efficacy between the two adjuvant, however, both appear to provide the necessary increase in residual control. As shown in other tests, earlier applications will provide longer residual activity than later ones, and this factor outweighs the choice of adjuvant.

