

II. Pome Fruits

d. Chemical control

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

Astrid H. Andersen and Elizabeth H. Beers
 Tree Fruit Research and Extension Center
 Washington State University
 1100 N. Western Ave.
 Wenatchee, WA 98801

The Translaminar Activity of Agri-Mek in Apple Foliage as Determined by Twospotted Spider Mite Mortality.

Site and method description.

This study was conducted in a mature 'Delicious' orchard at the Tree Fruit Research and Extension Center in Wenatchee, Washington. The experimental design was a $2 \times 2 \times 2$ factorial, with 2 leaf surfaces sprayed, 2 leaf surfaces assayed, at 2 different leaf ages. An unsprayed check was used to correct for natural mortality using Abbott's formula. One leaf from the basal part of several shoots were tagged on 12 trees. Some of the tagged leaves were sprayed on the upper leaf surface, some were sprayed on the bottom leaf surface and some were left as checks. The pesticide treatment were Agri-Mek 0.15EC 11 g ai/acre plus 0.25% Volck Supreme Oil applied with an atomizer to the point of drip 2 July and 13 August.

The residues were bioassayed weekly or biweekly 4 - 6 weeks post-treatment starting 1 week after treatment. Ten tagged leaves were collected from each treatment on each bioassay date. A 2-cm leaf disk was cut from each leaf and floated in a jelly cup with distilled water and cotton with the appropriate leaf surface uppermost. 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.

Translaminar activity of Agri-Mek.

The residual activity pattern for the application timings were analyzed separately. For both application timings there is a prominent significant effect of leaf surface sprayed and leaf surface bioassayed. Only where TSM was exposed to Agri-Mek sprayed on the bottom leaf surface was there any significant residual activity. This study indicates that Agri-Mek is mainly absorbed through the bottom side of apple leaves and that residues of Agri-Mek on apple leaves are primarily effective to mites and insects feeding on the bottom leaf surface.

The reasons for what is apparently better absorption through the lower surface is not yet clear. Some factors that may influence rate or total amount of absorption include: 1) greater pubescence on the lower leaf surface, which increases the effective amount of surface area to which the material may adhere; 2) slower evaporation and/or photodegradation of the material due to sheltering from sun and wind; and 3) greater amount of stomates through which there may be preferential penetration of material.

