

Pome Fruits—Chemical Control

Efficacy of Agri-Mek Against European Red Mite and Twospotted Spider Mite on Apple in Relation to the Translaminar Activity of Agri-Mek in Apple Foliage

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Keywords: European red mite, twospotted spider mite, Agri-Mek, Volck Supreme oil, apple

Site and Method Description

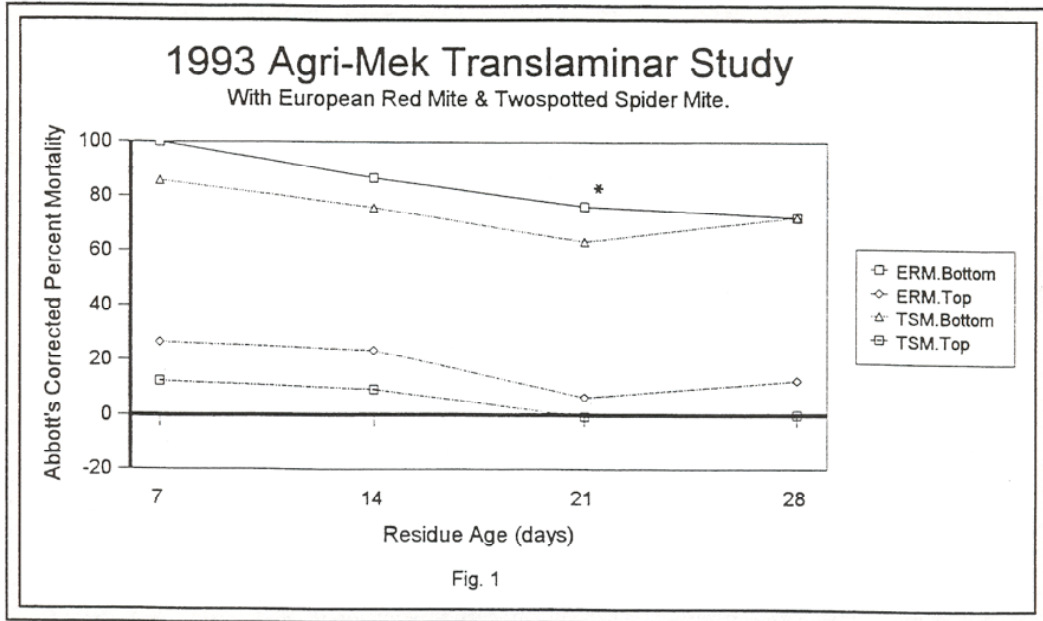
This study was conducted in a mature 'Delicious' orchard at the Tree Fruit Research and Extension Center in Wenatchee, Washington. The experimental design was a 2 x 2 factorial, with 2 mite species (ERM or TSM) and 2 leaf surfaces assayed (upper and lower). An unsprayed check was used to correct for natural mortality using Abbott's formula. The pesticide treatment was Agri-Mek 0.15EC 11 g ai/acre plus 0.25% Volck Supreme Oil, applied 23 July with a handgun sprayer at 300 psi to the point of drip.

The residues were bioassayed weekly for 4 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 mites (TSM from greenhouse colony on bean, ERM from local 'Delicious' orchard) 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.

Mite Susceptibility and Agri-Mek Translaminar Activity

Both mite species were primarily susceptible to Agri-Mek residues exposed from the bottom side of the leaves. There were no significant differences between the two mite species in susceptibility when exposed to Agri-Mek from either side of the leaves.

This study shows that Agri-Mek is mainly absorbed through the bottom side of apple leaves. Residues of Agri-Mek on apple leaves were only effective to mites feeding on the bottom leaf surface. TSM tend to colonize on the bottom surfaces of leaves, while ERM are thought to colonize both sides of the leaves. This study indicates that Agri-Mek's lack of performance against ERM in field trials may possibly be explained by behavior rather than physiology.



* Corrected mortality calculated from total number of individuals as opposed to within replicates, due to low numbers of mites in most replicates.

