II. Pome Fruits

d. Chemical control

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

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The Effect of Leaf Age on the Length of Residual Activity of Agri-Mek in Pear Foliage as determined by Twospotted Spider Mite Mortality.

Site and method description.

This study was conducted in a mature 'd'Anjou' orchard at the Tree Fruit Research and Extension Center in Wenatchee, Washington. A cohort of leaves (the leaf closest to mid-shoot on current season's growth) was tagged on 16 May. The experimental design was randomized complete block with three treatments (leaf age at time of application) and 10 replications. Leaf ages were 2, 6 and 12 weeks old, applied on 17 May, 16 June and 26 July respectively. Treatments were applied with a handgun sprayer at 350 psi to the point of drip, and untreated trees were left as checks. To avoid pear psylla damage the plot was treated with fenoxycarb pre-bloom and detergent several times during the experimental period. The pear psylla sprays were never applied closer than 3 days before a bioassay was initiated.

The Agri-Mek residues were bioassayed weekly or biweekly starting 1 week post-treatment continuing through 13 Sept. 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, and with the bottom surface facing up. 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.

Leaf age-dependent residual activity.

This experiment on pear is a follow-up to our 1992 bioassay study of the effect of leaf age on the length of residual activity of Agri-Mek in apple foliage. In both apple and pear there is clearly stronger residual effect of Agri-Mek the earlier in the season it is applied. Although these studies were performed in different growing seasons under different weather conditions, the period of residual control appear to be much longer in pear than in apple foliage, especially when applications were made to older leaves.

Residual activity is most easily explained by initial absorption into the leaf. This study indicates that changes in leaf surface characteristics as the leaf ages and are exposed to environmental factors are the reason for the decrease in rate of initial absorption of Agri-Mek as the foliage ages. The results of the study emphasizes the importance of using Agri-Mek early in the season for obtaining the best results in field performance.

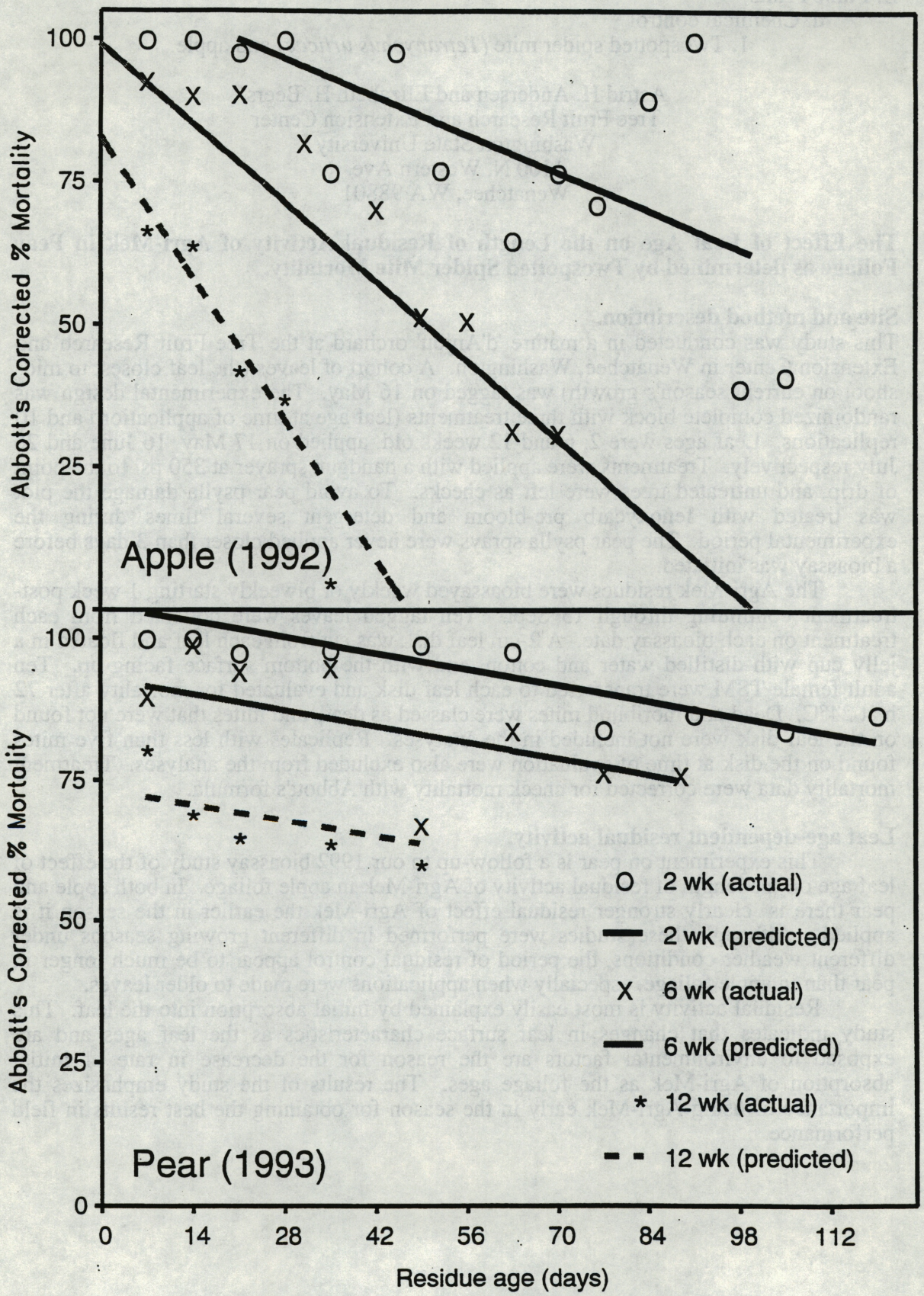

Figure 1. Effect of leaf age (2, 6, and 12 weeks) at time of Agri-Mek application on residual control of twospotted spider mite as determined by leaf-disk bioassay.