

II. Pome Fruits

e. Pesticide resistance

Twospotted Spider Mite (TSM); Pear

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RESISTANCE DEVELOPMENT AND ACARICIDE USE PATTERN. Five use patterns utilizing the acaricides Vendex (fenbutatin oxide) and Savey (hexythiazox), have been compared for the past four years in a Bartlett pear orchard for control of TSM. Acaricide applications were made with a handgun sprayer to plots 0.13 ac. in size (3 trees x 3 trees) with three replicates for each treatment. Using two acaricide applications per year the five treatments are:

- 1) exclusive use of Vendex (0.75 lbs. a.i./ac.)
- 2) exclusive use of Savey (0.125 lbs. a.i./ac.)
- 3) between year rotation--Savey in 1987,89 and Vendex in 1988,90 (rates as above)
- 4) within year rotation--Savey applied early season and Vendex applied late season (rates as above)
- 5) combination--Savey at 1/2 rate plus Vendex at 1/2 rate.

Both field performance and resistance level have been measured for all five use patterns. Field results (Fig. 1) show that after 4 years only the exclusive Vendex treatment has failed to control TSM adequately. Looking at the Vendex LC_{50} 's it is apparent that exclusive use of Vendex has resulted in the development of a resistant TSM population (Fig. 2). The orchard where the study is being conducted previously had an organotin (i.e. Vendex and Plictran) resistant TSM population, but when organotin pressure was relieved for 2 years the population reverted to susceptible. However, bioassay results indicate that after only four repeated Vendex applications, the TSM population was once again fully resistant. Exclusive use of Savey has resulted in increased levels of Savey resistance, but the highest level of resistance to Savey is seen in the exclusive Vendex treatment, which has not received any applications of Savey (Fig. 3). This may indicate a one way or unidirectional cross resistance between Vendex and Savey.

Both rotational patterns, and the combination treatment have apparently slowed the development of resistance to either compound as compared to exclusive use of a single acaricide. Analogous results could be expected for Apollo (clofentezine) which is similar in activity to Savey. These findings indicate that use patterns exist which may delay resistance development, prolonging the effective life of some of the acaricides currently registered for use on pears.

Fig. 1 Resistance Management Plot Leaf Counts for 1989 and 1990
Treated 10-11 May and 25-26 July

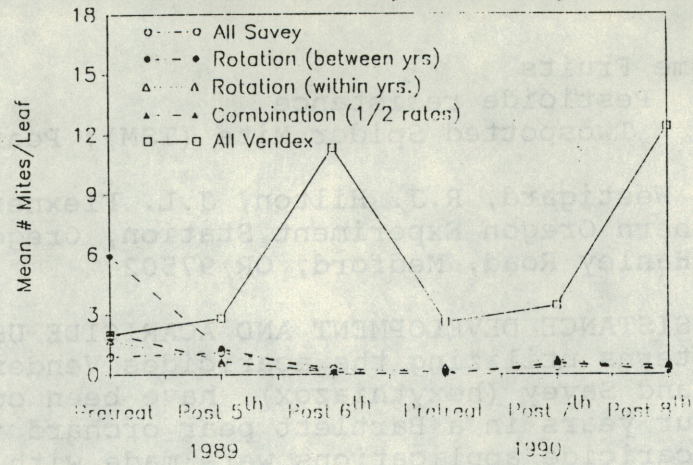


Fig. 2 Vendex Bioassays of the Resistance Management Plots
2 Applications/year (num. above bars= Tot. Ven. App.)

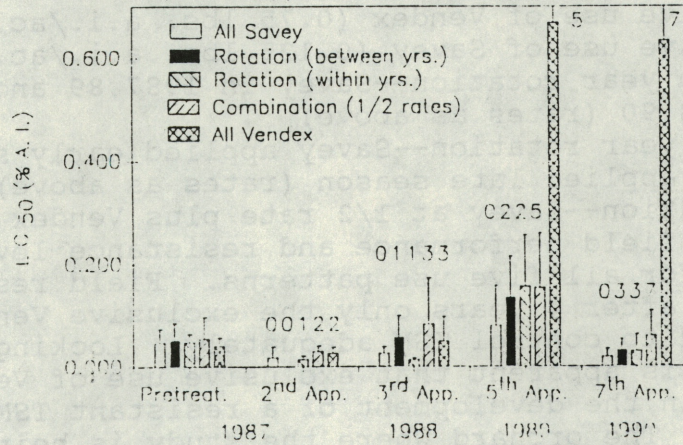


Fig. 3 Savey Bioassays of the Resistance Management Plots
2 Applications/year (num. above bars= Tot. Sav. App.)

