

II. Pome Fruits

d. Chemical control

European red mite (ERM); Panonychus ulmi Koch

Western predatory mite (WPM); Typhlodromus occidentalis (Nesbitt)

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FIELD AND LABORATORY EVALUATION OF THE MITTICIDAL PYRETHROIDS FENPROPATHRIN AND BIFENTHRIN FOR CONTROL OF EUROPEAN RED MITE AND THEIR IMPACT ON THE WESTERN PREDATORY MITE. During 3 years of field-testing bifenthrin at rates from 6.8 to 11.3 g AI/100 gal caused consistently resurgence in ERM whereas fenpropathrin at 68 g AI/100 gal did not. To determine whether the observed resurgence was due to differences in the biological activity between the two compounds or merely rate-related, tests were conducted in 1989 on small 'Red Delicious' apple trees to compare the effect of single sprays of bifenthrin and fenpropathrin at the same rates AI against ERM (low: 8.5, high: 45.4 g AI/100 gal). The suggested commercial rates for ERM control on apple with bifenthrin range from 27.2 to 36.3 g AI/ acre and from 136 to 181 g AI/acre with fenpropathrin. Both compounds caused ERM resurgence in the 1989 test. Resurgence was inversely related to the rate applied and occurred sooner at the low rate (8.5 g AI/100 gal). The magnitude and pattern of ERM resurgence caused by the two pyrethroids was similar. By comparison, a seasonal program of 4 cover sprays of fenpropathrin applied by handgun at 45.4 g AI/100 gal maintained ERM control with no observable resurgence. In all field tests foliar sprays of bifenthrin as well as fenpropathrin eliminated all phytoseiid mites for the rest of the season.

In the laboratory bifenthrin as well as fenpropathrin were highly repellent to ERM. Most of the mortality in leaf disk assays was due to runoff. Only a small proportion of test subjects died from direct toxicity. For the calculation of LC_{50} values (see table below) mortality from runoff and direct toxicity were combined.

LC_{50} (ppm)

	ERM*	WPM**
Bifenthrin	12	0.13
Fenpropathrin	22	0.28
Fenvalerate	415	0.16

* on peach leaf disks, **on bean leaf disks

Bifenthrin was twice as toxic to ERM as fenpropathrin. By comparison, both compounds were about 100 times more toxic to WPM than to ERM. Although fenvalerate has low toxicity to ERM, it was as toxic to WPM as the two pyrethroid miticides. The high susceptibility of phytoseiids to pyrethroids explains why foliar sprays of these compounds eliminate phytoseiid mites.