

THE SPECIFICITY OF BINAPACRYL, A DINITRO MITICIDE, AGAINST THE EUROPEAN RED AND McDANIEL SPIDER MITES¹

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The miticide, 2 - sec - butyl - 4,6 - dinitrophenyl 3-methyl-2-butenate, generically known as binapacryl, has been under investigation at the Summerland Research Station since 1959. Laboratory and field experiments in 1959 and 1960, when the preparation was known by the trade name Acricid, have been reported by Downing (1). Field experiments during 1961 and 1962 are described in this paper.

Methods

Sprays were applied to dripping with a high-volume handgun sprayer or at 50 gallons per acre with a low-volume "concentrate" sprayer. The handgun sprayer was used to spray dwarf apple trees where the plot size was 10 to 12 trees. The concentrate sprayer was used against standard size apple trees of which there were 12 to 18 trees per plot.

As a rule, mite populations were estimated by taking a 20-leaf sample from one quadrant of each of 5 trees

per plot. The leaves were processed by the method of Henderson and McBurnie (2) as modified by Morgan *et al.* (3).

In 1959 and 1960 the miticide was obtained from Farbwerke Hoechst, Frankfurt, Germany. In 1961 the Hoechst product, Acricid, was supplemented by a formulation from the United States, Niagara 9044, a 50 per cent wettable powder obtained from Niagara Chemical Division, Food Machinery Corporation, Middleport, New York. In 1962 Niagara 9044, given the brand name, Morocide, was formulated as 25 per cent or 50 per cent wettable powder.

Results and Discussion

In 1961 binapacryl (Niagara 9044) was applied at low volume to control the European red mite, *Panonychus ulmi* (Koch), and the McDaniel spider mite, *Tetranychus mcdanieli* McG. on mature Delicious, Winesap, Newtown, Jonathan and Stayman apple trees. The preparation gave excellent control of the McDaniel spider mite (Table 1) but was ineffective against the European red mite. The spray caused no foliage or fruit injury.

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TABLE 1—Average Numbers of the European Red Mite and McDaniel Spider Mite per Leaf Before and After Spraying Apple Trees by Low-Volume Sprayer on June 27, 1961.

Miticide	Amount per acre	Before spraying	Days after spraying	
			9	15
European Red Mite				
Binapacryl ¹ (50% w.p.)	4 lb.	18	27	25
Check — no treatment		12	36	35
McDaniel Spider Mite				
Binapacryl ¹ (50% w.p.)	4 lb.	7	1	1
Check — no treatment		4	3	2

¹ As Niagara 9044

Table 2 summarizes results from high volume application of binapacryl against mites infesting dwarf apple trees. Mite counts were from samples of 10 leaves from each of 5 trees per plot and 2 plots per treatment. As in the previous experiment binapacryl gave poor control of the European red mite but excellent control of the McDaniel spider mite.

TABLE 2—Average Numbers of the European Red Mite and McDaniel Spider Mite per Leaf Before and After Spraying Apple Trees by High-Volume Sprayer on August 7, 1961.

Miticide	Amount per acre	Before spraying	Days after spraying		
			7	14	25
European Red Mite					
Binapacryl ¹ (25% w.p.)	1.5 lb.	12	16	18	37
Check — no treatment		0.3	2	1	2
McDaniel Spider Mite					
Binapacryl ¹ (25% w.p.)	1.5 lb.	10	0	0	1
Check — no treatment		0.4	3	11	26
¹ As Acricid					

Later in the summer of 1961 binapacryl was compared with Tedion against the McDaniel spider mite. Applied at low volume, binapacryl 25 per cent wettable power at 8 or 12 pounds per acre gave excellent initial and residual control. Tedion, on the other hand, gave characteristically poor initial control but excellent res-

idual control. A year later, however, leaf samples from these plots, that had not been sprayed in the meantime, gave surprising results. As shown in Table 3 there was an outstanding increase in numbers of the European red mite where binapacryl had been applied. There was no such effect from the use of Tedion.

TABLE 3—Average Numbers of the McDaniel Spider Mite and European Red Mite per Leaf After Spraying Apple Trees by Low-Volume Sprayer on June 13, 1961.

Miticide	Amount per acre	McDaniel Spider Mite Before spraying	Days after spraying			European Red Mite 1 year after spraying
			8	18	27	
Binapacryl ¹ (25% w.p.)	8 lb.	70	0	0	0	66
Binapacryl ¹ (25% w.p.)	12 lb.	73	0	0	0	13
Tedion (25% w.p.)	4 lb.	82	11	1	0	6
Check — no treatment		85	69	47 ²	8	0.2
¹ As Acricid						
² Sprayed with Tedion (25% w.p.) 4 lb. per acre						

Application of binapacryl was repeated in this orchard in 1962 in the same way as in 1961 except that the formulation of binapacryl was 25 per cent wettable powder instead of 50 per cent wettable powder. The dosage of active ingredient, however, was

unchanged. Table 4 shows that binapacryl, 3 pounds of active ingredient per acre, in 2 applications gave good control of the European red mite, but a 2-pound dosage was inadequate. But even the lower dosage kept the McDaniel spider mite at an exceedingly low level for the season.

