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-butenoate, 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 Mc-Burnie (2) as modified by Morgan et al. (3).

In 1959 and 1960 the miticide was obtained from Farbewerke 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.

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.

2-2-1		Amount	Before	Days after spraying		
	Miticide	per acre	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 (50% w.p.)	4 lb.	7	1	1	
	Check — no treatment		4	3	2	
	As Niagara 9044					

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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 a	after sp 14	raying 25	
European Red Mite Binapacryl: (25% w.p.) Check — no treatment	1.5 lb.	$\begin{array}{c} 12 \\ 0.3 \end{array}$	16 2	18 1	37 2	
McDaniel Spider Mite Binapacryl ¹ (25% w.p.) Check — no treatment ¹ As Acricid	1.5 lb.	10 0.4	0 3	0 11	1 26	

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 residual 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.

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

²Sprayed 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.

TABLE 4—Average Numbers of the European Red Mite and McDaniel Spider Mite per Leaf After Spraying Apple Trees by Low-Volume Sprayer on July 26, 1962.

	Miticide	Amount	Before spraying	Days	after	spi	spraying	
		per acre		8	14	23	34	
	European Red Mite							
	Binapacryl ¹ (50% w.p.)	4 lb.	66	31	302	5	6	
	Binapacryl (50% w.p.)	6 lb.	13	2	22	0	0	
	Check — no treatment		2	9	14	25	21	
	McDaniel Spider Mite							
	Binapacryl: (50% w.p.)	4 lb.	1	0	02	0	0	
	Binapacryl ¹ (50% w.p.)	6 lb.	1	0	02	0	0	
	Check no treatment		2	10	16	20	62	
	As Morocide							
	² Resprayed Aug. 13							

Summary

Binapacryl is the generic name for the miticide that has been previously known by the trade designations: Acricid, Niagara 9044, and Morocide. During 1961 it gave excellent control of the McDaniel spider mite at a dosage of 2 pounds of active ingredient per acre in low-volume spraying and at 0.75 pound of active ingredient per 100 gallons in high volume spraying. Binapacryl was ineffective against the European red mite in 2

of the 3 orchards in which it was applied. In the third orchard the European red mite was not numerous in 1961; but in 1962 a surprisingly heavy European red mite infestation occurred in trees that had been sprayed with binapacryl the previous year. This infestation was not adequately controlled by 2 successive applications of binapacryl at 2 pounds of active ingredient per acre. Two applications at 3 pounds per acre did, however, prove effective.

References

- Downing, R. S. 1961. Experiments in British Columbia with Acricid, a new dinitro miticide. Proc. Entomol. Soc. Brit. Columbia 58: 22-25.
- 2. Henderson, C. F., and H. Y. McBurnie. 1943. Sampling technique for determining populations of citrus red mite and its predators. U.S. Dep. Agr. Circ. 671.
- 3. Morgan, C. V. G., D. A. Chant, N. H. Anderson, and G. L. Ayre. 1955. Methods for estimating orchard mite populations, especially with the mite brushing machine. Can. Entomologist 87: 189-200.

A Live Giant African Snail Intercepted in Vancouver, 1963

On January 16, 1963, one of us (R.J.D.) was telephoned by a housewife in North Vancouver about a large snail shell from Hawaii. I picked up the live snail and recognized it as the giant African snail, Achatina fulica Bowdich. The housewife was pleased to be rid of it.

The shell was collected near a beach at Honolulu by the man and his wife while they were on a Christmas vacation. They wanted the large attractive shell as a souvenir. The man put it in his pocket and it was carried thus in all innocence when they cleared through customs at Vancouver. At home the shell was placed on the moist soil of a large potted plant. Presently the family realized the shell was occupied

since the snail began to extend and bury itself. They then called the University.

The snail was killed and deposited in the Zoological Museum of the University of British Columbia, (U.B.C.I.M. 10743). The dimensions in cm. were as follows: length, 7.5; width, 4.0; aperture, 3.5x2.0; weight, 43.4 gm.; with about 7 whorls.

This is the second interception of the giant African snail at Vancouver (Zuk, P. Proc. Entomol. Soc. Brit. Columbia 46: 32, 1950).

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