

CONTROL OF THE HEMISPHERICAL SCALE, *SAISSETIA COFFEA* (WALKER), ON BIRDSNEST FERN

The hemispherical scale, *Saissetia coffea* (Walker), is a common pest of ornamental plants in Hawaii. Although there are several species of parasitic wasps which appear to keep the pest under varying degrees of control, the scale has occasionally been a serious pest in commercial production of potted foliage plants.

Malathion, diazinon, or superior oil (such as Volck Supreme) sprays have been recommended for control of the scale. However, these materials cannot be safely used on ferns at recommended rates without causing plant injury.

As a result of earlier studies (Mau, unpublished data), several insecticides were found to be non-phytotoxic to birdsnest or polypodium ferns when used at double the recommended rates. Based on the probability for scale control, 5 of these were chosen for this trial. A 6th insecticide, Temik, which is registered for use on ferns in California and Florida was also included. The insecticides and pertinent information related to them are given in Table 1.

The trial was conducted under 80% saran shade at Kohala, Hawaii during August and Sep-

Table 1. Pertinent information about insecticides used in the trial.

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Common Name	Insecticide		Acute Oral Mammalian Toxicity of Technical Material (Rats)	EPA Signal Word
	Trade Name	Formulation Used		
acephate	Orthene	75% soluble powder	866–945 mg/kg	Caution
aldicarb	Temik	10% granules	0.9 mg/kg oral 75 mg/kg dermal	Danger
carbaryl	Sevin	50% wettable powder	500–850 mg/kg	Caution
methomyl	Lannate	24% liquid	17 mg/kg oral	Danger
oxamyl	Vydate L	24% liquid	5.4 mg/kg oral	Danger
oxydemeton-methyl	Metasystox-R	50% emulsifiable concentrate	56–65 mg/kg oral 250 mg/kg dermal	Danger

tember 1977. Birdsnest fern plants which were heavily infested by all developmental stages of the hemispherical scale were selected. The plants were individually potted in treefern fiber in 4-inch plastic pots. Plants were chosen at random, marked with a treatment tag, then set on the bench according to a predetermined randomized complete block design. There were a total of 10 treatments, and each treatment was replicated 6 times.

The extreme degree of the scale infestation made counts of the total number of scales per plant impossible. Instead, pretreatment counts were made of scales on 1 to 4 leaves, and the leaves were marked using an indelible felt marking pen. Crawler stage scales were brushed from the leaves and were not included in the counts.

Triton B-1956 was used in each foliar treatment at the rate of 3 oz. per 100 gallons of spray to increase wetting of the foliage. The foliar treatments were applied to runoff on both leaf surfaces. Care was taken to prevent excessive runoff into the growing media. Drench treatments were made by pouring 4 fluid ounces of the treatment mixture into each pot being careful not to wet the surfaces of the leaves. Grannular treatments were made by first applying the granules evenly on the potting medium and then pouring 4 oz. of water over the granules.

There were significant differences in the effectiveness among the treatments (Table II). Two treatments, Sevin and Lannate L, were found to be outstanding when the plants were examined 2 weeks after the initial application. The average number of live scales in the Sevin and Lannate L treatments were 0 and 0.3, respectively. All other treatments were significantly less effective at this time.

A 2nd application of all treatments was made. Counts of remaining live scales were made 2 weeks later, and excellent control was noted in 5 treatments. These were foliar sprays of Sevin, Lannate L, Orthene, and Metasystox-R, and

Table II. Effect of insecticides on control of hemispherical scale, *Saissetia coffeae*, on birdsnest fern

Treatment ¹	Application Rate Per 100 Gal	Application Method	Ave. No. live scales/plant ^{2,3}			% Control ⁴ 8-18-77 to 9-14-77
			8-18-77	Pretreatment 9-1-77	9-14-77	
Sevin 50WP	2 lb	Foliar Spray	125.0	0a	0a	100
Lannate L	1 pt	Foliar Spray	105.2	0.3a	0a	100
Orthene 75SP	2/3 lb	Foliar Spray	124.5	9.8ab	0.7a	97.0
Metasystox-R	2 pt	Foliar Spray	105.2	15.5abc	0.8a	95.6
Orthene 75SP	2/3 lb	Drench	105.0	20.5bc	1.8a	90.2
Vydate L	2 pt	Foliar Spray	112.8	8.8ab	3.3ab	83.5
Orthene 75SP	1/3 lb	Drench	80.8	15.0abc	7.0abc	51.3
Vydate L	1 pt	Drench	85.2	39.5d	20.7c	0
Temik 10G	100 lb/acre ⁵	Grannular applied to media	77.5	22.5bcd	16.7bc	0
Untreated Check	---	---	97.2	32.7cd	17.3bc	---

¹Treatments applied on 8/18/77 and 9/1/77²Crawler stages not included.³% Control calculated using the method of Sun and Shepard (1947)⁴Averages not followed by the same letter are not significantly different according to Duncan's multiple range test (P = 0.01)⁵Rate per 4 in pot = 0.1g

drench application of Orthene (2/3 lb. rate). However, although there were no significant differences among these 5 treatments, only Sevin and Lannate L were totally effective in controlling the scale infestation.

Unfortunately, Lannate L is not labeled for use on ferns or any other foliage plants. Lannate L was superior to Sevin from the respect of visible residue remaining on the foliage after treatment; there was little or none. Although Sevin left considerable visible residue on the foliage, it was superior to Lannate L in certain respects. Sevin has a lower acute mammalian toxicity (Table I) which is desirable from the standpoint of worker safety. In addition, Sevin is believed to have longer residual activity than Lannate L.

All other treatments resulted in significantly lesser degrees of control. Orthene (1/3 lb. drench), Vydate (foliar and drench), and Temik were included among this group. These materials could have resulted in greater degrees of control if the trial was allowed to continue over a longer period.

CONCLUSIONS

Sevin 50 and Lannate L were found to be highly effective in controlling the hemispherical scale on birdsnest fern. Both insecticides gave complete or nearly complete control within 2 weeks of application. All sessile stages were killed after the 2nd application.

Orthene 75S and Metasystox-R gave excellent control within 2 weeks after the 2nd application.

However, total control was not achieved at this date.

Although application of Temik and Vydate L did not result in immediate control of the hemispherical scale, it is believed that these materials may be valuable if used in a preventative-application program.

Ronald F. L. Mau
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