Increased branching was not noted on some plants, such as oleander, that do not branch freely. Plants treated with Ancymidol had slightly thinner stems than the untreated control. This effect may persist for some time depending on the dosage. Stems of pyracantha given a heavy dosage of Ancymidol were ½ to ⅔ as thick as control plants 10 months after the treatment was applied. Linear growth appeared to be normal.

Preliminary data indicate that Ancymidol may be used to maintain prolonged dwarfing of vigorously growing plants. Timing of applications would be critical and would have to be developed separately for each species. Information on length of effectiveness and influence of environmental conditions remains to be determined.

Effects on foliage

The effect of Ancymidol on uniform decreasing of leaf size, and on the retardation in petiole length was previously observed on caladium and gerbera. Because the entire plant was uniformly dwarfed, these effects were not objectionable. Woody plants often grow more small leaves after treatment with Ancymidol and some become somewhat unsightly. Plants treated with Ancymidol turned darker green color, and in some cases their leaves appeared thicker. Quantitive data were not obtained on either attribute. In some plants such as oleander and eucalyptus, the new leaves twisted after treatment. This effect was temporary and disappeared as the leaf developed.

Ancymidol was also observed to have a differential effect on the width and length of the leaves. In *Eucalyptus viminalis,* the growth in width was more severely affected than growth in length, resulting in leaves that, although generally smaller than normal, were narrower in relation to the width than the length.

In plants with leaf coloration other than green, such as caladium, treated plants often had more green coloration than normal. This was true especially of the variety, Miss Chicago, a variety with predominantly red foliage (center of blade red with a green margin and speckled with white).

Effect on flowering

Some delay in the flowering of some plants was noted, as was the reduced size of the flowers. Also noted was a shortening of the peduncle of some species such as gerbera. The flowering display was improved in many cases, such as lantana, oleander and myrtle. On oleander plants, the growth of lateral shoots below the flowers was inhibited so that the flowers were not hidden by stem and foliage. On the other hand, lantana plants in flower had a more striking display because Ancymidol treatment resulted in shortened internodes, bringing the leaves and flowers closer together.

Stimulation of flowers on bougainvillea, 'Orange King,' plants occurred during the summer. Treated plants flowered while untreated plants did not. Flowering of pyracantha plants was also stimulated after treatment with Ancymidol. These flowers set berries that colored at the normal time. Additional tests are needed to determine whether time of initiation of flowers was influenced by the treatment. Treated azalea plants, cultivar 'Mission Bells,' were found to have initiated flowers sooner than control plants. On untreated plants, approximately 20 to 22 nodes formed before the flower bud initiated. On treated plants, only 10 to 12 nodes formed before flower buds initiated.

Plant injury

Soil drenches of Ancymidol, especially at the high rates of application, caused roots to become coarse, stunted and enenlarged. The foliage of ivy and several other plant species developed necrotic spots following foliar application of the emulsified formulation. This appears similar to "spray burn" observed from the use of many chemicals, and could be due to the emulsifier and carrier in the formulation.

Following treatment with high rates of the chemical, some species of annual flowering plants developed necrotic areas on the older leaves. Yellowing of the new leaves was also noted. These plants died before recovery. Irregular chlorosis or yellowing of newly developing leaves occurred on some plants treated with high rates. These symptoms occurred after use of both the emulsion and wettable powder. The dosages at which these symptoms occurred were generally many times that needed to obtain growth retardation.

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EXPERIMENTAL EUROPEAN PACIFIC

R. E. RICE • R. A. JONES

LEAF-FEEDING MITES are one of the most severe pest problems for growers of deciduous fruits and nuts in California. The mites primarily responsible for these problems include the European red mite, *Panonychus ulmi* (Koch), the two-spotted mite, *Tetranychus urticae* Koch, and the Pacific mite, *T. pacificus* McGregor. Control of these and other species of mite pests has depended upon the use of pesticides that may be harmful to non-target species of insects and mites, and may also lose their efficacy against target species because of a build-up of resistance. In an attempt to find those materials that are effective against the target species, and the least harmful to non-target species, new chemicals are continually being evaluated for their effect on both pest and beneficial species of mites and insects. This report presents the results of field trials of new, but as yet unregistered, pesticides that were evaluated as miticides on the European red mite and Pacific mite during 1971.

An infestation of European red mites on mature Santa Rosa plums was treated with several chemicals on June 30, 1971. The orchard was located at the San Joaquin Valley Research and Extension Center, Parlier. Treatments were replicated four times on single trees in a randomized complete block design. The chemicals were applied with a handgun sprayer at 300 psi, using about 5 gals spray per tree. Following the pretreatment count and application, the plots were evaluated at seven-day intervals according to the number of mites brushed from a 25-leaf sample taken from each replicate.

The results of this test (table 1) show that several of the chemicals were effective against European red mites. Carzol, SD 14114, and U-27415 provided the best control 28 days after treatment, while PP-511, Morestan, Plictran, and DPX-1410, in that order, gave satisfactory control up to 28 days. Dursban, Dowco 214, and Lannate were included

MITICIDES ON RED AND MITES

in the trial, although it was anticipated that they would not perform very well against mites. The observed results confirmed this, and because of the high counts obtained at 21 days, the plots treated with these materials were eliminated thereafter.

Pacific mite on peaches

A second field test of miticides was performed on Pacific mites on young peaches at the Research Center. Plot design for this test was a completely randomized block, with four single tree replicates per treatment. Chemicals were applied on July 28, 1971, with a handgun at 250 psi, using 2 gals of spray per tree. Mite counts were made with a brushing machine just prior to treatment, and at seven-day intervals after treatment.

The data from this trial (table 2) include counts of beneficial mites and thrips as well as the pest mites. Because of the influence of these species (particularly the thrips), it was difficult to really determine the residual effects of the pesticides on Pacific mites. Counts taken seven days after treatment do indicate that U-27415, SD-14114, Carzol, and Plictran had given good initial reduction of the Pacific mite populations, while the number of Pacific mites in the untreated check continued to increase.

At the 14-day counts, however, the number of Pacific mites declined drastically in all treatments except one (U-27415), where only a slight increase was noted. This sharp drop in the Pacific mite population was attributed to the activity of great numbers of adult six-spotted thrips, *Scolothrips sexmaculatus* Pergande, known to be predaceous on mites. These thrips were primarily adults that were flying into the treatments from nearby untreated areas. It was also observed that a similar decline occurred in populations of the predaceous mite *Metaseiulus occidentalis* (Nesbitt), apparently due to the non-selective feeding of the predaceous thrips on both the beneficial and pest mite species. Consequently, it was impossible to determine just what effect the chemicals had on the predaceous mites during this trial.

The 21-day count showed a continuing decline in Pacific mite populations, while the predaceous thrips continued to increase in most treatments. In the check treatment, however, the thrips began to decrease in number, which enabled the predaceous mites to begin increasing at this time.

Of the materials tested, it appears that U-27415, Plictran, PP-511, and possibly Carzol and DPX-1410 had initial detrimental effects on the predaceous thrips, based on the seven-day counts. Also, it appears from the 21-day counts that the thrips populations did not build up or recover as fast in the SD-14114 and Carzol treatments as in the other treatments, suggesting a residual effect of these two materials on the thrips. Again, however, it was hard to determine precisely what effect the chemicals had on the thrips, because the availability of Pacific mites as food also influenced the thrips populations.

The results of these field trials indicate that several of the miticides tested are effective against European red and Pacific mites. Additional data are still needed to determine the effects of these chemicals on certain beneficial insects and mites. None of the materials named are registered and are not recommended for use at this time.

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TABLE 1. EVALUATION OF CHEMICALS FOR CONTROL OF EUROPEAN RED MITE ON SANTA ROSA PLUMS. PARLIER, CALIFORNIA 1971

Material	Formulation	Rate	Pre-trmt.	No. days post-treatment			
				7	14	21	28
		per 100 gals		Average number of mites per leaf			
Carzol	95 SP	4 oz.	1.3	.3	.1	.5	.4
SD 14114	50 W	4 oz.	.6	.3	.9	.5	1.5
U-27415	75 W	6 oz.	1.4	.1	.8	.2	1.6
PP-511	4.3 E	15 oz.	1.1	1.0	1.3	–	2.8
Morestan	25 W	4 oz.	1.0	.4	.8	1.0	3.0
Plictran	50 W	4 oz.	2.3	.6	1.4	2.2	4.2
DPX-1410	2 E	½ pt.	1.6	1.3	1.2	2.1	5.1
Dowco 214	2 E	1 pt.	2.0	3.9	6.0	21.3	–
Dursban	4 E	½ pt.	2.1	9.8	4.3	23.1	–
Lannate	3 E	12 oz.	2.8	8.3	6.4	26.1	–
Check	–	–	1.8	5.1	16.0	33.1	–

TABLE 2. EVALUATION OF CHEMICALS FOR CONTROL OF PACIFIC MITE ON PEACHES, PARLIER, CALIFORNIA 1971

Material	Formulation	Rate	Variety	Species*	Pre-trmt.	No. days post-treatment		
						7	14	21
		per 100 gals.			No. mites and insects per 100 leaves			
U-27415	75 W	6 oz.	Andross	T. pac.	1104	3	11	6
				M. occ.	0	–	0	0
				S. sex.	28	0	12	36
SD 14114	50 W	2 oz.	Summerset	T. pac.	1856	26	6	12
				M. occ.	4	–	3	24
				S. sex.	0	7	0	6
Carzol	95 SP	2 oz.	Paloro	T. pac.	1128	27	21	15
				M. occ.	0	–	3	0
				S. sex.	4	3	6	12
Plictran	50 W	2 oz.	Red Top	T. pac.	1178	37	6	6
				M. occ.	0	–	0	0
				S. sex.	6	0	15	33
Galecron	97 SP	6 oz.	Loadel	T. pac.	1444	148	24	0
				M. occ.	20	–	0	0
				S. sex.	10	22	9	15
PP-511	4.3 E	15 oz.	Elberta	T. pac.	3580	651	147	96
				M. occ.	6	–	0	0
				S. sex.	10	4	42	72
DPX-1410	2 E	½ pt.	Fairtime	T. pac.	592	820	249	90
				M. occ.	16	–	0	0
				S. sex	16	11	36	30
Dursban	4 E	½ pt.	49er	T. pac.	1884	908	240	148
				M. occ.	6	–	9	0
				S. sex.	0	22	39	86
Dowco 214	2 E	1 pt.	Rio Oso	T. pac.	3780	4777	2108	1284
				M. occ.	36	–	8	0
				S. sex	32	26	80	384
Check	..	..	Halford	T. pac.	4806	9702	1021	360
				M. occ.	40	–	0	8
				S. sex.	42	133	156	48

* T. pac. = Pacific mite, **Tetranychus pacificus**
M. occ. = **Metaseiulus occidentalis** (predaceous mite)
S. sex. = six-spotted thrips, **Scolothrips sexmacullatus** (predaceous thrips)