

CHEMICAL CONTROL OF THE TWOSPOTTED
SPIDER MITE,
*TETRANYCHUS URTICAE*¹,
ON PEACHES IN NORTH FLORIDA²

SAM S. FLUKER

University of Florida, Agricultural Research Center, Monticello, Florida

ABSTRACT

Dimethoate ULV gave excellent control of the twospotted spider mite, *Tetranychus urticae* Koch, infesting peach trees. None of the acaricides tested in 1972 gave good control of the twospotted spider mite when applied as 24X concentrate. Plictran™ (Tricyclohexylhydroxytin) applied as a dilute spray at 4 oz a.i./100 gal was the most effective acaricide tested, with Galecron™ (N-(4-chloro-o-tolyl)-N,N-dimethylformamidine) at 8 oz a.i./100 gal, and Vydate™ (S-methyl 1-(dimethylcarbamoyl)-N-[(Methylcarbamoyl)oxy]thioformimidate) being nearly as effective as Plictran.

The twospotted spider mite, *Tetranychus urticae* Koch, has been a serious pest of peach trees in central Florida since the early 1960's (G. Sweat. Personal communication. 1972) Asquith (1970), Berry (1970), Hagel and Landis (1972), Abid and Ridgeway (1969), and Cone (1968) reported results of experiments to control the twospotted spider mite on various crops. During the year 1971, the first outbreak of the twospotted spider mite was observed in a commercial peach orchard in northern Florida.

It was noted that the mites began increasing to damaging levels during June or July. The spider mite build up to damaging numbers relatively early in the season requires control measures to be initiated as quickly as possible. The long growing season in north Florida (March-November) requires that the leaves be held on the trees until the first frost or freeze which usually occurs in mid-November. With severe infestations of the twospotted spider mite, the trees become defoliated resulting in loss of tree vigor and subsequent death of the trees from secondary invaders.

Tests were begun in 1971 to determine the effectiveness of various chemicals in controlling the twospotted spider mite. Chemical names of materials tested without approved common names are:

Phosvel™ 0-(2,5-dichloro-4-bromophenyl)0-methyl phenylthiophosphate
Supracide™ S-(2-methoxy-5-oxo- Δ^2 -1,3,4-thiadiazolin-4-yl) = methyl
0,0-dimethyl phosphorodithioate
Vydate™ S-methyl 1-(dimethylcarbamoyl)-N-[(methylcarbamoyl)oxy]
thioformimidate
Plictran™ Tricyclohexylhydroxytin
Galecron™ N'-(4-chloro-o-tolyl) = N,N-dimethylformamidine
Upjohn U-36,059 1,5-Di-(2,4-dimethylphenyl)-3-methyl-1,3,5-Triazapenta-1,4-diene

Results of the experiments conducted in 1971 and 1972 are reported herein.

¹Acarina: Tetranychidae.

²Florida Agricultural Experiment Station Journal Series No. 4729.

MATERIALS AND METHODS

In both experiments, the design used randomized single-tree plots, replicated 10 times for each treatment.

Test 1 (1971) - A SoloTM, Model 423, mistblower was used to spray ninety, 8 year old trees. Chemicals used were dimethoate ULV, methomyl 25% WP, Supracide 2E, endosulfan 2M, dimethoate 2.67E, Phosvel 3 ULV, Phosvel 3EC, parathion 4EC, and carbofuran 4F. The chemicals were mixed at a 12X concentration and applied at ca. 1 l material/tree. Dimethoate ULV was applied at the rate of 10 ml/tree and Phosvel 3 ULV at 2.4 ml/tree.

All trees in Test 1 had previously been sprayed with the same chemicals in an earlier test for catfacing insect evaluation. All trees had been sprayed 5 times from 16 March until 25 May using the same rates as above. From 25 May until 18 July, the trees did not receive any pesticide treatment. The samples to determine the mite infestation were made by randomly taking 10 leaves from each tree at each sampling date and checking each leaf for the number of live mites.

Test 2 (1972) - The effectiveness of 4 acaricides (Vydate, Plictran, U-36,059, and Galecron) applied as a dilute spray and as a high concentrate spray (24X) was evaluated in this test. The dilute sprays were applied with a John Bean Speed SprayerTM, Model 577CP. The material was applied at the rate of 2 gal/tree or ca. 200 gal/acre. The concentrate sprays were applied with a SoloTM, Model 423, mistblower with each tree receiving 500 ml of mixed material. The trees in this test had previously received sprays of parathion and sulfur every 7 days at the dosage rate of 4 oz a.i. parathion + 6 lb. sulfur/100 gal, with ca. 2 gal applied to each tree.

TABLE 1. EFFECTIVENESS OF 9 CHEMICALS AGAINST THE TWOSPOTTED SPIDER MITE ON PEACHES, AGRICULTURAL RESEARCH CENTER, MONTICELLO, 1971.

Treatment	oz. a.i./ 100 gal.	Pre- treatment	Mites/100 Leaves on Indicated Days		
			Post-treatment*		
			3 Days	7 Days	11 Days
Dimethoate ULV	**	0	0a	0a	0a
Methomyl 25% WP	2	800	0a	632ef	419de
Supracide 2E	4	750	0a	0a	962f
Endosulfan TM	12	613	0a	0a	75b
Dimethoate 2.67E	2.4	598	81b	0a	132bc
Phosvel 3 ULV	†	621	94b	90b	268d
Phosvel 3EC	12	695	102b	581de	1450fg
Parathion 4EC	10	736	155b	476d	118bc
Carbofuran	8	822	580d	728ef	145bc
Check	††	787	169bc	253c	302d

*Numbers followed by the same letter are not considered significantly different at the 5% level by Duncan's Multiple Range Test.

**10 ml/tree.

†2.4 ml/tree.

††2 gal H₂O/tree.

RESULTS AND DISCUSSION

Test 1 - The results of this test are shown in Table 1. Dimethoate ULV was the most effective chemical. During the entire testing period, no mite infestation was found on any trees treated with dimethoate ULV. Parathion failed to give satisfactory control of the mite even at double the recommended rate. Dimethoate ULV, methomyl, endosulfan, and Supracide were significantly more effective at 3 days post-treatment than parathion, dimethoate 2.67E, Phosvel 3EC, and Phosvel 3 ULV. Carbofuran gave very little, if any, control of the mites during this test.

At 7 days post-treatment, methomyl had lost its effectiveness, apparently because of its short residual life. Dimethoate ULV, dimethoate 2.67E, Supracide, and endosulfan continued to give significant control at 7 days post-treatment. The slow control exerted by dimethoate 2.67E apparently was because of its action as a systemic rather than a contact miticide.

At 11 days post-treatment, only dimethoate ULV gave absolute control of the mites. Endosulfan gave good control at 11 days while all other treatments were ineffective.

Test 2 - The results of the tests conducted in 1972 are shown in Table 2. The data indicate that dilute sprays were more effective in controlling the two-spotted spider mite than 24X concentrate sprays. Galecron at 8 and 192 oz a.i./100 gal showed the least difference at all days checked post-treatment. At 10 days post-treatment, Galecron at 8 and 192 oz was not significantly different in controlling the mites. The mite infestation that occurred on the trees treated with 24X Vydate was unusual because Vydate is considered a variable translocated systemic insecticide. Apparently the action of Vydate against mites on peach trees is contact and not systemic.

Although most dilute treatments showed significant control over the 24X

TABLE 2. EFFECTIVENESS OF 4 CHEMICALS AGAINST THE TWOSPOTTED SPIDER MITE ON PEACHES, AGRICULTURAL RESEARCH CENTER, MONTICELLO, 1972.

Treatment	oz. a.i./ 100 gal.	Pre- treat- ment	Mites/100 Leaves on Indicated Days				
			Post-treatment				
			1 Day	5 Days	10 Days	14 Days	21 Days
Vydate 2E	8	4744	130	26	936	27	55
Vydate 2E	192**	4008	755	971	748	2083	1708
Plictran 50W	4	5312	10	3	12	5	1
Plictran 50W	96**	4420	735	400	195	243	1058
U-36,059 1.66E	3	5958	70	50	470	524	28
U-36,059 1.66E	72**	4681	451	1050	358	1273	2788
Galecron 4EC	8	3841	672	111	431*	74	10
Galecron 4EC	192**	4370	343	466	393*	1555	1031
Check		3899	3849	3842	3836	3863	5113

*Not significantly different by chi-square test.

**Concentrate sprays.

all of the chemicals tested provided significant control at the 5% confidence level when compared to the check.

Only dimethoate ULV gave economic control of the twospotted spider mite, of the chemicals tested at the high concentration. The limiting factor in controlling the twospotted spider mite with high concentrate sprays seems to be adequate coverage of the materials on the infested leaves. If the acaricide is not a systemic poison, then it is necessary to assure complete coverage on both sides of the leaves in order to insure reaching all the mites and bringing about economic control.

LITERATURE CITED

- Abid, M. K., and R. L. Ridgeway.* 1969. Mortality, longevity, and fecundity of spider mites on cotton treated with systemic acaricides. *J. Econ. Entomol.* 62:13-16.
- Asquith, D.* 1970. Codling moth, Red-banded leaf roller, apple aphid, European red mite, and twospotted spider mite control on apple trees. *J. Econ. Entomol.* 63:181-185.
- Berry, R. E.* 1970. Control of the twospotted spider mite on peppermint. *J. Econ. Entomol.* 63:1708-1709.
- Cone, W. A.* 1968. Twospotted spider mite and hop aphid control on cluster hops with acaricides. *J. Econ. Entomol.* 61:1685-1689.
- Hagel, G. T., and B. J. Landis.* 1972. Chemical control of the twospotted spider mite on field beans. *J. Econ. Entomol.* 65:775-778.

The Florida Entomologist 56(2) 1973

ENTOMOLOGY IN ACTION

Members needing audio-visual material to aid in giving talks on entomology to students and organizations may borrow free a display of 72 color, 2×2 slides with a script. Write for reservations giving date and alternate date to Secretary, Florida Entomological Society (i.e., Frank Mead), P. O. Box 12425, Gainesville, Florida 32601.