Evaluation of Acaricides for Control of the Strawberry Spider Mite on Cotton & Alfalfa

Small-plot field tests were conducted at Parker, Arizona, to evaluate the effectiveness of several acaricides against the strawberry spider mite, *Tetranychus (Tetranychus) turkestani* U. and N., on both cotton and alfalfa. Populations were sufficiently high by early May that leaf damage was evident. The primary purpose of this research was to obtain information relative to control of this pest should a widespread problem develop later in the growing season.

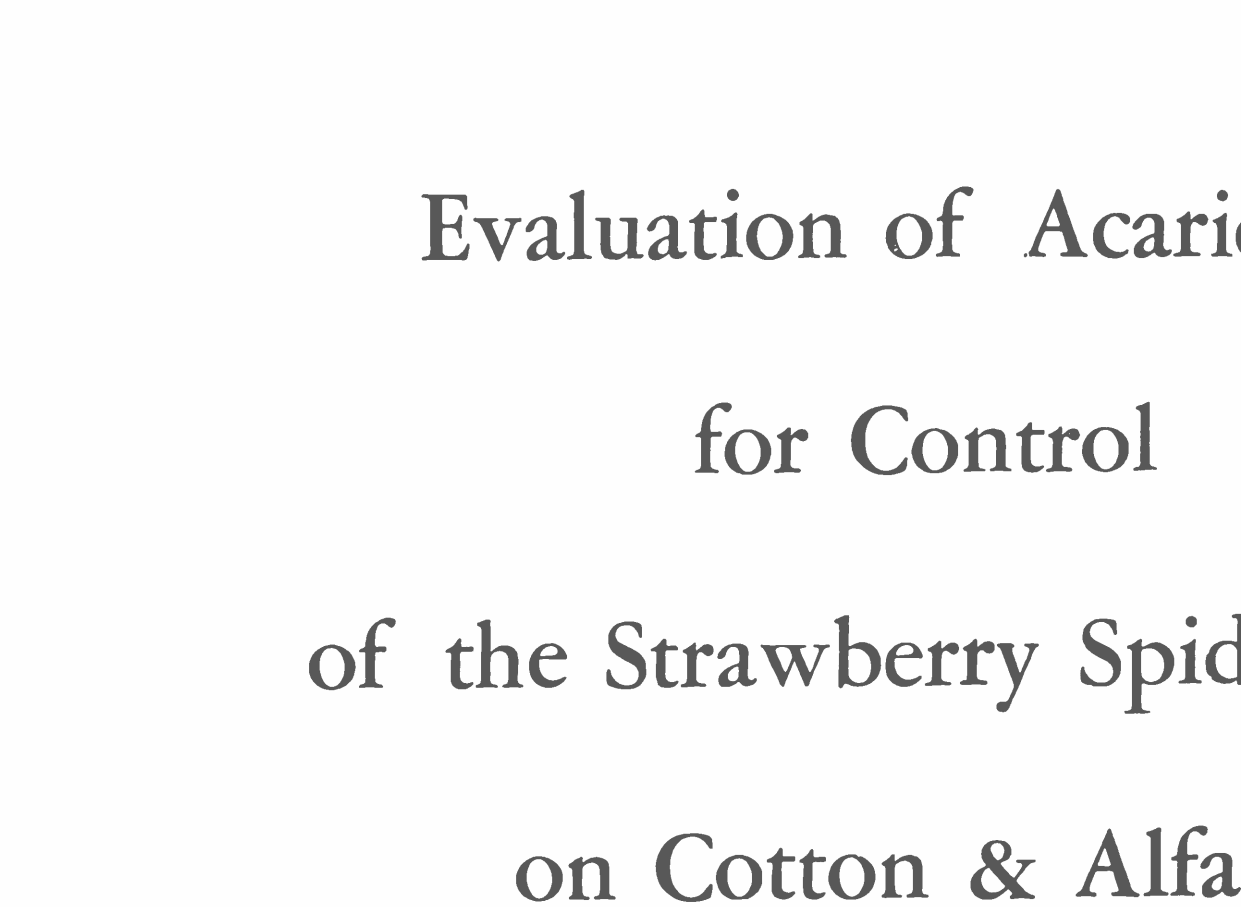

Figure 1. Arbitrary classification of several acaricides relative to their effectiveness in reducing all stages of the strawberry spider mite, Tetranychus (Tetranychus) turkestani, on cotton.

METHODS AND MATERIALS

The experiments were conducted in fields of alfalfa and seedling cotton, separated only by a field-road. Both experiments were designed as randomized complete blocks, replicated four times. Alfalfa plots were ten ft. sq. in size while plots in the cotton consisted of two rows, 25 ft. long in skip-row cotton (2-1).

Spray applications were made with a 3-gal. Hudson sprayer, equipped with a pressure gage. The acaricides were applied in 9-gal. total spray per acre at 40 p.s.i. pressure. Eleven materials were compared with untreated checks. Treatment of plots began at 9:00 a.m. and was completed at 12:00 noon on May 6, 1969. Weather conditions were cool, overcast and with a very light breeze. The materials and rates are shown in table 1.

Evaluation of treatments was made by sampling each plot four times: pre-

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Table 1. Influence of several acaricides on populations of the strawberry spider mite, *Tetranychus (Tetranychus) turkestani,* on seedling cotton. Parker, Arizona. 1969.

Treatment	Rate lbs./A.	Pre-treatment infestation[1] Egg	Immature	Adult	Per cent decrease (or increase) mean post-treatment infestations[2] Egg	Immature	Adult
Check	—	101	19	9	16.5	15.5	11.8
Morestan	0.20	45	5	5	(+32.0)	(+92.0)	(+89.7)
disulfoton	0.50	180	30	17	55.0	62.7	47.0
U-27415	0.75	147	38	17	48.1	58.4	53.9
ethion	1.00	65	9	4	68.3	64.8	(+4.8)
dimethoate	0.25	96	14	10	79.9	71.3	72.2
tetradifon	1.00[3]	135	34	8	67.8	93.9	76.5
Galecron	0.50	96	25	15	87.5	96.9	95.4
G.S. 19851	0.50	84	16	13	95.2	92.2	98.4
Chlorobenzilate	1.00	174	35	12	93.1	89.4	91.5
Acaralate	1.00	163	32	14	97.8	94.7	97.0
Azodrin	0.50	61	7	6	89.6	90.2	100.0

[1] *Means of 10 leaves sampled.*
[2] *Means of 3, 7, and 14-day post-treatment counts.*
[3] *Tetradifon was inadvertently applied at a heavier rate than 1.0 lb./acre.*

treatment, 3-day, 7-day, and 14-day post-treatment. Alfalfa samples consisted of 5 stems from each plot. Eggs, immatures (larvae and nymphs), and adults were counted on either the second or third trifoliate leaf from the base of each stem. Ten leaves, each from a different plant and exclusive of the cotyledon and terminal leaves, comprised a cotton sample. The same mite stages were counted as in the alfalfa samples.

RESULTS AND DISCUSSION

Cotton test. Several acaricides gave satisfactory control of the strawberry spider mite on seedling cotton. The 7-day post-treatment counts indicated that Azodrin, Acaralate, Chlorobenzilate, G.S. 19851 and Galecron had reduced the egg, immature and adult stages by 90 to 100 per cent (Table 1). Tetradifon could be classified in this category if the ratings were based on the 14-day post-treatment counts. This acaricide is slow-acting so this partially explains the reason for its poorer showing in the 3-day and 7-day counts.

The results of this test are depicted pictorially in figure 1. Points on this graph represent the means of the three post-treatment counts as departures from the pretreatment infestation levels of the respective treatments. An arbitrary classification of treatments in this experiment is presented in the graph and places each treatment in one of three categories: good, intermediate or poor. In general, a treatment which resulted in a good reduction of one stage of the mite also exhibited a similar reduction in the other stages. However, exceptions to this are noted, e.g., the ethion treatment resulted in reduction of the egg and immature stages sufficiently large to place it in the intermediate category but an overall increase in the adult population forced its placement in the poor category.

The relative positions of the un-

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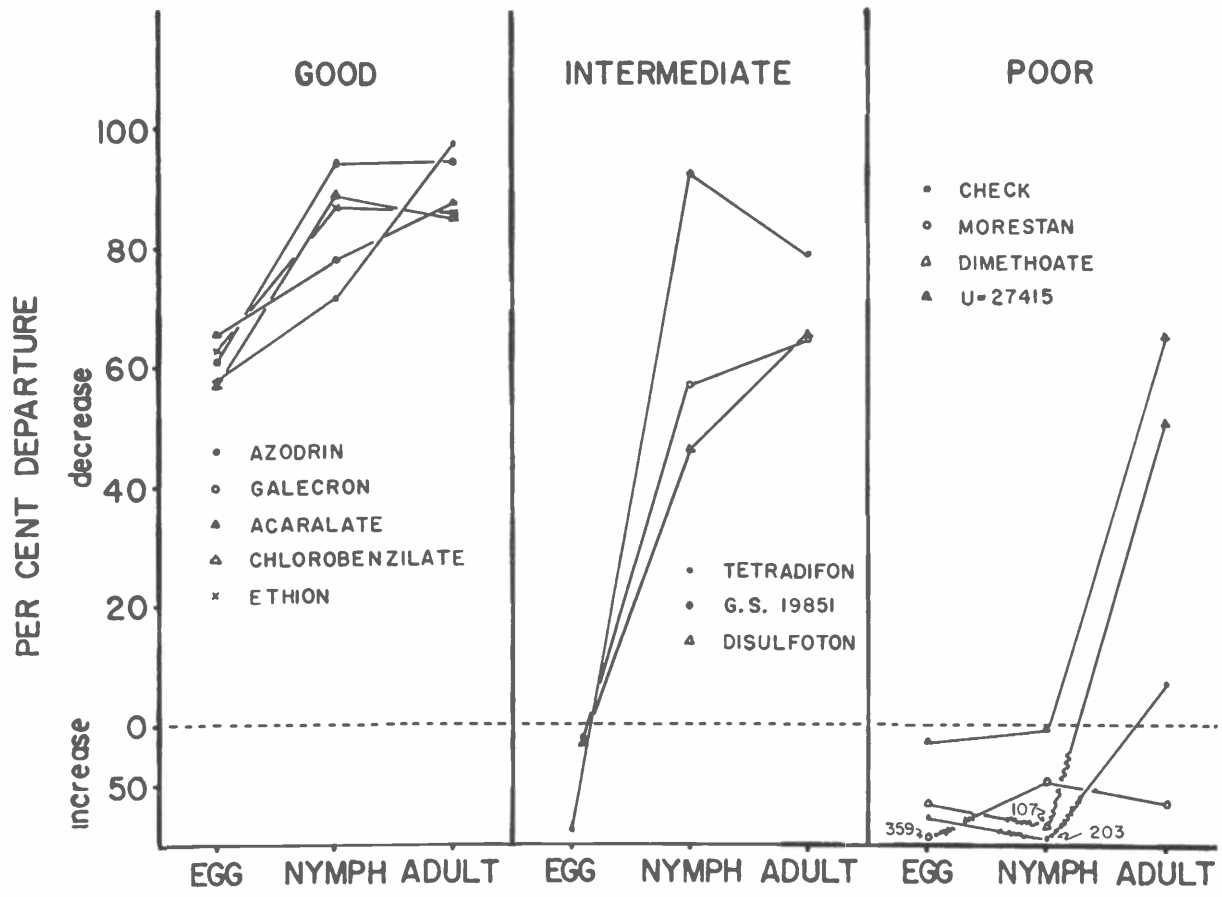

Figure 2. Arbitrary classification of several acaricides relative to their effectiveness in reducing all stages of the strawberry spider mite, Tetranychus (Tetranychus) turkestani, on alfalfa.

Spider Mite

treated check and the Morestan treatment in figure 1 require some explanation. All three stages — egg, immature forms, and adults — in the check were slightly lower than at the time of the pretreatment level while stages in the Morestan treatment showed considerable increase. A predaceous mite (species undetermined) was found to occur commonly in the pretreatment samples. A likely explanation is that this predator effected a certain amount of control over the population in the untreated check while it was eliminated from the Morestan-treated plants, permitting an increase of the spider mite which was apparently unaffected by the acaricide.

Alfalfa Test. Results of the alfalfa experiment, in general, agree with those obtained in cotton. However, control was somewhat poorer in the alfalfa treatments than identical treatments in the cotton, particularly when comparing the treatment effects on egg and immature stages. These data are presented in table 2 and in figure 2.

Four of the acaricides which were categorized as good in the cotton test achieved a similar ranking in the alfalfa test. The acaricide G.S. 19851 was ranked as good on cotton but fell to the intermediate ranking in the alfalfa because of poorer control of immature and adult stages and an actual increase in the egg counts. The greatest difference any material exhibited between the two tests involved ethion which moved from the ranking of poor in the cotton test to that of good in the alfalfa test, primarily because of a good reduction of the adult population. The poor showing of ethion against the adult mite in the cotton test was responsible for its placement in the poor category.

The untreated check and the Morestan treatment were placed in the poor category in both tests. Two treatments — tetradifon and disulfoton achieved intermediate rankings in both tests while the remaining two treatments—dimethoate and U-27415 — were ranked as intermediate on cotton and poor on alfalfa.

In summary, four treatments — Azodrin, Acaralate, Cholrobenzilate, and Galecron — gave the most satisfactory spider mite control in these tests. Other treatments exhibited less efficacy against the strawberry spider mite.

Table 2. Influence of several acaricides on populations of the strawberry spider mite, *Tetranychus (Tetranychus) turkestani, on alfalfa.* Parker, Arizona . 1969.

Treatment	*Rate lbs./A.*	*Pre-treatment infestation*[1] *Egg*	*Immature*	*Adult*	*Per cent decrease (or increase) mean post-treatment infestations*[2] *Egg*	*Immature*	*Adult*
Check	**—**	**66**	**5**	**19**	**(+78.5)**	**(+202.5)**	**7.1**
Morestan	**0.20**	**28**	**10**	**7**	**(+359.2)**	**(+47.4)**	**(+65.8)**
dimethoate	**0.25**	**23**	**4**	**15**	**(+66.4)**	**(+107.0)**	**50.8**
U-27415	**0.75**	**65**	**11**	**23**	**(+14.9)**	**(+2.1)**	**65.5**
disulfoton	**0.50**	**59**	**14**	**25**	**(+15.7)**	**46.1**	**64.9**
G.S. 19851	**0.50**	**30**	**10**	**12**	**(+11.1)**	**57.0**	**64.5**
tetradifon	**1.00**[3]	**60**	**33**	**15**	**(+88.7)**	**92.8**	**79.1**
ethion	**1.00**	**86**	**30**	**21**	**62.3**	**87.0**	**84.9**
Chlorobenzilate	**1.00**	**44**	**11**	**16**	**57.8**	**91.4**	**84.8**
Acaralate	**1.00**	**59**	**16**	**17**	**65.5**	**78.3**	**87.9**
Galecron	**0.50**	**64**	**19**	**20**	**60.6**	**94.1**	**94.3**
Azodrin	**0.50**	**56**	**5**	**18**	**58.4**	**71.8**	**97.7**

[1] *Mean of 5 triofaliates per sample.*
[2] *Means of 3, 7, and 14-day post-treatment counts.*
[3] *Tetradifon was inadventently applied at a heavier rate than 1.0 lb./acre.*

Barley

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irrigation may be required during grain formation because the crop matures during a period of higher temperatures.

Low Rates and Early Dates Are Best

Minimum rates of planting are suited to November and December dates of planting because cooler temperatures and usual winter moisture are conducive to a prolonged vegetative period and maximum tillering. Present barley planting rates could be decreased without decreasing grain yields. Growers in Arizona should plant high quality seed at lower rates to increase yield potential and grain quality by reducing lodging.

Varieties Differ

Barley yields are influenced by many variables. For maximum returns, seeding dates and rates must be adjusted to the specific variety planted and to the conditions under which the crop is grown.

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