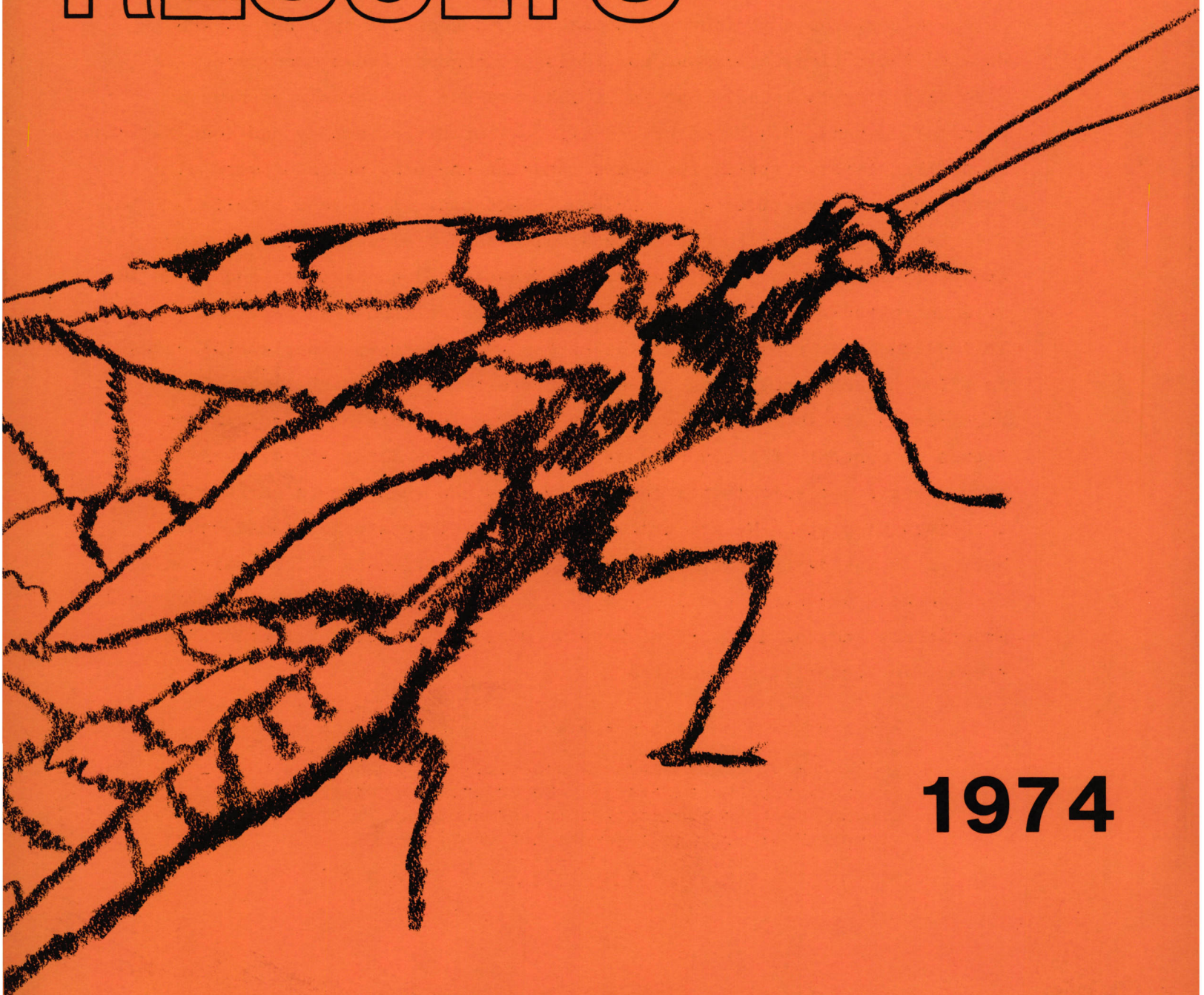
A PROGRESS REPORT OF

Sharon C. Mueller

INSECT STUDY RESULTS



1974

IN SEED ALFALFA

Acknowledgements

The work reported here was made possible by the financial support of seed growers and seed processors through the Alfalfa Seed Production Research Board. This support and cooperation and that received from chemical companies is greatly appreciated.

The assistance of grower cooperators and chemical applicators who donated their time, equipment and fields to conduct these experiments is also deeply appreciated. Special thanks are due Don Darnell of Panoche Chemical Company, Bob Vance of Tri-air, Wilbur Ellis Company and John Mallyon, James Irrigation District for their interest and many hours of work with these and past experiments concerning insect control in seed alfalfa.

Experiments were conducted in alfalfa seed fields of the following growers: John Maitia, Paul and Roland Crevolin, John Nakamura and in an 18 acre untreated seed field maintained by Don Darnell on land provided by Telles Ranch Incorporated. It was necessary in certain experimental areas to allow insect populations to remain untreated or to reach higher than recommended levels in order to obtain desired information on population trends or control effectiveness of pesticides. In doing so, growers may have experienced some losses in seed quality and quantity in certain of the experimental plots. We are grateful for their interest and these contributions in making it possible to conduct the experiments. The assistance of students, Ben Simko and Jon Knapp in carrying out the various surveys and experiments and the art work of Carolyn Oda, Agricultural Extension Service, Fresno, is sincerely appreciated.

The use of trade names is sometimes necessary to convey information more clearly. No endorsement of products named in this publication is intended nor is criticism implied of similar products not mentioned.

Research on Insects Affecting Seed Alfalfa 1974

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Introduction

This progress report summarizes research on insects affecting seed alfalfa conducted during 1974. It is our desire to fully inform seed growers, processors and agribusiness cooperators of the research conducted with their generous and much appreciated support.

The contents of this summary should not be interpreted as recommendations of the University of California. Insect control recommendations are published by the University of California and can be obtained free of charge from the Farm and Home Advisors Office.

Common and/or manufacturer's names of insecticides are used in this report instead of the less familiar chemical terms, but no endorsement of products mentioned is intended. The rates of insecticides applied per acre are all expressed as active material per treated acre. Some of the chemicals included in the experiments reported are not registered for commercial use on seed alfalfa at this time.

The common and/or manufacturer's names of insecticides mentioned in this report are as follows:

Bay Hox 1901	SD8832 10G
Carzol®	Temik 10G®
dimethoate	TEPP
Lannate®	Thiodan®
Lorsban®	UniRoyal K840
Monitor®	Vydate®

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These experiments were conducted in the San Joaquin Valley where the honeybee is the principal pollinator. We have no information concerning the effects of these insecticides and programs on leafcutting or alkali bees.

Discussion of 1974 Research Results

Research was continued on the control of lygus bugs, aphids and spider mites and on the biology and population dynamics of the consperse stink bug and other insects affecting seed alfalfa. During 1974, five separate experiments were conducted in which twelve insecticides and seven insecticide combinations were evaluated for control of lygus bugs and the spotted alfalfa aphid. Detailed biological studies were conducted in several commercial alfalfa seed fields and in a field specifically maintained for insect population studies. Although data were obtained on several insect species in each of the individual experiments, the results are categorized and reported according to species rather than by individual experiment.

Lygus bugs

Seven insecticides and seven insecticide combinations were evaluated for control of lygus bugs in five separate experiments. The insecticides and combinations applied as foliar sprays by aircraft were Bay Hox 1901, dimethoate, Lorsban®, Monitor®, Vydate®, Carzol® + Thiodan®, Carzol + UniRoyal K840, Carzol + Lorsban, Carzol + Lannate, Carzol + TEPP, Carzol + Vydate and Lannate® + TEPP. Temik® and SD8832 were applied to the soil as granular formulations with a commercial soil applicator. The following briefly summarizes the results obtained with each of the materials in controlling lygus bugs.

Bay Hox 1901, an experimental compound of Chemagro Corporation, applied at 0.5 lb. active ingredient per acre resulted in an initial reduction of the lygus bug population of 70 per cent over pretreatment counts but the material appeared to have a short residual toxicity, populations reached pretreatment levels within 13 days after application. Dimethoate, a long used standard, applied at 0.5 lb. AI/A reduced the lygus bug population approximately 97 per cent under the pretreatment level and and the population did not attain the pretreatment level for 20 days after application. Lorsban (formerly Dursban) was evaluated in two experiments

at 0.5 and 1.0 lb. AI/A and with and without a buffering agent (Buffer-X). Lygus bug control was not consistent. In an experiment conducted in June, Lorsban at 1.0 lb. AI/A with and without Buffer-X resulted in almost total initial control of lygus bugs. The addition of Buffer-X did not alter the control over that obtained with the Lorsban alone. Approximately 20 days elpased before lygus populations returned to pretreatment levels in both plots. A second application of Lorsban without buffer applied to the same plot was not as effective as the first, this time the population was reduced approximately 39 per cent over the pretreatment level. Within 13 days after this application the lygus bug population was almost double that at pretreatment.

In a later experiment Lorsban was evaluated at two rates, 0.5 and 1.0 lb. AI/A. Very low lygus bug populations were present at the time of treatment but 13 days after application populations were 10 to 20 times greater than the pretreatment levels. The 1.0 lb. rate was more effective than the 0.5 lb. rate in reducing lygus bug populations but neither rate provided adequate control. It would seem that Lorsban has a short residual toxicity for lygus bugs.

Monitor applied at 0.5 lb. AI/A resulted in an initial lygus bug population reduction of 98 per cent under the pretreatment level and 27 days after application the population, although increasing, was 44 per cent below the pretreatment level. A second application of Monitor at the same rate to the same plot also effectively controlled lygus bugs but this experiment was terminated 13 days after the second application because of heavy spotted alfalfa aphid populations.

Vydate applied at 0.75 lb. AI/A resulted in an initial reduction in the lygus bug population of 98 to 100 per cent. This material appeared to have a long residual toxicity for lygus bugs. Thirty-four days elapsed before lygus bug populations exceeded the pretreatment level. Vydate applied at 0.5 lb. AI/A in a second experiment also gave excellent control of lygus bugs but it was necessary to terminate this experiment 13 days after application because of extremely large spotted alfalfa aphid populations.

Past experiments have shown that where Carzol has been used alone on alfalfa varieties susceptible to the spotted alfalfa aphid, these applications have resulted in serious spotted alfalfa aphid infestations. For this reason, Carzol was combined in 1974, with other insecticides that might effectively control the aphid populations.

The following insecticides were tested in combination with Carzol 0.5 lb. AI/A: Thiodan 1.0 lb. AI/A, UniRoyal K840 0.5 lb. AI/A, Lorsban 1.0 lb. AI/A, Lannate 0.75 lb. AI/A, TEPP 1.0 lb. AI/A, and Vydate 0.75 lb. AI/A. Combinations of Carzol 0.75 lb. AI/A plus UniRoyal K840 0.5 lb. AI/A and Lannate 0.75 lb. AI/A plus TEPP 1.0 lb. AI/A were also evaluated. The Carzol-Thiodan combination was used as a standard treatment in four experiments. With one exception, this combination gave excellent control of lygus bugs. Initial population reductions of 95 to 97 per cent under pretreatment levels were obtained and populations did not reach pretreatment levels for 20 to 27 days after application. The one failure with this combination is believed to have been the result of poor timing with respect to a large egg population and subsequent hatch. As will be shown later in this report, Thiodan did not control the spotted alfalfa aphid.

Carzol plus UniRoyal K840 resulted in good control of lygus bugs but did not reduce nymph populations as well as the Carzol-Thiodan combination. UniRoyal K840 is a specific aphicide having virtually no effect on other insects. Thiodan, however, appeared to contribute to the total toxicity of the combination for lygus bugs.

Combinations of Carzol with Lorsban, Lannate and TEPP all effectively controlled lygus bugs for periods of 13 days. The Carzol-Vydate combination was highly effective in controlling lygus bugs but appeared to be no better than Vydate alone at 0.5 or 0.75 lb. AI/A.

A Lannate-TEPP combination was used in two experiments late in the season, on August 21 and 28. This combination resulted in excellent control of lygus bugs but it was not possible to follow the treatments for more than 13 days after application.

An experiment was conducted to evaluate timing and repeated applications throughout the season of Carzol 0.5 lb. AI/A + Thiodan 1.0 lb. AI/A and Carzol 0.75 lb. AI/A + UniRoyal K840 0.5 lb. AI/A for lygus bug control. The Carzol-Thiodan combination was applied to two 10 acre plots and the Carzol UniRoyal K840 combination was applied to a 5 acre plot. After the initial treatment of all three plots on June 12, one of the Carzol-Thiodan plots was retreated when total lygus bug counts (adults + nymphs) reached 4 to 6 bugs per sweep. The other two plots, Carzol-Thiodan and Carzol-UniRoyal K840 were retreated when counts reached 8 to 12 bugs per sweep. The alfalfa variety was Altfranken Schmidt, susceptible to the spotted

alfalfa aphid. It was apparent after the second applications of Carzol-Thiodan on July 10 and 17 that the spotted alfalfa aphid was not being controlled. TEPP 1.0 lb. AI/A was applied to both Carzol-Thiodan plots on July 24 but did not control the aphid. On August 7, Lorsban 0.5 and 1.0 lb. AI/A was applied to the 4 to 6 bug/sweep Carzol-Thiodan plot and Lannate 0.75 + TEPP 1.0 lb. AI/A was applied to the 8 to 12 bug/sweep Carzol-Thiodan plot. These insecticides resulted in excellent aphid control and Lannate-TEPP was used for the final application in both of the original Carzol-Thiodan plots. It was not necessary to add an aphicide treatment to the Carzol-UniRoyal K840 plot, for the K840 provided excellent control of the spotted alfalfa aphid. The plots treated at counts of 8 to 12 bugs per sweep received three applications for lygus bug control during the season ranging from 20 to 34 days apart. The plot treated at counts of 4 to 6 bugs per sweep received a total of four insecticide applications for lygus bug control ranging from 20 to 27 days apart.

At harvest, four one-quart samples of seed pods were hand stripped from each plot. Samples were hand threshed and lightly cleaned in a Clipper seed cleaner. The seeds were examined for lygus bug injury, seed chalcid, stink bug and other damage. The per cent of good seeds in the Carzol-Thiodan plots treated at counts of 4 to 6 bugs per sweep and at 8 to 12 bugs per sweep was 96.3 and 95.6 respectively. Seeds showing lygus bug injury in the two plots represented 1.9% and 2.3% respectively of the total seeds examined in each. The per cent of good seeds from the plot treated with Carzol-UniRoyal K840 at counts of 8 to 12 bugs per sweep was 93.6 and the per cent showing lygus bug injury was 3.3. The center 16 rows of each plot were harvested with commercial equipment on September 23. Calculated weights of uncleaned seed (lbs. per acre) from each harvested area were: Carzol-Thiodan, 4-6 bugs/sweep, 1,230 lbs./A, Carzol-Thiodan 8-12 bugs/sweep, 1,044 lbs./A, Carzol-UniRoyal K840 8-12 bugs/sweep, 1,031 lbs./A.

The systemic insecticides, Temik and Shell SD8832 were applied as 10% granules to the soil at a rate of 3.0 lbs. AI/A. Three plots, each 2.37 acres were treated. The Temik granules were applied to two plots, one plot was treated on April 23, soon after the normal spring clipping of the alfalfa and the other on May 28, after much regrowth had occurred. The SD8832 plot was treated on April 23. The insecticides were applied with a six-row applicator with two shanks per row, 9 inches on each side of the plant row and approximately

6 inches deep. These plots did not receive any additional insecticide treatments. The remainder of the field, approximately 8 acres, received no insecticides during the season and served as a check. Lygus bug control was poor in this experiment. There was no evidence that the Temik and SD8832 applied on April 23 had any effect on lygus bug populations. Somewhat lower lygus bug populations occurred in the Temik plot that was treated on May 28, than in the check and in the other treatments, but the numbers were far above economic levels. It is difficult to draw conclusions from the data obtained because of some differences in quantities of irrigation water received by the plots during the season. Adult lygus bugs move from dry areas into green areas and some of the greenest occurred in the untreated check. Lygus bug populations peaked on July 23 in the treated plots and declined rapidly thereafter. Two high peaks occurred in the check, one on July 9 and the other on July 23. A third smaller peak occurred in the check on August 6. It was felt that the prolonged period of high populations in the check was due to the greener condition of plants in this area and the consequent attraction for migrating bugs and continued reproduction.

Although poor control occurred with the insecticides, much valuable information was obtained from the large untreated check, concerning lygus bug population trends and the populations of the entire complex of insects normally found in untreated alfalfa seed fields. This area will remain untreated for the next four years to permit a study of the insect complex in the absence of insecticides. It was obvious from the data obtained that the lygus bug populations reached an equilibrium with the environment, although, at high levels. The natural factors influencing lygus bug populations are not well understood. Several predatory species are known to feed upon lygus bug eggs and nymphs but their effects are largely unknown because they are drastically suppressed with heavy insecticide programs.

The very high populations of lygus bugs encountered in this study caused extreme damage to developing buds severely reducing seed production. At harvest the following net weights of uncleaned seed were obtained from each of the 2.37 acre areas. SD8832 416 lbs., Temik applied on April 23, 598 lbs., Temik applied on May 28, 838 lbs., check 714 lbs. The quantities of seed harvested are of significance only in that they were produced under adverse conditions. Most of the seeds produced were set prior

to the occurrence of the high lygus bug populations beginning early in June. It must be emphasized that seed production in this experiment was greatly influenced by irrigation practices mentioned earlier and the effects of the insecticides were actually of little consequence as far as seed yields are concerned.

Four samples of seed pods were hand stripped from plants in each plot prior to harvest. These were hand threshed and lightly cleaned in a Clipper seed cleaner. The seeds were then examined for lygus bug injury, seed chalcid, stink bug and other damage. The per cent of good seeds in the samples taken from the check was 76.0, from the SD8832 plot 79.8, and from the Temik treatments applied on April 23 and May 28, 79.8 and 92.1, respectively. The per cent of seeds damaged by lygus bugs in the respective treatments were check 10.1, SD8832 19.1, Temik 4/23, 16.8 and Temik 5/28, 5.3. Data pertaining to the quality of the seed may indicate some beneficial effect of the May 28 Temik treatment.

Aphids

Data on control of aphids were obtained for all materials evaluated for lygus bug control. Of the insecticides evaluated, the most effective in controlling the spotted alfalfa aphid were UniRoyal K840 and Lorsban. UniRoyal K840 was used at a rate of 0.5 lb. AI/A and was combined with Carzol 0.5 or 0.75 AI/A in all experiments. Outstanding control of the spotted alfalfa aphid was obtained in all experiments where UniRoyal K840 was used and aphid populations were held to low levels for periods of three weeks or more after application. The addition of a surfactant (Uni-1141A) to the Carzol-K840 combination did not appear to enhance aphid control.

Lorsban was evaluated at rates 0.5 and 1.0 lb. AI/A. It was used alone and in a combination of Carzol 0.5 + Lorsban 1.0 lb. AI/A. Lorsban did not appear to be as effective as UniRoyal K840 in controlling the spotted alfalfa aphid but results with Lorsban were excellent and aphid populations were held to very low levels for periods of up to 20 days after application. Data with this material are limited but there would seem to be little difference in the control obtained with the two rates of 0.5 and 1.0 lb. AI/A.

A combination of Lannate 0.75 + TEPP 1.0 lb. AI/A was also effective in controlling the spotted alfalfa aphid. Experience with this combination was limited to three trials involving plots previously treated with other matierals that had failed to control the spotted alfalfa aphid. The Lannate-

TEPP combination was effective in the three tests and held aphid populations to low levels for 13 days after application. It is conceivable that longer residual effects would have been noted had it been possible to prolong the experiments. The effectiveness of this combination is of interest because neither Lannate nor TEPP alone is effective in controlling the spotted alfalfa aphid. The combining of these materials may have produced a synergistic effect. Further studies will be conducted.

In an early experiment, in June, Bay Hox 1901 and dimethoate appeared to suppress the spotted alfalfa aphid. In this same experiment Monitor and Vydate at 0.5 and 0.75 lb. AI/A respectively, did not control the spotted alfalfa aphid and these materials appeared to have possibly stimulated the aphid populations. Spotted alfalfa aphid populations doubled during a six-day period where a second application of Monitor was made to a plot previously treated with this material. In a later experiment Vydate at 0.5 lb. AI/A did not control the spotted alfalfa aphid; a 75% increase in the population was noted 6 days after application and the population had increased 131 per cent 13 days after application. Combinations of Carzol with Thiodan, Lannate, TEPP and Vydate did not control the spotted alfalfa aphid. In the season-long treatment timing experiment for lygus bug control, mentioned earlier, it became necessary to substitute other treatments for the Carzol-Thiodan combination to prevent severe spotted alfalfa aphid damage from occurring.

It was not possible to evaluate the effectiveness of SD8832 and Temik applied to the soil as a control for the spotted alfalfa aphid. The alfalfa variety used in this experiment was resistant to the spotted alfalfa aphid.

The pea aphid was present in early April when the experiment was begun but the population declined rapidly in the untreated check as well as in the treated plots. There were no discernible differences between the treatments and the check.

Although UniRoyal K840 provided excellent control of the spotted alfalfa aphid, it appears that UniRoyal does not intend to proceed with further development of this material at the present time. Markets do not appear sufficient to justify expenditures for its development and manufacture. Research emphasis in 1975 will therefore be placed on Carzol-Lorsban combinations and combinations of Lannate-TEPP. New aphicides will be evaluated as they become available.

Spider Mites

The effects of insecticide applications on spider mite populations were evaluated in three experiments. The Carzol combinations all resulted in excellent control of spider mites. While some mites could be found in plots treated with Carzol the numbers were very low after treatment and they remained low for periods of up to 30 days after treatment. Repeated applications of Carzol in combination with Thiodan or UniRoyal K840 in the insecticide timing experiment for lygus bug control held mite populations to very low levels for the entire season. Bay Hox 1901, dimethoate, Monitor and Vydate as applied for lygus bug control, did not control spider mites. Heavy mite populations developed in plots treated with Monitor and with Vydate.

Lorsban did not appear to be highly effective in controlling spider mites but populations did not increase greatly where this material was used.

Spider mite populations were low until about August 6 in the experiment where SD8832 and Temik were applied to the soil. It would appear from the populations occurring in the check and treatments during August that the treatments may have reduced the mite populations. However, differences between the treatments are slight. The seasonal population curve for the untreated check shows the highest mite numbers occurring during the month of August with the population peak occurring on August 20.

Consperse stink bug

Stink bug populations were measured in six alfalfa seed fields on the west side of the San Joaquin Valley on three dates, May 14-18 , July 9-10 and September 4-24. In late September seven additional fields were surveyed bringing the total to 13. The stink bug populations were sampled by using the "beating pan" technique developed in 1971 where five pan samples (25 feet of row) were examined in each field on each sampling date. Extremely low populations were encountered in these fields. No stink bugs were found in any of the fields at the May sampling. A total of only 4 nymphs were found in July. In September, eight of the 13 fields had very small populations consisting mostly of nymphs.

Seed samples were hand harvested from each of the eight infested fields just prior to harvest. Seeds from these samples were examined for sucking insect damage and other injuries. Damage attributed to the stink

bug was in keeping with the low populations observed in the sampling areas and ranged from 0 to 2.2% averaging approximately 1.04%.

Because of the generally low stink bug populations in seed alfalfa fields, no experiments were conducted with insecticides for their control. The populations were not sufficiently high over large enough areas to permit adequate insecticide evaluations.

Effects of Insecticides on Beneficial Insect Species

In each of the lygus bug and aphid control experiments, data were obtained on the effects of the various insecticides on 9 groups of predatory or parasitic arthropods. Much data were gathered and it is difficult to generalize but it would appear that all of the treatments, with the exception of SD8832 and Temik applied to the soil, had drastic effects on populations of the predatory species. Orius, Nabis and spiders appeared to survive some of the treatments better than other predators but even these populations were severely reduced. In the season-long insecticide timing experiment for lygus bug control, repeated applications of Carzol + Thiodan and applications of TEPP, Lorsban and Lannate + TEPP virtually eliminated the spiders as well as the other beneficial species.

One of the purposes of the large untreated check area associated with the Temik and SD8832 experiment was to study populations of predatory arthropods in the absence of insecticides. The species were sampled with a D-Vac suction machine at weekly intervals from April 2 to September 24. Following harvest in late September, sampling was resumed and is continuing at bi-weekly intervals throughout the winter. The collections are placed in Berlese separatory funnels to remove the insects from plant debris taken in the samples. The insects are then counted and recorded. The following groups of insects are recorded as to numbers of adults and larvae or nymphs: Orius (miute pirate bugs), Geocoris (big eyed bugs), Nabis (damsel bugs), lacewings, syrphid flies, coccinellid beetles (lady beetles), collops beetles, spiders and parasitic wasps. The populations of each group occurring through September 24 are shown in tables and graphs accompanying this report.

Predators occurring in the largest numbers throughout the period were Orius, Nabis, and spiders.

Small Hymenoptera (wasps), many of which are believed to be parasitic, were also present in fairly high numbers. The minute pirate bug, Orius, was abundant from June 11 through July 23. The population of Orius reached a peak on July 9 with smaller peaks on June 11 and July 23. Nabis was present in moderate numbers from June 11 through August 6. Peak numbers of Nabis occurred on June 11 and July 9. Geocoris was present in relatively small numbers throughout the season. The peak population of Geocoris occurred on September 11 with smaller peaks on July 9, August 6 and August 27. The spider population was greatest on July 23 with smaller peaks occurring on July 9, August 6 and September 11.

Lacewings, syrphid flies, lady beetles and Collops beetles were almost totally absent. These insects prey on aphids and the aphid populations were extremely low owing to the fact that the alfalfa variety was aphid resistant.

It is significant to note that although insecticides were not applied to the check area the predators were unable to effectively cope with the lygus bug populations. It will be of interest to determine if predator populations will increase sufficiently in subsequent years, in the absence of insecticides, to reduce lygus bug populations.



LYGUS

Lygus bug populations in seed alfalfa plots treated with insecticide sprays applied by aircraft. John Maitia, Firebaugh, California, 1974.

Treatment 1/		Days after application 3/	Number of lygus bugs per sweep 4/		
Insecticide 2/	AI/ Acre Lb		Adults	Nymphs	Total
		Pre	0.20	5.60	5.80
		1	0.45	1.50	1.95
Bay Hox	0.5	6	0.75	0.95	1.70
1901		13	1.60	4.05	5.65
		20	1.00	5.85	6.85
		Pre	0.80	4.70	5.50
Carzol plus	0.5	1	0.00	0.15	0.15
Thiodan	1.0	6	0.20	0.10	0.30
		13	0.05	0.45	0.50
		20	0.45	3.10	3.55
		27	1.35	5.45	6.80
		Pre	0.90	5.35	6.25
Carzol plus	0.5	1	0.20	1.15	1.35
UniRoyal K840	0.5	6	0.35	1.05	1.40
		13	0.60	3.60	4.20
		20	0.95	7.30	8.25
		Pre	0.30	4.60	4.90
Dimethoate	0.5	1	0.00	0.15	0.15
		6	0.30	0.05	0.35
		13	0.15	2.00	2.15
		20	0.55	3.55	4.10
		Pre	0.45	4.35	4.80
Lorsban	1.0	1	0.00	0.00	0.00
		6	0.10	0.05	0.15
		13	0.20	2.10	2.30
		20	0.65	4.55	5.20
		6	1.90	1.25	3.15
		13	0.40	10.9	11.3
		Pre	0.50	4.70	5.20
Lorsban	1.0	1	0.00	0.05	0.05
Plus		6	0.15	0.05	0.20
buffer-X		13	0.25	1.65	1.90
(1 pt./100 gal.)		20	0.70	5.30	6.00

Treatment 1/		Days after application 3/	Number of lygus bugs per sweep 4/		
Insecticide 2/	AI/ Acre Lb		Adults	Nymphs	Total
Monitor	0.5	Pre	1.55	7.90	9.45
		1	0.20	0.00	0.20
		6	0.15	0.05	0.20
		13	0.25	0.75	1.00
		20	0.90	2.90	3.80
		27	0.75	4.55	5.30
		6	0.35	0.05	0.40
		13	0.00	0.65	0.65
Vydate	0.75	Pre	0.85	7.55	8.40
		1	0.15	0.05	0.20
		6	0.00	0.00	0.00
		13	0.05	0.55	0.60
		20	0.60	0.60	1.20
		27	0.35	1.95	2.30
		34	1.10	20.8	21.9

1/ Plot size: each treatment 5 acres (165' x 1320').

2/ Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated June 12 from 3:00 to 5:30 A.M. The Lorsban plot was retreated on July 3 from 4:35 to 4:40 A.M. The Monitor plot was retreated on July 10 from 5:15 to 5:20 A.M.

3/ Pretreatment counts were made June 11.

4/ Average of 20 sweeps per treatment on each sampling date.

Lygus bug populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Paul and Roland Crevolin, Firebaugh, California, 1974.

Treatment [1]		Number of lygus bugs per sweep [3]								
Insecticide [2]	AI/ Acre lb	July 23 - Pre			July 30 - 6 days			August 6 - 13 days		
		Adults	Nymphs	A&N	Adults	Nymphs	A&N	Adults	Nymphs	A&N
Carzol + Lorsban	0.5 1.0	0.9	8.6	9.5	0.7	0.6	1.3	0.8	6.5	7.3
Carzol + Lannate	0.5 0.75	0.4	6.6	7.0	0.4	0.7	1.1	1.1	7.9	9.0
Carzol + Tepp	0.5 1.0	0.6	3.1	3.7	0.2	0.2	0.4	0.4	2.0	2.4
Carzol + Thiodan	0.5 1.0	1.4	10.7	12.1	1.1	0.8	1.9	2.0	15.7	17.7
Carzol + UniRoyal K840 without surfactant	0.5 0.5	1.3	9.8	11.1	1.0	1.0	2.0	4.0	18.9	22.9
Carzol + UniRoyal K840 plus surfactant 4.5 oz/10 gal. [4]	0.5 0.5	1.1	9.7	10.8	1.3	1.5	1.8	3.4	22.6	26.0
Carzol + Vydate	0.5 0.75	0.6	8.1	8.7	0.3	0.2	0.5	0.3	0.6	0.9

[1] Plot size: Each treatment 5 acres (165' x 1320').

[2] Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated July 24 from 5:00 to 6:00 A.M.

[3] Average of 20 sweeps per treatment on each sampling date.

[4] Surfactant = UNI - 1141A
JEB 070174-1
(Lot No. BL 7003)

Lygus bug populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. John Nakamura, Firebaugh, California, 1974.

Treatment 1/		Number of lygus bugs per sweep 3/								
Insecticide 2/	AI/ Acre lb	Aug. 13-Pretreat			Aug. 20-6 days			Aug. 27-13 days		
		Adults	Nymphs	A&N	Adults	Nymphs	A&N	Adults	Nymphs	A&N
Carzol + Thiodan	0.5 1.0	0.6	0.3	0.9	0.2	0.1	0.3	0.2	0.9	1.1
Carzol + UniRoyal K840	0.75 0.5	1.2	1.5	2.7	0.1	0.2	0.3	0.3	1.1	1.4
Lorsban	0.5	1.5	0.4	1.9	0.8	1.3	2.1	1.4	40.1	41.5
Lorsban	1.0	1.2	1.1	2.3	0.3	0.6	0.9	0.8	23.0	23.8
Vydate	0.5	0.7	0.3	1.0	0.3	0.0	0.3	0.3	0.9	1.2

1/ Plot size: Each treatment 5 acres (165' x 1320').

2/ Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated August 14 from 4:55 to 5:50 A.M.

3/ Average of 20 sweeps per treatment on each sampling date.

Lygus bug populations in a seed alfalfa plot where insecticides were applied at counts of 4 to 6 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatments [1]		Dates of Applications [2]	Days After Applications [3]	Number of lygus bugs per sweep [4]					
Insecticides	AI/Acre Lb.			Adults	Nymphs				Adults & Nymphs
					Small	Medium	Large	Total	
			Pre	0.4	2.0	1.5	0.8	4.3	4.7
Carzol +	0.5	June 12	1	0.1	0.0	0.0	0.1	0.1	0.2
Thiodan	1.0		6	0.1	0.0	0.0	0.0	0.0	0.1
			13	0.4	0.3	0.0	0.1	0.4	0.8
			20	0.5	0.5	1.3	0.3	2.2	2.7
			27	1.2	3.2	0.8	0.9	4.9	6.1
Carzol +	0.5	July 10	6	0.3	0.1	0.0	0.2	0.3	0.6
Thiodan	1.0		13	0.3	0.3	0.5	0.1	0.9	1.2
		*	20	0.4	3.1	0.3	0.4	3.8	4.2
Carzol +	0.5	July 31	6	0.2	0.2	0.0	0.2	0.4	0.6
Thiodan	1.0	*	13	0.4	0.2	0.0	0.0	0.2	0.6
			20	0.2	1.3	0.5	0.0	1.8	2.0
			27	0.7	1.5	1.8	2.2	5.5	6.2
Lannate +	0.75	Aug. 28	6	0.9	0.0	0.0	0.3	0.3	1.2
Tepp	1.0								

1/ Plot size: 10 acres (330' x 1320').

2/ Applications were made by aircraft at 10 GPA. Two additional treatments (*) were required to control high populations of the spotted alfalfa aphid; Tepp at 1.0 lb. per acre was used on July 24 and Lorsban at 0.5 and 1.0 lb. per acre (5 acres each) was used on August 7. The Lorsban treatment may have extended the time before the next required lygus bug treatment.

3/ Pretreatment counts were made on June 11.

4/ Average of 20 sweeps on each sampling date.

Lygus bug populations in a seed alfalfa plot where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatment 1/				Number of lygus bugs per sweep 4/					
Insecticide	AI/Acre Lb.	Dates of Applications 2/	Days After Applications 3/	Adults	Nymphs				Adults & Nymphs
					Small	Medium	Large	Total	
			Pre	0.8	2.7	1.3	0.7	4.7	5.5
Carzol +	0.5	June 12	1	0.0	0.1	0.1	0.1	0.3	0.3
Thiodan	1.0		6	0.2	0.0	0.0	0.1	0.1	0.3
			13	0.1	0.2	0.1	0.1	0.4	0.5
			20	0.5	0.9	1.6	0.6	3.1	3.6
			27	1.3	3.4	0.8	1.3	5.5	6.8
			34	1.0	3.6	5.4	2.3	11.3	12.3
Carzol +	0.5	July 17	6	0.2	0.1	0.1	0.1	0.3	0.5
Thiodan	1.0	*	13	1.4	0.7	0.3	0.1	1.1	2.5
			20	0.6	0.4	1.7	0.5	2.6	3.2
		*	27	0.1	0.1	0.1	0.1	0.3	0.4
			34	0.5	5.6	2.7	0.0	8.3	8.8
Lannate +	0.75	Aug. 21	6	0.2	0.0	0.1	0.3	0.4	0.6
Tepp	1.0		13	0.4	0.2	0.6	0.0	0.8	1.2

1/ Plot size: 10 acres (330' x 1320').

2/ Applications were made by aircraft at 10 GPA. Two additional treatments (*) were required to control high populations of spotted alfalfa aphid; Tepp at 1.0 lb. per acre was used on July 24 and Lannate + Tepp at 0.75 + 1.0 lb. per acre was used on August 7. Although the Lannate + Tepp treatment was not necessary for lygus bug control it did reduce lygus bug populations and no doubt extended the time before the next required treatment.

3/ Pretreatment counts were made on June 11.

4/ Average of 20 sweeps on each sampling date.

Lygus bug populations in a seed alfalfa plot where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatment 1/			Days	Number of lygus bugs per sweep 4/					
Insecticide	AI/Acre Lb.	Dates of Applications 2/	After Applications 3/	Adults	Nymphs				Adults & Nymphs
					Small	Medium	Large	Total	
			Pre	0.9	3.5	1.6	0.3	5.4	6.3
Carzol +	0.5	June 12	1	0.2	0.4	0.7	0.1	1.2	1.4
UniRoyal K840	0.5		6	0.3	0.1	0.6	0.4	1.1	1.4
			13	0.6	1.9	0.9	0.8	3.6	4.2
			20	1.0	1.5	2.4	3.4	7.3	8.3
Carzol +	0.75	July 3	6	1.3	0.0	0.1	0.2	0.3	1.6
UniRoyal K840	0.5		13	0.4	0.9	0.5	0.1	1.5	1.9
			20	0.3	0.6	0.3	1.7	2.6	2.9
			27	2.3	1.4	0.8	0.3	2.5	4.8
			34	1.7	1.9	3.1	0.8	5.8	7.5
Carzol +	0.75	Aug. 7	6	0.3	0.3	0.1	0.3	0.7	1.0
UniRoyal K840	0.5		13	0.5	0.2	0.7	0.4	1.3	1.8
			20	0.3	0.0	0.2	0.7	0.9	1.2
			27	0.4	0.0	0.3	0.1	0.4	0.8

1/ Plot size: 5 acres (165' x 1320').

2/ Applications were made by aircraft at 10 GPA.

3/ Pretreatment counts were made on June 11.

4/ Average of 20 sweeps on each sampling date.

Good and defective seeds in samples from seed alfalfa plots where sweep net lygus bug counts were used to time insecticide applications. John Maitia, Firebaugh, California, 1974.

Treatment 1/	Samples 2/	Total Seeds Exam.	Good Seed	Defective Seeds						
				Chalcid	Lygus bug	Stink bug	Shriveled	Water damaged	Green	Other
	1	809	783	0	9	5	4	4	4	0
K	2	766	744	3	15	4	0	0	0	0
	3	839	816	1	15	6	0	1	0	0
4-6/sweep	4	819	770	1	21	21	2	1	3	0
	Totals	3233	3133	5	60	36	6	6	7	0
	%	100	96.3	0.15	1.9	1.1	0.19	0.19	0.22	0.00
	1	762	741	1	6	10	0	4	0	0
L	2	828	784	3	24	14	0	3	0	0
	3	799	759	1	23	11	0	0	5	0
8-12/sweep	4	824	789	1	20	9	0	2	3	0
	Totals	3213	3073	6	73	44	0	9	8	0
	%	100	95.6	0.19	2.3	1.3	0.00	0.28	0.25	0.00
	1	734	684	3	33	6	0	3	5	0
M	2	774	736	2	20	10	0	4	2	0
	3	754	698	12	23	11	0	8	2	0
8-12/sweep	4	778	727	5	25	18	1	2	0	0
	Totals	3040	2845	22	101	45	1	17	9	0
	%	100	93.6	0.7	3.3	1.5	0.03	0.3	0.30	0.00

1/ Insecticide applications -

K - Applied at lygus bug counts of 4 to 6 per sweep as follows: Carzol 0.5 plus Thiodan 1.0 lb. AI per acre on June 12, July 10 and July 31. Lannate 0.75 plus Tepp 1.0 AI per acre on August 28. Two additional treatments were required to control high populations of spotted alfalfa aphid, Tepp 1.0 lb. AI per acre on July 24 and Lorsban 0.5 and 1.0 lb. per acre (5 acres each) on August 7. Plot size 10 acres.

L - Applied at lygus bug counts of 8 to 12 per sweep as follows: Carzol 0.5 plus Thiodan 1.0 lb. AI per acre on June 12 and July 17, Lannate 0.75 plus Tepp 1.0 lb. AI per acre on August 21. Two additional treatments were required to control high populations of spotted alfalfa aphid, Tepp 1.0 AI per acre on July 24 and Lannate 0.75 plus Tepp 1.0 lb. per acre on August 7. Plot size 10 acres.

M - Applied at lygus bug counts of 8 to 12 per sweep as follows: Carzol 0.5 plus UniRoyal K840 0.5 lb. AI per acre on June 12 and Carzol 0.75 plus UniRoyal K840 0.5 Lb. AI per acre on July 3 and August 7. Plot size 5 acres.

2/ Four samples of pods, approximately 1 quart each, were hand stripped from plants in each plot prior to commercial harvest. Samples were hand threshed and lightly cleaned in a clipper seed cleaner. Counts based on 4 subsamples from each of the threshed samples.

Note: The center 16 rows of each plot were harvested with commercial equipment on September 23. Calculated weights of seed (lbs. per acre) from each harvested area were:

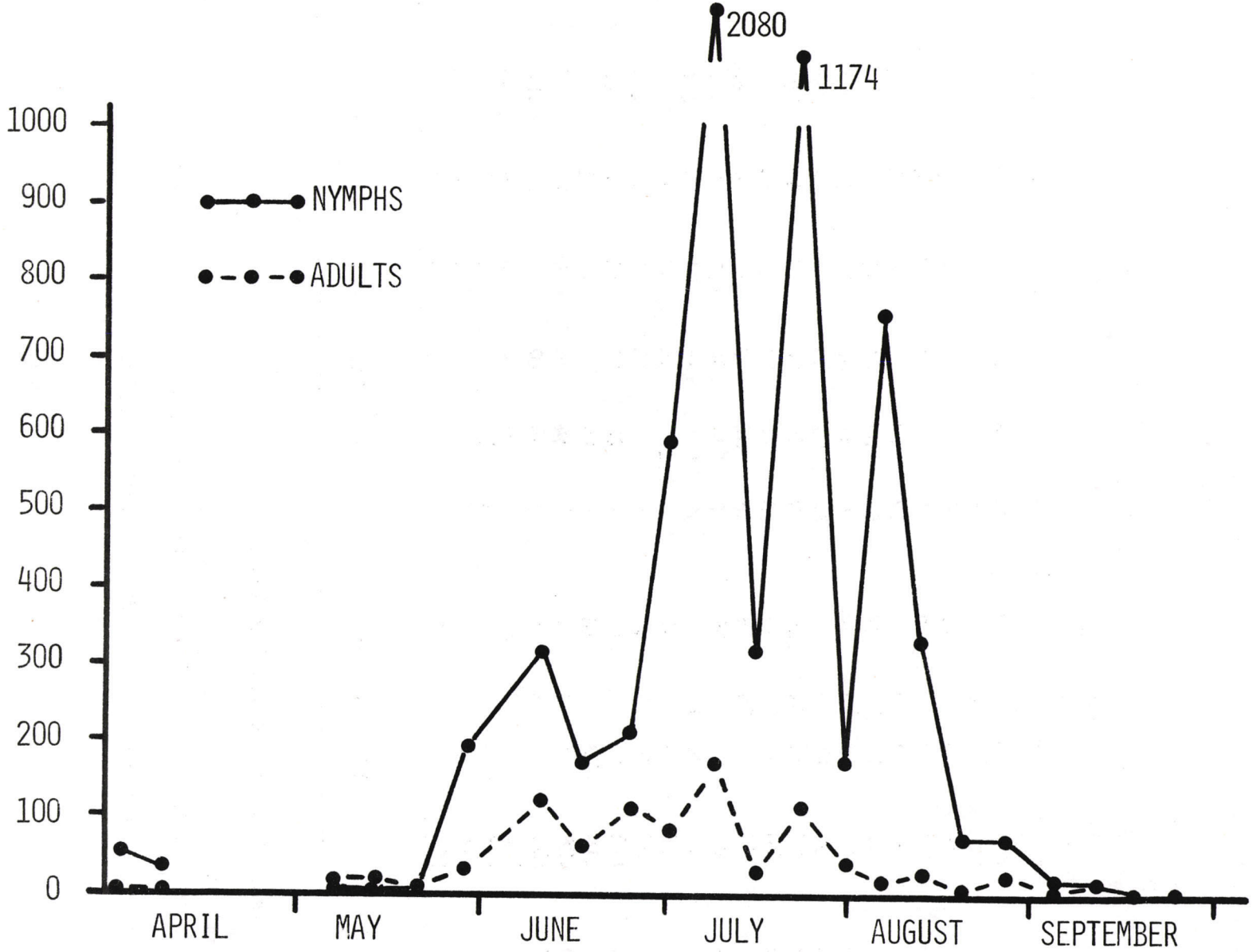
	Uncleaned seed	Cleaned seed
K =	1,230	1,160
L =	1,044	973
M =	1,031	949

Lygus bug populations in an untreated seed alfalfa plot. Firebaugh, California, 1974. 1/

Date Sampled	Number per 50 D-Vac Samples 2/									
	Adults			Nymphal Instars						Adults & Nymphs
	♂	♀	Total	1	2	3	4	5	Total	
April 2	0	1	1	29	14	12	2	0	57	58
9	3	0	3	5	15	7	7	0	34	37
May 7	6	3	9	1	0	0	1	0	2	11
14	11	4	15	0	0	3	0	0	3	18
21	0	2	2	1	1	1	0	0	3	5
28	16	17	33	19	92	60	13	7	191	224
June 5	-	-	-	-	-	-	-	-	-	wet
11	63	57	120	10	71	57	67	111	316	436
18	32	26	58	11	53	43	32	32	171	229
25	78	32	110	16	79	45	29	34	203	313
July 2	46	36	82	66	250	132	76	64	588	670
9	122	46	168	88	822	626	358	186	2080	2248
16	20	6	26	26	94	78	70	40	308	334
23	52	58	110	96	496	332	158	92	1174	1284
30	16	20	36	4	52	42	42	24	164	200
Aug. 6	12	6	18	90	296	172	126	74	758	776
13	14	8	22	16	92	80	78	56	322	344
20	0	0	0	2	24	18	24	2	70	70
27	10	12	22	2	22	22	18	6	70	92
Sept. 4	0	0	0	0	8	4	2	2	16	16
11	6	4	10	0	2	4	4	2	12	22
17	2	0	2	0	0	0	0	0	0	2
24	0	0	0	0	0	0	0	0	0	0
Seasonal totals	509	338	847	482	2483	1738	1107	732	6542	7389

1/ Plot size: 2.37 acres (253' x 408'). Plot was irrigated on April 29 and June 2.

2/ 5-10 suck D-Vac samples were taken on each sampling date.



LYGUS BUG POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD, FIREBAUGH, CALIFORNIA 1974.

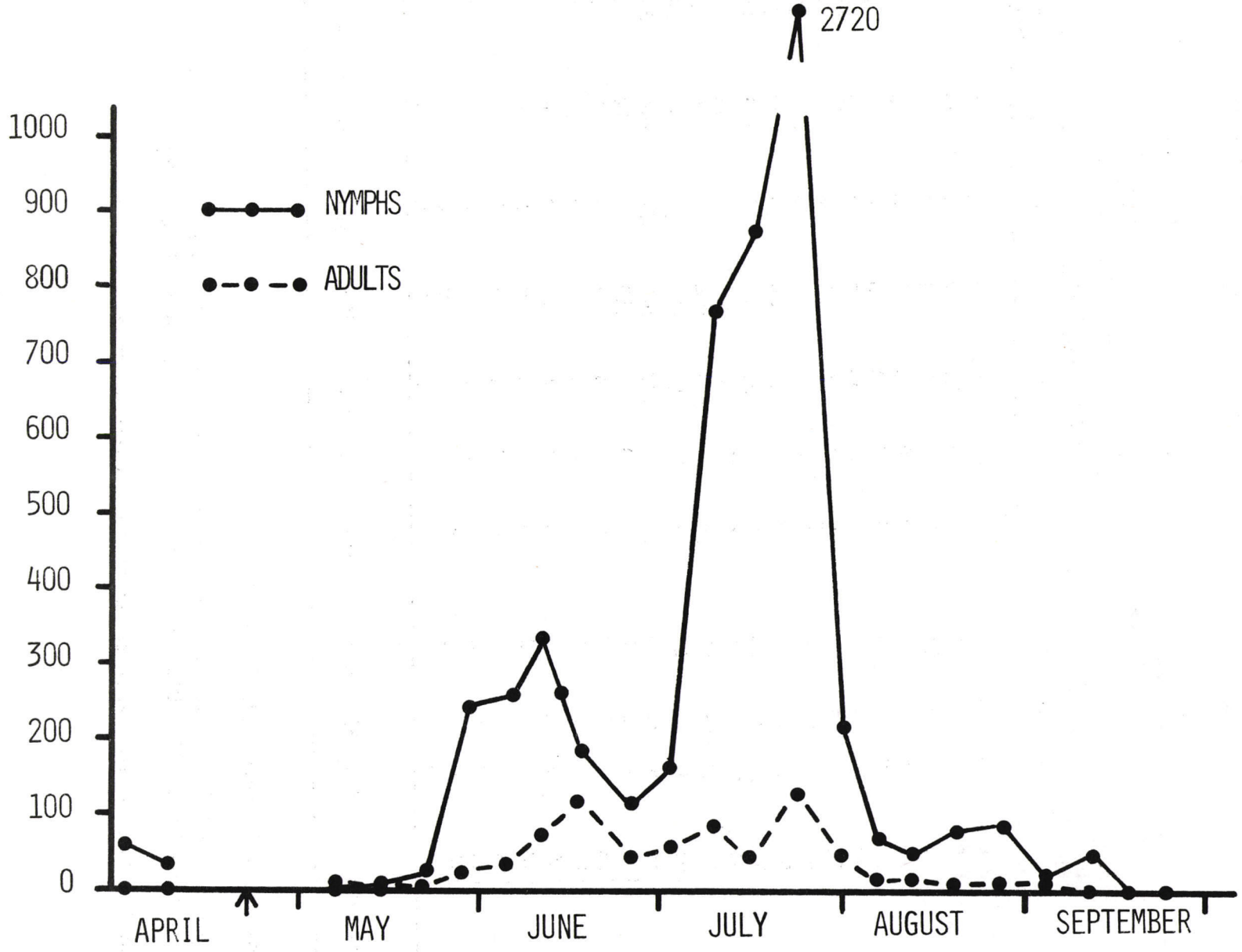
Lygus bug populations in a seed alfalfa plot treated with granular SD 8832 applied to the soil on April 23, Firebaugh, California, 1974. 1/

Date Sampled	Days after application 2/	Number per 50 D-Vac Samples 3/									
		Adults			Nymphal Instars						Adults & Nymphs
		♂	♀	Total	1	2	3	4	5	Total	
April 2	Pre	0	0	0	23	16	15	7	0	61	61
9	Pre	1	0	1	5	13	6	7	4	35	36
May 7	14	4	7	11	0	0	0	0	1	1	12
14	21	3	5	8	1	1	1	0	0	3	11
21	35	4	5	9	12	12	2	0	0	26	35
28	42	15	12	27	58	107	64	13	6	248	275
June 5	50	9	25	34	6	51	66	74	61	258	292
11	56	41	33	74	27	91	55	68	94	335	409
18	63	64	52	116	9	50	34	49	50	192	308
25	70	30	15	45	13	41	27	19	13	113	158
July 2	77	24	34	58	16	82	48	10	4	160	218
9	84	50	36	86	92	324	184	118	52	770	856
16	91	28	14	42	98	436	186	94	56	870	912
23	98	78	54	132	176	1230	784	330	200	2720	2852
30	105	30	14	44	18	56	40	64	34	212	256
Aug. 6	112	10	2	12	6	26	12	12	12	68	80
13	119	12	6	18	4	14	4	14	12	48	66
20	126	6	2	8	2	34	26	6	10	78	86
27	133	4	4	8	6	34	10	10	26	86	94
Sept. 4	141	8	2	10	2	10	2	0	6	20	30
11	148	0	0	0	4	16	16	12	2	50	50
17	154	2	2	4	0	0	0	0	0	0	4
24	161	0	0	0	0	0	0	0	2	2	2
Seasonal totals		423	324	747	578	2644	1582	907	645	6356	7103

1/ Plot size: 2.37 acres (253' x 408').

2/ SD 8832 10% granules were applied at 3.0 lb. AI per acre with a 6-row commercial applicator on April 23. Plot was furrow irrigated on April 27 and May 30.

3/ 5-10 suck D-Vac samples were taken on each sampling date.



LYGUS BUG POPULATIONS IN A SEED ALFALFA FIELD TREATED WITH GRANULAR SD 8832 APPLIED TO THE SOIL ON APRIL 23. FIREBAUGH, CALIFORNIA 1974.

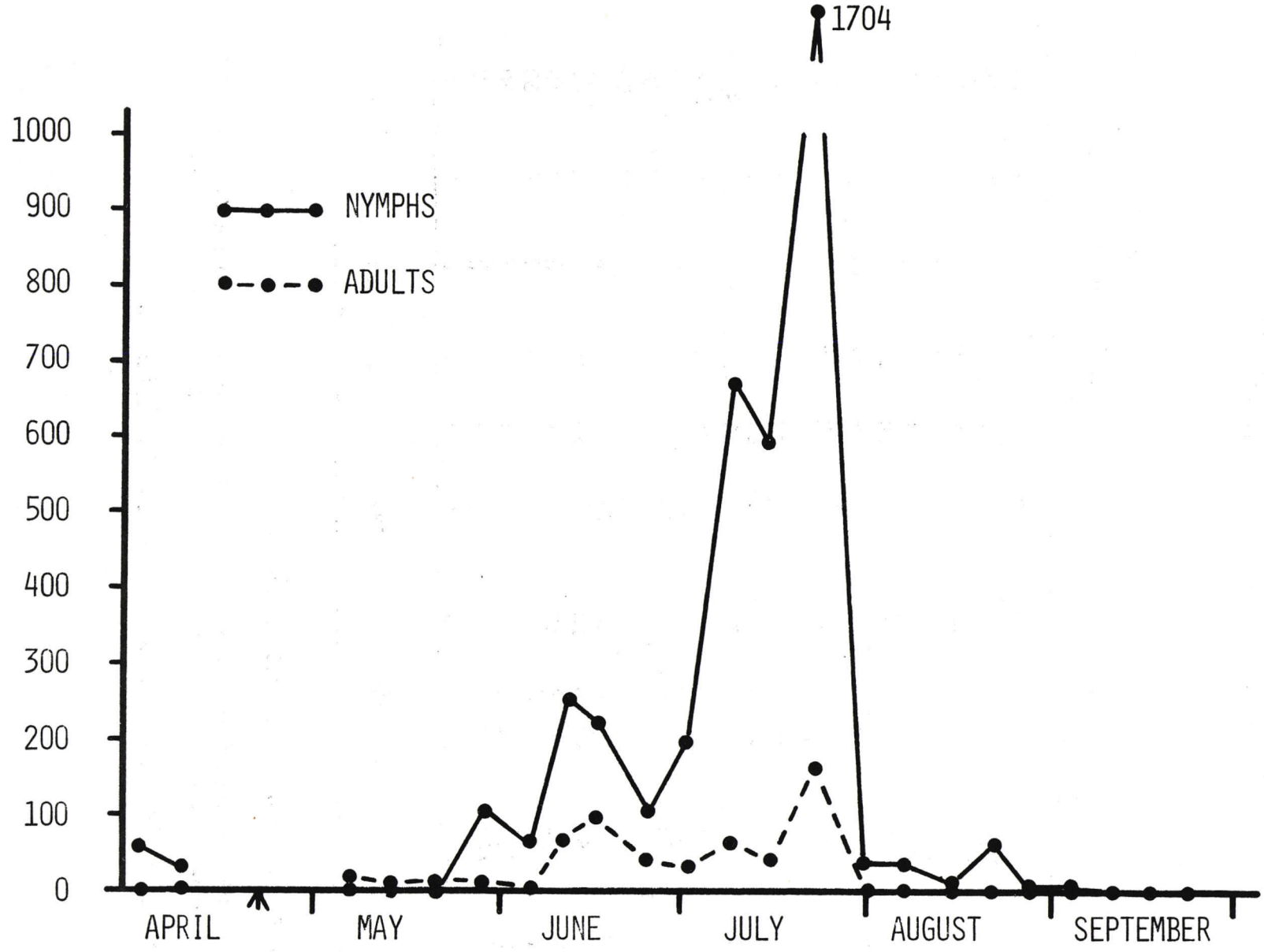
Lygus bug populations in a seed alfalfa plot treated with Temik 10G applied to the soil on April 23, Firebaugh, California, 1974. 1/

Date sampled	Days after application 2/	Number per 50 D-Vac Samples 3/									
		Adults			Nymphal Instars						Adults & Nymphs
		♂	♀	Total	1	2	3	4	5	Total	
April 2	Pre	0	0	0	23	16	15	7	0	61	61
9	Pre	1	1	2	6	8	11	7	1	33	35
May 7	14	9	5	14	0	0	0	3	1	4	18
14	21	8	5	13	0	0	0	0	0	0	13
21	35	8	9	17	6	2	0	0	0	8	25
28	42	10	7	17	12	63	30	7	0	112	129
June 5	50	1	7	8	1	14	16	21	16	68	76
11	56	43	32	75	11	80	57	52	58	258	333
18	63	60	41	101	7	56	47	49	69	228	329
25	70	24	20	44	6	44	23	18	12	103	147
July 2	77	22	16	38	6	72	60	44	16	198	236
9	84	40	28	68	70	302	124	104	74	674	742
16	91	30	14	44	58	204	146	112	76	596	640
23	98	90	76	166	132	572	478	248	274	1704	1870
30	105	0	2	2	2	10	6	10	14	42	44
Aug. 6	112	0	2	2	2	18	4	12	6	42	44
13	119	4	0	4	2	6	2	2	2	14	18
20	126	2	2	4	8	42	4	10	2	66	70
27	133	0	2	2	0	2	4	0	0	6	8
Sept. 4	141	0	4	4	0	2	2	0	2	6	10
11	148	2	6	8	0	0	0	0	0	0	8
17	154	0	0	0	0	0	0	0	0	0	0
24	161	0	4	4	0	0	0	2	0	2	6
Seasonal totals		354	283	637	352	1513	1029	708	623	4225	4862

1/ Plot size: 2.37 acres (253' x 408').

2/ Temik 10% granules were applied at 3.0 lb. AI per acre with a 6-row commercial applicator on April 23. Plot was furrow irrigated on April 28 and May 31.

3/ 5-10 suck D-Vac samples were taken on each sampling date.



LYGUS BUG POPULATIONS IN A SEED ALFALFA PLOT TREATED WITH TEMIK 10G APPLIED TO THE SOIL ON APRIL 23. FIREBAUGH, CALIFORNIA 1974.

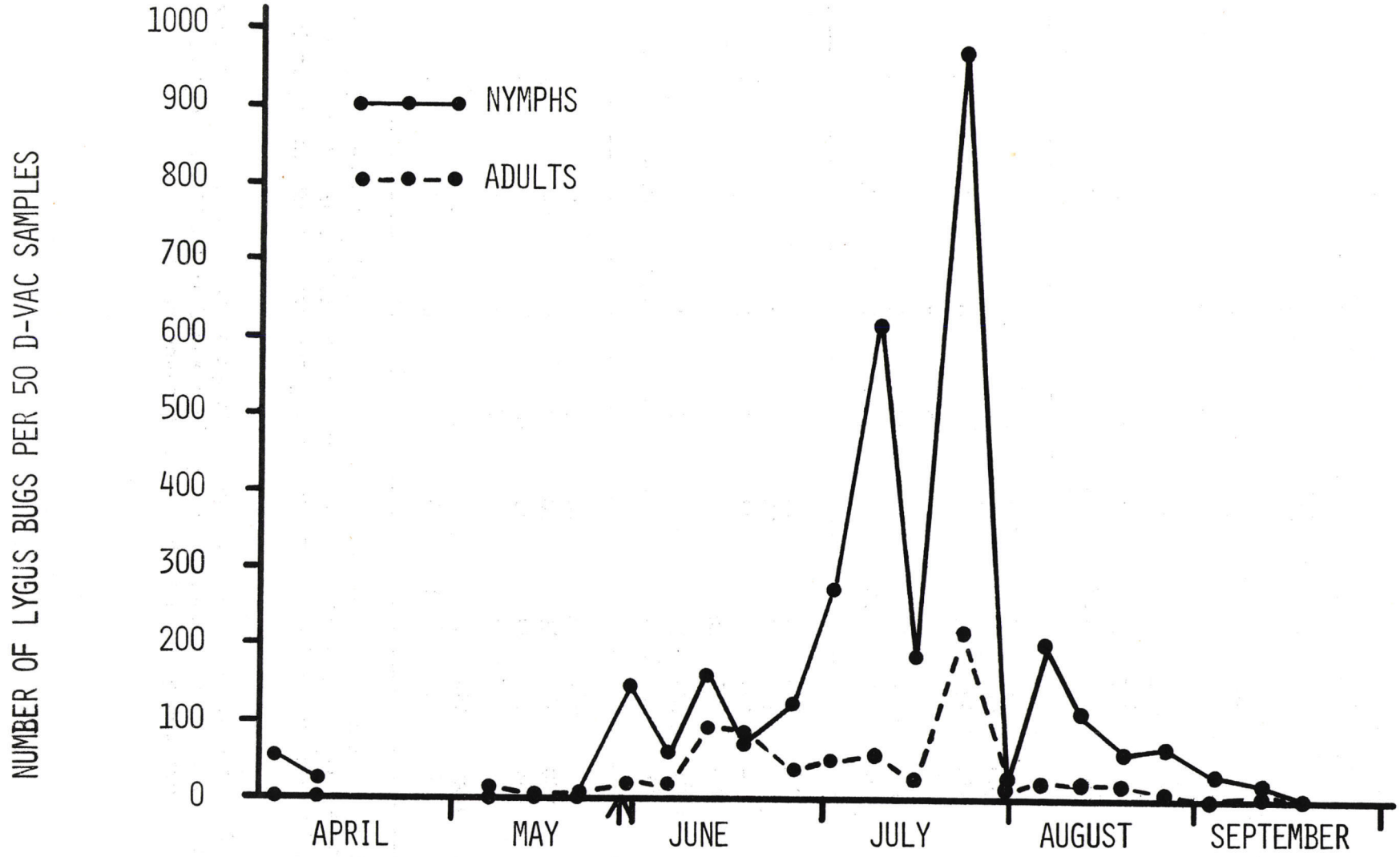
Lygus bug populations in a seed alfalfa plot treated with Temik 10G applied to the soil on May 28, Firebaugh, California, 1974 1/.

Date Sampled	Days after application 2/	Number per 50 D-Vac Samples 3/									
		Adults			Nymphal Instars						Adults & Nymphs
		♂	♀	Total	1	2	3	4	5	Total	
April 2	Pre	0	0	0	23	16	15	7	0	61	61
9	Pre	0	1	1	1	14	7	2	0	24	25
May 7	Pre	8	7	15	0	1	0	0	1	2	17
14	Pre	5	2	7	3	0	1	0	0	4	11
21	Pre	5	4	9	2	3	0	0	0	5	14
28	Pre	10	14	24	6	78	42	15	5	146	170
June 5	8	10	9	19	1	6	12	19	17	55	74
11	14	54	40	94	9	38	32	38	52	169	263
18	21	49	41	90	5	28	19	12	12	76	166
25	28	26	13	39	17	59	20	15	13	124	163
July 2	35	28	22	50	42	104	50	40	34	270	320
9	42	44	14	58	44	258	134	122	64	622	680
16	49	14	8	22	18	50	52	32	26	178	200
23	56	132	82	214	72	372	210	184	126	964	1178
30	63	4	4	8	4	10	0	2	10	26	34
Aug. 6	70	14	12	26	20	70	46	32	30	198	224
13	77	20	4	24	10	28	22	26	24	110	134
20	84	10	10	20	2	28	14	8	10	62	82
27	91	2	8	10	6	32	18	6	8	70	80
Sept. 4	99	2	0	2	4	12	4	2	8	30	32
11	106	4	4	8	0	4	10	2	4	20	28
17	112	0	2	2	0	0	0	0	0	0	2
24	119	0	0	0	0	0	0	0	0	0	0
Seasonal totals		441	301	742	289	1211	708	564	444	3216	3958

1/ Plot size: 2.37 acres (253' x 408').

2/ Temik 10% granules were applied at 3.0 lb. AI per acre with a 6-row commercial applicator on May 28. Plot was furrow irrigated on April 28 and June 1.

3/ 5-10 suck D-Vac samples were taken on each sampling date.



LYGUS BUG POPULATIONS IN A SEED ALFALFA PLOT TREATED WITH TEMIK 10G APPLIED TO THE SOIL ON MAY 28. FIREBAUGH, CALIFORNIA 1974.

Good and defective seeds in samples from seed alfalfa plots treated with granular insecticides applied to the soil. Firebaugh, California, 1974.

Treatment 1/	Samples 2/	Total seeds exam.	Good seed	Defective Seeds						
				Chalcid	Lygus bug	Stink bug	Shriveled	Water damaged	Green	Other
SD 8832 (4/23)	1	757	593	7	123	14	0	4	16	0
	2	771	603	5	126	24	0	3	10	0
	3	766	540	3	197	20	0	0	6	0
	4	784	602	7	143	24	1	2	4	1
	Totals	3078	2338	22	589	82	1	9	36	1
	%	100	76.0	0.7	19.1	2.7	0.03	0.3	1.2	0.03
Temik (4/23)	1	722	579	5	117	15	0	3	3	0
	2	690	580	5	81	18	0	1	5	0
	3	673	523	6	127	12	0	2	3	0
	4	718	556	0	145	14	0	1	2	0
	Totals	2803	2238	16	470	59	0	7	13	0
	%	100	79.8	0.6	16.8	2.1	0.00	0.2	0.4	0.00
Temik (5/28)	1	691	646	6	28	5	1	0	5	0
	2	715	651	14	38	8	0	1	3	0
	3	748	698	4	38	5	0	1	2	0
	4	780	707	10	51	9	0	0	3	0
	Totals	2934	2702	34	155	27	1	2	13	0
	%	100	92.1	1.2	5.3	0.9	0.03	0.06	0.4	0.00
Check	1	771	674	6	76	11	0	0	4	0
	2	688	591	16	68	7	0	4	2	0
	3	736	624	11	85	10	1	2	3	0
	4	787	697	3	72	8	0	6	1	0
	Totals	2982	2586	36	301	36	1	12	10	0
	%	100	86.7	1.2	10.1	1.2	0.03	0.4	0.3	0.00

1/ Plot size: Each treatment 2.37 acres (253' x 408'). Granular insecticides were applied at 3.0 lb. AI per acre with a 6-row commercial applicator, SD 8832 and Temik on April 23 and Temik on May 28. Plots were irrigated April 27-30 and again May 30-June 2.

2/ Four samples of pods from each plot were hand stripped from plants prior to commercial harvest. Samples were hand threshed and lightly cleaned in a clipper seed cleaner. Counts based on 4 subsamples from each of the threshed samples.



APHID

Spotted alfalfa aphid and pea aphid populations in seed alfalfa plots treated with insecticide to control lygus bugs. John Maitia, Firebaugh, California, 1974.

Treatment 1/		Days after application 3/	Number of aphids per 50 D-Vac samples 4/	
Insecticide 2/	AI/Acre lb		S.A.A.	P.A.
Bay Hox 1901	0.5	Pre	7	21
		1	9	0
		6	10	3
		13	34	19
		20	71	51
Carzol plus Thiodan	0.5 1.0	Pre	35	51
		1	6	1
		6	8	0
		13	18	21
		20	108	125
		27	2,355	61
Carzol plus UniRoyal K840	0.5 0.5	Pre	37	35
		1	1	4
		6	3	0
		13	8	32
		20	18	202
Dimethoate	0.5	Pre	11	39
		1	0	0
		6	9	12
		13	15	21
		20	37	127
Lorsban	1.0	Pre	6	35
		1	0	0
		6	5	2
		13	18	13
		20	39	112
		6	66	12
		13	353	11
Lorsban plus Buffer-X (1 pt./100 gal.)	1.0	Pre	7	35
		1	0	0
		6	10	0
		13	10	16
		20	19	163

Treatment 1/		Days after application 3/	Number of aphids per 50 D-Vac samples 4/	
Insecticide 2/	AI/Acre lb		S.A.A.	P.A.
Monitor	0.5	Pre	10	32
		1	21	8
		6	20	2
		13	31	14
		20	371	463
		27	2,528	48
		6	5,528	0
Vydate	0.75	Pre	3	21
		1	8	3
		6	4	0
		13	10	31
		20	98	689
		27	1,360	240
		34	4,560	112

1/ Plot size: Each treatment 5 acres (165' x 1320').

2/ Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated June 12 from 3:00 to 5:30 A.M. The Lorsban plot was retreated on July 3 from 4:35 to 4:40 A.M. The Monitor plot was retreated on July 10 from 5:15 to 5:20 A.M.

3/ Pretreatment counts were made June 11.

4/ 2-25 suck D-Vac samples per plot on each sampling date.

Spotted alfalfa aphid populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Paul and Roland Crevolin, Firebaugh, California, 1974.

Treatment 1/		Number of aphids per 50 D-Vac samples 3/		
Insecticide 2/	AAI/ Acre lb	July 23 Pre	July 30 6 days	August 6 13 days
Carzol + Lorsban	0.5 1.0	6,556	209	3,264
Carzol + Lannate	0.5 0.75	5,926	2,498	24,148
Carzol + Tepp	0.5 1.0	6,878	3,732	18,304
Carzol + Thiodan	0.5 1.0	6,852	3,268	7,032
Carzol + UniRoyal K840 without surfactant	0.5 0.5	4,152	175	129
Carzol + UniRoyal K840 plus surfactant 4.5 oz/10 gal. 4/	0.5 0.5	4,160	317	421
Carzol + Vydate	0.5 0.75	5,204	1,921	7,040

1/ Plot size: Each treatment 5 acres (165' x 1320').

2/ Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated July 24 from 5:00 to 6:00 A.M.

3/ 2-25 suck D-Vac samples per treatment on each sampling date.

4/ Surfactant = UNI - 1141A
JEB 070174-1
(Lot No. BL 7003)

Spotted alfalfa aphid populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. John Nakamura, Firebaugh, California, 1974.

Treatment 1/		Number of aphids per 50 D-Vac Sample 3/		
Insecticide 2/	AI/ Acre lb	Aug. 13 Pretreatment	Aug. 20 6 days	Aug. 27 13 days
Carzol +	0.5			
Thiodan	1.0	12,308	25,328	42,300
Carzol +	0.75			
UniRoyal K840	0.5	73,176	33	78
Lorsban	0.5	44,156	90	450
Lorsban	1.0	31,976	106	1,234
Vydate	0.5	16,976	29,760	39,296

1/ Plot size: Each treatment 5 acres (165' x 1320').

2/ Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated August 14 from 4:55 to 5:50 A.M.

3/ 2-25 suck D-Vac samples per treatment on each sampling date.

Aphid populations in a seed alfalfa plot where insecticides were applied at counts of 4 to 6 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatment 1/		Dates of Applications 2/	Days After Applications 3/	Number per 50 D-Vac Samples 4/	
Insecticides	AI/Acre Lb.			Spotted Alfalfa Aphid	Pea Aphid
			Pre	5	61
Carzol +	0.5	June 12	1	0	0
Thiodan	1.0		6	24	2
			13	34	19
			20	109	215
			27	1,793	127
Carzol +	0.5	July 10	6	998	7
Thiodan	1.0		13	6,024	31
Tepp	1.0	July 24*	6	5,800	12
Carzol +	0.5	July 31	6	39,712	1
Thiodan	1.0				
Lorsban	0.5	Aug. 7*	6	16	0
			13	128	5
			20	123	0
Lannate +	0.75	Aug. 28	6	42	0
Tepp	1.0				

1/ Plot size: 10 acres (330' x 1320').

2/ Applications were made by aircraft at 10 GPA. * treatments were not needed for lygus bug control but were required because of high populations of spotted alfalfa aphid.

3/ Pretreatment counts were made June 11.

4/ 2-25 suck D-Vac samples on each sampling date.

Aphid populations in a seed alfalfa plot where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

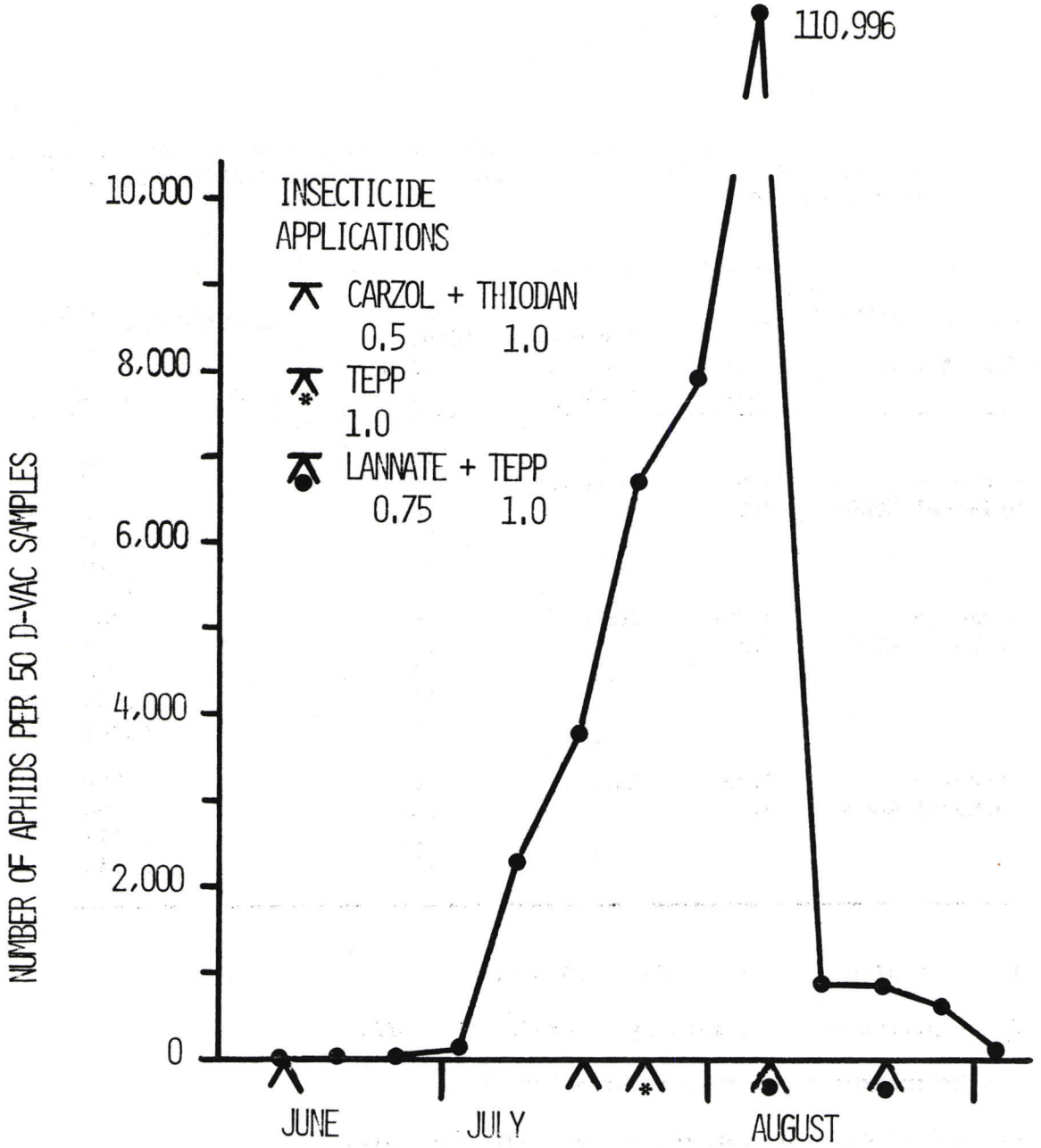
Treatment 1/		Dates of Applications 2/	Days After Applications 3/	Number per 50 D-Vac Samples 4/	
Insecticides	AI/Acre Lb.			Spotted Alfalfa Aphid	Pea Aphid
			Pre	35	51
Carzol +	0.5	June 12	1	6	1
Thiodan	1.0		6	8	0
			13	18	21
			20	108	125
			27	2,355	61
			34	3,800	18
Carzol +	0.5	July 17	6	6,752	15
Thiodan	1.0				
Tepp	1.0	July 24*	6	7,912	3
			13	110,996	1
Lannate +	0.75	Aug. 7*	6	886	30
Tepp	1.0		13	869	0
Lannate +	0.75	Aug. 21	6	636	1
Tepp	1.0		13	116	1

1/ Plot size: 10 acres (330' x 1320').

2/ Applications were made by aircraft at 10 GPA. * treatments were not needed for lygus bug control but were required because of high populations of spotted alfalfa aphid.

3/ Pretreatment counts were made on June 11.

4/ 2-25 suck D-Vac samples on each sampling date.



SPOTTED ALFALFA APHID POPULATION IN A SEED ALFALFA PLOT WHERE INSECTICIDES WERE APPLIED AT COUNTS OF 8 TO 12 LYGUS BUGS PER SWEEP. JOHN MAITIA, FIREBAUGH, CALIFORNIA, 1974.

Aphid populations in a seed alfalfa plot where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatment 1/			Days After Applications 3/	Number per 50 D-Vac Samples 4/	
Insecticides	AI/Acre Lb.	Dates of Applications 2/		Spotted Alfalfa	Pea
			Pre	37	35
Carzol +	0.5	June 12	1	1	4
UniRoyal K840	0.5		6	3	0
			13	8	32
			20	18	202
Carzol +	0.75	July 3	6	380	78
UniRoyal K840	0.5		13	43	2
			20	540	145
			27	1,163	33
			34	14,864	22
Carzol +	0.75	Aug. 7	6	139	22
UniRoyal K840	0.5		13	496	2
			20	123	0
			27	2,153	0

1/ Plot size: 5 acres (165' x 1320').

2/ Applications were made by aircraft at 10 GPA.

3/ Pretreatment counts were made June 11.

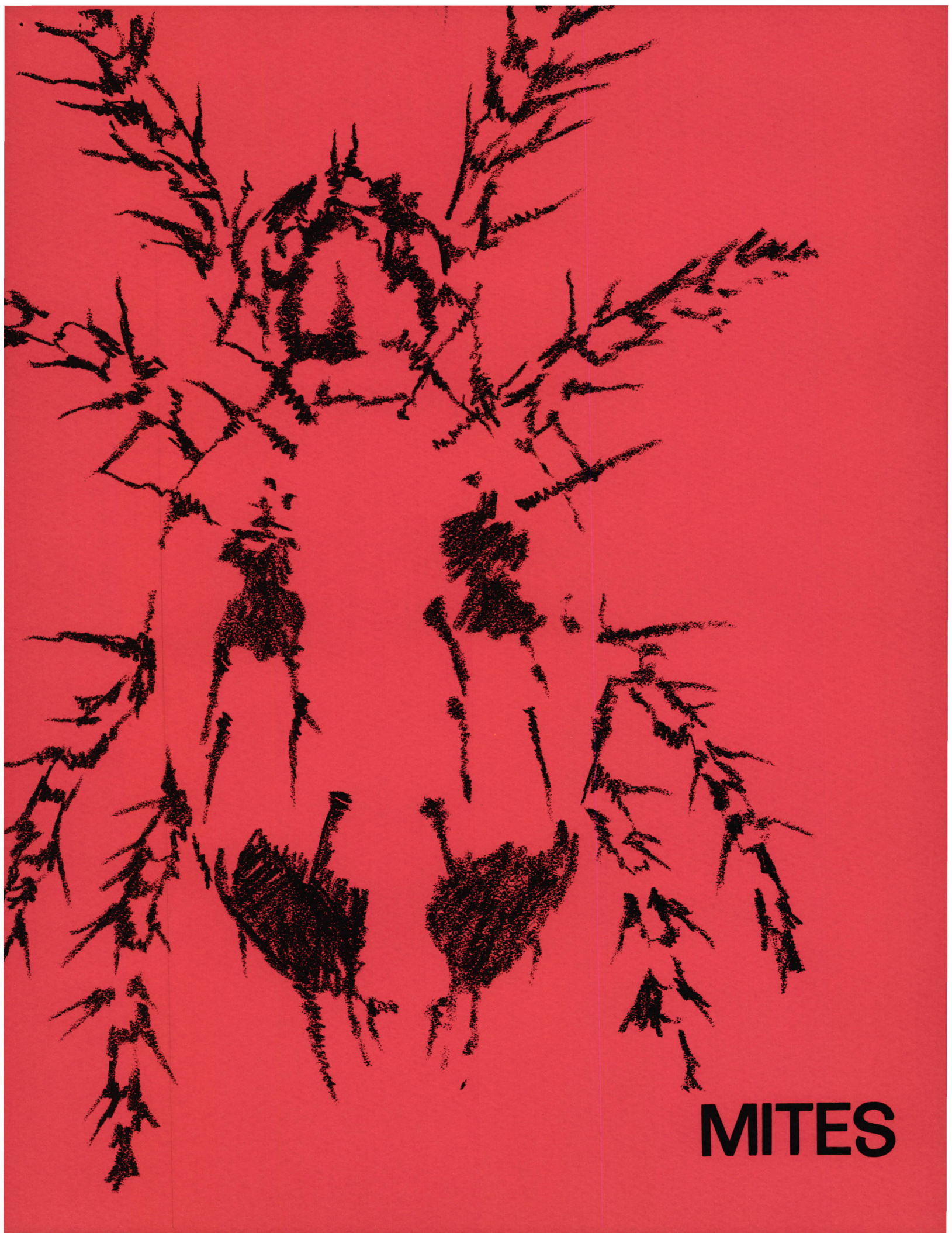
4/ 2-25 suck D-Vac samples on each sampling date.

Spotted alfalfa aphid and pea aphid populations in seed alfalfa plots treated with granular insecticides applied to the soil. Firebaugh, California, 1974. 1/

Date Sampled	Number per 50 D-Vac Samples 2/										
	SD 8832 (4/23)			Temik (4/23)			Temik (5/28)			Untreated	
	Days after applic.	S.A.A.	P.A.	Days after applic.	S.A.A.	P.A.	Days after applic.	S.A.A.	P.A.	S.A.A.	P.A.
April 2	pre	0	2,324	pre	0	2,324	pre	0	2,324	0	2,048
9	pre	0	1,693	pre	0	1,627	pre	0	1,567	0	1,778
May 7	14	1	135	14	0	38	pre	1	153	0	113
14	21	1	376	21	0	39	pre	2	251	1	241
21	35	1	905	35	0	78	pre	1	248	0	69
28	42	0	191	42	0	67	pre	0	118	2	175
June 5	50	1	62	50	0	7	8	0	1	wet	
11	56	0	5	56	6	0	14	0	0	0	8
18	63	3	8	63	2	4	21	1	1	3	10
25	70	7	1	70	11	14	28	12	18	12	33
July 2	77	2	16	77	4	34	35	0	46	12	34
9	84	72	48	84	112	168	42	88	82	84	48
16	91	2	10	91	0	32	49	1	34	0	8
23	98	8	48	98	6	44	56	0	56	0	20
30	105	4	0	105	0	0	63	14	2	0	0
Aug. 6	112	20	0	112	6	0	70	2	16	6	14
13	119	26	0	119	8	0	77	8	4	2	12
20	126	10	2	126	6	0	84	0	16	2	0
27	133	14	2	133	0	2	91	4	0	0	0
Sept. 4	141	22	0	141	26	0	99	12	2	6	0
11	148	2	0	148	64	18	106	48	8	10	2
17	154	14	26	154	24	0	112	6	0	4	0
24	161	6	0	161	18	0	119	0	0	0	0

1/ Plot size: Each treatment 2.37 acres (253' x 408'). Granular insecticides were applied at 3.0 lb. AI per acre with a 6-row commercial applicator, SD 8832 and Temik on April 23 and Temik on May 28. Plots were irrigated April 27-30 and again May 30 - June 2.

2/ 5-10 suck D-Vac samples per treatment on each sampling date.



MITES

Spider mite populations in seed alfalfa plots treated with insecticide sprays applied by aircraft to control lygus bugs. John Maitia, Firebaugh, California, 1974.

Treatment 1/		Dates of applications	Days after applications 3/	Average per leaf 4/	
Insecticides 2/	AI/Acre Lb			Mites	Eggs
Bay Hox 1901	0.5	June 12	Pre	0.66	0.84
			6	4.26	5.70
			13	2.48	2.70
			20	3.00	8.46
Carzol plus Thiodan	0.5 1.0	June 12	Pre	0.06	1.16
			6	0.00	0.92
			13	0.02	0.18
			20	0.36	1.54
			27	0.80	0.32
Carzol plus UniRoyal K840	0.5 0.5	June 12	Pre	0.08	0.20
			6	0.02	0.06
			13	0.00	0.02
			20	0.00	0.12
Dimethoate	0.5	June 12	Pre	0.22	2.12
			6	1.00	4.06
			13	1.64	1.84
			20	2.10	5.86
Lorsban	1.0	June 12	Pre	0.00	0.00
			6	1.58	3.26
			13	0.72	1.00
			20	1.48	2.00
		July 3	6	0.44	4.06
			13	1.68	5.46
Lorsban plus Buffer-X (1 pt./100 gal.)	1.0	June 12	Pre	0.06	0.32
			6	0.70	1.64
			13	1.78	1.34
			20	0.42	4.30

Treatment 1/		Dates of applications	Days after applications 3/	Average per leaf 4/	
Insecticides 2/	AI/Acre Lb			Mites	Eggs
Monitor	0.5	June 12	Pre	1.32	4.48
			6	3.92	6.14
			13	10.7	6.06
			20	8.48	25.3
			27	5.80	3.66
		July 10	6	3.96	3.10
			13	3.34	10.6
Vydate	0.75	June 12	Pre	0.12	0.80
			6	3.40	5.52
			13	1.86	3.10
			20	4.28	11.1
			27	7.10	7.84
			34	5.98	4.94

1/ Plot size: Each treatment 5 acres (165' x 1320').

2/ Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated June 12 from 3:00 to 5:30 A.M. The Lorsban plot was retreated on July 3 from 4:35 to 4:40 A.M. The Monitor plot was retreated on July 10 from 5:15 to 5:20 A.M.

3/ 50 infested trifoliate leaves from each treatment were examined on each sampling date.

Spider mite populations in a seed alfalfa plot where insecticides were applied at counts of 4 to 6 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatment [1]				Number of mites and mite eggs per leaf [4]	
Insecticides	AI/Acre Lb.	Dates of Applications [2]	Days After Applications [3]	Mites	Eggs
			Pre	0.56	1.88
Carzol +	0.5	June 12	6	0.38	0.59
Thiodan	1.0		13	0.40	0.88
			20	0.42	2.48
			27	0.48	2.90
Carzol +	0.5	July 10	6	0.00	0.06
Thiodan	1.0		13	0.74	0.28
Tepp	1.0	July 24*	6	0.18	0.02
Carzol +	0.5	July 31	6	0.18	1.36
Thiodan	1.0				
Lorsban	0.5	Aug. 7*	6	0.50	0.30
			13	0.48	0.90
			20	0.20	1.18
Lannate +	0.75	Aug. 28	6	0.86	0.98
Tepp	1.0				

1/ Plot size: 10 acres (330' x 1320').

2/ Applications were made by aircraft at 10 GPA. * treatments were not needed for lygus bug control but were required because of high populations of spotted alfalfa aphid.

3/ Pretreatment counts were made June 11.

4/ 50 infested trifoliate leaves were examined on each sampling date.

Spider mite populations in a seed alfalfa plot where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatment 1/		Dates of Applications 2/	Days After Applications 3/	Number of mites and mite eggs per leaf 4/	
Insecticides	AI/Acre Lb.			Mites	Eggs
Carzol + Thiodan	0.5 1.0	June 12	Pre 6 13 20 27 34	0.06 0.00 0.02 0.36 0.80 0.82	1.16 0.92 0.18 1.54 0.32 0.86
Carzol + Thiodan	0.5 1.0	July 17	6	0.04	0.08
Tepp	1.0	July 24*	6 13	0.00 0.26	0.00 0.48
Lannate + Tepp	0.75 1.0	Aug. 7*	6 13	0.00 0.42	0.00 1.26
Lannate + Tepp	0.75 1.0	Aug. 21	6 13	0.10 0.96	0.12 8.70

1/ Plot size: 10 acres (330' x 1320').

2/ Applications were made by aircraft at 10 GPA. * treatments were not needed for lygus bug control but were required because of high populations of spotted alfalfa aphid.

3/ Pretreatment counts were made June 11.

4/ 50 infested trifoliate leaves were examined on each sampling date.

Spider mite populations in a seed alfalfa plot where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatment 1/				Number of mites and mite eggs per leaf 4/	
Insecticides	AI/Acre Lb.	Dates of Applications 2/	Days After Applications 3/	Mites	Eggs
			Pre	0.08	0.20
Carzol +	0.5	June 12	6	0.02	0.06
UniRoyal K840	0.5		13	0.00	0.02
			20	0.00	0.12
Carzol +	0.75	July 3	6	0.12	0.20
UniRoyal K840	0.5		13	0.14	0.36
			20	0.06	0.26
			27	1.00	5.06
			34	2.64	2.68
Carzol +	0.75	Aug. 7	6	0.16	0.30
UniRoyal K840	0.5		13	0.00	0.06
			20	0.00	0.30
			27	0.06	0.70

1/ Plot size: 5 acres (165' x 1320').

2/ Applications were made by aircraft at 10 GPA.

3/ Pretreatment counts were made June 11.

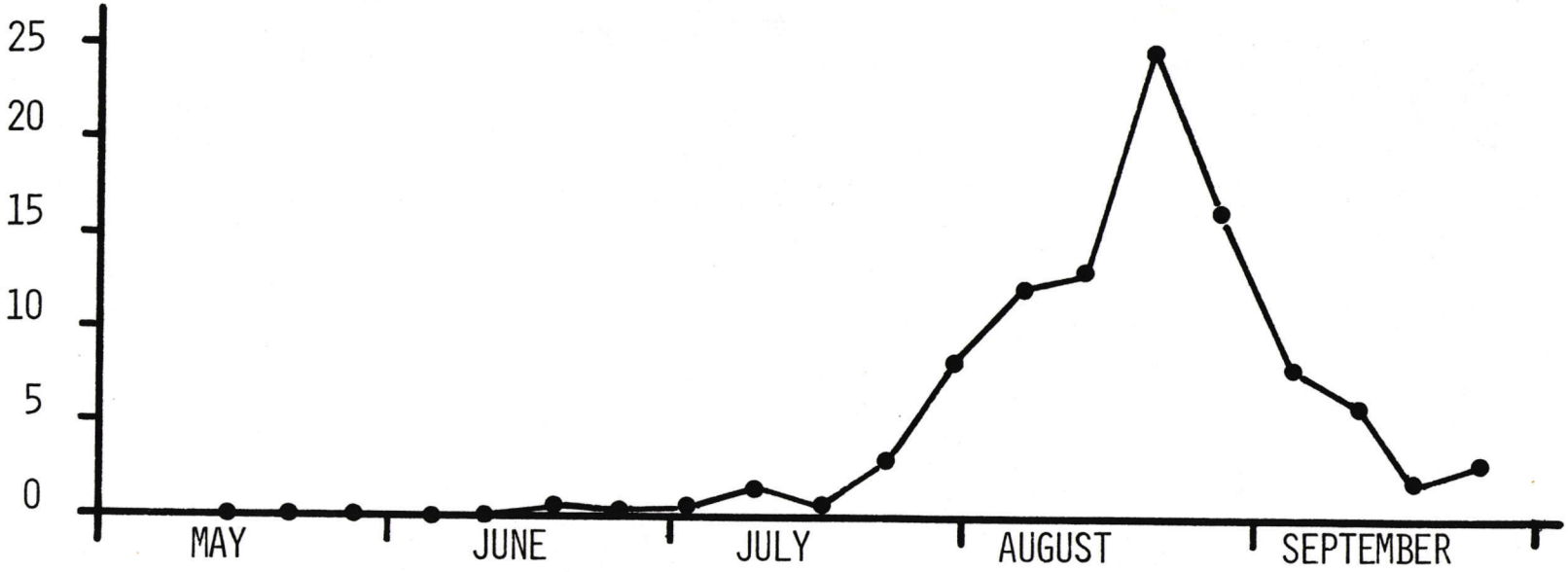
4/ 50 infested trifoliate leaves were examined on each sampling date.

Spider mite populations in seed alfalfa plots treated with granular insecticides applied to the soil. Firebaugh, California, 1974. 1/

Date Sampled		Number of mites and mite eggs per leaf 2/										
		SD 8832 (4/23)			Temik (4/23)			Temik (5/28)			Untreated	
		Days after applic.	Mites	Eggs	Days after applic.	Mites	Eggs	Days after applic.	Mites	Eggs	Mites	Eggs
May	14	21	0.00	0.00	21	0.00	0.02	pre	0.02	0.58	0.02	0.80
	21	35	0.00	0.02	35	0.00	0.00	pre	0.00	0.00	0.00	0.00
	28	42	0.00	0.00	42	0.00	0.00	pre	0.00	0.00	0.00	0.00
June	5	50	0.02	0.00	50	0.00	0.00	8	0.00	0.00	wet	
	11	56	0.00	0.00	56	0.00	0.00	14	0.00	0.00	0.04	0.02
	18	63	0.04	0.12	63	0.00	0.08	21	0.02	0.08	0.74	4.76
	25	70	0.14	0.54	70	0.04	0.10	28	1.54	1.86	0.28	2.04
July	2	77	0.02	0.00	77	0.00	0.00	35	0.14	0.12	0.44	2.62
	9	84	1.34	4.44	84	0.12	0.54	42	0.12	0.78	1.48	3.74
	16	91	0.80	5.68	91	0.26	1.46	49	0.34	2.04	0.88	3.96
	23	98	4.80	8.40	98	1.10	1.90	56	1.06	1.22	3.02	6.36
	30	105	2.06	3.46	105	0.70	1.40	63	0.92	1.32	8.46	13.0
Aug.	6	112	0.70	0.76	112	0.44	0.70	70	1.58	2.60	11.9	10.7
	13	119	4.26	2.86	119	1.18	1.84	77	5.04	4.94	12.7	9.18
	20	126	6.62	7.08	126	1.44	1.28	84	1.44	2.20	25.0	3.76
	27	133	10.8	8.24	133	0.96	0.64	91	5.40	4.76	16.6	17.2
Sept.	4	141	16.9	10.9	141	3.46	6.10	99	13.6	5.30	8.14	0.76
	11	148	6.60	6.16	148	10.5	5.64	106	8.38	3.36	6.22	0.74
	17	154	2.58	6.64	154	1.04	0.58	112	2.32	1.26	1.74	0.40
	24	161	3.70	2.62	161	0.42	0.54	119	0.54	0.60	2.98	4.40

1/ Plot size: Each treatment 2.37 acres (253' x 408'). Granular insecticides were applied at 3.00 AI per acre with a 6-row commercial applicator, SD 8832 and Temik on April 23 and Temik on May 28. Plots were irrigated April 27-30 and again May 30 - June 2.

2/ 50 infested trifoliate leaves from each plot were examined on each sampling date.



SPIDER MITE POPULATION IN AN UNTREATED SEED ALFALFA FIELD. FIREBAUGH, CALIFORNIA 1974.



PREDATORS & PARASITES

Predator and parasite populations in seed alfalfa plots treated with insecticide sprays by aircraft to control lygus bugs. John Maitia, Firebaugh, California, 1974.

Treatment 1/		Dates of applications	Days after application 3/	Number per 50 D-Vac Samples 4/															
				Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
Insecticide 2/	AI/ Acre Lb			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
			Pre	57	25	19	18	9	92	13	3	0	0	0	4	0	0	24	111
Bay Hox	0.5	June 12	1	23	39	18	11	0	48	3	9	0	0	0	1	1	0	49	21
1901			6	28	18	7	4	1	28	3	6	0	0	0	0	0	1	7	28
			13	36	56	14	23	2	123	4	13	1	0	0	0	1	1	17	99
			20	90	128	4	10	7	92	4	1	0	0	0	0	0	0	17	77
			Pre	71	40	30	25	11	135	11	1	0	0	10	4	0	0	34	148
Carzol +	0.5	June 12	1	3	8	0	0	5	12	1	8	0	0	1	0	4	0	20	12
Thiodan	1.0		6	3	2	2	0	0	8	1	7	0	0	0	0	0	0	38	34
			13	9	6	2	1	0	50	1	6	0	0	0	0	1	1	30	62
			20	21	13	0	0	0	8	2	0	0	0	0	0	0	0	24	47
			27	30	26	1	3	0	15	7	12	0	0	0	8	1	0	38	51
			Pre	64	45	13	29	12	134	6	5	0	0	2	6	0	1	46	129
Carzol +	0.5	June 12	1	9	15	5	2	0	28	2	3	0	0	3	1	2	0	10	5
UniRoyal	1.0		6	15	7	0	2	1	34	0	3	0	0	0	1	1	0	37	38
K840			13	18	18	3	3	1	67	6	1	1	0	1	0	0	1	17	58
			20	30	18	2	3	3	15	0	4	0	0	1	3	1	2	5	33
			Pre	48	27	17	41	17	149	18	3	0	0	2	16	2	0	13	127
Dimethoate	0.5	June 12	1	6	10	9	5	1	8	0	2	0	0	0	0	1	0	21	2
			6	32	13	19	9	2	46	2	18	0	0	0	0	0	1	55	49
			13	31	21	3	20	3	72	0	9	2	0	0	0	0	3	20	68
			20	71	64	3	5	3	75	0	4	0	0	0	0	0	0	25	67

Treatment 1/		Dates of applications	Days after application 3/	Number per 50 D-Vac Samples 4/															
Insecticide 2/	AI/ Acre Lb			Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
				A	N	A	N	A	N	A	L	A	L	A	L	A	L		
Lorsban	1.0	June 12	Pre	53	29	15	39	6	168	11	6	0	0	1	10	0	1	39	152
			1	1	1	0	1	0	0	0	8	0	0	0	0	1	0	3	1
			6	4	1	5	0	0	27	0	6	0	0	0	0	0	0	22	30
			13	9	10	6	16	6	91	3	7	0	0	0	0	0	2	13	56
			20	32	23	0	5	2	101	1	2	0	0	0	0	0	0	8	37
		July 3	6	28	9	1	6	0	32	2	6	0	0	0	0	1	4	34	20
			13																
Lorsban plus Buffer-X (1 pt/100 gal.)	1.0	June 12	Pre	45	32	14	25	11	95	18	3	0	0	4	12	0	1	26	147
			1	0	5	2	0	1	0	0	3	0	0	0	0	1	0	17	1
			6	15	1	7	0	0	17	2	6	0	0	0	0	0	1	26	35
			13	11	4	3	14	6	95	0	13	1	0	0	0	0	0	38	44
			20	59	24	2	4	5	61	0	6	0	0	0	0	0	0	5	67
Monitor	0.5	June 12	Pre	132	46	15	48	5	226	11	7	0	0	1	3	2	2	35	159
			1	5	10	1	4	1	6	2	1	0	0	0	0	0	0	17	5
			6	0	4	7	0	0	9	0	2	0	0	0	0	0	0	30	30
			13	0	8	3	23	2	44	3	8	0	0	0	0	0	0	14	55
			20	12	1	1	3	1	6	1	1	0	0	1	0	1	0	29	77
			27	36	5	0	0	1	13	7	7	0	0	0	6	0	0	16	13
		July 10	6	0	0	1	0	0	2	0	2	0	0	0	0	0	0	1	9
			13	32	10	0	0	7	4	9	24	0	0	0	0	1	0	33	85
Vydate	0.75	June 12	Pre	129	42	39	36	11	198	27	2	0	0	0	3	0	1	34	134
			1	3	13	10	2	2	31	1	6	0	0	2	1	2	0	28	25
			6	18	1	3	1	0	4	0	0	0	0	0	0	0	1	20	35
			13	6	13	5	13	1	39	2	1	0	0	1	0	0	1	13	75
			20	38	7	1	2	0	1	2	1	0	0	0	0	0	0	11	47
			27	66	31	0	6	0	5	3	7	0	0	0	7	0	0	71	36
			34	61	165	3	14	3	8	4	2	0	0	0	1	0	1	6	33

1/ Plot size: Each treatment 5 acres (165' x 1320').

2/ Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated June 12 from 3:00 to 5:30 A.M. The Lorsban plot was retreated on July 3 from 4:35 to 4:40 A.M. The Monitor plot was retreated on July 10 from 5:15 to 5:20 A.M.

3/ Pretreatment counts were made June 11.

4/ 2-25 suck D-Vac samples were taken in each plot on each sampling date.

Predator and parasite populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Paul and Roland Crevolin, Firebuagh, California, 1974.

Treatment 1/		Days after application 3/	Number per 50 D-Vac Samples 4/															
Insecticide 2/	AI/ acre lb		Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
Carzol +	0.5	Pre	45	176	4	8	2	0	1	0	0	0	0	0	5	0	8	7
Lorsban	1.0	6	16	9	0	0	0	0	4	12	0	0	0	0	4	7	22	28
		13	9	15	0	0	0	0	60	7	0	0	0	0	8	2	16	41
Carzol +	0.5	Pre	46	204	3	30	0	0	4	2	0	0	0	0	4	0	2	3
Lannate	0.75	6	28	27	1	0	0	2	5	5	0	0	0	0	0	3	19	121
		13	31	5	0	0	0	1	130	1	0	0	0	0	2	3	11	29
Carzol +	0.5	Pre	18	66	2	0	0	4	2	2	1	0	0	0	2	0	5	14
Tepp	1.0	6	35	10	0	0	0	0	4	3	0	0	0	0	8	4	13	52
		13	26	38	0	0	1	1	102	4	0	0	0	1	5	0	6	21
Carzol +	0.5	Pre	37	115	0	0	0	4	8	12	0	0	0	1	0	3	32	27
Thiodan	1.0	6	68	28	0	0	0	0	8	11	0	0	0	0	7	6	41	318
		13	16	20	1	0	0	5	59	0	0	0	0	0	5	3	7	32
Carzol +	0.5	Pre	30	33	6	4	1	0	0	7	0	0	0	2	6	0	9	26
UniRoyal K840	0.5	6	37	17	0	3	0	1	3	12	0	0	0	0	3	7	11	73
without surfactant		13	15	22	0	0	1	4	18	4	0	0	0	0	2	7	17	49
Carzol +	0.5	Pre	50	194	1	6	0	6	7	6	0	0	0	0	3	0	25	11
UniRoyal K840	0.5	6	24	29	0	0	0	1	3	7	0	0	0	0	2	7	11	97
plus surfactant 4.5 oz/10 gal. 5/		13	19	22	0	3	1	6	41	11	1	0	0	0	9	9	31	30

Treatment [1]		Days after application [3]	Number per 50 D-Vac Samples [4]															
Insecticide [2]	AI/ Acre lb		Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
Carzol +	0.5	Pre	32	47	0	0	1	0	0	1	0	0	0	0	2	0	1	3
Vydate	0.75	6	31	31	0	0	0	0	4	7	0	0	0	0	3	7	49	75
		13	21	21	0	0	0	5	59	5	0	0	0	0	6	9	14	55

1/ Plot size: Each treatment 5 acres (165' x 1320').

2/ Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated July 24 from 5:00 to 6:00 A.M.

3/ Pretreatment counts were made July 23.

4/ 2-25 suck D-Vac samples per treatment on each sampling date.

5/ Surfactant = UNI - 1141A
JEB 070174-1
(Lot No. BL 7003)

Predator and parasite populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. John Nakamura, Firebaugh, California, 1974.

Treatment 1/			Number per 50 D-Vac Samples 4/															
Insecticide 2/	AI/ Acre Lb	Days after application 3/	Orius A	Orius N	Geocoris A	Geocoris N	Nabis A	Nabis N	Lacewing A	Lacewing L	Syrphid A	Syrphid L	Cocci-nellidae A	Cocci-nellidae L	Collops A	Collops L	Spiders	Par Wasps
Carzol + Thiodan	0.5 1.0	Pre	9	7	0	0	0	1	2	28	0	0	0	0	0	4	0	1
		6	0	0	0	0	0	0	1	14	0	0	0	0	2	2	1	3
		13	22	4	0	0	0	0	0	6	0	0	0	0	0	0	1	2
Carzol + UniRoyal K840	0.5 0.5	Pre	3	2	0	0	0	0	8	6	0	0	0	0	0	2	4	40
		6	7	19	0	1	0	0	1	50	0	0	0	0	0	6	3	3
		13	34	22	1	0	0	0	8	23	0	0	0	0	2	8	2	2
Lorsban	0.5	Pre	29	33	1	0	1	2	14	34	1	0	0	0	0	29	27	26
		6	11	5	2	0	0	0	25	21	0	0	0	0	0	10	12	2
		13	3	5	0	0	0	5	24	7	0	0	0	0	0	2	4	3
Lorsban	1.0	Pre	15	12	0	0	0	0	4	35	0	0	0	0	0	7	1	25
		6	9	3	0	0	0	0	10	40	0	0	0	0	0	6	1	3
		13	5	5	0	0	0	0	31	15	0	0	0	0	2	3	1	1
Vydate	0.5	Pre	9	3	1	0	0	3	1	27	0	0	0	0	1	5	4	12
		6	0	10	0	0	0	0	1	12	0	0	0	0	0	0	0	0
		13	11	2	0	0	0	0	8	3	0	0	0	0	0	0	0	1

1/ Plot size: Each treatment 5 acres (165' x 1320').

2/ Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. All plots were treated August 14 from 4:55 to 5:50 A.M.

3/ Pretreatment counts were made August 13.

4/ 2-25 suck D-Vac samples were taken in each plot on each sampling date.

Predator and parasite populations in a seed alfalfa plot where insecticides were applied at counts of 4 to 6 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatments 1/				Number per 50 D-Vac Samples 4/															
Insecticides	AI/ Acre Lb	Dates of applications 2/	Days after applications 3/	Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
				A	N	A	N	A	N	A	L	A	L	A	L	A	L		
			Pre	78	35	21	27	14	124	16	3	0	0	1	10	0	0	43	76
Carzol +	0.5	June 12	1	2	9	0	0	5	17	0	14	0	0	1	1	0	1	17	5
Thiodan	1.0		6	3	2	0	1	1	20	0	3	0	0	0	0	0	0	50	34
			13	25	3	6	1	1	31	3	3	0	0	2	0	0	1	28	44
			20	16	9	0	2	0	33	2	1	0	0	0	1	0	0	15	37
			27	26	49	0	0	0	16	6	7	0	0	0	7	0	0	17	27
Carzol +	0.5	July 10	6	11	19	0	0	0	1	0	0	0	0	0	1	0	0	1	16
Thiodan	1.0		13	32	11	0	0	2	16	6	9	0	0	0	0	1	3	11	76
Tepp	1.0	July 24*	6	10	0	0	0	1	1	6	2	0	0	0	0	0	4	11	34
Carzol +	0.5	July 31	6	4	1	0	0	0	1	16	0	1	0	0	0	0	3	1	6
Thiodan	1.0																		
Lorsban	0.5	Aug. 7*	6	3	5	0	0	0	0	13	4	0	0	0	0	0	2	36	5
			13	9	4	0	1	0	0	0	6	0	0	0	0	0	0	6	4
			20	18	30	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Lannate +	0.75	Aug. 28	6	2	2	0	0	0	0	0	3	0	0	0	0	0	0	4	0
Tepp	1.0																		

1/ Plot size: 10 acres (330' x 1320').

2/ Applications were made by aircraft at 10 GPA. * treatments were not needed for lygus bug control but were required because of high populations of spotted alfalfa aphid.

3/ Pretreatment counts were made June 11.

4/ 2-25 suck D-Vac samples on each sampling date.

Predator and parasite populations in a seed alfalfa plot where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatments [1]				Number per 50 D-Vac Samples [4]															
Insecticides	AI/ Acre Lb	Dates of applications [2]	Days after applications [3]	Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
				A	N	A	N	A	N	A	L	A	L	A	L	A	L		
			Pre	71	40	30	25	11	135	11	1	0	0	10	4	0	0	34	148
Carzol +	0.5	June 12	1	3	8	0	0	5	12	1	8	0	0	1	0	4	0	20	12
Thiodan	1.0		6	3	2	2	0	0	8	1	7	0	0	0	0	0	0	38	34
			13	9	6	2	1	0	50	1	6	0	0	0	0	1	1	30	62
			20	21	13	0	0	0	8	2	0	0	0	0	0	0	0	24	47
			27	30	26	1	3	0	15	7	12	0	0	0	8	1	0	38	51
			34	70	69	0	0	0	5	2	0	0	0	0	0	0	0	7	21
Carzol +	0.5	July 17	6	33	12	0	1	0	15	4	14	0	0	0	0	2	4	12	13
Thiodan	1.0																		
Tepp	1.0	July 24*	6	23	2	0	0	0	5	4	2	0	0	0	2	1	4	3	55
			13	5	0	1	0	1	1	22	0	0	0	0	0	1	1	0	1
Lannate +	0.75	Aug. 7*	6	3	12	0	2	0	3	29	43	0	0	0	0	0	3	10	5
Tepp	1.0		13	6	13	0	0	0	1	3	14	0	0	0	0	0	0	1	0
Lannate +	0.75	Aug. 21	6	3	2	0	2	1	0	5	0	0	0	0	0	0	0	2	4
Tepp	1.0		13	9	11	0	4	0	0	0	1	0	0	0	0	0	0	4	2

1/ Plot size: 10 acres (330' x 1320').

2/ Applications were made by aircraft at 10 GPA. * treatments were not needed for lygus bug control but were required because of high population of spotted alfalfa aphid.

3/ Pretreatment counts were made June 11.

4/ 2-25 suck D-Vac samples on each sampling date.

Predator and parasite populations in a seed alfalfa plot where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. John Maitia, Firebaugh, California, 1974.

Treatment 1/				Number per 50 D-Vac Samples 4/															
Insecticides	AI/ Acre Lb	Dates of applications 2/	Days after applications 3/	Orius		Geocoris		Nabis		Lacewing		Syrphid		Coccinellidae		Collops		Spiders	Par Wasps
				A	N	A	N	A	N	A	L	A	L	A	L	A	L		
			Pre	64	45	13	29	12	134	6	5	0	0	2	6	0	1	46	129
Carzol +	0.5	June 12	1	9	15	5	2	0	28	2	3	0	0	3	1	2	0	10	5
UniRoyal K840	0.5		6	15	7	0	2	1	34	0	3	0	0	0	1	1	0	37	38
			13	18	18	3	3	1	67	6	1	1	0	1	0	0	1	17	58
			20	30	18	2	3	3	15	0	4	0	0	1	3	1	2	5	33
Carzol +	0.75	July 3	6	10	19	0	2	0	15	0	6	0	0	0	2	1	0	24	45
UniRoyal K840	0.5		13	35	18	4	0	0	49	0	1	0	0	0	0	3	0	11	24
			20	107	18	0	5	0	4	5	12	0	0	0	0	1	8	16	78
			27	22	25	0	0	0	2	1	5	0	0	0	0	1	4	1	50
			34	46	67	0	0	3	18	0	2	0	0	0	0	3	1	6	31
Carzol +	0.75	Aug. 7	6	20	34	0	0	0	5	2	8	0	0	0	1	0	2	2	23
UniRoyal K840	0.5		13	4	10	0	1	0	4	0	1	0	0	0	0	1	0	2	4
			20	5	7	0	2	0	0	1	0	0	0	0	0	0	0	3	12
			27	6	17	2	1	0	0	0	2	0	0	0	0	5	0	1	9

1/ Plot size: 5 acres (165' x 1320').

2/ Applications were made by aircraft at 10 GPA.

3/ Pretreatment counts were made June 11.

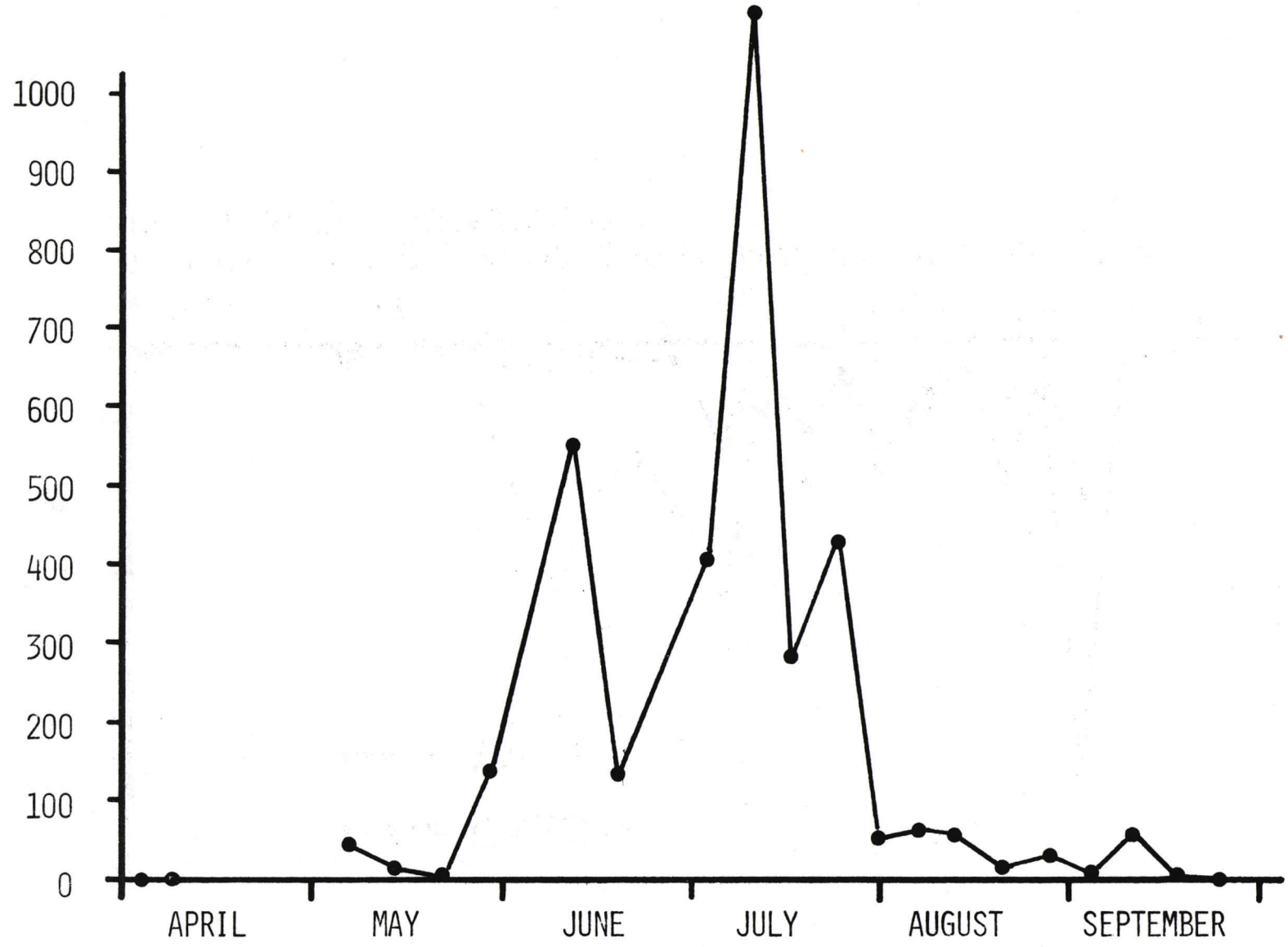
4/ 2-25 suck D-Vac samples on each sampling date.

Predator and parasite populations in an untreated seed alfalfa plot. Firebaugh, California, 1974. 1/

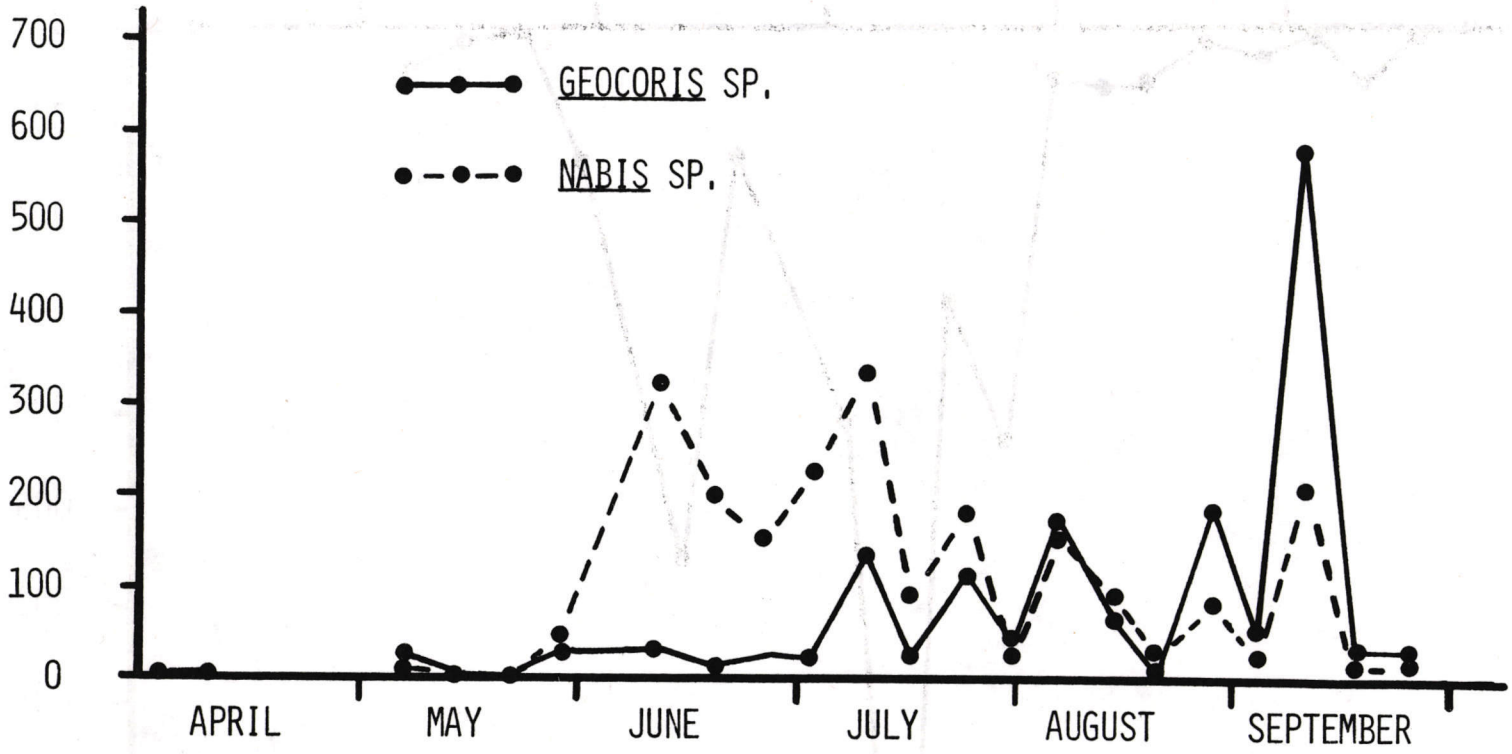
Date Sampled		Number per 50 D-Vac Samples 2/															
		Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
		A	N	A	N	A	N	A	L	A	L	A	L	A	L		
April	2	0	1	2	0	1	3	0	2	0	0	1	0	0	0	26	32
	9	0	1	1	0	0	0	0	4	0	0	0	0	0	0	9	63
May	7	46	0	23	5	4	2	4	0	0	0	3	1	2	0	8	88
	14	17	1	2	4	2	0	3	0	1	0	2	4	0	0	5	79
	21	3	1	0	0	1	0	0	2	0	0	2	1	0	0	0	36
	28	54	92	11	19	12	27	41	9	1	0	7	16	1	0	62	311
June	5	wet		-	-	-	-	-	-	-	-	-	-	-	-	-	-
	11	414	143	23	14	24	300	44	6	0	0	2	0	1	2	66	338
	18	88	41	9	3	12	187	0	2	0	0	0	0	0	0	56	239
	25	178	100	15	12	17	135	0	0	1	0	0	0	2	0	48	307
July	2	142	264	4	18	28	206	0	0	0	0	0	0	0	0	124	240
	9	482	628	36	100	66	274	0	2	0	0	0	0	0	0	522	620
	16	140	136	6	20	10	82	0	0	0	0	0	0	0	2	156	162
	23	306	132	26	94	68	118	0	4	0	0	0	0	0	2	902	440
	30	34	18	2	36	10	18	0	0	0	0	0	0	0	0	114	104
Aug.	6	38	26	20	156	36	128	0	2	0	0	0	0	4	0	550	180
	13	20	32	2	68	20	74	0	2	0	0	0	0	2	0	450	110
	20	6	8	0	4	0	20	0	0	0	0	0	0	0	0	32	38
	27	18	12	9	178	18	66	0	0	0	0	0	0	0	0	120	30
Sept.	4	4	6	4	38	0	24	0	0	0	0	0	0	0	0	28	14
	11	18	44	146	444	14	202	0	0	0	0	0	0	0	0	334	50
	17	4	6	2	34	0	12	0	0	0	0	0	0	0	0	24	8
	24	0	0	6	24	4	8	0	0	0	0	0	0	0	0	10	16

1/ Plot size: 2.37 acres (253' x 408'). Plot was irrigated on April 29 and June 2.

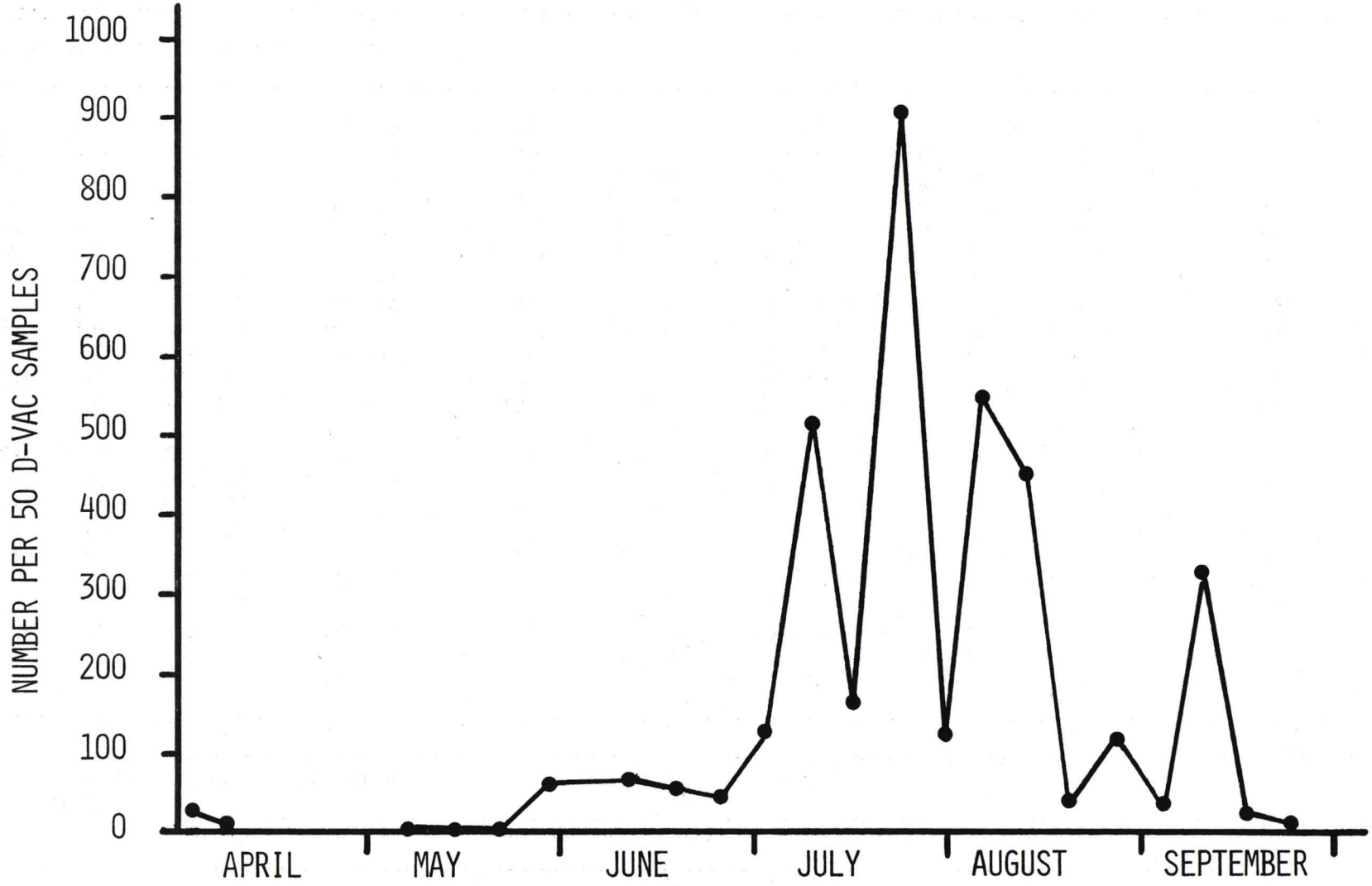
2/ 5-10 suck D-Vac samples were taken on each sampling date.



POPULATION OF ORIUS SP. IN AN UNTREATED SEED ALFALFA FIELD. FIREBAUGH, CALIFORNIA 1974.



POPULATIONS OF GEOCORIS SP. AND NABIS SP. IN AN UNTREATED SEED ALFALFA FIELD, FIREBAUGH, CALIFORNIA 1974.



POPULATION OF SPIDERS IN AN UNTREATED SEED ALFALFA FIELD. FIREBAUGH, CALIFORNIA 1974.

Predator and parasite populations in a seed alfalfa plot treated with granular SD 8832 applied to the soil on April 23, Firebaugh, California, 1974. 1/

Date Sampled		Days after application 2/	Number per 50 D-Vac Samples 3/															
			Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
April	2		1	0	2	0	1	2	2	3	0	0	3	0	0	1	52	36
	9		1	1	0	0	0	5	2	3	0	0	3	0	0	0	30	36
May	7	14	35	0	32	3	2	2	1	0	0	0	2	2	4	0	5	73
	14	21	24	2	7	3	4	1	5	0	0	0	3	3	2	0	5	91
	21	35	16	4	1	8	3	5	9	2	0	0	0	4	0	0	12	162
	28	42	59	65	3	26	22	77	41	3	3	0	22	14	1	0	40	309
June	5	50	122	48	1	6	7	177	21	4	1	0	6	2	2	0	39	299
	11	56	225	128	12	31	25	632	7	13	0	0	2	0	6	0	42	232
	18	63	105	93	16	9	20	179	0	3	0	0	0	0	4	0	40	137
	25	70	108	68	6	13	25	75	1	0	0	0	0	0	3	0	56	114
July	2	77	78	46	18	24	34	116	0	0	0	0	0	0	0	0	16	106
	9	84	374	214	26	96	62	150	2	12	0	0	0	0	0	0	64	420
	16	91	158	202	20	86	24	88	0	0	0	0	0	0	0	6	32	160
	23	98	254	804	28	200	48	186	0	4	0	0	0	0	10	2	242	410
	30	105	32	80	60	94	36	42	0	0	0	0	0	0	0	2	82	158
Aug.	6	112	32	6	38	292	2	82	0	0	0	0	0	0	2	2	70	98
	13	119	20	4	34	252	2	58	0	4	0	0	0	0	0	2	86	70
	20	126	8	22	18	230	2	52	0	0	0	0	0	0	0	0	88	46
	27	133	32	16	34	174	0	12	0	0	0	0	0	0	0	0	50	30
Sept.	4	141	16	26	88	588	16	106	0	0	0	0	0	0	2	2	54	28
	11	148	8	6	104	584	6	168	0	18	0	0	0	0	0	0	66	52
	17	154	2	2	12	90	0	46	0	0	0	0	0	0	0	0	34	28
	24	161	0	0	22	76	0	18	0	0	0	0	0	0	0	0	32	2

1/ Plot size: 2.37 acres (253' x 408').

2/ SD 8832 10% granules were applied at 3.0 AI per acre with a 6-row commercial applicator on April 23. Plot was furrow irrigated on April 27 and May 30.

3/ 5-10 suck D-Vac samples were taken on each sampling date.

Predator and parasite populations in a seed alfalfa plot treated with Temik 10 G applied to the soil on April 23, Firebaugh, California, 1974. 1/

Date Sampled		Days after application 2/	Number per 50 D-Vac Samples 3/															
			Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
April	2		1	0	2	0	1	2	2	3	0	0	3	0	0	1	52	36
	9		0	1	1	1	0	4	2	0	0	0	4	0	0	0	26	52
May	7	14	24	0	30	3	13	1	0	0	1	0	3	1	3	0	14	70
	14	21	7	1	1	3	1	0	3	0	1	0	0	0	1	0	3	75
	21	35	15	4	1	0	1	0	2	0	0	0	1	3	0	0	5	100
	28	42	53	40	3	18	10	10	57	5	1	0	17	7	1	0	39	225
June	5	50	37	8	1	0	1	3	2	1	1	0	0	1	1	0	10	76
	11	56	206	98	8	16	18	126	7	24	0	0	1	0	6	3	35	213
	18	63	96	84	39	9	13	97	1	9	0	0	0	0	2	0	58	190
	25	70	109	143	23	26	4	50	3	0	0	0	0	0	1	0	9	126
July	2	77	122	86	10	12	24	128	0	2	0	0	0	0	2	0	12	124
	9	84	492	264	26	62	18	120	0	2	0	0	0	0	2	0	70	350
	16	91	160	270	36	76	28	112	0	0	0	0	0	0	0	6	20	290
	23	98	244	782	20	154	12	190	0	24	0	0	0	0	0	0	107	241
	30	105	32	18	12	100	4	38	0	0	0	0	0	0	0	0	24	88
Aug.	6	112	2	4	28	228	4	46	0	0	0	0	0	0	0	0	36	130
	13	119	4	4	26	150	2	24	0	0	0	0	0	0	0	0	22	40
	20	126	0	0	18	52	2	6	0	0	0	0	0	0	0	0	48	14
	27	133	0	6	18	30	0	0	0	0	0	0	0	0	0	0	28	18
Sept.	4	141	2	6	18	220	0	32	0	0	0	0	0	0	0	0	30	28
	11	148	4	0	78	480	0	26	0	2	4	0	0	0	0	0	28	12
	17	154	2	2	10	84	0	14	0	0	0	0	0	0	0	0	40	32
	24	161	0	0	10	42	2	10	0	0	0	0	0	0	0	0	22	0

1/ Plot size: 2.37 acres (253' x 408').

2/ Temik 10% granules were applied at 3.0 lb. AI per acre with a 6-row commercial applicator on April 23. Plot was furrow irrigated on April 28 and May 31.

3/ 5-10 suck D-Vac samples were taken on each sampling date.

Predator and parasite populations in a seed alfalfa plot treated with Temik 10 G applied to the soil on May 28, Firebaugh, California, 1974. 1/

Date Sampled	Days after application 2/	Number per 50 D-Vac Samples 3/															
		Orius		Geocoris		Nabis		Lacewing		Syrphid		Cocci-nellidae		Collops		Spiders	Par Wasps
		A	N	A	N	A	N	A	L	A	L	A	L	A	L		
April 2		1	0	2	0	1	2	2	3	0	0	3	0	0	1	52	36
9		3	6	0	0	0	14	0	6	0	0	2	0	0	0	21	25
May 7		63	0	26	2	11	3	1	0	0	0	1	3	1	0	8	8
14		11	1	1	2	2	0	1	1	2	0	0	6	1	0	4	93
21		10	3	0	4	0	0	1	0	0	0	3	2	0	0	2	68
28		59	101	4	21	9	55	33	1	1	0	15	9	0	0	28	219
June 5	8	44	22	3	2	6	18	15	3	2	0	3	0	3	0	7	79
11	14	221	110	19	19	12	83	98	10	0	0	3	0	4	3	64	332
18	21	64	34	19	1	9	35	7	2	0	0	1	0	3	0	58	349
25	28	141	134	15	7	5	46	1	1	1	0	0	0	1	0	63	340
July 2	35	162	202	40	18	6	54	4	0	0	0	0	0	0	0	72	216
9	42	334	836	14	44	2	40	0	0	0	0	0	0	0	0	448	674
16	49	128	164	4	10	4	34	0	0	0	0	0	0	0	4	24	162
23	56	296	408	42	86	10	70	0	22	0	0	0	0	8	6	1116	500
30	63	12	18	0	22	0	16	0	0	0	0	0	0	0	4	38	136
Aug. 6	70	32	14	20	158	0	42	0	0	0	0	0	0	0	0	298	190
13	77	24	18	6	100	2	32	0	2	0	0	0	0	0	0	258	124
20	84	2	12	18	46	4	32	0	0	0	0	0	0	0	2	94	58
27	91	6	6	12	78	0	0	0	0	0	0	0	0	0	0	42	16
Sept. 4	99	8	4	24	158	2	28	0	0	0	0	0	0	0	0	64	8
11	106	4	2	174	702	0	68	0	0	0	0	0	0	0	0	212	72
17	112	0	2	16	90	0	12	0	0	0	0	0	0	0	0	36	24
24	119	0	0	12	48	0	6	0	0	0	0	0	0	0	0	8	6

1/ Plot size: 237 acres (253' x 408').

2/ Temik 10% granules were applied at 3.0 lb. AI per acre with a 6-row commercial applicator on May 28. Plot was furrow irrigated on April 28 and June 1.

3/ 5-10 suck D-Vac samples were taken on each sampling date.



STINKBUG

Populations of consperse stink bugs in 13 seed alfalfa fields. Fresno County, California, 1974.

Grower	Number per 25' of row 1/								
	May 14-18			July 9-10			September 4-24		
	Adults	Nymphs	Total	Adults	Nymphs	Total	Adults	Nymphs	Total
Enrico Farms Sec. 4	0	0	0	0	0	0	0	0	0
Mike Perez Sec. 10	0	0	0	0	0	0	0	3	3
Echeveste & Elizaldi Sec. 2	0	0	0	0	1	1	0	1	1
John Nakamura Sec. 11	0	0	0	0	0	0	0	0	0
U.C. Test-Plot D Sec. 13	0	0	0	0	3	3	8	2	10
John Maitia Plot K Sec. 18	-	-	-	-	-	-	1	30	31
Vera Brothers Sec. 21	0	0	0	0	0	0	0	19	19
Dick Fortune Sec. 28	-	-	-	-	-	-	8	137	145
John Nakamura Sec. 35	-	-	-	-	-	-	2	14	16
Nicolini & Maitia Sec. 33	-	-	-	-	-	-	0	4	4
SE1/4 Sec. 33 T13S R14E	-	-	-	-	-	-	0	0	0
SE1/4 Sec. 13 T15S RISE	-	-	-	-	-	-	0	0	0
NW1/4 of Sec. 7 T16S RISE	-	-	-	-	-	-	0	0	0

1/ 5 beating pan samples in each field for each period. Samples were examined in laboratory after 24 hr. belese funnel separation.

Percentages of good and defective seeds in samples from 8 seed alfalfa fields surveyed for consperse stink bug. Firebaugh area, Fresno County, California, 1974.

Grower	Dates Sampled	Total seeds examined 1/	Good seed	Detective Seeds						
				Chalcid	Lygus	Stink bug	Shriveled	Water damaged	Green	Other
Enrico Farms Sec. 4	Sept. 4	2,438	84.7	6.8	7.8	2.2	0.08	0.45	0.16	0.00
Mike Perez Sec. 10	Sept. 4	2,780	89.6	1.8	7.0	0.40	0.07	0.17	0.93	0.00
Echeveste & Elizaldi Sec. 2	Sept. 4	3,085	96.3	0.52	2.5	0.00	0.00	0.06	0.68	0.00
John Nakamura Sec. 11	Sept. 4	3,029	87.8	3.5	2.2	0.36	0.00	0.03	6.1	0.00
U.C. Test Plot D Sec. 13	Sept. 10	2,982	86.7	1.2	10.1	1.2	0.03	0.40	0.33	0.00
John Maitia Plot K Sec. 18	Sept. 20	3,233	96.3	0.15	1.9	1.1	0.19	0.19	0.22	0.00
Vera Brothers Sec. 21	Sept. 24	3,098	89.3	3.4	5.9	0.89	0.00	0.20	0.20	0.03
Dick Fortune Sec. 28	Sept. 24	2,634	90.0	1.0	6.2	2.2	0.00	0.45	0.08	0.00

1/ Four 2-quart samples of pods were hand stripped from plants prior to commercial harvest. Samples were hand threshed and lightly cleaned in a clipper seed cleaner. Counts based on four subsamples from each of the threshed 2-quart samples.

CO-OPERATIVE EXTENSION WORK IN AGRICULTURE ANDHHOME ECONOMICS, U. S. Department of Agriculture and University of California co-operating.

The University of California's Agricultural Extension programs are available to all, without regard to race, color, or national origin.