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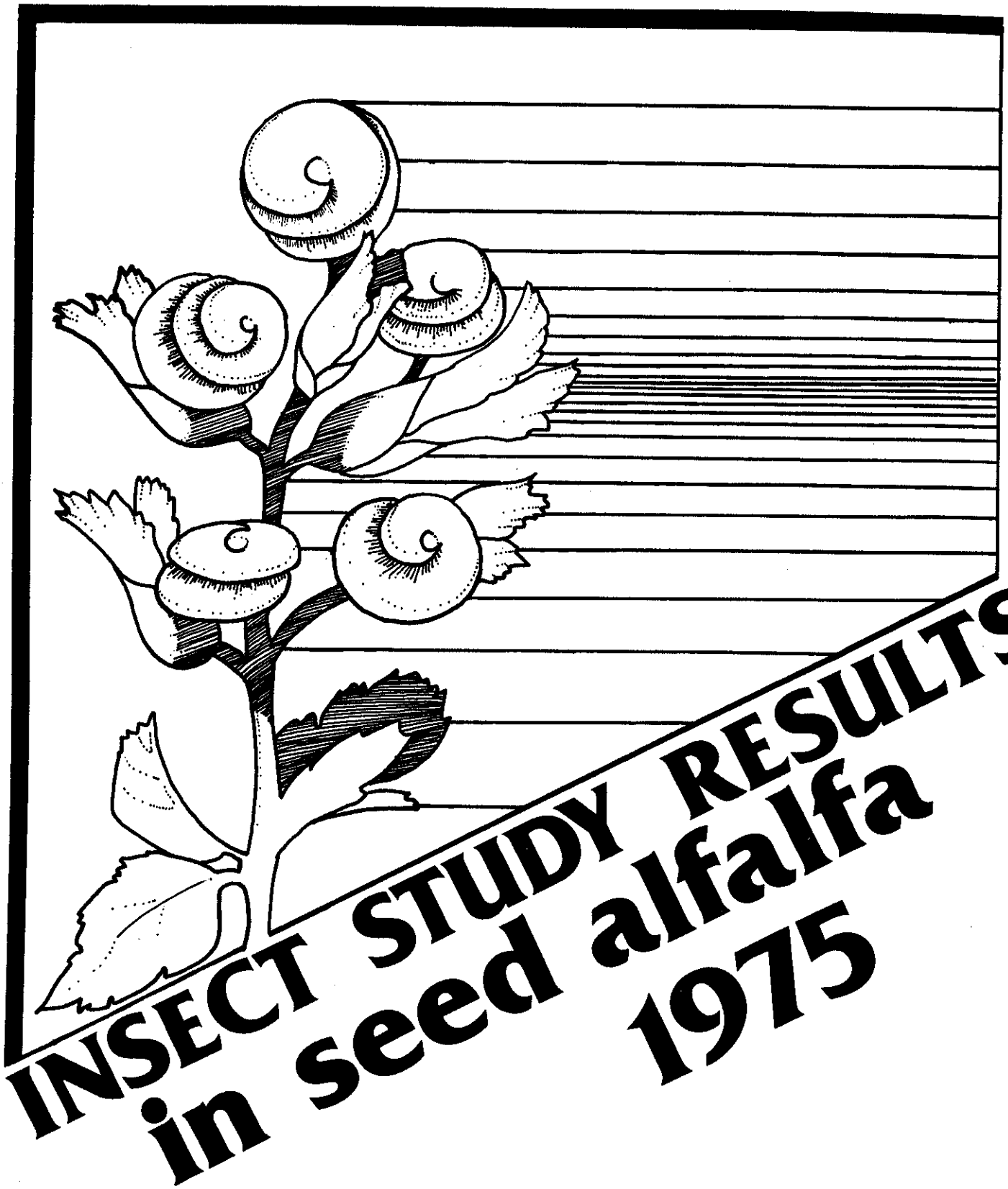

INSECT STUDY RESULTS in seed alfalfa 1975

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 sincerely 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, 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 Paul and Roland Crevolin, Mike Perez and in an untreated seed field maintained by Don Darnell on land provided by Telles Ranch Incorporated. We also wish to acknowledge Mr. Roy D. Brant who granted permission to use an experimental insecticide program in a field in which his bees were utilized as pollinators. We are grateful for the interest and contributions of these cooperators in making it possible to conduct the experiments. The assistance of students Mark Eberle and Scott Johnson in carrying out the various surveys and experiments and the art work of Gwen Okamoto, Cooperative Extension Service, Fresno County, is sincerely appreciated.

The contents of this report 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 any Cooperative Extension 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	Lorsban®
Carzol®	SD WL 43775
Dacamox®	TEPP
Lannate®	Vydate®

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

Research on Insects Affecting Seed Alfalfa 1975

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Introduction

It is our desire to fully inform seed growers, processors and agribusiness cooperators of the research conducted with their generous and much appreciated support. This progress report summarizes research on insects affecting seed alfalfa conducted during 1975.

Research was continued on the population dynamics and control of lygus bugs, aphids, spider mites and other insects associated with seed alfalfa. Detailed population studies on the entire complex of pest and beneficial insect species were continued in an untreated alfalfa seed field specifically maintained for these studies. During 1975 three separate experiments were conducted in which three new insecticides and three insecticide combinations were evaluated for control of lygus bugs, the spotted alfalfa aphid and spider mites. 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 experiments.

Lygus bugs

The following insecticides and combinations were evaluated for control of lygus bugs: Bay Hox 1901, Shell Development WL 43775, Dacamox®, Carzol® + Lorsban®, Lannate® + TEPP and Vydate® + TEPP. Also evaluated were grower applied combinations of Carzol + Lannate, Carzol + TEPP and Lannate + TEPP. All of the materials were applied at night as foliar sprays by aircraft with the exception of Dacamox which was applied to the soil as a granular formulation with a commercial soil applicator. The following briefly summarizes the results obtained with each of the materials in controlling lygus bugs.

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Bay Hox 1901, a product of Chemagro Corporation applied at 1.0 lb. active ingredient per acre resulted in an initial reduction of the lygus bug population of only 34 per cent over pretreatment counts. The material did not appear highly toxic to medium and large sized nymphs. Many of these nymphs matured into adults and a hatch of first and second instar nymphs began to appear within 14 days after application.

Shell Development WL 43775, an experimental compound applied at 0.1 lb. AI/acre, also appeared to be virtually nontoxic to lygus bugs.

The systemic insecticide, Dacamox was applied as a 10% granule to the soil on June 5 at the rate of 3.0 lb. AI/acre with a six row applicator with two shanks per row, 9 inches on each side of the plant row and approximately 6 inches deep. The remainder of the field received no insecticide applications during the period of this evaluation and served as a check. There was no evidence, up to 26 days after application, that Dacamox had any effect on lygus bug populations. Lygus bug populations increased each week from a pretreatment level of 1.6 bugs/sweep to 8.7 bugs/sweep 26 days after application. Lygus bug populations were actually lower in the untreated portion of the field but the location of the Dacamox plot along a field edge may have accounted for the slightly higher lygus bug population in this treatment.

Combinations of Lannate with TEPP and Vydate with TEPP effectively controlled lygus bugs for more than 14 days. Trials with these materials were terminated 14 days after application, even though control was still excellent, because a desiccant was applied to the field in preparation for harvest.

An experiment was conducted to evaluate timing and repeated applications, throughout the season, of Carzol + Lorsban for lygus bug control. This combination was applied to eight 7-acre plots. Pretreatment counts were taken in all plots on June 10 and June 17. All plots were treated on June 18 with Carzol 0.5 lb. AI/acre + Lorsban 0.5 lb. AI/acre. The amount of Carzol was increased in succeeding applications to 0.75 lb. AI/acre. The insecticides were applied by aircraft in 10 gallons of water per acre. Applications were made in the early morning and in no instance later than 4:30 AM. Insect populations were sampled each week with a sweep net and with a D-Vac® suction machine. The insecticide applications were timed to coincide with hatching and nymphal development of lygus bugs. After the initial treatment of all

plots on June 18 four of the plots were retreated when total lygus bug counts (adults + nymphs) in each reached 4 to 6 bugs per 180° sweep. The other four plots were retreated when counts reached 8 to 12 bugs per sweep. The plots treated at counts of 4 to 6 bugs per sweep received a total of five insecticide applications ranging from 13 to 22 days apart. The plots treated at counts of 8 to 12 bugs per sweep received four applications during the season ranging from 16 to 32 days apart. The alfalfa variety in this field was Altfranken Schmidt, susceptible to the spotted alfalfa aphid. The Carzol-Lorsban combination, in addition to controlling lygus bugs, resulted in excellent control of the spotted alfalfa aphid, the pea aphid and spider mites.

The remainder of the field (grower treated portion) was first treated on July 15 at a lygus bug count of 9.4 bugs/sweep. The insecticide applied was Carzol 0.5 lb. AI/acre plus Lannate 0.34 lb. AI/acre. The lygus bug population exceeded the pretreatment level 17 days after application. The second treatment consisting of Carzol 0.5 lb. AI/acre + TEPP 1.0 lb. AI/acre, applied 24 days after the first, reduced the lygus bug population but failed to adequately control the spotted alfalfa aphid which had increased to large numbers. A third treatment applied 7 days after the second consisted of Lannate 0.45 lb. AI/acre + TEPP 1.0 lb. AI/acre. This treatment resulted in excellent lygus bug control and the field did not receive additional insecticide applications although the spotted alfalfa aphid populations were again very high when the field was desiccated 16 to 22 days after the third application.

At harvest, two 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-Lorsban plots treated at counts of 4 to 6 bugs per sweep and at 8 to 12 bugs per sweep was 92.6 and 92.0 respectively. Seeds showing lygus bug injury in the two treatments represented 2.9% and 3.8% respectively of the total seeds examined in each. The center 9 rows of each plot were harvested with commercial equipment on September 24. Calculated weights of cleaned seed (lbs. per acre) from each treatment were: grower treatment, 965.7 lbs./A, Carzol-Lorsban 8-12 bugs/sweep, 1,073.9 lb./A, Carzol-Lorsban 4-6 bugs/sweep 1,121.0 lb./A.

Lygus bug populations were monitored in the untreated study field from October 22, 1974 through September 18, 1975. This covered the period from harvest in 1974 to harvest in 1975. Sweep net and D-Vac samples were taken at bi-weekly intervals from October 22 through May 6. Beginning on May 20 populations were sampled at weekly intervals through September 18. With the exception of a single third instar nymph taken in D-Vac samples on October 22, no lygus nymphs were found in the field until April 15 when one small nymph was observed in sweep counts. Nymphs of the first generation were first found in D-Vac samples on June 3. This was in contrast to 1974 when lygus bug nymphs were present in fair numbers as early as April 2. The overwintering adult population ranged from 0.15 to 1.20 bugs per sweep and up to June 3 the ratio of males to females was slightly over 2 to 1.

It was obvious from the data obtained that the lygus bug populations reached an equilibrium with the environment but at a high level that was similar to that of 1974. In 1975 the lygus bug populations were approximately 2 to 3 weeks later in developing than in 1974. In 1975 the lygus bug population peak occurred between July 29 and August 5. On August 5, sweep counts of 188 bugs/sweep were recorded. In 1974 two peaks occurred, one on July 9, the other on July 23. The peak populations in 1974 averaged 187 lygus bugs per sweep. Overall lygus bug populations appeared to be lower in 1975 than in 1974. From April 3, to September 18, 1975 a total of 4,986 lygus bugs were taken in D-Vac samples. During the period from April 2, to September 24, 1974 a total of 7,389 lygus bugs were taken in an equal number of D-Vac samples.

The very high populations of lygus bugs caused extreme damage to buds and severely reduced seed production but in spite of this 333.7 pounds of cleaned seed per acre were harvested from this untreated field in 1975. This seed had been largely produced before the extremely high lygus bug populations began to occur on July 22. In 1974 approximately 160 pounds of cleaned seed per acre were produced in the untreated area. The higher yield in 1975 may be due to a later spring buildup of lygus bug populations.

Four samples of seed pods were hand stripped from plants prior to commercial 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 averaged 79.7. The

per cent of seeds damaged by lygus bugs was 10.6. These data are almost identical to those obtained in 1974.

Aphids

The blue alfalfa aphid Acyrthosiphon kondoi Shinji and the pea aphid occurred in large numbers in experimental alfalfa seed fields during April and early May. The blue alfalfa aphid was not recognized as being distinct from the pea aphid until about mid April. As a result of this, the population data for these species is not clear and represents a mixture of the two. Tabular data are presented under the heading of pea aphid. The blue alfalfa aphid disappeared very quickly with the onset of warm weather. One experimental field was treated by the grower with phosdrin at 0.5 lb. AI/acre with excellent results.

Data on control of aphids were obtained for all materials evaluated for lygus bug control. Lorsban was not tested alone in 1975 but in combination with Carzol at a rate of 0.5 lb. AI/acre. Control of the spotted alfalfa aphid and the pea aphid was excellent in all trials. Other insecticide combinations that were effective in controlling the spotted alfalfa aphid were Lannate 0.75 lb. AI/acre + TEPP 1.0 lb. AI/acre and Vydate 0.5 lb. AI/acre + TEPP 1.0 lb. AI/acre. The effectiveness of the Lannate-TEPP and Vydate-TEPP combinations for control of the spotted alfalfa aphid is interesting because previous experiments have shown that none of these insecticides if used alone will control the spotted alfalfa aphid.

Bay Hox 1901 appeared to have little effect on spotted alfalfa aphid populations. Aphid numbers more than doubled each week following the application of this material.

Shell Development WL 43775 appeared to have a short residual effect on populations of the spotted alfalfa aphid. Spotted alfalfa aphid populations were approximately 85% below pretreatment levels 6 days after application of SD WL 43775 but aphid populations exceeded pretreatment levels 14 days after application.

Populations of the spotted alfalfa aphid and the pea aphid declined in the Dacamox plot during the 26 days that this chemical was under evaluation. However, the decline in aphid populations did not appear to be due to Dacamox because a similar decline occurred in the untreated check. It appeared that heavy predator populations were responsible for the reduction in aphid populations in this experiment.

Aphid populations were monitored in the untreated experimental field throughout the year. The alfalfa variety grown in this field is resistant to the spotted alfalfa aphid and only small numbers of this aphid occurred on the plants. As mentioned previously, populations of the pea aphid and the blue alfalfa aphid reached a peak on April 15 when 50,790 aphids were found per 50 D-Vac samples. The field was pastured with sheep shortly after this count was made. On May 6 and on May 20 pea aphid populations were respectively 5,960 and 4,692 aphids per 50 D-Vac samples. Populations declined sharply after May 20 and ranged from 0 to 94 aphids per 50 D-Vac samples for the remainder of the year.

Spider mites

The effects of insecticide applications on spider mite populations were evaluated in all experiments. The Carzol combinations resulted in excellent control of spider mites. Some spider mites could always be found in Carzol treated plots by searching for infested leaves but populations were low. Repeated applications of Carzol in combination with Lorsban in the insecticide timing experiment for lygus bug control held spider mites to very low levels throughout the season. There were some indications at the end of the season that unusually large numbers of mites were surviving the Carzol-Lorsban treatment in one portion of the field. The reason for this was not determined but it may indicate that resistance to Carzol was beginning to develop in the mite populations.

The following insecticides and insecticide combinations were not effective in controlling spider mites: Lannate + TEPP, Vydate + TEPP, Bay Hox 1901, Shell Development WL 43775 and Dacamox. Heavy spider mite populations developed in plots treated with Bay Hox 1901, SD WL 43775 and Dacamox.

Spider mite populations were monitored throughout the year in the untreated experimental field. Spider mite populations remained low in this field through June 3. On June 10, populations averaged 3.46 mites per trifoliate leaf on selected infested leaf samples. The populations remained at approximately this level until July 29 when the average rose to 15.0 mites per leaf. The populations remained at approximately this level until September 3 when a peak of 24.8 mites per leaf occurred.

Consperse stink bug

Stink bug populations were measured in six alfalfa seed fields on the west side of the San Joaquin Valley on July 14 and on September 2-18. On September 18 eight additional fields were surveyed bringing the total to 14. 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. Very low populations were encountered in these fields. Stink bugs were found in 3 of the six fields sampled on July 14. The numbers of bugs per 25 feet of row, in fields where they were found, ranged from 2 to 7. Most of those observed at this time were nymphs. In September eleven of the 14 fields had populations, consisting mostly of nymphs, that ranged from 1 to 59 bugs per 25 feet of row. Because of the low stink bug populations no seed samples were taken for assessment of damage and no experiments were conducted with insecticides for stink bug control.

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 and parasitic arthropods. These data have yet to be studied in detail but there is little question that all of the insecticides with the exception of Dacamox, which was applied to the soil, had a devastating effect on predator and parasite populations.

One of the primary purposes of the untreated experimental field is to study populations of predatory arthropods in the absence of insecticides. The species were sampled with a D-Vac suction machine at bi-weekly intervals from October 22, 1974 to May 20, 1975. Beginning on May 20 samples were taken at weekly intervals through September 18. Sampling was resumed in October 1975 and is continuing. We now have continuous data from April 2, 1974. Data are being maintained on the following groups of predatory organisms: Orius (minute pirate bugs), Geocoris (big-eyed bugs - 3 species), Nabis (damsel bugs), lacewings, syrphid flies, coccinellid beetles (lady beetles), collops beetles, spiders and parasitic wasps. The populations of each group will be presented in graphs and tables. Detailed analysis of these data are planned to include seasonal population trends, comparison of trends over a several-year period and possible correlations that might show a relationship between a predator

and one or more of the pest species affecting seed alfalfa.

Predators occurring in the greatest numbers throughout the 1974-75 study period were Orius, Nabis, Geocoris and spiders. Small Hymenoptera (wasps), many of which are believed to be parasitic, were also present in rather large numbers. The minute pirate bug (Orius) was abundant from June 3 through August 20. The population of Orius reached a peak on July 1-8. Nabis was present in large numbers from June 3 through September 3. Peak numbers of Nabis occurred on June 24-July 1. The Geocoris complex was separated into three species each of which have different periods of abundance. Geocoris pallens was the predominant species during the period May 27 through September 3. Populations of this species reached a peak on July 29-August 5. Geocoris punctipes was the second most abundant species and was the most abundant from August 12 through September 18. Peak numbers of this species occurred on September 3. Geocoris atricolor was present from July 22 through September 18 and occurred in peak numbers on August 20. The spider population was greatest during the period from August 5 through September 3.

Lacewings, syrphid flies, lady beetles, and collops beetles were present in very small numbers. These insects prey on aphids and although the alfalfa variety in this experiment is resistant to the spotted alfalfa aphid it is not resistant to the blue alfalfa aphid and the pea aphid. These latter aphid species occurred in large numbers during the period March 4 through May 20. It is interesting that aphid predators were almost totally lacking in this field during that period.

Insecticide application via drip irrigation system

(With the cooperation of R. W. Hagemann, R. K. Sharma and C. F. Ehlig)

Preliminary information was obtained on the application of aldicarb (Temik®) to seed alfalfa via an underground drip irrigation system at the U.S.D.A. Station at Brawley, California. The experimental plot consisted of five rows of seed alfalfa planted on 40 inch centers and 30 ft. long. The irrigation system was buried approximately 6 inches below the soil surface. Technical grade aldicarb was dissolved in acetone and the stock solution was introduced into the irrigation system at three rates, the equivalent of 1.0 2.0 and 3.0 lb. AI/acre. The 1.0 and 2.0 lb. AI/acre dosage rates were applied

in two increments, at bi-weekly intervals, each consisting of one half of the total dosage rate of 1.0 lb. AI/acre and 2.0 lb. AI/acre. The full 3.0 lb. AI/acre equivalent was applied in a single injection.

Two checks completed the five treatments, one consisted of only the irrigation water, the other included an equivalent amount of acetone from the stock solution but without the aldicarb. The materials were first applied on June 15. The insect populations were sampled with a D-Vac suction machine taking 5 samples (5 sq. ft.) from each treatment on each date. Pretreatment samples were taken on June 12 and posttreatment samples were taken on June 16, 20, 27, July 8 and 18.

Insects present in greatest numbers on the plants were lygus bugs. There were no aphids and virtually no spider mite populations. The effectiveness of the treatments was based on the numbers of lygus bug nymphs occurring in the samples. There was a fairly large and consistent population of adult lygus bugs that moved freely among the 5 rows in the experiment. The aldicarb applied in 1.0 lb. AI/acre increments and the 3.0 lb. AI/acre single application reduced nymph populations to very low levels. The 0.5 lb. AI/acre increments did not result in good nymph control. Populations of lygus bug adults did not appear to be greatly influenced by the treatments. However, this may be misleading because of the small plot size and the great mobility of the adults.

The results obtained in this experiment are very preliminary and are at best only indications of a possible potential for this means of applying insecticides to seed alfalfa. A more extensive facility for further experiments is now under development on the Davis campus and will be utilized in 1976.

Summary and Conclusions

Three new insecticides were evaluated in 1975 for the control of insects affecting seed alfalfa. They were Bay Hox 1901, Shell Development WL 43775, and Dacamox. None of these were effective in controlling the principal pests of seed alfalfa.

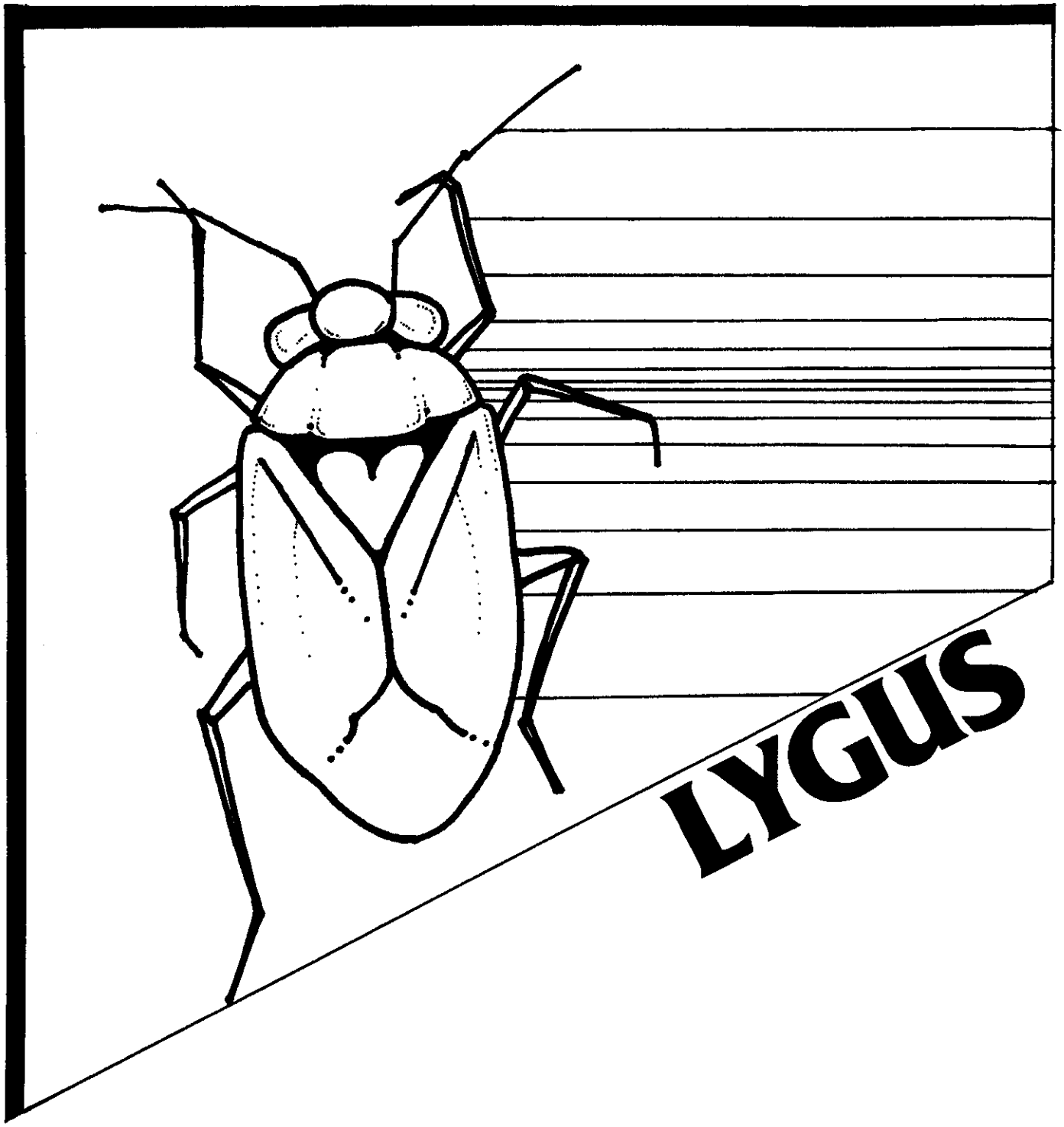
Carzol 0.75 lb. AI/acre + Lorsban 0.5 lb. AI/acre used throughout the season in an insecticide timing experiment gave good control of lygus bugs and also resulted in excellent control of the spotted alfalfa aphid and spider mites. Lorsban is highly effective in controlling the spotted alfalfa aphid

and it is expected that this material will be registered for use in seed alfalfa in 1976.

In the insecticide timing experiment mentioned above, there were no significant differences in seed yields and quality resulting from the effects of lygus bug treatment levels of 4-6 and 8-12 bugs per sweep. Further work is needed to determine if even higher lygus bug populations can be tolerated in alfalfa seed fields, especially late in the season, without causing serious crop loss.

Promising insecticide combinations that have already been tested for the control of insects affecting seed alfalfa are Vydate 0.5 lb. AI/acre + TEPP 1.0 lb. AI/acre and Lannate 0.75 lb. AI/acre + TEPP 1.0 lb. AI/acre. Other combinations that should be evaluated are Vydate 0.5 lb. AI/acre + Lorsban 0.5 lb. AI/acre and Monitor 0.5 lb. AI/acre + Lorsban 0.5 lb. AI/acre.

Studies in the untreated experimental alfalfa seed field indicate the desirability of initiating crop management experiments aimed at starting fields for seed production earlier in the year. This may enable growers to produce a significant portion of the crop before the peak of lygus bug activity. An early bloom would have fewer competing pollen sources and might receive greater visitation from honey bee pollinators. An early crop would also reduce the time that the crop would require protection from insect and mite pests, would conserve irrigation water and would avoid early rains in the fall which can reduce seed quality. As problems with insecticide usage become more critical greater reliance may have to be placed on modified cultural practices.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Lygus bug populations in seed alfalfa plots where insecticides were applied at counts of 4 to 6 lygus bugs per sweep. Firebaugh, California. 1975 1/

Treatment 2/		Dates of applications	Days after applications 3/	Number of lygus bugs per sweep 4/					
Insecticides	AI/acre lb.			Adults	Nymphs				Adults & Nymphs
					Small	Medium	Large	Total	
			Pre	0.45	0.37	0.42	1.16	1.95	2.40
			Pre	1.92	0.44	0.86	0.46	1.76	3.68
Carzol +	0.5	June 18	6	0.15	0.00	0.00	0.01	0.01	0.16
Lorsban	0.5		13	0.36	1.04	0.09	0.00	1.13	1.49
			20	0.36	1.04	3.03	0.11	4.19	4.55
			22	0.54	1.28	3.01	0.46	4.76	5.30
Carzol +	0.75	July 11	6	0.30	0.15	0.00	0.21	0.36	0.66
Lorsban	0.5		13	1.30	0.97	0.99	0.09	2.05	3.35
			18	1.52	1.11	1.45	1.40	3.96	5.48
Carzol +	0.75	July 30	6	0.36	0.63	0.03	0.07	0.73	1.09
Lorsban	0.5		13	0.81	4.36	1.50	0.01	5.87	6.68
Carzol +	0.75	Aug. 13	6	0.13	0.00	0.21	0.20	0.41	0.54
Lorsban	0.5		13	0.66	2.34	2.74	0.07	5.15	5.81
			15	0.65	2.19	2.97	0.39	5.55	6.20
Carzol +	0.75	Aug. 29	6	0.31	0.04	0.57	0.50	1.11	1.42
Lorsban	0.5		13	1.28	0.52	0.55	0.17	1.24	2.52

1/ The treatment was replicated 4 times, each replicate consisted of 7 acres.

2/ Applications were made by aircraft at 10 GPA prior to 4:30 AM.

3/ Pretreatment counts were made on June 10 and June 17.

4/ Average of 20 sweeps in each of the 4 replicates on each sampling date.

Lygus bug populations in seed alfalfa plots where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. Firebaugh, California. 1975 1/

Treatment 2/		Dates of applications	Days after applications 3/	Number of lygus bugs per sweep 4/					
Insecticide	AI/acre lb.			Adults	Nymphs				Adults & Nymphs
					Small	Medium	Large	Total	
			Pre	0.61	0.59	0.64	0.90	2.13	2.74
			Pre	1.30	0.30	0.44	0.26	1.00	2.30
Carzol +	0.5	June 18	6	0.10	0.00	0.00	0.01	0.01	0.11
Lorsban	0.5		13	0.54	1.00	0.24	0.00	1.24	1.78
			20	0.30	1.07	2.31	0.23	3.61	3.91
			27	1.25	1.73	0.76	1.76	4.25	5.50
			32	1.60	3.52	3.57	1.57	8.66	10.3
Carzol +	0.75	July 21	6	1.00	0.30	0.04	0.24	0.58	1.58
Lorsban	0.5		13	0.81	2.14	6.21	0.05	8.40	9.21
			16	0.75	7.60	4.15	1.25	13.0	13.75
Carzol +	0.75	Aug. 7	6	0.35	0.19	0.24	0.57	1.00	1.35
Lorsban	0.5		13	0.71	1.19	2.21	0.04	3.44	4.15
			20	0.38	0.95	2.88	1.83	5.66	6.04
			23	3.52	3.47	3.88	1.17	8.52	12.05
Carzol +	0.75	Aug. 31	6	0.57	0.07	0.75	0.95	1.77	2.34
Lorsban	0.5		13	1.73	1.97	1.25	0.30	3.52	5.25

1/ The treatment was replicated 4 times, each replicate consisted of 7 acres.

2/ Applications were made by aircraft at 10 GPA prior to 4:30 AM.

3/ Pretreatment counts were made on June 10 and June 17.

4/ Average of 20 sweeps in each of the 4 replicates on each sampling date.

Lygus bug populations in grower treated portion of field utilized in insecticide timing experiment for lygus bug control. Firebaugh, California, 1975. 1/

Treatment 2/		Dates of applications	Days after treatment 3/	Number of lygus bugs per sweep 4/					
Insecticides	AI/acre lb.			Adults	Nymphs				Adults & Nymphs
					Small	Medium	Large	Total	
			Pre	0.65	0.35	1.05	0.75	4.15	4.80
			Pre	1.35	0.45	0.60	0.35	1.40	2.75
			Pre	1.30	0.10	0.15	0.40	0.65	1.95
			Pre	1.75	2.15	0.85	0.15	3.15	4.90
			Pre	1.35	1.70	5.20	1.15	8.05	9.40
Carzol +	0.5	July 12	3	0.20	0.05	0.00	0.25	0.30	0.50
Lannate	0.34		10	0.65	2.15	0.25	0.10	2.50	3.15
			17	1.65	1.50	5.40	1.55	8.45	10.1
			24	4.40	16.4	25.9	3.80	46.1	50.5
Carzol +	0.5	Aug. 6	5	0.20	1.25	0.95	0.70	2.90	3.10
TEPP	1.0								
Lannate +	0.45	Aug. 18	1	0.10	0.15	0.60	0.15	0.90	1.00
TEPP	1.0		8	1.15	0.10	0.45	1.10	1.65	2.80
			16	1.25	1.45	0.60	0.10	2.15	3.40
			22	0.70	0.40	0.60	1.50	2.50	3.20

1/ Treatment evaluations were made in portion of field adjacent to insecticide timing experiment for lygus bug control.

2/ Applications were made by aircraft at 10 GPA.

3/ Pretreatment counts were made June 10, June 17, June 24, July 1 and July 8.

4/ Average of 20 sweeps on each sampling date.

Weights of harvested alfalfa seed in the insecticide timing experiment for lygus bug control. Firebaugh, California, 1975.

Treatment[1]	Cleaned seed lbs. per acre[2]				Average of 4[3] replications
	Replications				
	I	II	III	IV	
Carzol+Lorsban 4-6 bugs/sweep	1095.7	1266.9	1045.6	1075.9	1121.0 a
Carzol+Lorsban 8-12 bugs/sweep	1030.5	1074.9	1081.9	1108.1	1073.9 a
Grower treatment	994.2	994.2	937.2	937.2	965.7 b

1/ The Carzol+Lorsban plots were treated with Carzol 0.5 lb. AI/acre plus Lorsban 0.5 lb. AI/acre on June 18. Thereafter, individual plots were treated with Carzol 0.75 lb. AI/acre plus Lorsban 0.5 lb. AI/acre when the lygus bug sweep net counts in the plot reached the required level. The plots with 4-6 bugs/sweep each received a total of 5 applications. The plots with 8-12 bugs/sweep each received a total of 4 applications.

The grower program consisted of three applications. Carzol 0.5 AI/acre plus Lannate 0.34 lb. AI/acre on July 12, Carzol 0.5 lb. AI/acre plus TEPP 1.0 lb. AI/acre on August 6 and Lannate 0.45 lb. AI/acre plus TEPP 1.0 lb. AI/acre on August 18.

2/ Calculated weights based on harvest of the center 9 rows of each replicate. Harvest was on September 24 with commercial equipment.

3/ Means followed by the same letter are not significantly different at the 5% level of probability.

Good and defective seeds in samples from insecticide timing experiment for lygus bug control. Firebaugh, California, 1975.

Treatment[1/]	Replication 2/	Total seeds exam.	Good seed	Defective seeds					
				Chalcid	Lygus bug	Stink bug	Shriveled	Water damaged	Green
Carzol + Lorsban 4-6 bugs/swp.	1	1472	1394	3	45	13	0	15	2
	2	1517	1389	4	45	13	0	43	23
	3	1405	1313	0	34	6	1	41	10
	4	1418	1285	0	43	7	0	75	8
	totals	5812	5381	7	167	39	1	174	43
	%		92.6	0.12	2.87	0.67	0.02	3.00	0.74
Carzol + Lorsban 8-12 bugs/swp.	1	1511	1395	14	74	24	0	3	1
	2	1438	1307	7	78	19	0	20	7
	3	1446	1377	2	33	5	0	26	3
	4	1458	1304	3	37	6	0	105	3
	totals	5853	5383	26	222	54	0	154	14
	%		92.0	0.44	3.79	0.92	0.00	2.63	0.24
Grower program	1	1586	1493	7	40	10	1	4	31
	2	1362	1217	6	50	20	2	54	13
	totals	2948	2710	13	90	30	3	58	44
	%		91.9	0.44	3.05	1.02	0.10	1.97	1.49

1/ The Carzol+Lorsban treatments were each replicated four times. All plots were treated with Carzol 0.5 lb. AI/acre plus Lorsban 0.5 lb. AI/acre on June 18. Thereafter individual plots were treated with Carzol 0.75 lb. AI/acre plus Lorsban 0.5 lb. AI/acre when the lygus bug sweep net counts in the plot reached the required level. The plots with 4-6 bugs/sweep each received a total of 5 applications. The plots with 8-12 bugs/sweep each received a total of 4 applications.

The grower program consisted of three applications; Carzol 0.5 lb. AI/acre plus Lannate 0.34 lb. AI/acre on July 12, Carzol 0.5 lb. AI/acre plus TEPP 1.0 lb. AI/acre on August 6 and Lannate 0.45 lb. AI/acre plus TEPP 1.0 lb. AI/acre on August 18.

2/ Two samples of seed 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.

Lygus bug populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Firebaugh, California. 1975.

Treatment 1/		Days after application 2/	Number of lygus bugs per sweep 3/					
Insecticides	lb. AI/acre		Adults	Nymphs				Adults & Nymphs
				Small	Medium	Large	Total	
Lannate +	0.75	Pre	0.00	0.70	14.4	0.10	15.2	15.2
Tepp	1.0	6	0.10	0.00	0.60	0.30	0.90	1.00
		14	0.70	0.50	0.00	0.00	0.50	1.20
Vydate +	0.5	Pre	0.00	1.80	12.4	0.10	14.3	14.3
Tepp	1.0	6	0.10	0.00	0.10	0.10	0.20	0.30
		14	0.40	0.10	0.00	0.00	0.10	0.50
Bayhox 1901	1.0	Pre	0.10	1.60	12.6	0.00	14.2	14.3
		6	0.40	0.00	5.70	3.30	9.00	9.40
		14	4.90	0.50	0.60	0.00	1.10	6.00
SD WL 43775	0.1	Pre	0.10	2.50	16.6	0.00	19.1	19.2
Code 5-2-8-5		6	0.10	0.10	8.5	5.80	14.4	14.5
		14	12.3	2.10	1.40	0.20	3.70	16.0
Carzol +	0.75	Pre	0.20	2.80	19.6	0.00	22.4	22.6
Lorsban	0.5	6	0.00	0.00	1.30	1.20	2.50	2.50
		14	1.30	0.10	0.10	0.00	0.20	1.50
Check 4/	None	Pre	0.20	4.80	17.0	0.00	21.8	22.0
		6	0.50	0.60	11.3	12.4	24.3	24.8
		6	1.10	0.00	0.00	0.00	0.00	1.10

1/ Plot size: Each treatment 5 acres (165' x 1320'). Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. Plots were treated August 6 from 4:30 to 5:30 AM.

2/ Pretreatment counts were made on August 5.

3/ Average of 10 sweeps per treatment on each sampling date.

4/ Check was treated after the 6-day count with Carzol 0.75 lb. AI/acre plus Lorsban 0.5 lb. AI/acre on August 13 because of high populations of spotted alfalfa aphid and lygus bugs.

Lygus bug populations in a seed alfalfa plot treated with Dacamox granules applied to the soil. Firebaugh, California, 1975.

Treatment[1]		Days after application[2]	Number per sweep[3]				
Insecticide	lb. AI/acre		Adults	Nymphs			Adults & Nymphs
				Small	Medium	Large	Total	
		Pre	0.15	0.60	0.80	0.05	1.45	1.60
Dacamox 10G	3.0	5	0.60	1.00	1.05	1.30	3.35	3.95
		12	2.65	0.55	0.40	0.45	1.40	4.05
		19	2.75	0.55	0.80	0.95	2.30	5.05
		26	2.05	3.95	1.95	0.75	6.65	8.70
		-	-	-	-	-	-	-
No treatment	None	5	0.65	0.35	1.05	2.75	4.15	4.80
		12	1.35	0.45	0.60	0.35	1.40	2.75
		19	1.30	0.10	0.15	0.40	0.65	1.95
		26	1.75	2.15	0.85	0.15	3.15	4.90

1/ Dacamox 10% granules were applied at 3.0 lb. AI/acre with a 6-row commercial applicator on June 5. Plot was furrow irrigated on June 6. Plot size 2.8 acres.

2/ Pretreatment counts were made on June 3.

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

Lygus bug populations in seed alfalfa treated with aldicarb applied via an underground drip irrigation system. Brawley, California 1975

Treatment [1]			Number per 5 D-Vac Samples	
Insecticide [3]	AI/acre lb.	Date [2] Sampled	Adults	Nymphs
Aldicarb	1.0 (0.5x2)	Pre June 12	20	64
		16	49	14
		20	30	14
		27	18	13
		July 7	4	14
		18	9	10
Aldicarb	2.0 (1.0x2)	Pre June 12	25	40
		16	37	1
		20	23	2
		27	27	0
		July 7	5	0
		18	4	4
Aldicarb	3.0 (3.0x1)	Pre June 12	27	56
		16	18	0
		20	19	0
		27	8	4
		July 7	7	1
		18	3	3
Acetone solvent	None	Pre June 12	23	28
		16	21	9
		20	37	8
		27	24	16
		July 7	2	3
		18	1	1
Water	None	Pre June 12	14	28
		16	66	23
		20	41	3
		27	25	5
		July 7	5	2
		18	1	1

1/ Plot size: Each treatment was applied to a single row 30' long. Row spacing 40".

2/ Pre treatment samples were taken on June 12.

3/ Technical grade aldicarb was dissolved in acetone and the stock solution was introduced into the irrigation system at three rates, the equivalent of 1.0, 2.0 and 3.0 lb. AI/acre. The 1.0 and 2.0 rates were applied in two increments, at biweekly intervals, each consisting of one half the total dosage rate. The 3.0 lb. AI/acre dosage was introduced into the system in a single injection.

Percentages of good and defective seeds in samples from seed alfalfa treated with aldicarb applied via an underground drip irrigation system. Brawley, California 1975

Treatment				Defective Seeds					
Insecticide	AI/acre lb.	Total Seeds Examined 1/	Good Seed	Chalcid	Lygus Bug	Stink Bug	Shriveled	Water Damaged	Green
Aldicarb	1.0 (0.5x2)	829	94.8	2.04	2.41	0.36	0.00	0.12	0.24
Aldicarb	2.0 (1.0x2)	756	92.9	4.10	2.51	0.26	0.00	0.13	0.12
Aldicarb	3.0 (3.0x1)	808	94.2	2.23	2.10	0.12	0.00	0.37	0.99
Acetone solvent	None	841	92.9	3.45	2.26	0.36	0.00	0.95	0.12
Water	None	825	90.7	2.91	5.09	0.36	0.00	0.48	0.48

1/ Samples of pods 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.

Lygus bug populations in an untreated seed alfalfa field. Firebaugh, California, 1974-1975.

Date Sampled 1/	Number per sweep 2/					
	Adults	Nymphs				Adults & Nymphs
		Small	Medium	Large	Total	
Nov. 12	1.10	0	0	0	0	1.10
25	0.10	0	0	0	0	0.10
Dec. 11	0.60	0	0	0	0	0.60
26	0.35	0	0	0	0	0.35
Jan. 7, 1975	1.20	0	0	0	0	1.20
21	0.60	0	0	0	0	0.60
Feb. 2	0.90	0	0	0	0	0.90
18	0.75	0	0	0	0	0.75
Mar. 4	0.90	0	0	0	0	0.90
18	0.30	0	0	0	0	0.30
Apr. 3	0.15	0	0	0	0	0.15
15 3/	0	0.05	0	0	0.05	0.05
May 27	0.30	0.10	0	0	0.10	0.40
June 3	0.40	2.00	2.10	0.15	4.20	4.60
10	0.10	0.60	0.95	0.65	2.20	2.30
17	1.60	1.25	1.25	0.75	3.25	4.85
24	5.65	1.80	2.60	0.90	5.30	11.0
July 1	4.00	4.40	3.40	0.85	8.65	12.7
8	2.80	6.55	4.20	0.60	11.4	14.2
15	1.40	10.4	6.25	1.95	18.6	20.0
22	7.30	57.5	36.0	9.10	10.3	110
29	9.30	61.0	44.6	22.1	128	137
Aug. 5	11.3	78.9	61.0	36.4	176	188
12	3.20	68.8	44.5	3.70	117	120
20	3.10	37.6	39.9	4.70	82.2	85.3
26	6.40	18.5	16.6	9.60	47.7	51.1
Sept 3	1.60	9.10	12.4	5.90	27.4	29.0
10	-	-	-	-	-	-
18	0.50	2.50	3.80	1.90	8.20	8.70
22	1.40	1.10	4.40	2.50	8.10	9.40

1/ Field was sampled after the 1974 seed harvest until the 1975 harvest.

2/ Average of 20 sweeps on each sampling date.

3/ The field was pastured with sheep from April 22 to April 29.

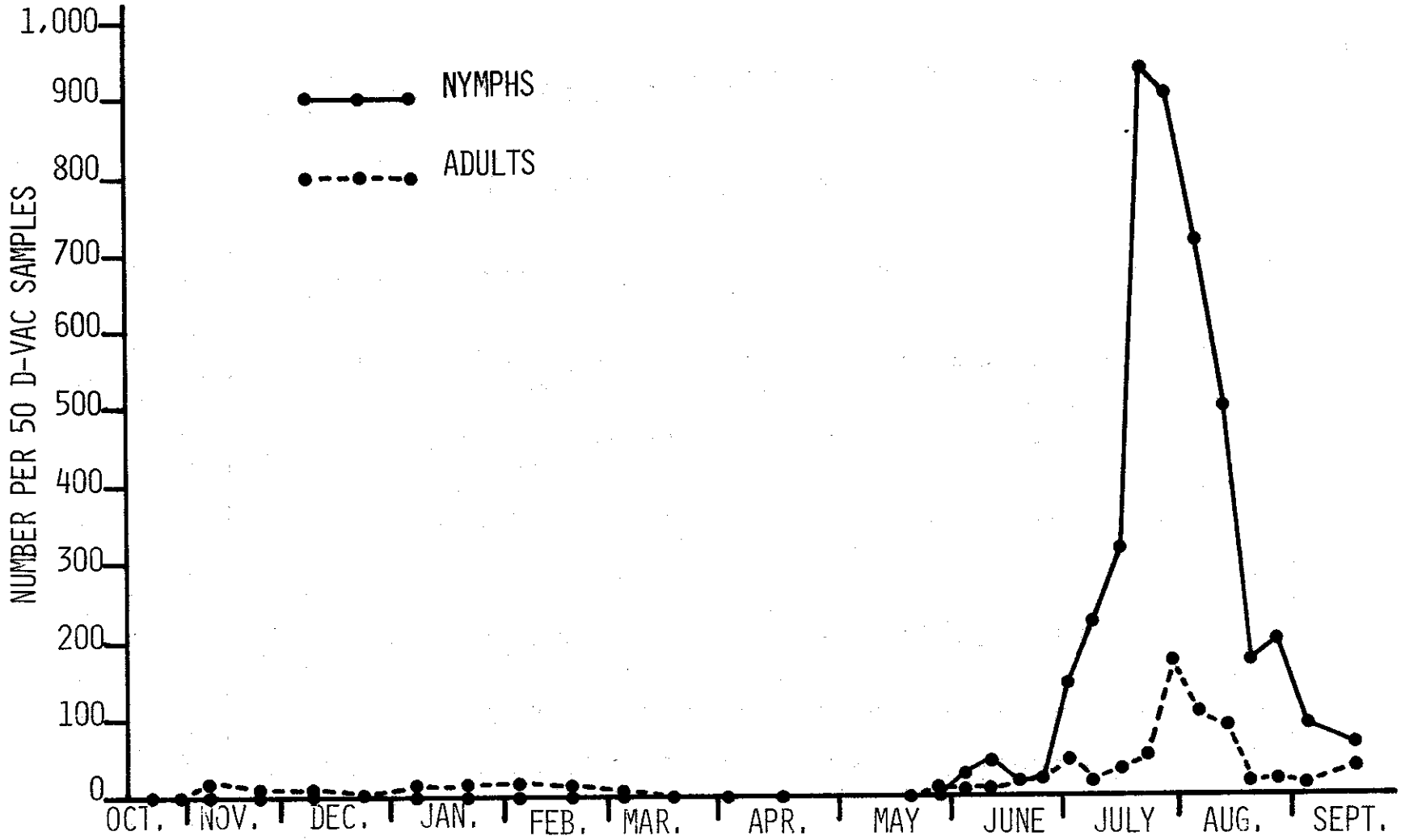
Lygus bug populations in an untreated seed alfalfa field. Firebaugh, California, 1974-75.

Date Sampled 1/	Number Per 50 D-Vac Samples 2/									
	Adults			Nymphal Instars						Adults & Nymphs
	♂	♀	Total	1	2	3	4	5	Total	
Oct. 22, 1974	3	0	3	0	0	1	0	0	1	4
30	0	1	1	0	0	0	0	0	0	1
Nov. 12	13	8	21	0	0	0	0	0	0	21
25	8	0	8	0	0	0	0	0	0	8
Dec. 10	4	2	6	0	0	0	0	0	0	6
26	2	0	2	0	0	0	0	0	0	2
Jan. 7, 1975	8	1	9	0	0	0	0	0	0	9
21	9	4	13	0	0	0	0	0	0	13
Feb. 4	17	5	22	0	0	0	0	0	0	22
18	4	6	10	0	0	0	0	0	0	10
Mar. 4	2	2	4	0	0	0	0	0	0	4
18	2	2	4	0	0	0	0	0	0	4
Apr. 3	0	0	0	0	0	0	0	0	0	0
15 3/	0	0	0	0	0	0	0	0	0	0
May 6	0	0	0	0	0	0	0	0	0	0
20	2	0	2	0	0	0	0	0	0	2
27	4	1	5	0	0	0	0	0	0	5
June 3	1	4	5	8	11	9	0	3	31	36
10	1	2	3	1	4	20	15	22	62	65
17	13	6	19	1	3	3	6	10	23	42
24	17	6	23	2	6	5	5	3	21	44
July 1	37	17	54	0	9	72	44	21	146	200
8	15	6	21	0	20	109	52	13	194	215
15	17	19	36	76	118	84	36	3	317	353
22	36	18	54	146	278	294	142	44	904	958
29	86	82	168	174	252	212	148	78	864	1032
Aug. 5	36	68	104	104	198	150	166	92	710	814
12	36	54	90	70	128	126	102	64	490	580
20	6	16	22	22	34	42	36	44	178	200
26	16	8	24	0	2	34	92	74	202	226
Sept. 3	14	4	18	0	2	20	32	38	92	110
10	wet	-	-	-	-	-	-	-	-	-
18	22	14	36	0	2	6	34	26	68	104
Seasonal totals	431	356	787	604	1067	1187	910	535	4303	5090

1/ Samples are for period after seed harvest 1974 until harvest 1975.

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

3/ The field was pastured with sheep from April 22 to April 29.

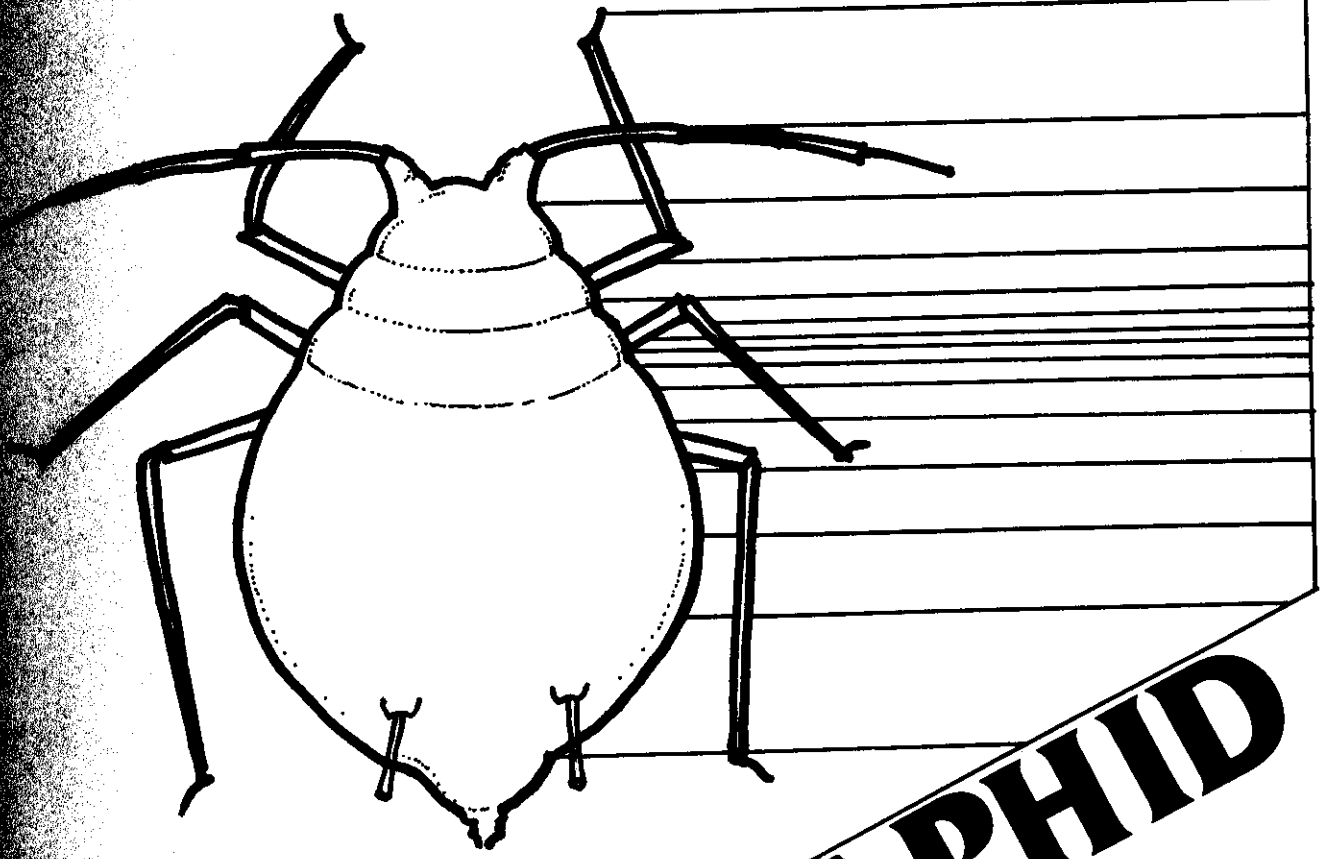


LYGUS BUG POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD FROM OCTOBER 22, 1974, UNTIL SEPTEMBER 18, 1975. FIELD WAS PASTURED WITH SHEEP APRIL 22-29. FIREBAUGH, CALIFORNIA, 1974-1975.

Good and defective seeds in samples from an untreated seed alfalfa field. Firebaugh, California, 1975.

Sample 1/	Sub Sample	Total seeds exam.	Good seed	Defective Seeds					
				Chalcid	Lygus bug	Stink bug	Shriveled	Water damaged	Green
1	a	205	145	0	28	3	0	2	27
	b	204	158	0	23	3	0	3	17
	c	177	133	0	26	4	0	2	12
	d	204	150	1	24	0	0	1	28
	Totals	790	586	1	101	10	0	8	84
2	a	190	146	2	17	2	0	1	22
	b	210	152	0	21	3	0	1	33
	c	205	164	1	16	2	0	1	21
	d	209	173	2	25	0	0	1	8
	Totals	814	635	5	79	7	0	4	84
3	a	178	147	0	17	0	0	1	13
	b	195	160	1	22	0	0	0	12
	c	187	149	0	18	0	0	1	19
	d	196	163	0	17	3	0	0	13
	Totals	756	619	1	74	3	0	2	57
4	a	175	151	0	12	1	0	10	1
	b	170	140	0	20	2	0	8	0
	c	171	154	0	14	1	0	2	0
	d	171	142	0	24	0	0	5	0
	Totals	687	587	0	70	4	0	25	1
Sample totals		3047	2427	7	324	24	0	39	226
%		100	79.7	0.23	10.6	0.79	0.00	1.28	7.42

1/ Four samples of pods were hand stripped from plants prior to commercial harvest. Samples were hand threshed and lightly cleaned in a clipper seed cleaner.



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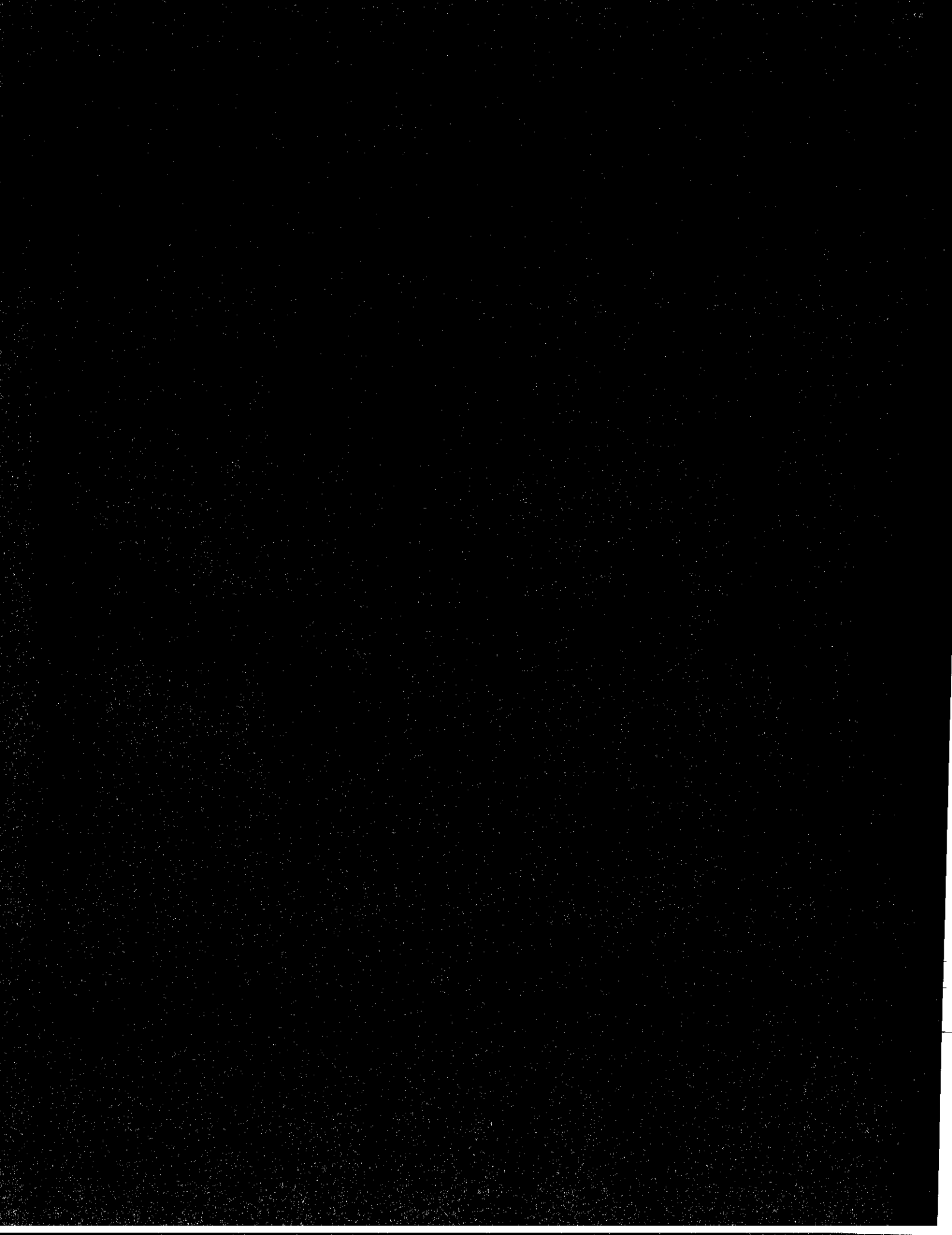


Aphid populations in seed alfalfa plots where insecticides were applied at counts of 4 to 6 lygus bugs per sweep. Firebaugh, California, 1975. 1/

Treatment 2/		Dates of applications	Days after applications 3/	Number per 50 D-Vac samples 4/	
Insecticides	AI/acre lb.			Spotted alfalfa aphid	Pea aphid
			Pre	2,841	13.8
			Pre	139	0.00
Carzol +	0.5	June 18	6	3.00	0.00
Lorsban	0.5		13	2.50	0.25
			20	2.25	0.25
			22	2.00	0.75
Carzol +	0.75	July 11	6	1:75	0.75
Lorsban	0.5		13	3.25	11.5
			18	3.75	9.00
Carzol +	0.75	July 30	6	26.8	1.25
Lorsban	0.5		13	47.0	0.00
Carzol +	0.75	Aug. 13	6	21.0	0.50
Lorsban	0.5		13	66.3	19.3
			15	153.0	21.0
Carzol +	0.75	Aug. 29	6	12.0	0.30
Lorsban	0.5				

1/ The treatment was replicated 4 times, each replicate consisted of 7 acres.

2/ Applications were made by aircraft at 10 GPA prior to 4:30 AM.

3/ Pretreatment counts were made on June 10 and June 17.

4/ Average of 2-25 suck D-Vac samples in each of the 4 replicates on each sampling date.

Aphid populations in seed alfalfa plots where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. Firebaugh, California, 1975. 1/

Treatment 2/		Dates of applications	Days after applications 3/	Number per 50 D-Vac Samples 4/	
Insecticides	AI/acre lb.			Spotted alfalfa aphid	Pea aphid
			Pre	3,765	13.0
			Pre	132	0.75
Carzol +	0.5	June 18	6	2.25	0.00
Lorsban	0.5		13	3.00	0.00
			20	3.25	2.50
			27	2.25	1.00
			32	4.00	3.00
Carzol +	0.75	July 21	6	2.75	0.25
Lorsban	0.5		13	80.5	0.75
			18	86.0	2.00
Carzol +	0.75	Aug. 7	6	21.5	0.00
Lorsban	0.5		13	40.5	6.75
			20	460	19.0
			24	1,272	20.5
Carzol +	0.75	Aug. 29	6	9.50	7.50
Lorsban	0.5				

1/ The treatment was replicated 4 times, each replicate consisted of 7 acres.

2/ Applications were made by aircraft at 10 GPA prior to 4:30 AM.

3/ Pretreatment counts were made on June 10 and June 17.

4/ Average of 2-25 suck D-Vac samples in each of the 4 replicates on each sampling date.

Aphid populations in grower treated portion of field utilized in insecticide timing experiment for lygus bug control. Firebaugh, California, 1975.[1/]

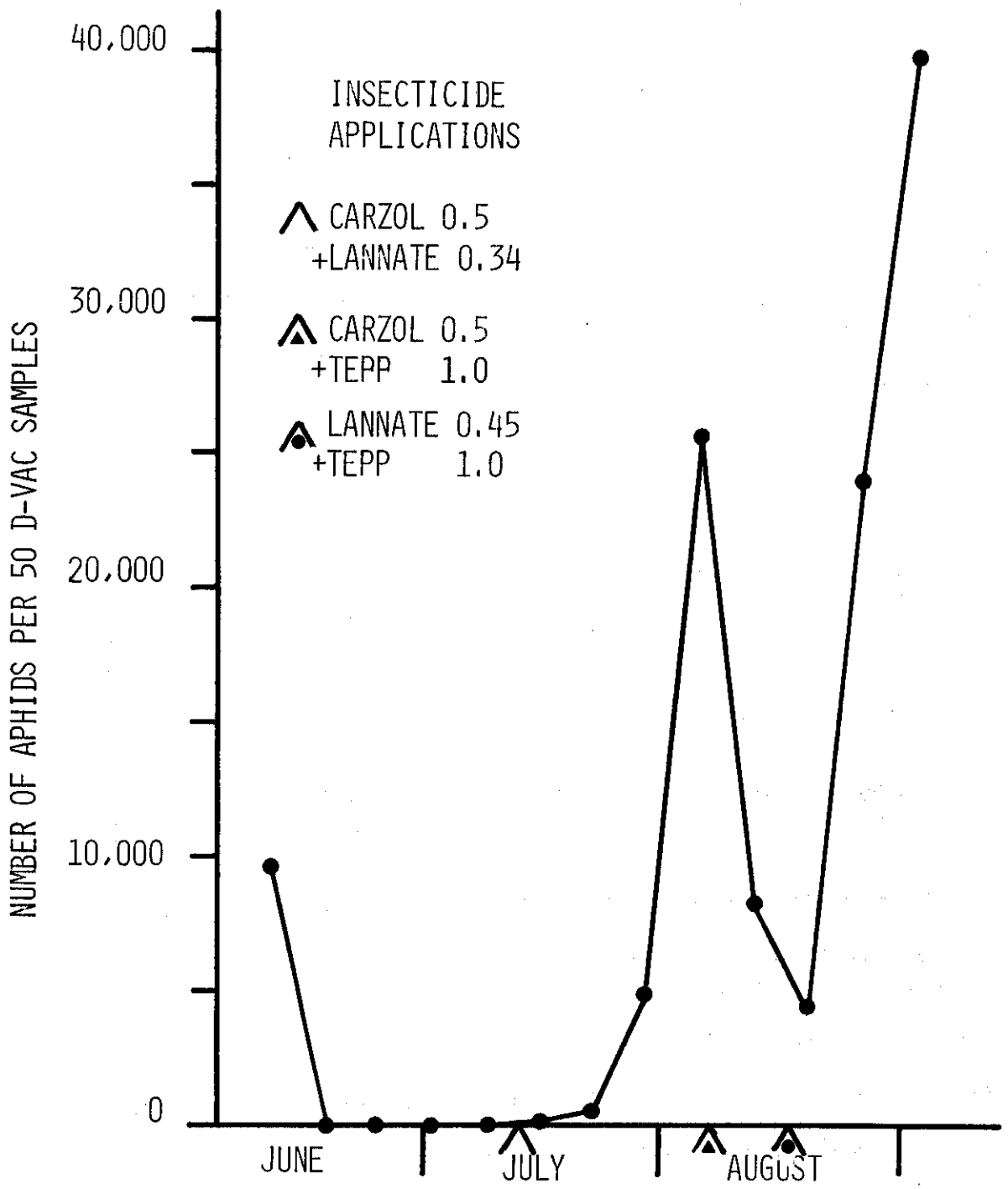
Treatments[2/]		Dates of applications	Days after applications[3/]	Number per 50 D-Vac samples[4/]	
Insecticide	AI/acre lb			Spotted alfalfa aphid	Pea aphid
			Pre	9,648	20
			Pre	64	0
			Pre	10	2
			Pre	5	0
			Pre	54	0
Carzol +	0.5	July 12	3	32	0
Lannate	0.34		10	611	8
			17	4,869	47
			24	25, 872	352
Carzol +	0.5	Aug. 6	5	8,160	2
Tepp	1.0				
Lannate +	0.45	Aug. 18	1	4,096	2
Tepp	1.0		8	28,924	8
			16	39,336	14

1/ Treatment evaluations were made in portion of field adjacent to insecticide timing experiment for lygus bug control.

2/ Applications were made by aircraft at 10 GPA.

3/ Pretreatment counts were made June 10, June 17, June 24, July 1 and July 8.

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



SPOTTED ALFALFA APHID POPULATION IN GROWER TREATED PORTION OF FIELD UTILIZED IN INSECT TIMING EXPERIMENT FOR LYGUS BUG CONTROL. FIREBAUGH, CALIFORNIA, 1975.

Spotted alfalfa aphid populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Firebaugh, California. 1975.

Treatment[1]		Number of Aphids Per 20 D-Vac Samples[2]		
Insecticide	lb. AI/acre	August 5 Pre	August 12 6 days	August 20 14 days
Lannate + Tepp	0.75 1.0	1075	17	170
Vydate + Tepp	0.5 1.0	1090	22	135
Bayhox 1901	1.0	1076	3122	7004
SD WL 43775 Code 5-2-8-5	0.1	1274	183	1568
Carzol + Lorsban	0.75 0.5	1458	17	267
Check 3/	None	1403	5494	123

1/ Plot size: Each treatment 5 acres (165' x 1320'). Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. Plots were treated August 6 from 4:30 to 5:30 AM.

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

3/ Check was treated after the 6-day count with Carzol 0.75 lb. AI/acre plus Lorsban 0.5 lb. AI/acre on August 13 because of high populations of spotted alfalfa aphid and lygus bugs.

Aphid populations in a seed alfalfa plot treated with Dacamox granules applied to the soil. Firebaugh, California, 1975.

Treatment 1/		Days after application 2/	Number per 50 D-Vac samples 3/	
Insecticide	AI/acre lb		Spotted alfalfa aphid	Pea aphid
Dacamox 10G	3.0	Pre	6048	126
		5	1264	3
		12	87	1
		19	86	2
		26	70	13
No Treatment	None	-	--	-
		5	9648	20
		12	64	0
		19	10	2
		26	5	0

1/ Dacamox 10% granules were applied at 3.0 lb. AI/acre with a 6-row commercial applicator on June 5. Plot was furrow irrigated on June 6. Plot size - 2.8 acres.

2/ Pretreatment counts were made on June 3.

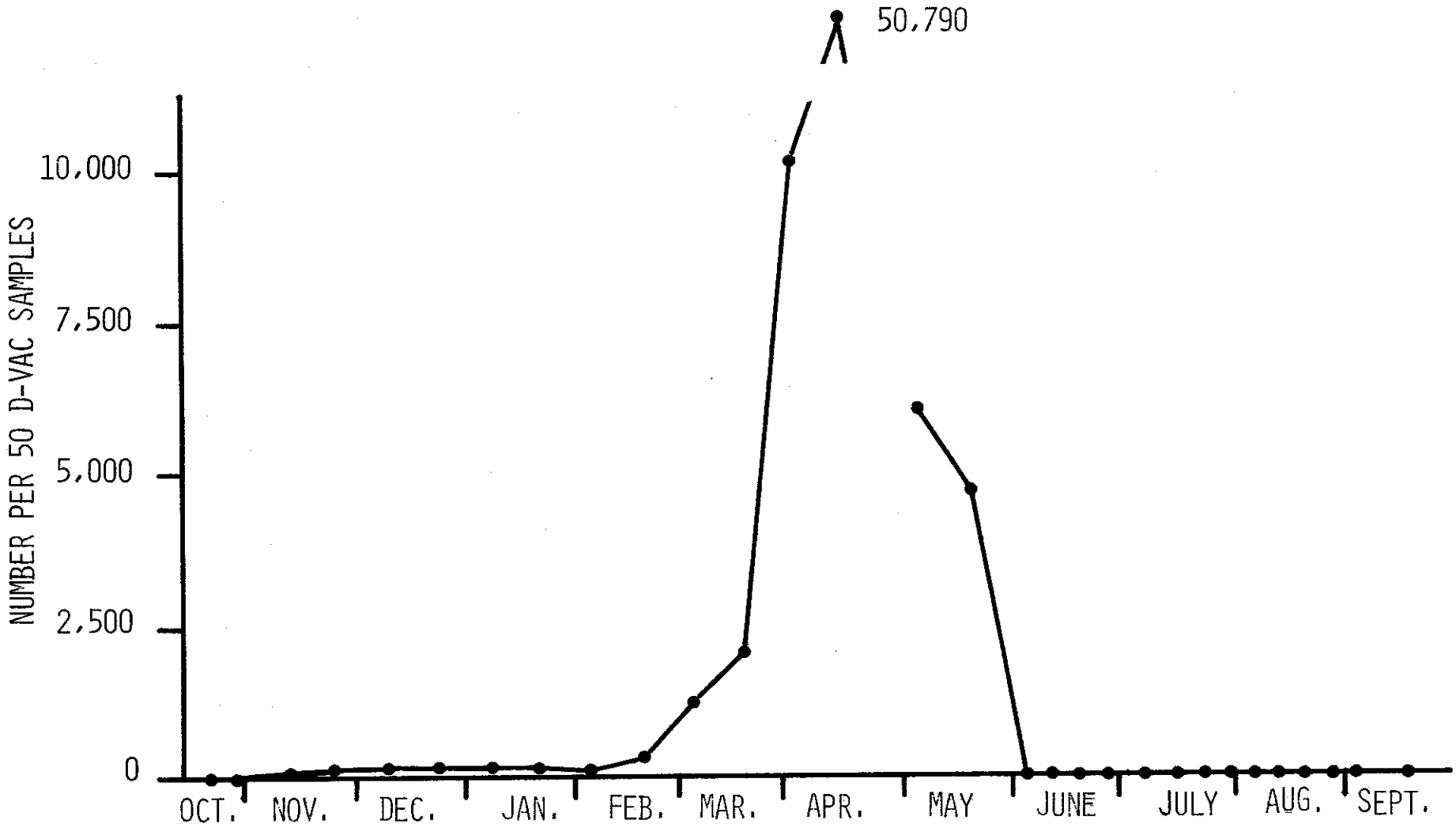
3/ 2-25 suck D-Vac samples on each sampling date.

Aphid populations in an untreated seed alfalfa field. Firebaugh, California, 1974-1975.

Date sampled[1/]	Number per 50 D-Vac Samples[2/]	
	Spotted alfalfa aphid	Pea aphid
Oct. 22, 1974	0	2
30	1	3
Nov. 12	0	84
25	3	145
Dec. 10	10	174
26	5	156
Jan. 7, 1975	8	244
21	2	164
Feb. 4	0	108
18	6	268
Mar. 4	2	1,233
18	2	1,967
Apr. 3	2	10,084
15	0	50,790
May 6	0	5,960
20	1	4,692
27	7	44
June 3	7	18
10	1	19
17	23	5
24	1	4
July 1	1	10
8	2	25
15	4	14
22	12	94
29	46	86
Aug. 5	10	20
12	6	0
20	0	8
26	142	8
Sept. 3	18	8
10	wet	wet
18	12	24

1/ The field was pastured with sheep from April 22 to April 29.

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



PEA APHID POPULATION IN AN UNTREATED SEED ALFALFA FIELD FROM OCTOBER 22, 1974 UNTIL SEPTEMBER 18, 1975. FIELD WAS PASTURED WITH SHEEP FROM APRIL 22 TO APRIL 29. FIREBAUGH, CALIFORNIA, 1974-1975.

Spider mite populations in seed alfalfa plots where insecticides were applied at counts of 4 to 6 lygus bugs per sweep. Firebaugh, California, 1975 1/

Treatment 2/		Dates of applications	Days after applications 3/	Number per leaf 4/	
Insecticides	AI/acre lb.			Mites	Eggs
			Pre	5.94	12.4
			Pre	5.46	10.3
Carzol +	0.5	June 18	6	0.03	0.87
Lorsban	0.5		13	0.82	1.81
			20	0.85	3.47
			22	1.07	4.42
Carzol +	0.75	July 11	6	0.58	0.82
Lorsban	0.5		13	0.45	1.33
			18	0.75	3.43
Carzol +	0.75	July 30	6	0.60	0.52
Lorsban	0.5		13	-	-
Carzol +	0.75	Aug. 13	6	0.78	1.40
Lorsban	0.5		13	0.69	3.97
			15	0.81	4.13
Carzol +	0.75	Aug. 29	6	1.81	5.05
Lorsban	0.5		13	3.63	10.1

1/ The treatment was replicated 4 times, each replicate consisted of 7 acres.

2/ Applications were made by aircraft at 10 GPA prior to 4:30 AM.

3/ Pretreatment counts were made on June 10 and June 17.

4/ Average of 50 trifoliate leaves showing mite injury from each of the 4 replicates on each sampling date.

Spider mite populations in seed alfalfa plots where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. Firebaugh, California 1975. 1/

Treatment 2/		Dates of applications	Days after applications 3/	Number per leaf 4/	
Insecticides	AI/acre lb.			Mites	Eggs
			Pre	4.73	11.4
			Pre	8.15	13.0
Carzol +	0.5	June 18	6	0.01	1.71
Lorsban	0.5		13	0.58	1.73
			20	0.89	2.91
			27	2.24	4.90
			32	2.35	4.84
Carzol +	0.75	July 21	6	0.91	1.16
Lorsban	0.5		13	0.84	2.39
			18	0.87	2.65
Carzol +	0.75	Aug. 7	6	-	-
Lorsban	0.5		13	1.36	3.57
			20	1.58	4.77
			24	2.91	6.34
Carzol +	0.75	Aug. 29	6	2.53	5.36
Lorsban	0.5				

1/ The treatment was replicated 4 times, each replicate consisted of 7 acres.

2/ Applications were made by aircraft at 10 GPA prior to 4:30 AM.

3/ Pretreatment counts were made on June 10 and June 17.

4/ Average of 50 trifoliate leaves showing mite injury from each of the 4 replicates on each sampling date.

Spider mite populations in grower treated portion of field utilized in insecticide timing experiment for lygus bug control. Firebaugh, California, 1975.[1/]

Treatment[2/]		Dates of applications	Days after applications[3/]	Number per leaf[4/]	
Insecticides	AI/acre lb.			Mites	Eggs
			Pre	0.66	0.32
			Pre	0.70	1.28
			Pre	3.06	2.12
			Pre	0.42	2.40
			Pre	3.40	10.6
Carzol +	0.5	July 12	3	0.54	1.58
Lannate	0.34		10	0.38	0.84
			17	0.82	2.78
			24	7.34	16.4
Carzol +	0.5	Aug. 6	5	-	-
Tepp	1.0				
Lannate +	0.45	Aug. 18	1	0.12	0.78
Tepp	1.0		8	0.34	1.40
			16	1.08	5.24

1/ Treatment evaluations were made in portion of field adjacent to insecticide timing experiment for lygus bug control.

2/ Applications were made by aircraft at 10 GPA.

3/ Pretreatment counts were made June 10, June 17, June 24, July 1 and July 8.

4/ 50 trifoliate leaves showing mite damage were examined on each sampling date.

Mite populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Firebaugh, California. 1975.

Treatment[1]		Number of Mites Per Leaf[2]		
Insecticide	lb. AI/Acre	August 5 Pre	August 12 6 days	August 20 14 days
Lannate + Tepp	0.75 1.0	5.54	9.92	8.42
Vydate + Tepp	0.5 1.0	7.04	8.58	10.3
Bayhox 1901	1.0	5.26	12.7	11.9
SD WL 43775 Code 5-2-8.5	0.1	12.7	13.5	11.7
Carzol + Lorsban	0.75 0.5	6.30	3.52	2.16
Check[3]	None	5.12	15.1	1.06

1/ Plot size: Each treatment 5 acres (165' x 1320'). Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. Plots were treated August 6 from 4:30 to 5:30 AM.

2/ 50 trifoliate leaves from each treatment on each date.

3/ Check was treated after the 6 day count with Carzol at 0.75 lb. AI/acre plus Lorsban 0.5 lb. AI/acre on August 13 because of high populations of spotted alfalfa aphid and lygus bugs.

Spider mite populations in a seed alfalfa plot treated with Dacamox granules applied to the soil. Firebaugh, California, 1975.

Treatment[1]		Days after application[2]	Number per leaf[3]	
Insecticide	AI/acre lb.		Mites	Mite eggs
Dacamox 10G	3.0	Pre	2.32	9.62
		5	8.00	15.2
		12	15.1	19.3
		19	22.2	15.0
		26	10.4	13.3
No treatment	None	-	-	-
		5	0.66	3.94
		12	0.70	3.42
		19	3.06	3.74
		26	0.42	1.98

1/ Dacamox 10% granules were applied at 3.0 lb. AI/acre with a 6-row commercial applicator on June 5. Plot was furrow irrigated on June 6. Plot size - 2.8 acres.

2/ Pretreatment counts were made on June 3.

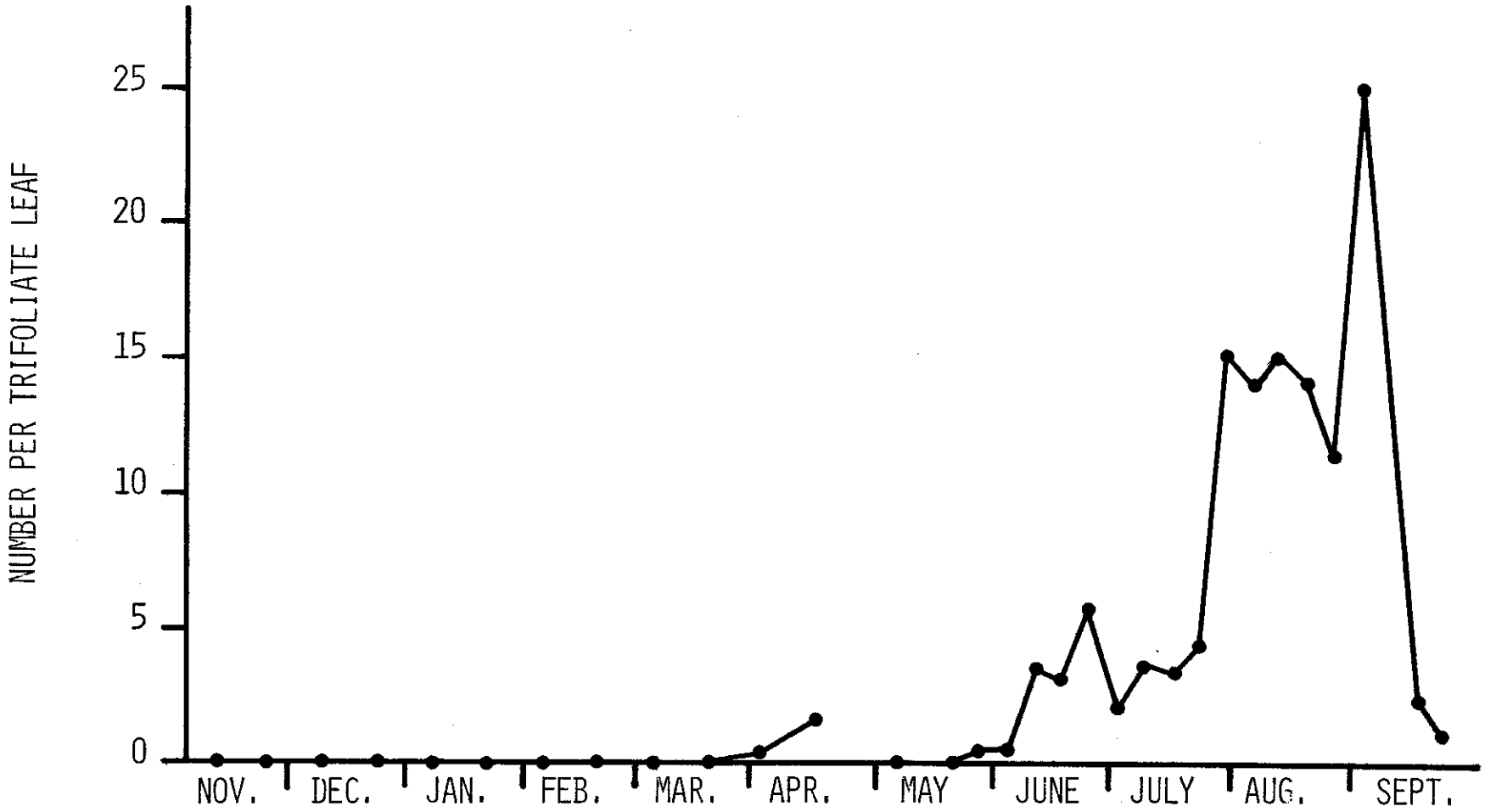
3/ 50 trifoliate leaves showing mite damage were examined on each sampling date.

Spider mite populations in an untreated seed alfalfa field. Firebaugh, California. 1974-75.

Date sampled[1]	Number per leaf[2]	
	Mites	Mite eggs
Nov. 12, 1974	0.08	0.02
25	0.02	0.02
Dec. 10	0.00	0.00
26	0.12	0.00
Jan. 7, 1975	0.00	0.00
21	0.00	0.00
Feb. 4	0.02	0.02
18	0.02	0.04
Mar. 4	0.14	0.68
18	0.22	1.78
Apr. 3	0.48	3.58
15	1.78	12.5
May 6	0.00	0.02
20	0.00	0.00
27	0.50	0.78
June 3	0.52	1.84
10	3.46	3.20
17	3.10	6.34
24	5.90	5.92
July 1	2.08	4.50
8	3.66	14.2
15	3.44	16.8
22	4.34	12.3
29	15.0	53.1
Aug. 5	13.9	18.2
12	15.1	30.0
20	14.0	21.8
26	11.2	22.6
Sept. 3	24.8	24.9
10	wet	wet
18	2.30	1.64
22	0.82	0.04

1/ The field was pastured with sheep from April 22 to April 29.

2/ 50 trifoliate leaves showing mite injury were examined on each sampling date.



SPIDER MITE POPULATION IN AN UNTREATED SEED ALFALFA FIELD FROM NOVEMBER 12, 1974 UNTIL SEPTEMBER 22, 1975. FIELD WAS PASTURED WITH SHEEP FROM APRIL 22 TO APRIL 29. FIREBAUGH, CALIFORNIA, 1974-1975.

Predator and parasite populations in seed alfalfa plots where insecticides were applied at counts of 4 to 6 lygus bugs per sweep. Firebaugh, California, 1975. 1/

Treatment 2/		Date of application	Day after application 3/	Number per 50 D-Vac samples 4/															
Insecticides	Lb AI/ acre			Geocoris		Nabis		Orius		Lacewing		Syrphid		Cocci-nellidae		Collops		Par Wasps	Spiders
				A	N	A	N	A	N	A	L	A	L	A	L	A	L		
			Pre	34	383	4	135	453	153	28	23	0	0	4	11	1	5	756	27
			Pre	67	256	7	235	288	460	19	7	0	0	7	6	1	3	170	45
Carzol +	0.5	June 18	6	15	9	1	28	76	58	9	3	0	0	2	0	1	8	38	61
Lorsban	0.5		13	35	22	4	63	126	129	13	4	0	0	2	0	2	10	54	72
			20	29	48	9	56	124	175	10	7	0	0	2	0	3	14	94	108
			22	26	41	7	51	120	311	7	6	0	0	2	0	3	11	77	93
Carzol +	0.75	July 11	6	2	4	0	9	39	38	0	5	0	0	0	0	4	7	6	53
Lorsban	0.5		13	2	2	1	22	48	29	3	7	0	0	0	0	6	12	19	124
			18	2	2	2	4	91	60	1	7	0	0	0	0	9	12	21	103
Carzol +	0.75	July 30	6	3	1	0	0	13	25	2	7	0	0	0	0	14	19	4	20
Lorsban	0.5		13	0	0	0	2	37	110	1	6	0	0	0	0	9	23	6	28
Carzol +	0.75	Aug. 13	6	1	0	0	1	20	13	1	3	0	0	0	0	7	15	6	24
Lorsban	0.5		13	12	6	2	1	48	20	4	3	0	0	0	0	13	24	6	25
			15	14	8	1	1	47	31	4	2	0	0	0	0	10	20	7	20
Carzol +	0.75	Aug. 29	6	2	0	0	1	25	10	2	4	0	0	0	0	5	19	4	7
Lorsban	0.5																		

1/ The treatment was replicated four times, each replicate consistent of 7 acres.

2/ Applications were made by aircraft at 10 GPA prior to 4:30 A.M.

3/ Pretreatment counts were made on June 10 and June 17.

4/ Average of 2-25 suck D-Vac samples from each of the four replicates on each sampling date.

Predator and parasite populations in seed alfalfa plots where insecticides were applied at counts of 8 to 12 lygus bugs per sweep. Firebaugh, California, 1975. 1/

Treatment 2/ Insecticides	Lb AI/ acre	Date of application	Day after application 3/	Number per 50 D-Vac samples 4/																	
				Geocoris		Nabis		Orius		Lacewing		Syrphid		Cocci-nellidae		Collops		Par Wasps	Spiders
				A	N	A	N	A	N	A	L	A	L	A	L	A	L		
			Pre	55	524	6	142	396	151	24	16	0	0	4	16	0	7	794	37
			Pre	104	234	6	282	311	485	19	6	1	0	5	11	1	4	249	46
Carzol +	0.5	June 18	6	20	10	1	29	104	59	9	3	0	0	2	0	1	8	35	52
Lorsban	0.5		13	20	25	4	55	134	115	9	4	0	0	2	0	4	12	49	68
			20	20	23	9	38	119	147	7	8	0	0	2	0	1	14	70	77
			27	9	19	5	42	182	369	1	6	0	0	0	0	4	11	12	80
			32	15	26	8	112	208	429	1	5	0	0	0	0	5	16	25	115
Carzol +	0.75	July 21	6	2	1	1	14	69	22	2	5	0	0	0	0	7	21	10	123
Lorsban	0.5		13	2	1	1	10	58	27	0	8	0	0	0	0	4	18	16	81
			18	1	1	0	7	54	17	1	7	0	0	0	0	5	16	17	34
Carzol +	0.75	Aug. 7	6	1	0	0	0	16	28	1	3	0	0	0	0	7	17	3	25
Lorsban	0.5		13	2	1	0	3	46	68	1	1	0	0	0	0	13	27	11	33
			20	5	0	1	4	98	50	2	3	0	0	1	0	6	27	23	33
			24	4	3	1	6	79	116	1	3	0	0	1	1	7	27	12	28
Carzol +	0.75	Aug. 31	6	1	0	0	0	32	20	1	0	0	0	0	0	2	34	4	10
Lorsban	0.5																		

1/ The treatment was replicated four times, each replicate consisted of 7 acres.

2/ Applications were made by aircraft at 10 GPA prior to 4:30 A.M.

3/ Pretreatment counts were made on June 10 and June 17.

4/ Average of 2-25 suck D-Vac samples from each of the 4 replicates on each sampling date.

Predator and parasite populations in grower treated portion of field utilized in insecticide timing experiment for lygus bug control. Firebaugh, California, 1975. 1/

Treatment 2/		Date of application	Day after application 3/	Number per 50 D-Vac samples 4/															
				Geocoris		Nabis		Orius		Lacewing		Syrphid		Cocci-nellidae		Collops		Par Wasps	Spiders
Insecticides	Lb AI/ acre			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
			Pre	56	596	16	187	540	325	56	34	0	0	2	23	2	10	938	31
			Pre	165	227	22	366	432	881	8	10	0	0	7	11	1	6	159	13
			Pre	246	196	19	181	468	374	26	3	0	0	0	0	1	6	201	33
			Pre	195	147	44	183	405	239	16	0	0	0	1	0	2	8	161	28
			Pre	116	236	52	190	347	322	6	1	0	0	0	0	1	16	214	30
Carzol + Lannate	0.5 0.338	July 12	3	16	46	0	0	18	33	1	0	0	0	1	0	0	9	11	109
			10	5	80	0	19	27	49	7	6	0	0	0	0	6	32	56	212
			17	0	19	2	9	37	81	2	5	0	0	0	0	4	19	89	145
			24	8	4	2	52	176	80	4	0	0	0	0	0	0	8	32	56
Carzol + Tepp	0.5 1.0	Aug. 6	5	0	14	0	2	6	12	0	36	0	0	0	30	0	4	8	52
Lannate + Tepp	0.45 1.0	Aug. 18	1	0	0	0	0	10	18	0	28	0	0	0	0	0	22	0	90
			8	6	3	0	0	50	11	29	4	0	0	0	2	1	3	54	100
			16	6	0	3	0	39	29	18	6	0	0	0	0	0	9	15	28

1/ Treatment evaluations were made in portion of field adjacent to insecticide timing experiments for lygus bug control.

2/ Applications were made by aircraft at 10 GPA.

3/ Pretreatment counts were made on June 10, June 17, June 24, July 1 and July 8.

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

Predator and parasite populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Firebaugh, California. 1975.

Treatment[1]		Days after applications	Number per 20 D-Vac samples[2]															
Insecticide	lb. AI/acre		Geocoris		Nabis		Orius		Lacewings		Syrphids		Coccinellidae		Collops		Par wasps	Spiders
			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
Lannate + Tepp	0.75 1.0	Pre	0	0	0	3	55	40	14	16	0	0	0	0	1	5	0	26
		6	0	0	0	0	10	1	10	11	0	0	0	0	3	0	1	7
		14	0	1	0	0	9	10	0	1	0	0	0	0	2	2	3	19
Vydate + Tepp	0.5 1.0	Pre	2	0	0	0	28	17	11	12	0	0	0	0	7	1	8	22
		6	0	0	0	0	11	0	4	11	0	0	0	0	1	0	1	13
		14	0	0	0	0	0	32	0	4	0	0	0	0	2	1	4	18
Bayhox 1901	1.0	Pre	2	0	0	1	45	39	11	17	0	0	0	0	5	2	2	33
		6	1	0	0	0	35	28	7	1	0	0	1	0	0	1	2	12
		14	2	1	0	2	14	42	2	1	0	0	0	0	4	3	3	12
SD WL 43775 Code 5-2-8-5	0.1	Pre	1	1	0	0	67	38	9	11	0	0	0	0	3	0	7	19
		6	0	0	0	0	61	38	6	3	0	0	0	0	4	3	4	8
		14	0	0	0	0	53	76	2	2	0	0	0	0	2	5	6	10
Carzol + Lorsban	0.75 0.5	Pre	3	1	0	3	60	43	3	20	0	0	0	0	3	2	2	34
		6	0	0	0	0	12	6	1	9	0	0	0	0	1	0	0	10
		14	0	0	0	0	12	24	4	1	0	0	0	0	2	10	0	24
Check[3]	None	Pre	3	0	0	3	36	70	1	16	0	0	0	0	2	5	6	40
		6	0	0	0	0	112	35	8	3	0	0	0	0	1	0	1	23
		7	0	0	0	0	1	19	6	2	0	0	0	0	4	2	8	10

1/ Plot size: Each treatment 5 acres (165'x1320'). Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. Plots were treated August 6 from 4:30 to 5:30 AM.

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

3/ Check was treated after the 6-day count with Carzol at 0.75 lb. AI/acre plus Lorsban at 0.5 lb. AI/acre on August 13 because of high populations of spotted alfalfa aphids and lygus bugs.

Predator and parasite populations in a seed alfalfa plot treated with Dacamox granules applied to the soil. Firebaugh, California, 1975.

Treatment 1/		Date of application	Day after application 2/	Number per 50 D-Vac samples 3/															
Insecticides	Lb AI/ acre			Geocoris		Nabis		Orius		Lacewing		Syrphid		Cocci-nellidae		Collops		Par Wasps	Spiders
				A	N	A	N	A	N	A	L	A	L	A	L	A	L		
Dacamox 10G	3.0	6/5	Pre	19	88	8	10	92	18	41	1	15	0	13	5	4	0	1237	27
			5	66	270	60	199	592	127	68	8	10	0	6	2	3	0	2915	53
			12	16	84	66	309	104	346	18	0	0	0	7	0	2	0	1114	68
			19	99	124	17	266	557	1023	5	7	0	0	4	0	1	20	640	85
			26	220	246	116	670	748	1052	25	8	0	0	9	0	8	1	798	208
No treatment	-	None	5	56	596	16	187	540	325	56	34	0	0	2	23	2	10	938	31
			12	165	227	22	366	432	881	8	10	0	0	7	11	1	6	159	13
			19	246	196	19	181	468	374	26	3	0	0	0	0	1	6	201	33
			26	195	147	44	183	405	239	16	0	0	0	1	0	2	8	161	30

1/ Dacamox 10% granules were applied at 3.0 lb. AI/acre with a 6-row commercial applicator on June 5. Plot was furrow irrigated on June 6. Plot size - 2.8 acres.

2/ Pretreatment counts were made on June 3.

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

Predator populations in an untreated seed alfalfa field. Firebaugh, California. 1974-75.

Date Sampled [1]	Number Per 50 D-Vac Samples [2]									
	Geocoris						Nabis		Orius	
	atricolor		pallens		punctipes					
	A	N	A	N	A	N	A	N	A	N
Oct. 22, 1974	1	0	2	0	12	3	8	1	4	1
30	9	0	1	0	14	0	5	0	6	0
Nov. 12	6	1	6	0	72	1	22	0	55	0
25	1	0	0	0	4	0	3	0	37	0
Dec. 10	0	0	1	0	4	0	12	0	25	0
26	0	0	0	0	2	0	7	0	4	0
Jan. 7, 1975	0	0	1	0	3	0	13	0	4	0
21	0	0	1	0	0	0	9	0	10	0
Feb. 4	0	0	0	0	4	0	6	0	3	0
18	0	0	1	0	17	0	6	0	2	0
Mar. 4	0	0	0	0	11	0	1	0	2	0
18	0	0	0	0	7	1	0	1	0	0
Apr. 3	0	0	0	0	2	0	0	0	0	0
15 [3]	0	0	0	0	0	0	0	10	9	18
May 6	0	0	0	0	0	0	0	0	1	0
20	1	0	2	0	0	0	0	0	0	0
27	0	0	13	14	0	0	13	1	42	27
June 3	0	0	19	272	0	0	20	158	81	179
10	0	0	21	179	7	0	35	291	364	108
17	3	5	6	151	1	0	4	452	89	68
24	0	0	21	98	5	8	133	754	103	164
July 1	5	7	73	187	1	9	93	840	368	474
8	9	2	24	83	4	5	64	526	401	416
15	9	1	12	73	2	0	106	265	238	192
22	24	28	64	182	0	0	216	566	350	172
29	20	62	86	252	0	0	140	410	264	184
Aug. 5	20	86	50	260	2	26	114	352	172	188
12	12	64	10	80	50	358	92	308	150	158
20	26	154	28	40	116	252	70	290	112	148
26	0	26	2	10	56	398	44	224	44	34
Sept. 3	12	62	10	10	152	416	38	118	50	18
10	wet	-	-	-	-	-	-	-	-	-
18	0	34	0	6	200	276	26	76	56	36

1/ Field was sampled at weekly or bi-weekly intervals after the 1974 seed harvest until the 1975 harvest.

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

3/ The field was pastured with sheep from April 22 to April 29.

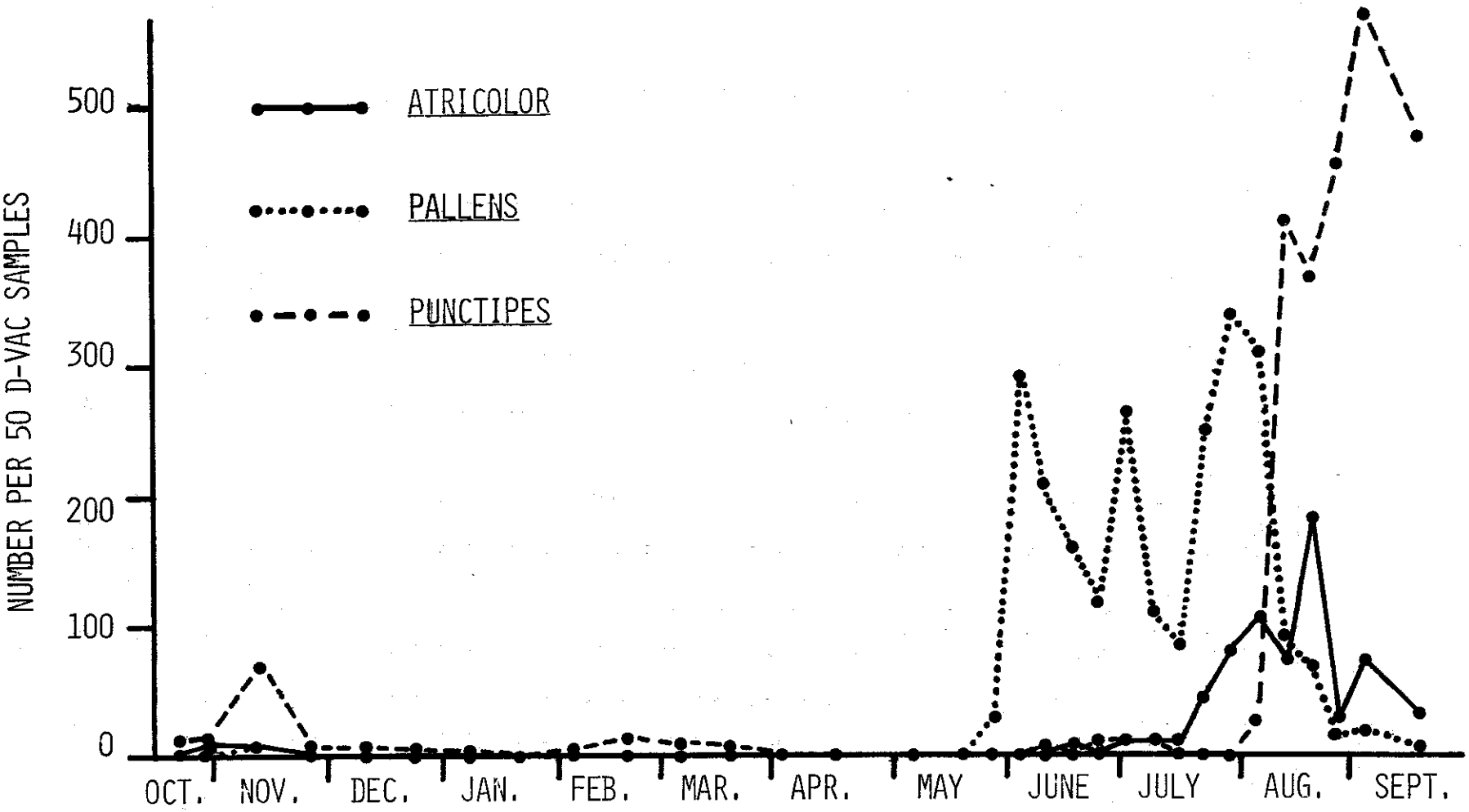
Predator and parasite populations in an untreated seed alfalfa field. Firebaugh, California. 1974-75.

Date Sampled 1/	Number Per 50 D-Vac Samples 2/											
	Lacewings				Syrphids		Cocci-nellidae		Collops		Spiders	Par Wasps
	Brown		Green									
	A	L	A	L	A	L	A	L	A	L		
Oct. 22, 1974	0	0	0	0	0	0	0	0	0	0	59	59
30	0	0	0	1	0	0	0	0	0	0	140	82
Nov. 12	0	0	5	0	0	0	0	0	0	0	106	216
25	2	0	7	0	0	0	0	0	0	0	67	705
Dec. 10	0	0	14	0	0	0	0	0	0	0	78	258
26	3	0	12	0	0	0	0	0	0	0	51	94
Jan. 7, 1975	2	0	4	0	0	0	0	0	0	0	41	47
21	2	0	1	0	0	0	0	0	0	0	55	130
Feb. 4	3		1	6	0	0	1	0	0	0	80	20
18	1	0	0	1	0	0	0	0	0	0	47	9
March 4	0	0	2	2	0	0	2	0	0	0	39	20
18	0	0	1	0	0	0	0	0	0	1	27	31
April 3	1	0	1	0	0	0	0	4	0	2	22	38
15 3/	0	0	0	0	0	0	1	0	0	0	13	8
May 6	1	0	0	0	0	0	0	0	1	0	6	12
20	0	0	0	0	1	0	0	12	0	0	0	63
27	7	0	3	0	9	0	4	42	2	0	40	290
June 3	4	0	0	0	0	0	3	1	0	0	62	427
10	18	1	1	0	0	0	5	0	0	0	164	611
17	1	1	2	7	0	0	0	0	1	4	79	304
24	4	1	7	1	0	0	3	0	0	7	93	75
July 1	0	0	5	2	0	0	3	0	1	17	174	573
8	0	0	0	6	0	0	1	0	0	12	124	269
15	0	1	0	0	0	0	2	0	1	0	178	217
22	0	0	0	2	0	0	0	0	6	0	480	510
29	0	6	4	2	0	0	0	2	0	0	818	438
Aug. 5	0	34	0	20	0	0	4	0	0	0	1190	468
12	0	0	0	0	0	0	0	0	2	10	1616	480
20	0	0	0	0	0	0	16	0	8	0	862	608
26	0	0	0	8	0	0	0	0	0	12	1262	340
Sept. 3	0	0	0	0	0	0	0	0	8	18	1740	270
10	wet	-	-	-	-	-	-	-	-	-	-	-
18	0	0	0	0	0	0	0	0	2	6	614	94

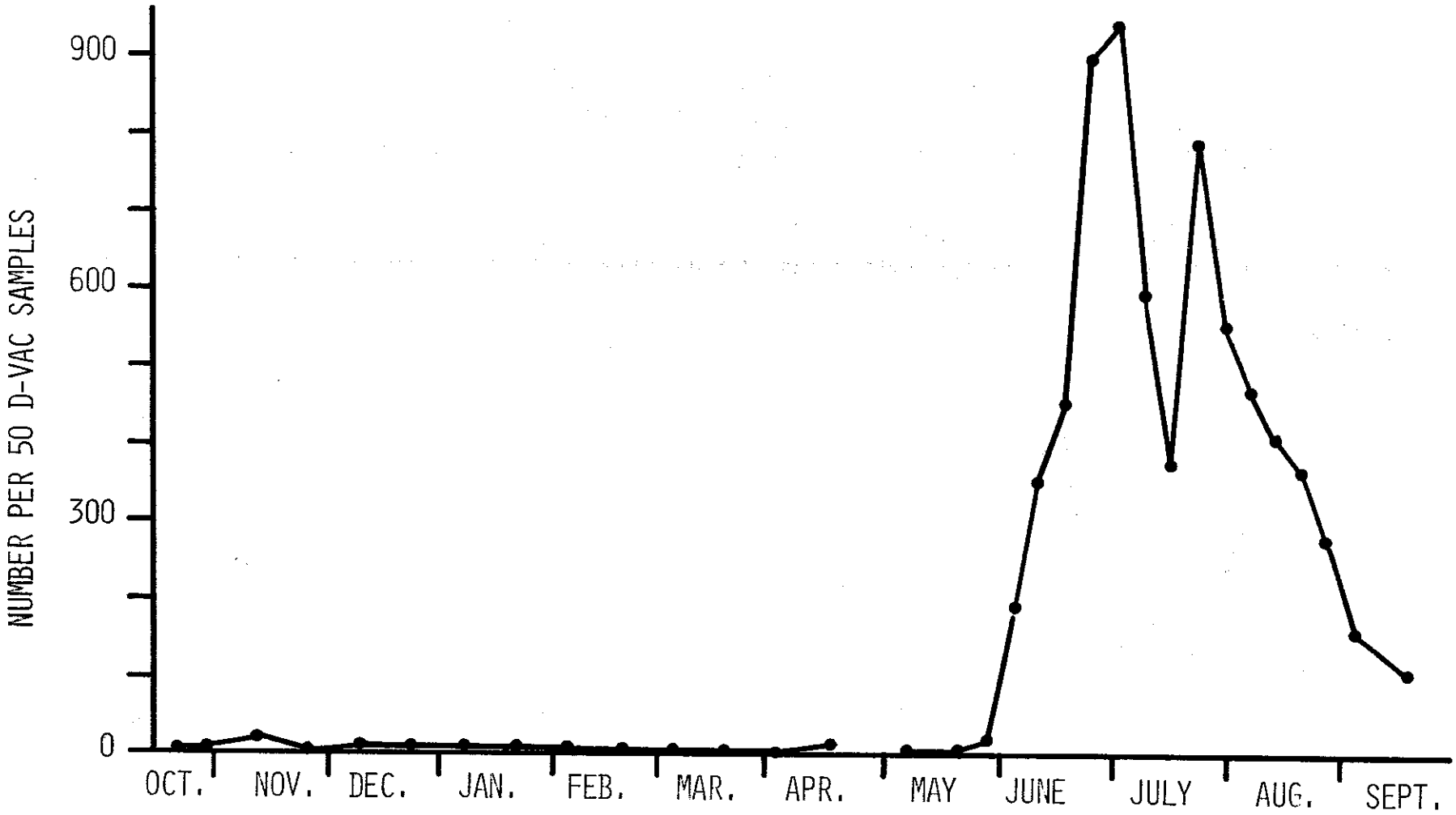
1/ Field was sampled at weekly or bi-weekly intervals after the 1974 seed harvest until the 1975 harvest.

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

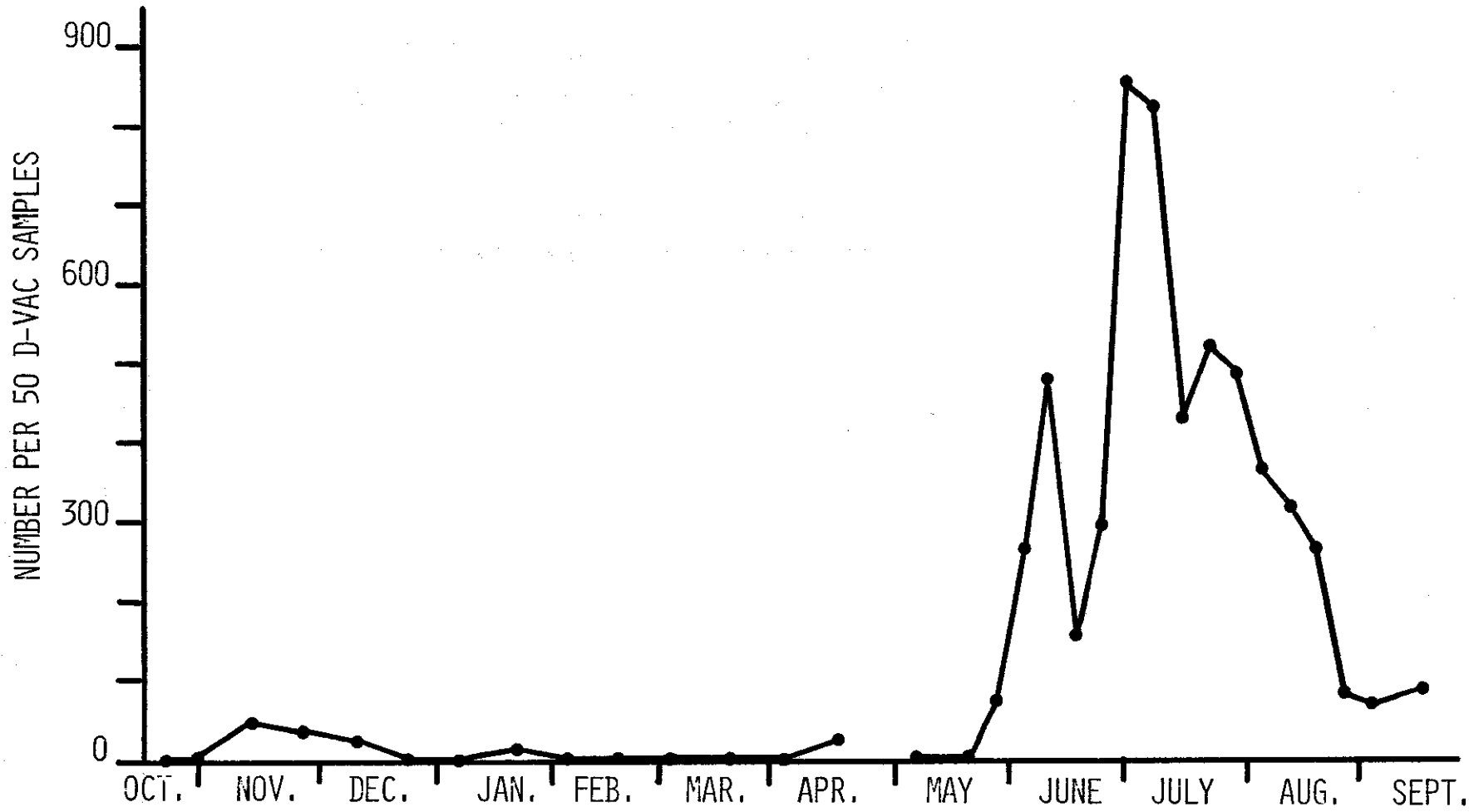
3/ The field was pastured with sheep from April 22 to April 29.



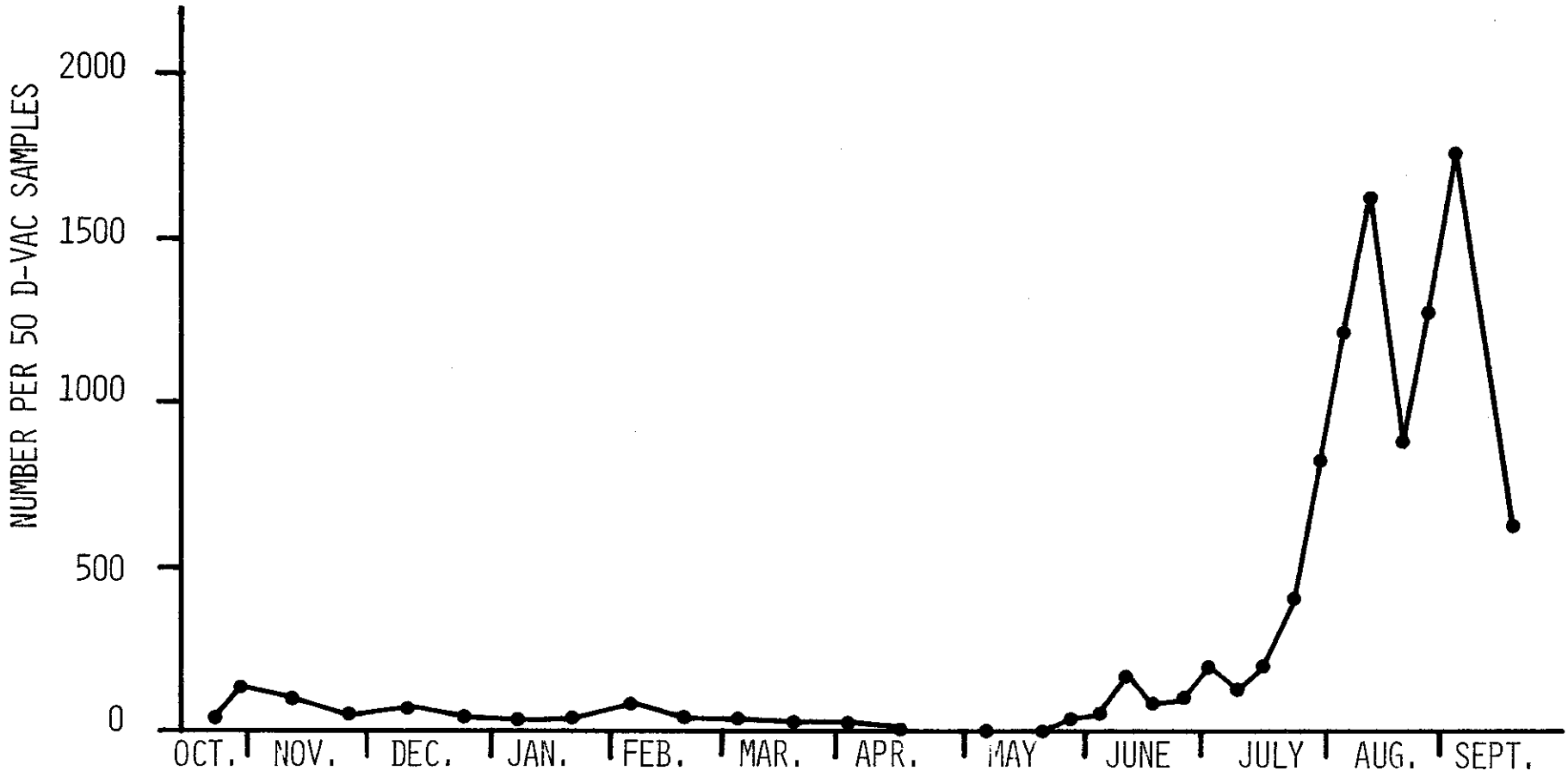
GEOCORIS SP. POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD FROM OCTOBER 22, 1974 UNTIL SEPTEMBER 18, 1975. FIELD WAS PASTURED WITH SHEEP FROM APRIL 22 TO APRIL 29. FIREBAUGH, CALIFORNIA, 1974-1975.



NABIS SP. POPULATION IN AN UNTREATED SEED ALFALFA FIELD FROM OCTOBER 22, 1974 UNTIL SPETEMBER 18, 1975. FIELD WAS PASTURED WITH SHEEP FROM APRIL 22 TO APRIL 29. FIREBAUGH, CALIFORNIA, 1974-1975.



ORIUS SP. POPULATION IN AN UNTREATED SEED ALFALFA FIELD FROM OCTOBER 22 1974 UNTIL SEPTEMBER 18, 1975. FIELD WAS PASTURED WITH SHEEP FROM APRIL 22 TO APRIL 29. FIREBAUGH, CALIFORNIA, 1974-1975.



SPIDER POPULATION IN AN UNTREATED SEED ALFALFA FIELD FROM OCTOBER 22, 1974 UNTIL SEPTEMBER 18, 1975. FIELD WAS PASTURED BY SHEEP FROM APRIL 22 TO APRIL 29. FIREBAUGH, CALIFORNIA, 1974-1975.

Consperse stink bug populations in 14 seed alfalfa fields. Fresno County, California, 1975.

Grower & Location	Number per 25' of row[1/]					
	July 14			September 2-18		
	Adults	Nymphs	Total	Adults	Nymphs	Total
Enrico Farms T13S R13E Sec. 4	0	0	0	0	0	0
Mike Perez T13S R13E Sec. 16	2	3	5	42	17	59
John Nakamura T13S R13E Sec. 11	0	7	7	6	19	25
U.C. test plot D T13S R12E Sec. 13	1	1	2	1	0	1
Paul & Roland Crevolin T13S R13E Sec. 14	0	0	0	0	0	0
Allen & Benton T13S R13E Sec. 22	0	0	0	2	7	9
Vera Brothers T13S R13E Sec. 21	-	-	-	0	1	1
Dick Fortune T12S R12E Sec. 28	-	-	-	0	0	0
Echevesti & Elizaldi T13S R13E Sec. 2	-	-	-	3	27	30
Harold Hale T16S R16E Sec. 1	-	-	-	6	12	18
Frank Motte T15S R16E Sec. 36	-	-	-	2	3	5
Don Schramm T16S R17E Sec. 9	-	-	-	1	5	6
Walker Rogers T16S R17E Sec. 26	-	-	-	3	15	18
Russel Barlow & Sons T18S R18E Sec. 36	-	-	-	2	0	2

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

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