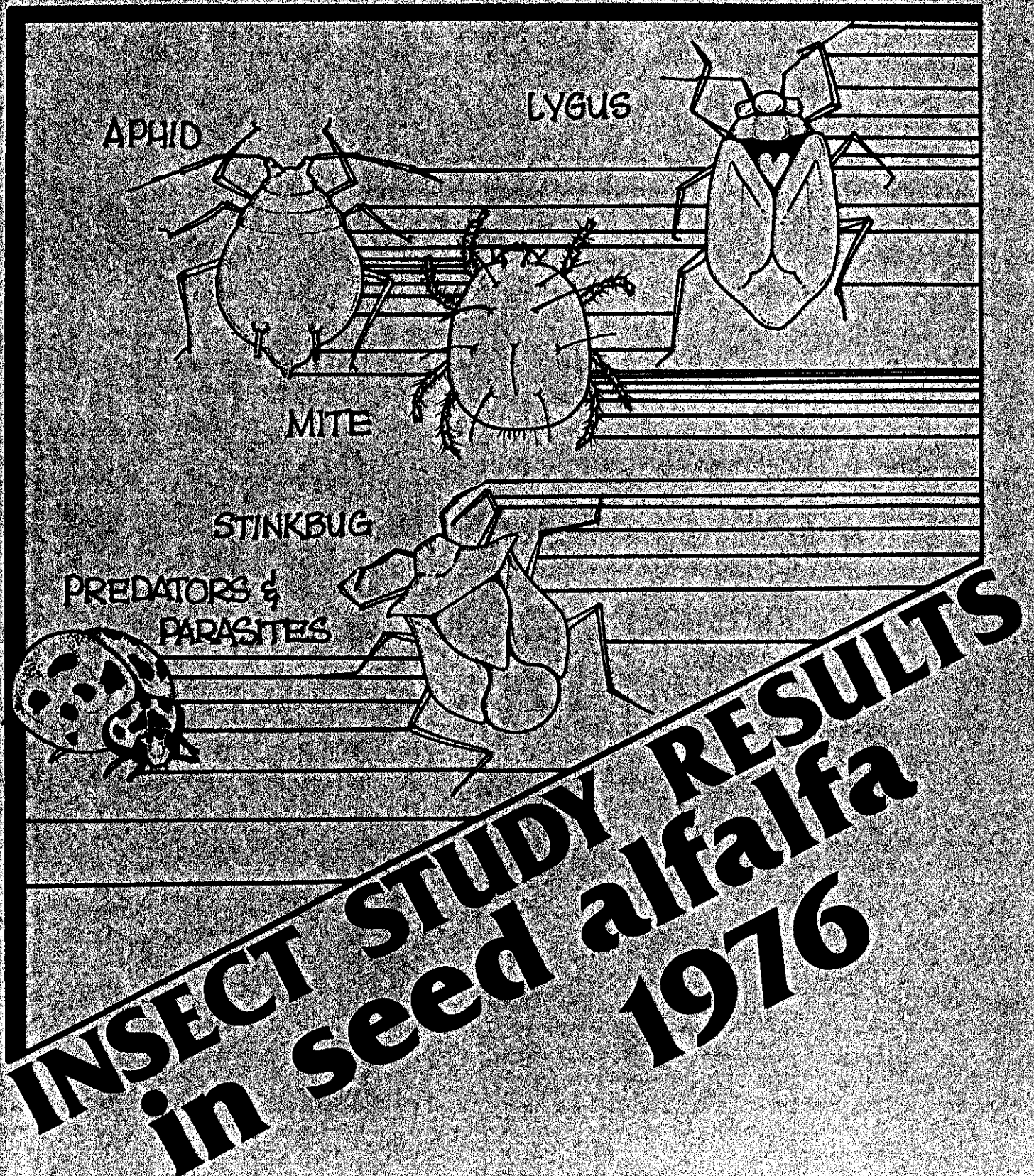


A PROGRESS REPORT OF



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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 Bob Vance of Vance Ag Craft Inc. and Don Darnell 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 Mike Perez and in an untreated seed field maintained by Don Darnell on land provided by Telles Ranch Incorporated. We are grateful for the interest and contributions of these cooperators in making it possible to conduct the experiments. The assistance of students Bob Kimsey, Rob Page, Stan Woodward, Mark Eberle and Paul Mason in carrying out the various surveys and experiments and the art work of Gwen Okamoto, Cooperative Extension Service, Fresno County is sincerely appreciated.

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* 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. *
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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	Guthion®
Bay Hox NTN 9306	Lorsban®
Carzol®	Monitor®
Comite®	SD WL 43775
Fundal®	UC 21865
Galecron®	Vydate®
	Zardex®

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 1976

O. G. Bacon¹, B. Sheesley², R. H. James³ and G. W. Forister³

Introduction

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 maintained for these studies. A date of clipping study was conducted in the untreated alfalfa seed field to determine the feasibility of producing an early seed set in advance of peak lygus bug populations. Studies in the untreated seed field have been terminated and data accumulated over the preceeding three years are being analyzed and summarized.

During 1976 three separate experiments were conducted in which six insecticides and three insecticide combinations were evaluated for control of lygus bugs, the spotted alfalfa aphid, the pea aphid and spider mites. In addition four acaricides were evaluated in one experiment. 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: Monitor, Carzol, Bay Hox NTN 9306, Bay Hox 1901, Shell Development WL 43775, Union Carbide 21865, Vydate + Lorsban + Galecron, Carzol + Lorsban, Bay Hox 1901 + Guthion. Also evaluated were grower applied combinations of Carzol + Lorsban and Carzol + Lorsban + Fundal. All of the materials were applied as foliar sprays by aircraft from 3:00 to 5:30 AM. Most of the applications were made prior to 4:30 AM. The following briefly summarizes the results obtained with each of the materials in controlling lygus bugs.

Monitor, applied at 0.5 lb active ingredient per acre initially reduced the lygus bug population approximately 93 per cent under pretreatment levels. The population increased rapidly following a hatch 14 days after application and was approximately 3 times the pretreatment level 21 days after application.

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Bay Hox NTN 9306 applied at 1.0 lb AI/acre initially reduced the lygus bug population approximately 48 per cent under pretreatment levels. At 14 days after treatment the population was nearly double the pretreatment level.

Bay Hox 1901 applied at 1.0 lb AI/acre resulted in virtually no initial reduction of the lygus bug population and populations were double pretreatment levels 14 days after treatment.

The combining of Guthion 0.75 lb AI/acre with Bay Hox 1901 1.0 lb AI/acre did not improve control of lygus bugs.

Shell Development WL 43775, a synthetic pyrethroid compound, applied at 0.2 lb AI/acre initially reduced the lygus bug population 84 per cent under pretreatment levels. Populations remained below pretreatment levels for 14 days after application.

Union Carbide 21865, applied at 1.0 lb AI/acre initially reduced the lygus bug population approximately 85 per cent under pretreatment levels. This treatment held populations below pretreatment levels for approximately 14 days after application.

An experiment was conducted to evaluate timing and repeat applications, throughout the season, of combinations of Vydate 0.5 lb AI/acre + Lorsban 0.5 lb AI/acre + Galecron 1.0 lb AI/acre and Carzol 0.75 lb AI/acre + Lorsban 0.5 lb AI/acre for control of lygus bugs, aphids and spider mites. Applications were timed to coincide with hatching and nymphal development of lygus bugs and according to average lygus bug population levels of 8 to 12 and 16 to 24 bugs per 180° sweep with a standard insect sweeping net. The experimental area consisted of eight 7-acre plots and two 5-acre plots. The two treatment levels (8 to 12 and 16 to 24 bugs/sweep) used with the Vydate-Lorsban-Galecron combination were each replicated 4 times, each replicate consisting of a 7 acre plot. The two treatment levels utilizing the Carzol-Lorsban combination were not replicated and each consisted of a 5 acre plot. The insecticides were applied by aircraft in 10 gallons of water per acre no later than 4:30 AM on each application date. Insect populations were sampled each week with a sweep net and with a D-vac® suction machine.

Lygus bug populations developed slowly during the spring and early summer of 1976. As a result, insecticides were not applied until July 14 to the plots treated at counts of 8 to 12 bugs per sweep and on July 28 to the plots treated at counts of 16 to 24 bugs per sweep. The plots treated at counts of 8 to 12 bugs per sweep received a total of three insecticide applications during the

season ranging from 13 to 20 days apart. The plots treated at counts of 16 to 24 bugs per sweep received two insecticide applications 27 days apart.

There appeared to be little difference between the Vydate-Lorsban-Galecron and the Carzol-Lorsban combinations in controlling lygus bugs; both resulted in good population reductions and both exhibited approximately the same degree of residual activity. Neither combination appeared to be effective for more than approximately 20 days. In addition to controlling lygus bugs the two insecticide combinations resulted in good control of the spotted alfalfa aphid, the pea aphid and spider mites.

The remainder of the field (grower treated portion) was first treated on June 30 at a lygus bug count of 2.1 bugs/sweep. The insecticide used was Carzol 0.5 lb AI/acre plus Lorsban 0.5 lb AI/acre. The lygus bug population exceeded the pretreatment level 13 days after application. The second treatment, consisting of Carzol 0.5 lb AI/acre + Lorsban 0.5 lb AI/acre + Fundal 1.0 lb AI/acre, was applied 17 days after the first. Fundal was included because Carzol had not controlled an increasing spider mite population. This combination resulted in excellent control of mites as well as lygus bugs and aphids. A third application 19 days after the second consisted of Carzol 0.75 lb AI/acre + Lorsban 0.5 lb AI/acre. This treatment resulted in excellent control of lygus bugs and aphids and the field did not receive additional insecticide applications.

On September 21, 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 percentages of good seeds in the Vydate-Lorsban-Galecron plots treated at counts of 8 to 12 bugs per sweep and at 16 to 24 bugs per sweep were 85.1 and 81.0 respectively. Seeds damaged by lygus bugs in the two treatments were 3.7% and 5.6% respectively of the total seeds examined in each. The percentages of good seeds in the Carzol-Lorsban treatments applied at counts of 8 to 12 bugs per sweep and at 16 to 24 bugs per sweep were 85.4 and 75.9 respectively. Seeds damaged by lygus bug feeding in these treatments averaged 2.4 and 7.1 per cent respectively of the total seeds examined in each. Seeds showing heavy water damage, i.e. cracked seed coats and discoloration, averaged 7.3% over all.

Unseasonable rainfall adversely affected yields and seed quality in this experiment. Two rains, one in mid August of approximately 1.5 inches and a second on September 10 of approximately 1.5 inches severely damaged the maturing seed in this field. On September 28, just before the anticipated commercial harvest, rainfall that varied from 2.5 to 3.0 inches caused further heavy damage

to the field. Because of cumulative effects of the heavy rainfall and in particular the rain of September 28, the field was not harvested. Therefore data on yields are not available from these treatments.

Effect of Clipping date Experiment

An experiment was conducted in the untreated study field to determine if it would be possible, through early clipping, to induce an early seed set that would avoid some of the damage inflicted by peak lygus bug populations that usually occur from mid July to mid August. The field was divided into 8 plots of equal size. The entire field was clipped on March 22, it was cultivated and an herbicide was applied. Four of the 8 plots were again clipped on April 29. The field then consisted of 4 plots clipped on March 22 and 4 plots clipped on April 29. Insect populations in each of the 8 plots were monitored from April 20 or May 11 through September 21.

The lygus bug population (all nymphs) averaged 0.5 bugs per sweep when sampling began on April 20. In the plots clipped on March 22, the lygus bug population averaged 1.5 bugs per sweep on June 2 and increased rapidly thereafter. On July 6, the population averaged 12.87 bugs per sweep. In the plots clipped on April 29 the lygus bug populations initially lagged behind those of the earlier clipping date. The population averaged 1.5 bugs per sweep in these plots on June 15. On July 6, the population averaged 11.0 bugs per sweep, nearly equalling that of the March 22 clipping date. From July 6 throughout the remainder of the season, populations were virtually equal in both the early and late clipped treatments. The lygus bug populations peaked in both treatments on August 17 averaging 140.9 bugs per sweep in plots clipped on March 22 and 160.5 bugs per sweep in plots clipped on April 29. The populations remained equal in the two treatments and declined rapidly after the peak averaging 0.69 and 0.44 bugs per sweep on September 21 when sampling was terminated.

The field was damaged by two rains mentioned earlier, one occurring in mid August and the other on September 10.

The plots were harvested on September 27 with a commercial harvester. Before harvesting, four one quart samples of seed pods were hand stripped from each plot. The 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 samples from plots clipped on March 22 averaged 50.9 and from plots clipped on April 29, 59.2. The per cent of seeds damaged by lygus bugs in the March and April clip treatments was 16.6 and 12.9 respectively. A statistical analysis of yields of clean seed

harvested from the treatments showed there was no significant difference between the early and late clippings. The average yield of clean seed per acre for the early clipping (March 22) was 118 lbs per acre. The late clipping (April 29) yielded an average of 175 lbs per acre. Although there is a 57 lb per acre difference between the treatment means, this is not statistically significant, even at the 10% level.

Aphids

Data on control of aphids were obtained for all materials evaluated for lygus bug control. Lorsban at 0.5 lb AI/acre combined with Vydate or Carzol for lygus bug control also resulted in excellent control of the spotted alfalfa aphid and the pea aphid. Although the aphid populations increased in the intervals between applications for lygus bug control, aphid numbers were low and did not reach damaging levels. Neither Vydate nor Carzol is effective in controlling aphids, therefore the use of an aphicide such as Lorsban with these insecticides is essential to prevent the spotted alfalfa aphid from seriously damaging susceptible alfalfa seed varieties.

The following insecticides were evaluated for control of the spotted alfalfa aphid and the pea aphid. Monitor 0.5 lb AI/acre, Bay Hox NTN 9306, 1.0 lb AI/acre, Bay Hox 1901 1.0 lb AI/acre, Bay Hox 1901 1.0 + Guthion 0.75 lb AI/acre, Shell WL 43775 0.2 lb AI/acre and Union Carbide 21865 1.0 lb AI/acre.

The spotted alfalfa population was small in this experiment and evaluations of these materials are perhaps not as severe as they might have been with larger populations. Of this array of insecticides the only one that appeared to have good potential for controlling the spotted alfalfa aphid was Shell WL 43775. Union Carbide 21865 also appeared to reduce and hold spotted alfalfa aphid populations to low levels. Both of these materials should be evaluated further in 1977. With respect to control of the pea aphid, Shell WL 43775 and Bay Hox 1901 appeared to be the most effective insecticide but further testing is needed.

As in 1975, the blue alfalfa aphid, Acyrtosiphon kondoi Shinji and the pea aphid Acyrtosiphon pisum occurred in moderate to large numbers in alfalfa seed fields on the west side of the San Joaquin Valley during April and early May. Aphid populations were monitored in the untreated experimental field throughout the 1976 season. The first blue alfalfa aphids found in this field in 1976 were in samples collected on January 27. The population peaked on April 20 when 6,721 aphids were found per 50 D-vac samples. The blue alfalfa aphid populations declined sharply after the peak and the last specimen was taken on May 24.

The pea aphid was present at the first sampling on December 30, 1975 and continued to be present throughout the 1976 season. The pea aphid population peaked during the period April 26 to May 4 when 2665 aphids were found per 50 D-vac samples.

The data indicated that populations of both species were much lower in 1976 than in the preceeding year in this field. In 1975, the combined populations of both species peaked on April 15 when 50,790 aphids were found per 50 D-vac samples. The population peak of the two species together occurred on April 20 in 1976 with 7,546 aphids per 50 D-vac samples.

Spider mites

The effects of insecticide applications on spider mite populations were evaluated in all experiments. One experiment was conducted in which only acaricides were evaluated.

Galecron at 1.0 lb AI/acre combined with Vydate and Lorsban resulted in excellent control of spider mites in the lygus bug population level study and appeared to be effective for at least 20 days following application. Spider mite control with Carzol plus Lorsban ranged from good to poor. In general Carzol suppressed the mites but some spider mites could always be found in Carzol treated plots by searching for infested leaves and in some instances mite populations increased following Carzol applications.

Comite and Galecron at 1.0 lb AI/acre resulted in excellent control of spider mites and were the most effective of the acaricides tested. A new compound, Zardex®, under development by Zoecon Corporation did not significantly reduce populations of adult mites or eggs.

Union Carbide 21865 appeared to suppress spider mite populations and this compound should receive further study.

The following insecticides and insecticide combinations were not effective in controlling spider mites: Monitor, Bay Hox NTN 9306, Bay Hox 1901, Bay Hox 1901 + Guthion and Shell Development WL 43775.

Spider mite populations were monitored throughout the year in the untreated experimental field. There appeared to be no significant differences in populations between portions of the field clipped on March 22 and on April 29. Populations peaked in the early clipped treatments on July 13 and in the late clipped treatments on July 27 averaging 12.85 and 16.10 mites per trifoliate leaf respectively.

Conspere stink bug

Stink bug populations were measured in six alfalfa seed fields in the Firebaugh area on July 27 and on September 8-15. During the period September

8-15 eight additional fields were surveyed bringing the total to 14. The stink bug populations were sampled 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 occurred in these fields and were almost identical to those observed in 1975. Stink bugs were found in 3 of the six fields sampled on July 27. The numbers of bugs per 25 feet of row, in fields where they occurred, ranged from 2 to 17 and all individuals were nymphs. In September, ten of the 14 fields had populations consisting mostly of nymphs that ranged from 1 to 37 bugs per 25 feet of row. Seed samples were hand stripped from each of the fields included in the stink bug survey. The percentages of good seeds in these fields ranged from 55.1 to 90.3. The percentages of seeds damaged by stink bugs ranged from 1.7 to 7.5.

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. The data obtained indicate that all of the insecticides used in the 1976 trials drastically reduced predator and parasite populations. As expected, repeat applications further amplified initial population reductions. Treating at higher lygus bug population levels thus reducing the number of applications and increasing the interval between applications enabled more of the predators to survive, but survival was not good even under these conditions.

One of the primary purposes of the untreated experimental field is to study populations of predatory arthropods in the absence of insecticides. As mentioned in the introduction this study was terminated at the end of September 1976. We now have continuous population data from April 2, 1974 on the following groups of predatory organisms: Orius (minute pirate bugs), Geocoris (big-eyed bugs-3 species), Nabis (damselflies), lacewings, syrphid flies, coccinellid beetles (lady beetles), collops beetles, spiders and parasitic wasps. Detailed analyses of the three years of 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.

Summary and Conclusions

Of the six insecticides evaluated for control of insects affecting seed alfalfa, those that were most promising for control of lygus bugs were Monitor, Shell Development WL 43775 and Union Carbide 21865. These insecticides held lygus bug populations below pretreatment levels for 14 + days after application.

Vydate + Lorsban + Galecron and Carzol + Lorsban used throughout the season in an insecticide timing experiment gave good control of lygus bugs, the spotted alfalfa aphid and the pea aphid. There was little difference in the control of lygus bugs and aphids with the two insecticide combinations. Spider mites appeared to be more consistently controlled with Galecron than with Carzol in the combinations. Because of severe rain damage the field was not harvested, thus yield data from the insecticide timing experiments were not obtained. An analysis of seed samples, hand stripped from the plots, showed the per cent of lygus bug damaged seed to be 3.7 and 5.6 respectively in plots treated with Vydate + Lorsban + Galecron at counts of 8 to 12 and 16 to 24 bugs per sweep. This damage represents only a small portion of the total loss since it does not account for the losses due to blasted buds and florets resulting from lygus bug feeding.

Studies conducted from 1973 through 1976 indicate that lygus bug populations above 6 to 8 per sweep are likely to be economically significant and that treatments should be timed to coincide with hatching and nymphal development. To be most effective the insecticides should be applied after a hatch and before the nymphs reach the fourth and fifth instars.

The most promising new aphicidal material is Shell Development WL 43775. This material gave excellent control of the spotted alfalfa aphid and good control of the pea aphid. Union Carbide 21865 also appeared to reduce and hold spotted alfalfa aphids to low levels but did not appear highly effective in controlling the pea aphid.

Of the specific acaricides tested those resulting in best mite control were Comite and Galecron at 1.0 lb AI/acre. A new compound, Zardex®, under development by Zoecon Corporation, did not significantly reduce populations of adult mites or eggs. Union Carbide 21865 appeared to suppress spider mite populations.

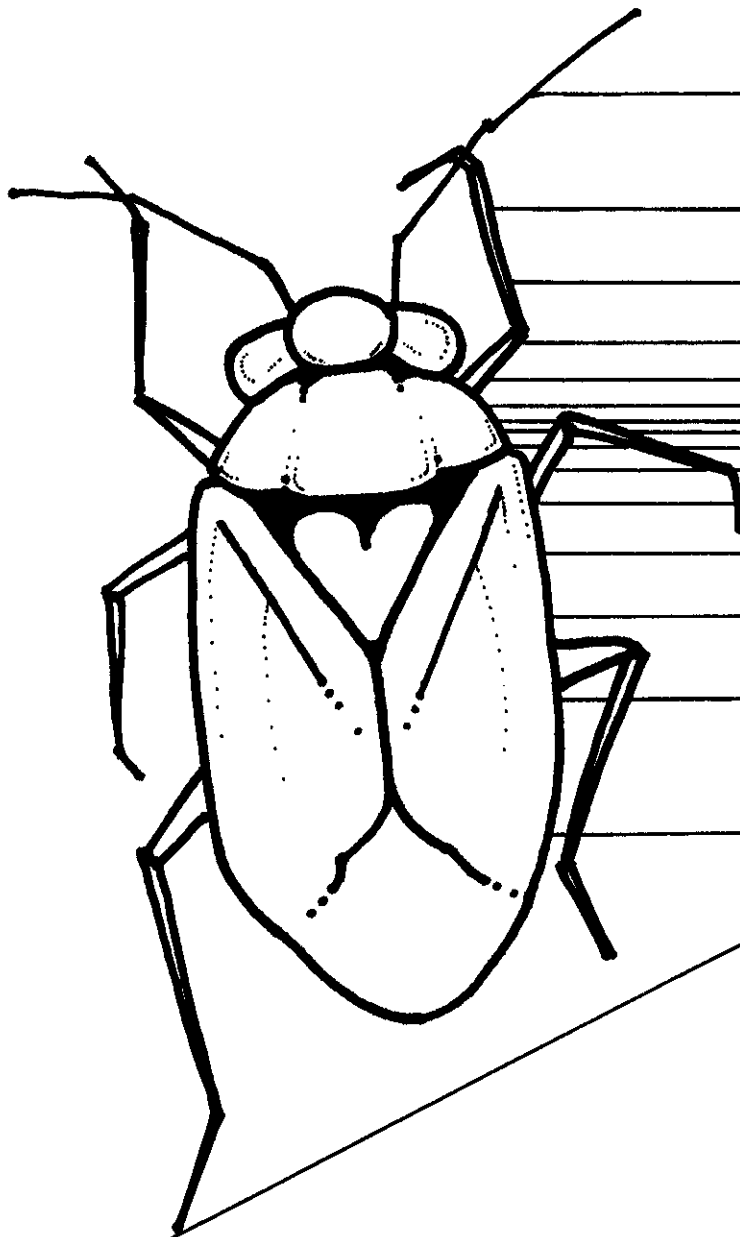
It should be noted here that Galecron and Fundal have been voluntarily withdrawn from the market by their manufacturers because of reported carcinogenic effects at high dosages in test animals. The future of these compounds is uncertain.

An experiment conducted in an untreated alfalfa seed field to evaluate the feasibility of producing an early seed set, in advance of peak lygus bug populations, through early clip back did not show positive results. An early clipping date (March 22) was compared with a late (April 29) clipping date. Lygus bug and other insect populations were virtually identical in the two

treatments after July 6. The per cent of good seeds from plots clipped on March 22 and on April 29 averaged 50.9 and 59.2 respectively. The per cent of seeds damaged by lygus bugs in the March and April clip treatments was 16.6 and 12.9. Yields of clean seed were very low averaging 118 lb per acre for the early clipping and 175 lbs per acre for the late clipping. Although there is a 57 lb per acre difference between the treatment means this is not statistically significant.

Stink bug populations were measured in six alfalfa seed fields in the Firebaugh area on July 27 and September 8-15. During September 8-15, eight additional fields were surveyed bringing the total to 14. Extremely low populations were encountered. Stink bugs were found in 3 of the six fields sampled on July 27 with populations ranging from 2 to 17 bugs per 25 feet of row. All individuals were nymphs. In September ten of the 14 fields had populations, consisting mostly of nymphs, that ranged from 1 to 37 bugs per 25 feet of row. Because of the low stink bug populations, no experiments were conducted with insecticides for their control.

All of the insecticides used in the trials adversely affect predatory and parasitic arthropods. It is significant to note however, that although insecticides were not applied to the experimental study field for the third consecutive year, undisturbed predator populations were unable to cope with the lygus bug populations sufficiently to prevent severe damage. Data on the entire complex of insects in the untreated field over the three year study period are being assembled and analyzed. A report of this study will follow.



LYGUS

Lygus bug populations in seed alfalfa plots treated by aircraft
for aphid and lygus bug control. Firebaugh, California. 1976.

Treatment ^{1/}		Days after treat- ment ^{2/}	Number of lygus bugs per sweep ^{3/}					
Insecticides	AI/acre lb.		Adults	Nymphs				Adults & Nymphs
				Small	Medium	Large	Total	
Monitor	0.5	Pre	1.60	4.70	1.20	0.25	6.15	7.75
		6	0.10	0.40	0.05	0.00	0.45	0.55
		14	0.10	2.55	1.80	0.25	4.60	4.70
		21	0.50	6.00	6.83	11.00	23.83	24.33
Bay Hox NTN 9306	1.0	Pre	0.75	4.70	1.00	0.30	6.00	6.75
		6	0.25	2.30	0.80	1.05	4.15	4.40
		14	0.30	5.90	4.60	1.20	11.70	12.00
		21	2.50	9.17	9.67	18.66	37.50	40.00
Bay Hox 1901	1.0	Pre	0.65	4.50	1.10	0.40	6.00	6.65
		6	0.25	0.35	3.25	2.45	6.05	6.30
		14	1.15	6.15	4.50	2.15	12.80	13.95
		21	1.33	9.67	19.16	14.50	43.33	44.66
Bay Hox 1901 + Guthion	1.0	Pre	0.70	5.05	1.55	0.35	6.95	7.65
	0.75	6	0.30	2.10	2.55	1.50	6.15	6.45
		14	0.95	6.60	4.60	2.15	13.35	14.30
		21	1.83	5.33	6.83	11.34	23.50	25.33
Shell WL 43775	0.2	Pre	0.65	3.25	0.95	0.25	4.45	5.10
		6	0.15	0.10	0.35	0.20	0.65	0.80
		14	0.00	1.25	1.50	0.10	2.85	2.85
		21	0.50	4.17	7.50	2.00	13.67	14.17
UC 21865	1.0	Pre	1.00	4.25	1.36	0.30	5.91	6.91
		6	0.05	0.60	0.00	0.35	0.95	1.00
		14	0.25	2.20	1.75	0.40	4.35	4.60
		21	0.00	2.00	5.75	1.33	9.08	9.08

^{1/} Plot size: Each treatment 5 acres (165'x1320'). Sprays were applied at 10 GPA. UC 21865 was a 75% wettable powder while others were emulsifiable concentrates. Plots were treated August 18 from 3:00 to 5:30 AM.

^{2/} Pretreatment counts were made on August 17.

^{3/} Average of 20 sweeps (10-2 sweep samples) per treatment on each sampling date.

Lygus bug populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Firebaugh, California. 1976.

Insecticides	Treatment ^{1/}	Days after treat- ment ^{2/}	Number per 50 D-Vac Samples ^{3/}									
	AI/ acre lb.		Adults			Nymphal Instars						Adults + Nymphs
			♂	♀	Total	1	2	3	4	5	Total	
Monitor	0.5	Pre	3	2	5	15	32	32	11	3	93	98
		6	0	1	1	14	10	0	1	0	25	26
		14	3	2	5	17	97	39	21	11	185	190
		21	1	1	2	19	22	26	29	19	115	117
Bay Hox NTN 9306	1.0	Pre	5	4	9	31	68	35	16	4	154	163
		6	0	3	3	39	23	7	7	0	76	79
		14	4	6	10	11	220	42	11	1	285	295
		21	11	5	16	11	74	57	49	41	232	248
Bay Hox 1901	1.0	Pre	6	8	14	38	44	44	16	10	152	166
		6	2	6	8	13	47	18	32	16	126	134
		14	13	20	33	23	137	55	26	18	259	292
		21	5	9	14	19	100	42	39	26	226	240
Bay Hox 1901 + Guthion	1.0 0.75	Pre	3	5	8	9	57	18	4	3	91	99
		6	2	4	6	25	35	6	7	5	78	84
		14	15	4	19	9	129	48	13	6	205	224
		21	8	10	18	19	82	41	40	35	217	235
Shell WL 43775	0.2	Pre	11	11	22	6	34	22	3	0	65	87
		6	2	3	5	6	3	1	2	2	14	19
		14	6	6	12	5	83	26	6	2	122	134
		21	11	4	15	2	28	18	40	18	106	121
UC 21865	1.0	Pre	1	3	4	5	20	12	4	1	42	46
		6	3	0	3	19	41	7	5	3	75	78
		14	5	2	7	7	83	26	2	4	122	129
		21	1	1	2	6	33	3	8	4	54	56

1/ Plot size: Each treatment 5 acres (165'x 1320'). Sprays were applied at 10 GPA. UC 21865 was a 75% wettable powder while others were emulsifiable concentrates. Plots were treated August 18 from 3:00 to 5:30 AM.

2/ Pretreatment counts were made on August 17.

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

Lygus bug populations in seed alfalfa plots where insecticides were applied at an average count of 8-12 lygus bugs per sweep. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Dates of appli- cations	Days after treat- ment ^{3/}	Number of lygus bugs per sweep ^{4/}					
Insecticides	AI/acre lb.			Adults	Nymphs				Adults & Nymphs
					Small	Medium	Large	Total	
			Pre	0.11	0.06	0.08	0.03	0.17	0.28
			Pre	0.14	0.18	0.35	0.16	0.69	0.83
			Pre	0.30	0.50	1.00	0.26	1.76	2.06
			Pre	0.92	0.54	0.51	0.83	1.88	2.80
			Pre	1.02	1.51	0.69	0.60	2.80	3.82
			Pre	0.95	4.23	2.33	1.09	7.65	8.60
Vydate +	0.5	July 14	6	0.19	0.03	0.00	0.05	0.08	0.27
Lorsban +	0.5		13	0.48	1.28	1.04	0.00	2.32	2.80
Galecron	1.0		20	0.56	3.36	1.19	1.71	6.26	6.82
			27	1.21	13.75	8.68	3.48	25.91	27.12
Vydate +	0.5	Aug. 11	6	0.25	0.05	0.00	0.11	0.16	0.41
Lorsban +	0.5		13	0.56	5.72	2.25	0.09	8.06	8.62
Galecron	1.0								
Vydate +	0.5	Aug. 25	6	0.08	0.01	0.00	0.00	0.01	0.09
Lorsban +	0.5		13	0.62	3.18	0.35	0.00	3.53	4.15
Galecron	1.0								

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 8, 15, 22, 29 and July 6 and 13.

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 an average count of 8-12 lygus bug per sweep. Firebaugh, California. 1976. 1/

Insecticide	Treatment ^{2/} AI/acre lb.	Date of appli- cation	Days after treat ^{3/} ment	Number per 50 D-Vac Samples ^{4/}					Total Nymphs &				
				Adults		Nymphal instars							
				♂	♀	Total	1	2		3	4	5	
Vydate + Lorsban + Galecron	0.5	July 14	Pre	1.00	1.00	2.00	0.75	1.25	0.50	0.00	0.00	2.50	4.50
	0.5		Pre	3.50	4.75	8.25	1.75	3.75	2.00	1.25	0.75	9.50	17.75
	1.0		Pre	2.00	2.50	4.50	3.75	4.50	3.50	2.50	0.50	14.75	19.25
			Pre	6.25	6.00	12.50	3.50	7.75	8.75	6.25	3.00	29.25	41.75
			Pre	9.00	6.75	15.75	6.75	15.75	8.00	8.00	4.50	43.00	58.75
			Pre	12.75	10.00	22.75	25.75	44.75	18.25	24.25	8.25	121.25	144.00
			6	2.00	2.75	4.75	1.50	1.00	0.75	0.25	1.75	5.25	10.00
Vydate + Lorsban + Galecron	0.5	Aug. 11	13	8.00	7.00	15.00	10.75	29.25	17.00	6.50	3.50	67.00	82.00
	1.0		20	4.00	3.50	7.50	37.00	66.25	10.00	5.75	9.75	128.75	136.25
			27	13.75	12.25	26.00	55.50	266.00	131.25	53.25	11.25	517.25	543.25
Vydate + Lorsban + Galecron	0.5	Aug. 25	6	2.50	1.75	4.25	1.25	1.50	0.50	0.25	0.25	3.75	8.00
	0.5		13	5.75	5.50	11.25	44.00	139.50	13.25	6.25	3.75	206.75	218.00
	1.0		6	1.25	0.25	1.50	1.00	0.25	0.25	0.00	0.00	1.50	3.00
	1.0		13	4.25	4.50	8.75	8.00	80.75	17.00	0.50	0.25	106.50	115.25

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 8, 15, 22, 29 and July 6 and 13.

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

Lygus bug populations in seed alfalfa plots where insecticides were applied at an average count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Dates of appli- cations	Days after treat- ment ^{3/}	Number of lygus bugs per sweep ^{4/}					
Insecticides	AI/acre lb.			Adults	Nymphs				Adults & Nymphs
					Small	Medium	Large	Total	
			Pre	0.13	0.04	0.14	0.10	0.28	0.41
			Pre	0.19	0.16	0.26	0.19	0.61	0.80
			Pre	0.28	0.46	0.65	0.35	1.46	1.74
			Pre	0.55	0.76	0.54	0.73	2.03	2.58
			Pre	1.04	1.19	0.66	0.55	2.40	3.44
			Pre	0.84	4.63	2.66	1.00	8.29	9.13
			Pre	1.70	2.31	1.91	2.41	6.63	8.33
			Pre	2.10	5.95	6.80	2.27	15.02	17.12
Vydate +	0.5	July 28	6	0.56	0.23	0.04	0.22	0.49	1.05
Lorsban +	0.5		13	0.58	1.88	0.76	0.02	2.66	3.24
Galecron	1.0		20	0.48	0.96	1.55	1.66	4.17	4.65
			27	0.56	10.34	3.69	2.40	16.43	16.99
Vydate +	0.5	Aug. 25	6	0.51	0.12	0.01	0.08	0.21	0.72
Lorsban +	0.5		13	0.59	4.63	1.09	0.00	5.72	6.31
Galecron	1.0								

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 8, 15, 22, 29 and July 6, 13, 20, 27.

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 an average count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Date of application	Days after treatment ^{3/}	Number per 50 D-Vac Samples ^{4/}									
Insecticide	AI/acre lb.			Adults			Nymphal instars					Adults &	
				♂	♀	Total	1	2	3	4	5	Total Nymphs	
			Pre	0.25	0.00	0.25	1.25	1.50	1.00	0.50	0.25	4.50	4.75
			Pre	3.25	2.00	5.25	7.00	6.00	3.25	1.25	1.50	19.00	24.25
			Pre	3.75	2.50	6.25	3.75	6.25	7.75	5.00	2.50	25.25	31.50
			Pre	7.25	7.00	14.25	10.75	7.75	6.00	4.25	3.50	32.25	46.50
			Pre	11.00	11.00	22.00	4.00	8.00	6.00	3.00	7.00	28.00	50.00
			Pre	7.25	5.50	12.75	14.50	42.00	18.75	20.75	12.25	108.25	121.00
			Pre	11.50	10.25	21.75	11.25	23.25	12.75	11.25	11.50	70.00	91.75
			Pre	31.25	29.00	60.25	46.00	118.25	66.75	48.75	22.00	301.75	362.00
Vydate +	0.5	July 28	6	2.75	2.50	5.25	5.00	2.25	0.25	1.00	0.75	9.25	14.50
Lorsban +	0.5		13	3.75	6.75	10.50	11.75	37.50	8.00	3.00	0.75	61.00	71.50
Galecron	1.0		20	5.00	5.75	10.75	11.75	27.00	27.25	7.50	2.75	76.25	87.00
			27	9.50	9.50	19.00	42.25	172.75	34.00	10.25	5.75	265.00	284.00
Vydate +	0.5	Aug. 25											
Lorsban +	0.5		6	5.25	3.50	8.75	4.50	0.75	0.00	0.00	0.50	5.75	14.50
Galecron	1.0		13	3.25	4.75	8.00	3.25	129.25	12.25	0.25	0.25	145.25	153.25

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 8, 15, 22, 29 and July 6, 13, 20, 27.

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

Lygus bug populations in a seed alfalfa plot where insecticides were applied at a count of 8-12 lygus bugs per sweep. Firebaugh, California. 1976 1/

Treatment ^{2/}		Dates of appli- cations	Days after treat- ment ^{3/}	Number of lygus bugs per sweep ^{4/}					
Insecticides	AI/acre lb.			Adults	Nymphs				Adults & Nymphs
					Small	Medium	Large	Total	
Carzol + Lorsban	0.75 0.50	July 14	Pre	0.05	0.00	0.05	0.00	0.05	0.10
			Pre	0.10	0.15	0.40	0.20	0.75	0.85
			Pre	0.30	0.60	1.00	0.50	2.10	2.40
			Pre	0.80	0.45	0.60	0.85	1.90	2.70
			Pre	1.20	1.25	0.40	0.65	2.30	3.50
			Pre	1.05	4.65	2.40	1.25	8.30	9.35
Carzol + Larsban	0.75 0.50	Aug. 4	6	0.20	0.00	0.05	0.20	0.25	0.45
			13	1.10	1.95	1.00	0.00	2.95	4.05
			20	1.15	2.45	1.50	2.80	6.75	7.90
			6	0.55	0.30	0.00	0.15	0.45	1.00
Carzol + Larsban	0.75 0.50	Aug. 25	13	1.05	2.15	1.10	0.50	3.75	4.80
			20	0.35	1.80	2.10	2.90	6.80	7.15
			6	0.55	0.20	0.00	0.75	0.95	1.50
			13	1.15	1.60	0.30	0.25	2.15	3.30

1/ Treatment consisted of 1-5 acre plot.

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

3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6 and 13.

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

Lygus bug populations in a seed alfalfa plot where insecticides were applied at a count of 8-12 lygus bugs per sweep. Firebaugh, California. 1976 1/

Treatment ^{2/}		Dates of applications	Days after Treatment ^{3/}	Number per 50 D-Vac Samples ^{4/}										Adults & Nymphs
Insecticides	AI/acre lb.			Adults	Nymphal instars									
				♂	♀	Total	1	2	3	4	5	Total		
Carzol + Lorsban	0.75 0.50	July 14	Pre	0	1	1	0	3	1	1	0	5	6	
			Pre	1	2	3	1	5	0	0	0	6	9	
			Pre	2	0	2	4	5	3	5	1	18	20	
			Pre	7	4	11	2	7	4	9	4	26	37	
			Pre	8	9	17	7	8	7	2	1	25	42	
			Pre	9	6	15	36	75	19	13	3	146	161	
			6	4	3	7	0	1	0	0	4	5	12	
			13	11	5	16	7	13	20	3	0	43	59	
			20	3	4	7	20	42	10	12	14	98	105	
			Carzol + Lorsban	0.75 0.50	Aug. 4	6	7	5	12	4	8	1	2	2
13	2	3				5	4	8	2	2	0	16	21	
20	0	2				2	28	32	8	6	1	75	77	
Carzol + Lorsban	0.75 0.50	Aug. 25	6	2	1	3	5	8	1	5	1	20	23	
			13	19	11	30	1	34	3	0	0	38	68	

1/ Treatment consisted of 1-5 acre plot.

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

3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6 and 13.

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

Lygus bug populations in seed alfalfa plot where insecticides were applied at a count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Dates of appli- cation	Days after treat- ment ^{3/}	Number of lygus bugs per sweep ^{4/}						
Insecticides	AI/acre lb.			Adults	Nymphs				Adults & Nymphs	
					Small	Medium	Large	Total		
Carzol + Lorsban	0.75 0.50	Aug. 14	Pre	0.05	0.00	0.00	0.10	0.10	0.15	
			Pre	0.10	0.20	0.05	0.00	0.25	0.35	
			Pre	0.20	0.20	0.40	0.35	0.95	1.15	
			Pre	0.55	0.40	0.25	0.20	0.85	1.40	
			Pre	0.35	0.25	0.20	0.25	0.70	1.05	
			Pre	0.40	2.25	1.00	0.30	3.55	3.95	
			Pre	0.25	0.55	0.45	1.80	2.80	3.05	
			Pre	1.20	2.20	3.65	0.60	6.45	7.65	
			Pre	1.30	5.30	4.35	5.30	14.95	16.25	
				6	0.85	0.10	0.00	0.80	0.90	1.75
				13	2.15	3.40	0.50	0.35	4.25	6.40
				20	0.45	2.70	3.05	1.35	7.10	7.55
				27	0.80	6.85	3.15	2.65	12.65	13.45
Carzol + Lorsban	0.75 0.50	Sept. 1	6	1.30	0.50	0.00	0.15	0.65	1.95	

1/ Treatment consisted of 1-5 acre plot.

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

3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6, 13, 20, 27 and August 3.

4/ Average of 20 sweep counts on each sampling date.

Lygus bug populations in a seed alfalfa plot where insecticides were applied at a count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976 1/

Treatment ^{2/}		Dates of appli- cations	Days after treat- ment ^{3/}	Number per 50 D-Vac Samples ^{4/}									
Insecticides	AI/acre			Adults		Nymphal instars						Adults & Nymphs	
		♂	♀	Total	1	2	3	4	5	Total			
Carzol + Lorsban	0.75 0.50	Aug. 4	Pre	0	0	0	1	3	1	2	1	8	8
			Pre	1	3	4	4	6	1	2	1	14	18
			Pre	0	0	0	3	2	1	2	3	11	11
			Pre	6	5	11	10	5	9	4	0	28	39
			Pre	8	7	15	6	10	4	6	2	28	43
			Pre	5	4	9	2	8	9	7	3	29	38
			Pre	5	9	14	2	3	5	7	2	19	33
			Pre	22	24	46	64	55	59	57	27	262	308
			Pre	19	14	33	13	33	36	43	29	154	187
			6	13	20	33	6	6	5	9	11	37	70
			13	9	7	16	26	56	12	2	0	96	112
			20	14	17	31	31	69	20	5	5	130	161
			27	7	4	11	23	143	30	13	16	225	236
Carzol + Lorsban	0.75 0.50	Sept. 1	6	9	4	13	4	14	3	0	4	25	38

1/ Treatment consisted of 1-5 acre plot.

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

3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6, 13, 20, 27 and August 3.

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

Lygus bug populations in grower portion of field
utilized in insecticide timing experiment for lygus
bug control. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Dates of appli- cations	Days after treat- ment ^{3/}	Number of lygus bugs per sweep ^{4/}					
Insecticides	AI/acre lb.			Adults	Nymphs			Adults & Nymphs	
					Small	Medium	Large	Total	
Carzol + Lorsban	0.75 0.50	June 30	Pre	0.30	0.00	0.18	0.20	0.38	0.68
			Pre	0.10	0.23	0.35	0.00	0.58	0.68
			Pre	0.13	0.30	0.37	0.53	1.20	1.33
			Pre	0.52	0.43	0.57	0.53	1.53	2.05
Carzol + Lorsban + Fundal	0.50 0.25 1.00	July 17	6	0.22	0.17	0.07	0.05	0.29	0.51
			13	0.43	1.68	0.75	0.38	2.81	3.24
			3	0.13	0.03	0.03	0.10	0.16	0.29
			10	0.18	0.65	0.12	0.05	0.82	1.00
Carzol + Lorsban	0.75 0.50	Aug. 5	17	0.50	0.28	0.42	0.78	1.48	1.98
			5	0.30	0.10	0.02	0.23	0.35	0.65
			12	0.48	0.45	0.02	0.13	0.60	1.08
			19	0.20	2.05	2.27	0.80	5.12	5.32
			26	0.18	2.40	2.65	1.57	6.62	6.80
			33	2.10	3.07	3.05	0.80	6.92	9.02

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 on June 8, 15, 22, 29.

4/ Average of 20 sweeps in each of the 2 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. 1976. 1/

Insecticide	2/ Treatment- lb./acre	Date of appli- cation	Days after treat- ment	Number per 50 D-Vac Samples										Adults & Total Nymphs
				Adults		Nymphal instars								
				♂	♀	Total	1	2	3	4	5	Total		
Carzol + Lorsban	0.75 0.50	June 30	Pre	1.0	1.5	2.5	0.5	1.0	1.0	1.5	1.5	5.5	5.5	8.0
			Pre	1.5	3.0	4.5	1.0	3.5	3.0	0.5	0.5	8.5	8.5	13.0
			Pre	2.5	2.5	5.0	2.0	3.5	3.0	3.0	0.5	12.0	12.0	17.0
			Pre	5.5	6.5	12.0	6.0	5.0	3.0	6.0	5.0	25.0	25.0	37.0
			6	8.0	6.0	14.0	7.0	4.0	2.0	6.0	5.0	24.0	24.0	38.0
Carzol + Lorsban + Fundal	0.50 0.25 1.00	July 17	13	7.0	4.0	11.0	4.5	27.5	14.0	11.5	5.5	63.0	74.0	
			3	0.5	0.0	0.5	0.0	0.5	0.5	2.5	3.0	6.5	6.5	7.0
			10	5.5	5.0	10.5	14.0	29.0	3.0	0.0	0.0	46.0	46.0	56.5
			17	3.5	3.0	6.5	9.0	8.0	11.0	9.5	2.5	40.0	40.0	46.5
			5	1.5	0.5	2.0	0.0	1.0	1.0	1.0	1.5	4.5	4.5	6.5
Carzol + Lorsban	0.75 0.50	Aug. 5	12	4.0	4.5	8.5	22.5	14.5	4.5	0.0	0.0	41.5	50.0	
			19	8.0	3.0	11.0	28.5	90.5	45.5	5.0	2.0	171.5	182.5	
			26	1.5	1.5	3.0	8.0	67.5	19.0	18.5	14.0	127.0	130.0	
			33	32.5	17.0	49.5	21.5	138.5	33.5	17.5	14.0	225.0	274.5	

- 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 on June 8, 15, 22, 29.
- 4/ 4-25 suck D-Vac samples on each sampling date.

Good and defective seeds in samples from insecticide timing experiment for lygus bug control. Firebaugh, California. 1976.

Treatment ^{1/}	Repli- cation ^{2/}	Total Seed Exam.	Good Seed	Defective Seeds					
				Chalcid	Lygus bug	Stink bug	Shriveled	Water damage	Green
Vydate +	1	1218	1009	2	66	28	7	102	4
Lorsban +	2	1204	1027	2	30	19	13	102	11
Galecron	3	1258	1072	0	47	28	13	95	3
8-12 bugs/swp.	4	1291	1120	0	41	24	20	80	6
Totals		4971	4228	4	184	99	53	379	24
%			85.05	0.08	3.70	1.99	1.07	7.62	0.48
Vydate +	1	1175	1011	4	56	16	10	76	2
Lorsban +	2	1221	960	5	65	49	27	110	5
Galecron	3	1272	972	2	101	75	13	102	7
16-24 bugs/swp.	4	1310	1089	0	56	46	16	97	6
Totals		4978	4032	11	278	186	66	385	20
%			81.00	0.22	5.58	3.74	1.33	7.73	0.40
Carzol +	1	1270	1085	3	30	27	17	101	7
Lorsban	%		85.43	0.24	2.36	2.13	1.34	7.95	0.55
8-12 bugs/swp.									
Carzol +	1	1295	983	3	92	59	38	99	21
Lorsban	%		75.91	0.23	7.10	4.56	2.93	7.64	1.62
16-24 bugs/swp.									
Grower program	1	1266	1073	1	53	23	20	91	5
	2	1286	1053	0	98	51	12	69	3
Totals		2552	2126	1	151	74	32	160	8
%			83.31	0.04	5.92	2.90	1.25	6.27	0.31

1/ Vydate and Lorsban were applied at 0.50 lb.AI/acre, Carzol at 0.75 lb.AI/acre and the Galecron at 1.00 lb.AI/acre.

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

The plots with 8-12 bugs/sweep each received a total of 3 applications.

The plots with 16-24 bugs/sweep each received 2 applications.

The grower program consisted of three applications; Carzol 0.75 lb AI/acre plus Lorsban 0.50 lb.AI/acre on June 30, Carzol 0.50 lb.AI/acre plus Lorsban 0.25 lb.AI/acre plus Fundal 1.0 lb.AI/acre on July 17 and Carzol 0.75 lb. AI/acre plus Lorsban 0.50 lb.AI/acre on August 5.

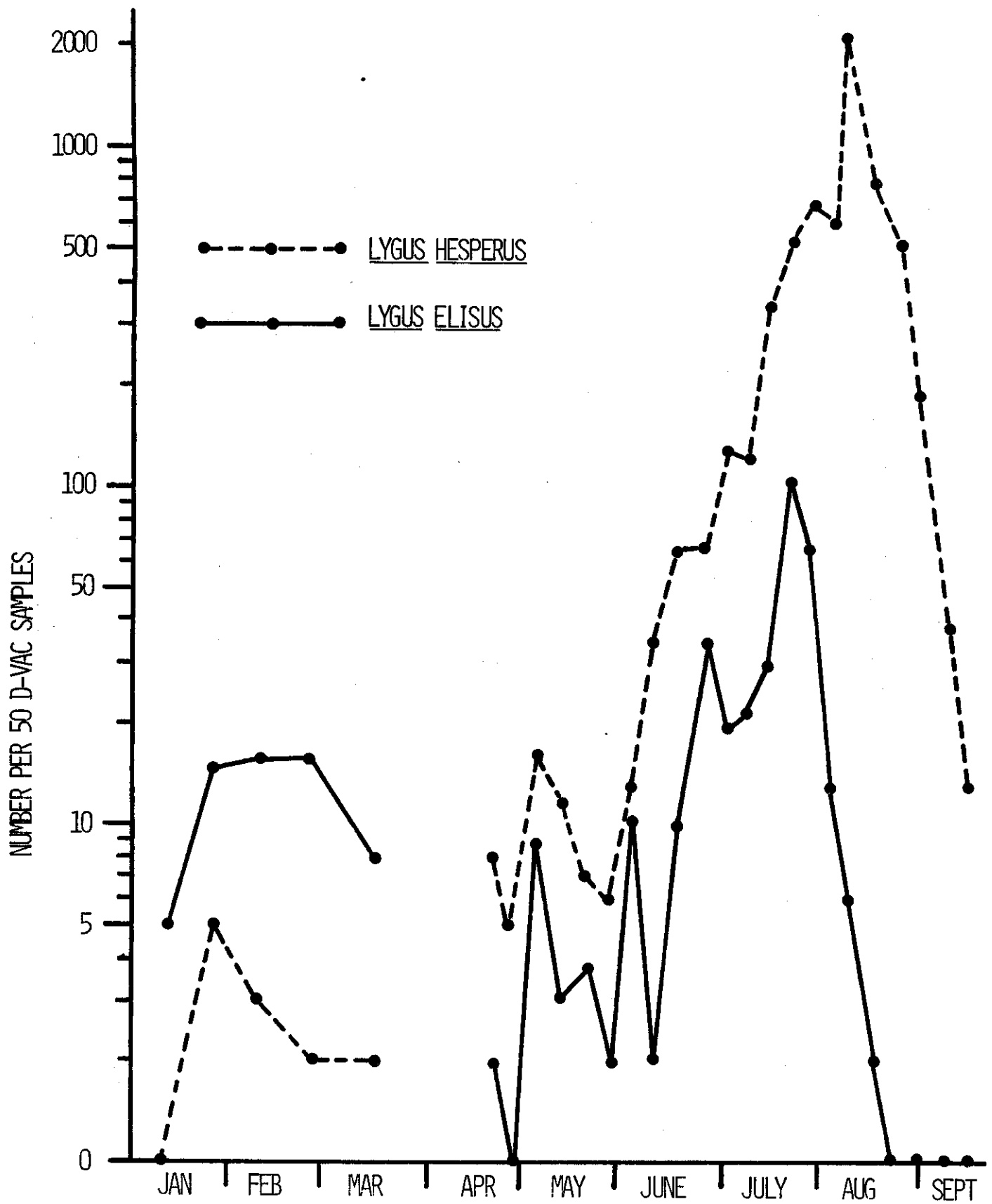
2/ Four 1 quart samples of seed pods were hand stripped from each replicate. Samples were hand threshed and lightly cleaned in a clipper seed cleaner. Counts based on 4 subsamples from each of the threshed samples.

Populations of Lygus hesperus and Lygus elisus in an untreated alfalfa seed field.
Firebaugh, California. 1976.

Date Sampled ^{1/}	Number per 50 D-Vac Samples ^{2/}					
	<u>Lygus hesperus</u>			<u>Lygus hesperus</u>		
	Adults	Nymphs	Adults + Nymphs	Adults	Nymphs	Adults + Nymphs
January 13	1	0	1	5	0	5
27	5	0	5	15	0	15
February 11	3	0	3	15	1	16
24	2	0	2	16	0	16
March 16	1	1	2	6	2	8
30	-	-	-	-	-	-
April 20	1	7	8	0	2	2
26	0	5	5	0	0	0
May 4	1	15	16	1	8	9
11	4	8	12	2	1	3
18	2	5	7	3	1	4
24	3	3	6	2	0	2
June 2	1	10	11	10	2	12
8	7	28	35	2	0	2
15	19	46	65	3	7	10
22	30	37	67	8	27	35
29	40	89	129	8	11	19
July 6	39	183	222	18	3	21
13	49	262	311	27	2	29
20	76	453	529	40	65	105
27	130	560	690	53	12	65
August 3	160	460	620	11	2	13
10	127	1975	2102	4	2	6
17	37	746	783	2	0	2
24	61	477	538	0	0	0
31	42	145	187	1	0	1
September 7	16	22	38	0	0	0
14	3	10	13	0	0	0

^{1/} Entire field clipped March 22, half of field was clipped again on April 29.

^{2/} Data based on eight 10 suck D-Vac samples on each sampling date.



POPULATIONS OF *LYGUS HESPERUS* AND *LYGUS ELISUS*
IN AN UNTREATED ALFALFA SEED FIELD. FIREBAUGH,
CALIFORNIA, 1976.

Lygus bug populations in an untreated seed alfalfa field clipped back on March 22. Firebaugh, California. 1976. 1/

Date Sampled	Number per sweep ^{2/}					Adults & Nymphs
	Adults	Nymphs				
		Small	Medium	Large	Total	
Apr. 20	0.00	0.50	0.00	0.00	0.50	0.50
26	0.00	0.00	0.00	0.00	0.00	0.00
May 4	0.00	0.06	0.13	0.06	0.25	0.25
11	0.31	0.06	0.13	0.00	0.19	0.50
18	0.25	0.06	0.19	0.13	0.38	0.63
24	0.50	0.06	0.56	0.13	0.75	1.25
June 2	0.37	0.13	0.62	0.38	1.13	1.50
8	0.63	0.56	0.63	0.43	1.62	2.25
15	0.75	0.56	1.89	1.44	3.89	4.64
22	1.88	1.40	1.30	0.94	3.64	5.52
29	2.50	3.62	2.31	1.87	7.80	10.30
July 6	3.50	5.56	1.37	2.37	9.30	12.80
13	5.13	21.25	5.38	9.63	36.26	42.39
20	4.63	18.38	8.38	13.75	40.51	45.14
27	8.75	23.88	21.12	14.50	59.50	68.25
Aug. 3	25.00	22.75	28.25	23.00	74.00	99.00
10	8.25	30.75	10.88	7.87	49.50	57.75
17	9.75	70.00	46.13	15.00	131.13	140.88
24	5.75	33.00	16.25	9.25	58.50	64.25
31	4.13	8.12	6.50	3.00	17.62	21.75
Sept 7	1.75	1.62	0.75	0.13	2.50	4.25
14	0.25	0.19	0.06	0.06	0.31	0.56
21	0.06	0.13	0.31	0.19	0.63	0.69

1/ The treatment consisted of 4 replicated plots which were all clipped back on March 22.

2/ Average of 16 sweeps on each sampling date.

Lygus bug populations in an untreated seed alfalfa field clipped on March 22.
Firebaugh, California. 1976. 1/

Date Sampled		Number per 50 D-Vac Samples <u>2/</u>									Adults & Nymphs
		Adults			Nymphal instars					Total	
		♂	♀	Total	1	2	3	4	5		
Apr.	20	0.00	0.00	0.00	0.00	5.00	2.50	0.00	0.00	7.50	7.50
	26	0.00	0.00	0.00	0.00	2.50	0.00	0.00	0.00	2.50	2.50
May	4	0.00	2.50	2.50	2.50	10.00	10.00	5.00	1.25	28.25	31.25
	11	3.75	2.50	6.25	0.00	5.00	2.50	0.00	0.00	3.75	13.75
	18	7.50	2.50	10.00	1.25	5.00	1.25	1.25	1.25	10.00	20.00
	24	2.50	3.75	6.25	0.00	0.00	0.00	1.25	0.00	1.25	7.50
June	2	0.00	0.00	0.00	0.00	7.50	5.00	3.75	0.00	16.25	16.25
	8	3.75	5.00	8.75	6.25	16.25	10.00	7.50	7.50	47.50	56.25
	15	13.75	22.50	36.25	3.75	16.25	18.75	5.00	30.00	73.75	110.00
	22	19.20	25.00	55.00	5.00	12.50	10.00	36.25	31.25	95.00	150.00
	29	32.50	33.75	66.25	7.50	46.50	30.00	26.25	32.50	142.50	208.75
July	6	41.25	22.50	63.75	15.00	165.00	38.75	36.25	15.00	270.00	333.75
	13	71.25	37.50	108.75	28.75	141.25	51.25	67.50	70.00	358.75	467.50
	20	70.00	56.25	126.25	46.25	185.00	225.00	116.25	37.50	610.00	736.25
	27	133.75	80.00	213.75	62.50	280.00	226.25	142.50	61.25	772.50	986.25
Aug.	3	87.50	53.75	141.25	20.00	161.00	148.75	85.00	63.75	478.75	620.00
	10	118.75	38.75	157.50	68.75	878.75	787.50	383.75	268.75	2387.50	2545.00
	17	27.50	2.50	30.00	35.00	457.50	457.50	177.50	51.25	1178.75	1208.75
	24	52.50	2.00	72.50	11.25	85.00	168.75	168.25	52.50	503.75	576.25
	31	26.25	8.75	35.00	0.00	26.25	48.75	33.75	28.75	137.50	172.50
Sept.	7	16.25	3.75	20.00	0.00	13.75	5.00	15.00	1.25	35.00	55.00
	14	2.50	1.25	3.75	0.00	5.00	3.75	2.50	0.00	11.25	15.00

1/ The treatment consisted of 4 replicated plots all of which were clipped March 22.

2/ Data based on four 10 suck D-Vac samples taken on each sampling date.

Lygus bug populations in a untreated seed alfalfa field clipped back on April 29. Firebaugh, California. 1976. 1/

Date Sampled	<u>1/</u>	Number per sweep <u>2/</u>				Adults & Nymphs		
		Adults	Nymphs					
			Small	Medium	Large		Total	
May	4	<u>3/</u>	-	-	-	-	-	-
	11		0.13	0.00	0.13	0.00	0.13	0.26
	18		0.50	0.00	0.00	0.20	0.20	0.70
	24		0.37	0.00	0.19	0.00	0.19	0.56
June	2		0.12	0.19	0.19	0.00	0.38	0.50
	8		0.19	0.44	0.31	0.19	0.94	1.13
	15		0.19	0.31	0.81	0.19	1.31	1.50
	22		1.56	0.94	0.81	0.25	2.00	3.56
	29		2.25	2.00	1.00	1.37	4.37	6.62
July	6		3.31	4.00	1.63	2.06	7.69	11.00
	13		3.63	14.00	5.38	7.38	26.76	30.39
	20		5.50	19.25	9.25	9.50	38.00	43.50
	27		10.38	36.25	17.88	13.63	67.76	78.14
Aug.	3		27.38	27.75	33.50	32.50	93.75	121.13
	10		11.50	36.75	10.62	8.63	56.00	67.50
	17		10.50	80.63	53.37	16.00	150.00	160.50
	24		5.75	35.00	15.13	9.63	59.76	65.51
	31		9.62	7.75	5.25	3.88	16.88	26.50
Sept.	7		0.88	1.38	2.37	0.50	4.25	5.13
	14		0.25	0.38	0.31	0.25	0.94	1.19
	21		0.00	0.13	0.25	0.06	0.44	0.44

1/ Treatment consisted of 4 replicated plots which were all clipped back on April 29.

2/ Average of 16 sweeps on each sampling date.

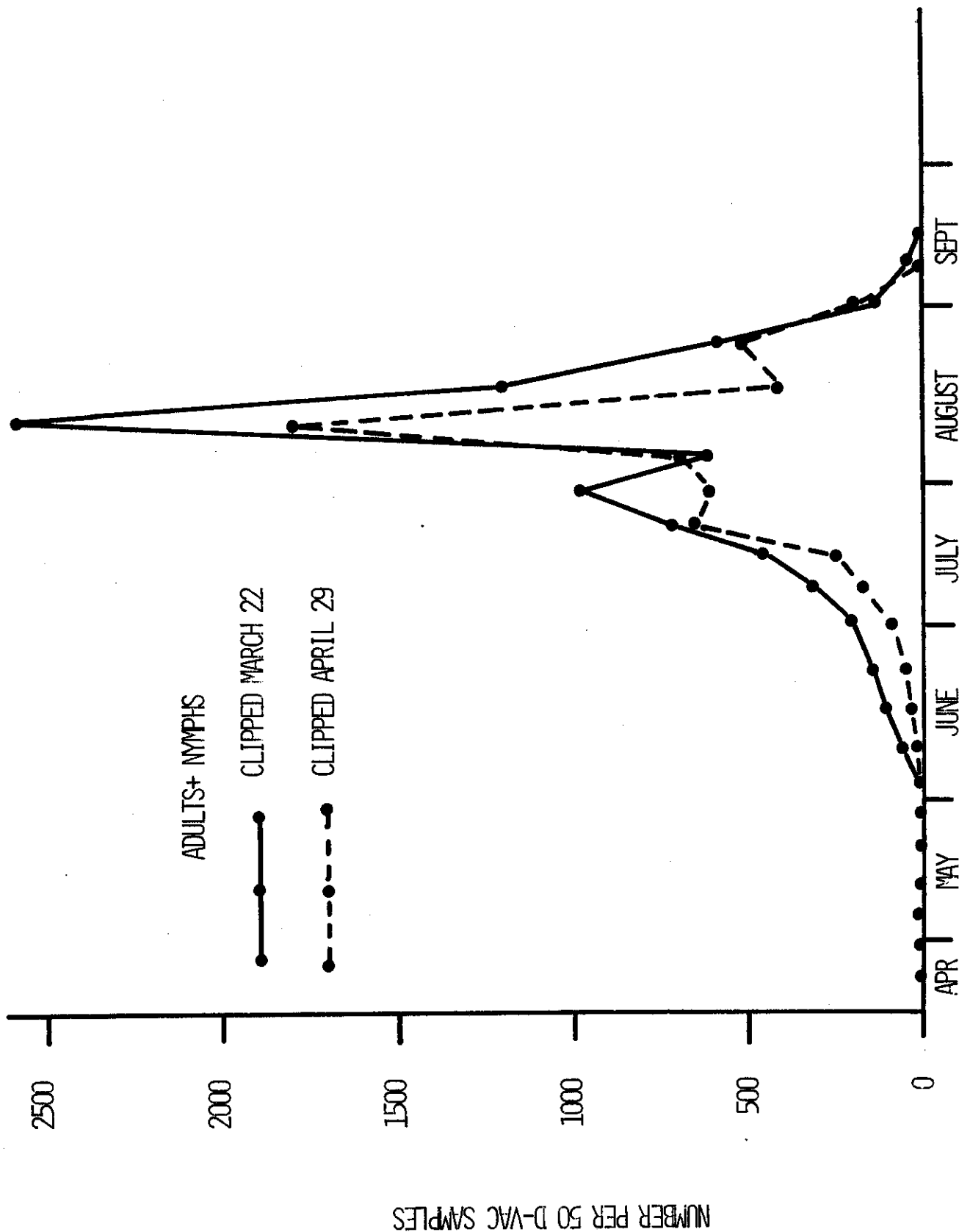
3/ No sweeps taken as alfalfa too short to sweep.

Lygus bug populations in an untreated seed alfalfa field clipped on April 29.
Firebaugh, California. 1976. ^{1/}

Date Sampled		Number per 50 D-Vac Samples ^{2/}									Adults & Nymphs
		Adults			Nymphal instars						
		♂	♀	Total	1	2	3	4	5	Total	
May	4	0.00	0.00	0.00	0.00	6.25	5.00	5.00	2.50	18.75	18.75
	11	1.25	2.50	3.75	0.00	3.75	1.25	2.50	1.25	8.75	12.50
	18	0.00	0.00	0.00	1.25	1.25	0.00	1.25	1.25	5.00	5.00
	24	2.50	1.25	3.75	0.00	3.75	0.00	0.00	0.00	3.75	7.50
June	2	1.25	2.50	3.75	0.00	2.50	1.25	0.00	0.00	3.75	7.50
	8	0.00	6.25	6.25	1.25	6.25	6.25	0.00	1.25	15.00	21.25
	15	1.43	5.71	7.14	4.28	17.14	10.00	2.86	4.28	38.57	45.71
	22	6.25	13.75	20.00	2.50	12.50	6.25	8.75	8.75	38.75	58.75
	29	15.00	13.75	28.75	2.50	27.50	12.50	12.50	11.25	66.25	95.00
July	6	31.25	18.75	50.00	8.75	66.25	28.75	13.75	7.50	125.00	175.00
	13	23.75	17.50	41.25	15.00	135.00	28.75	18.75	12.50	210.00	251.25
	20	65.00	40.00	105.00	68.75	147.50	150.00	78.50	96.25	541.25	646.25
	27	111.25	41.25	152.50	31.25	130.00	170.00	83.75	48.75	463.75	616.25
Aug.	3	131.25	70.00	201.25	36.25	176.25	143.75	86.25	56.25	498.75	700.00
	10	70.00	33.75	103.75	36.25	642.50	557.50	240.00	195.00	1671.25	1775.00
	17	40.00	6.25	46.25	21.25	167.50	115.00	48.75	17.50	370.00	416.25
	24	36.25	13.75	50.00	16.25	125.00	158.75	98.75	78.75	477.50	527.50
	31	35.00	13.75	48.75	2.50	32.50	51.25	46.25	22.50	155.00	203.75
Sept.	7	7.50	5.00	12.50	0.00	2.50	0.00	5.00	1.25	8.75	21.25
	14	1.25	1.25	2.50	0.00	2.50	1.25	3.75	0.00	7.50	10.00

^{1/} Treatment consisted of 4 replicated plots all of which were clipped on April 29.

^{2/} Data based on four 10 suck D-Vac samples taken on each sampling date.



LYGUS BUG POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD HALF OF WHICH WAS CLIPPED MARCH 22 AND HALF CLIPPED ON APRIL 29. FIREBAUGH, CALIFORNIA, 1976.

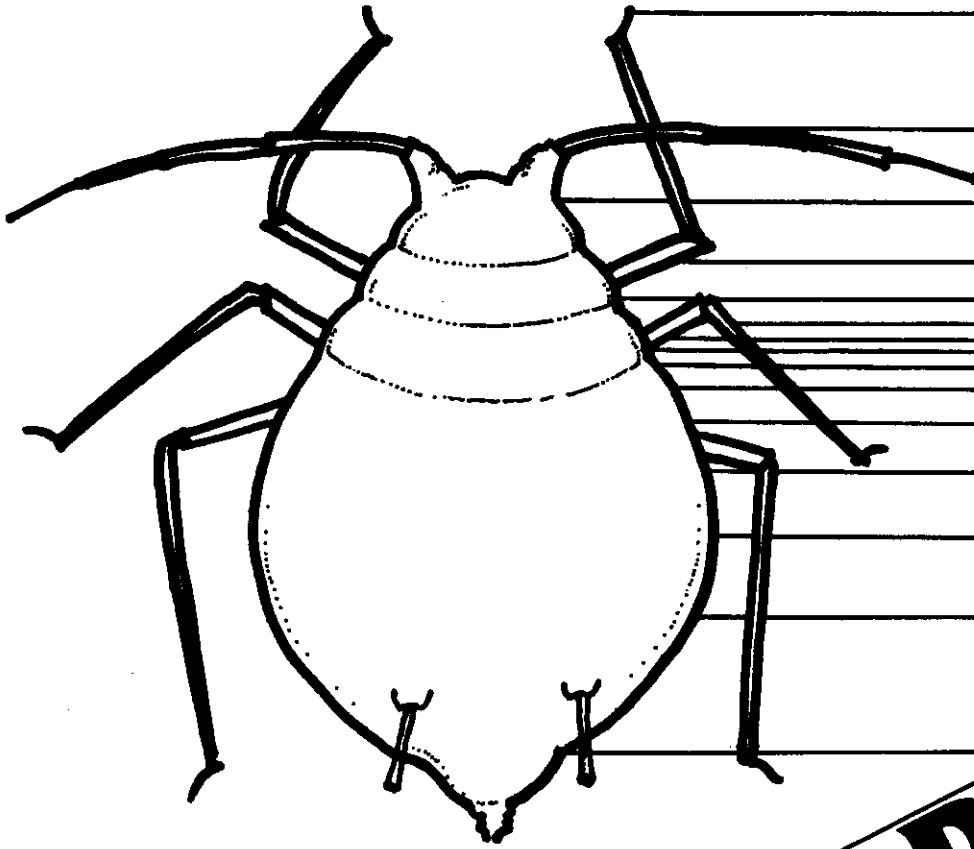
Good and defective seeds in samples from an untreated seed alfalfa field clipped early (March 22) and late (April 29). Firebaugh, California. 1976.

Treatment ^{1/}	Clipped March 22 ^{2/}		Clipped April 29 ^{2/}	
Seed Categories	Number of seeds	percent	Number of seeds	percent
Good seed	2782	50.90	3270	59.22
Insect damaged seed				
Lygus bug	906	16.58	714	12.93
Stink bug	430	7.87	392	7.10
Chalcid	26	0.48	10	0.18
Shriveled seed	59	1.08	64	1.16
Water damaged seed	1255	22.96	1056	19.12
Green seed	7	0.13	16	0.29
Total damaged seed	2683	49.10	2252	40.78
Total seeds examined ^{3/}	5465		5522	

1/ Each treatment consisted of 4 replicated plots.

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

3/ Data based on 8 random subsamples drawn from threshed clean seed of each replicate.



APHID

Spotted alfalfa aphid populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Firebaugh, California. 1976.

Treatment ^{1/} Insecticides	AI/acre lb.	Number of Aphids per 50 D-Vac Samples ^{2/}			
		August 17 Pre	August 24 6 days	August 31 14 days	September 7 21 days
Monitor	0.5	24	145	96	1479
Bay Hox NTN 9306	1.0	1	68	48	399
Bay Hox 1901	1.0	15	15	56	174
Bay Hox 1901 + Guthion	1.0 0.75	12	9	19	115
Shell WL 43775	0.2	0	2	0	0
UC 21865	1.0	1	13	65	76

^{1/} Plot size: Each treatment 5 acres (165'x1320'). Sprays were applied at 10 GPA. UC 21865 was a 75% wettable powder while others were emulsifiable concentrates. Plots were treated August 18 from 3:00 to 5:30 AM.

^{2/} 2-25 suck D-vac samples per treatment on each sampling date.

Pea aphid populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Firebaugh, California. 1976.

Treatment ^{1/} Insecticides	AI/acre lb.	Number of Aphids per 50 D-Vac Samples ^{2/}			
		August 17 Pre	August 24 6 days	August 31 14 days	September 7 21 days
Monitor	0.5	120	36	160	45
Bay Hox NTN 9306	1.0	139	96	287	117
Bay Hox 1901	1.0	53	11	34	38
Bay Hox 1901 +	1.0	96	31	72	54
Guthion	0.75				
Shell WL 43775	0.2	66	1	11	33
UC 21865	1.0	41	398	855	228

1/ Plot size: Each treatment 5 acres (165'x1320'). Sprays were applied at 10 GPA. UC 21865 was a 75% wettable powder while others were emulsifiable concentrates. Plots were treated August 18 from 3:00 to 5:30 AM.

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

Aphid populations in seed alfalfa plots where insecticides were applied at an average count of 8-12 lygus bugs per sweep. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Dates of applica- tion	Days after treat ^{3/} ment	Number per 50 D-Vac Samples ^{4/}			
Insecticides	AI/acre lb.			Spotted Alfalfa aphid	Pea aphid		
Vydate + Lorsban + Galecron	0.5	July 14	Pre	94.3	46.0		
			Pre	25.3	34.8		
			Pre	37.5	43.8		
	0.5		Pre	29.8	77.0		
			Pre	20.8	211.8		
			Pre	85.5	643.3		
			6	1.8	1.5		
Vydate + Lorsban + Galecron	1.0	Aug. 11	13	63.0	23.0		
			20	54.8	61.3		
			27	184.8	374.5		
			0.5	Aug. 25	6	24.5	11.5
					13	31.5	177.3
0.5	6	8.8			5.3		
	13	15.8	176.3				

1/ The treatment was replicated 4 times, each replicated 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 8, 15, 22, 29 and July 6 and 13.

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

Aphid populations in seed alfalfa plots where insecticides were applied at an average count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Dates of applica- tion	Days after treat- ment ^{3/}	Number per 50 D-Vac Samples ^{4/}	
Insecticides	AI/acre lb.			Spotted Alfalfa aphid	Pea aphid
Vydate + Lorsban + Galecron	0.5	July 28	Pre	61.3	36.8
			Pre	22.8	35.0
			Pre	61.0	78.0
	Pre		30.0	68.5	
	Pre		44.0	272.5	
	Pre		56.3	578.8	
	Pre		119.8	767.0	
	0.5		Pre	208.8	2298.9
	1.0		6	4.3	8.0
			13	10.3	33.8
20		54.3	228.3		
27		151.3	1188.0		
Vydate + Lorsban + Galecron	0.5	Aug. 25			
			6	10.3	14.5
			13	20.5	177.8
	1.0				

1/ 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 8, 15, 22, 29 and July 6, 13, 20, 27.

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

Aphid populations in seed alfalfa plot where insecticides were applied at a count of 8-12 lygus bugs per sweep. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Dates of applica- tions	Days after treat- ments ^{3/}	Number per 50 D-Vac Samples ^{4/}	
Insecticides	AI/acre lb.			Spotted Alfalfa aphid	Pea aphid
Carzol + Lorsban	0.75 0.50	July 14	Pre	24	19
			Pre	7	11
			Pre	16	55
			Pre	14	53
			Pre	7	71
			Pre	43	215
			6	0	7
Carzol + Lorsban	0.75 0.50	Aug. 4	13	105	95
			20	330	270
			6	62	195
			13	172	34
Carzol + Lorsban	0.75 0.50	Aug. 25	20	792	678
			6	150	145
			13	646	329

1/ Treatment consisted of 1-5 acre plot.

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

3/ Pretreatment counts were made on Juan 8, 15, 22, 29 and July 6 and 13.

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

Aphid populations in seed alfalfa plot where insecticides were applied at a count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Dates of applica- tions	Days after treat- ments ^{3/}	Number per 50 D-Vac Samples ^{4/}	
Insecticides	AI/acre lb.			Spotted Alfalfa aphid	Pea aphid
Carzol + Lorsban	0.75	Aug. 4	Pre	142	71
			Pre	26	31
	0.50		Pre	10	21
			Pre	56	35
			Pre	12	51
			Pre	31	105
			Pre	40	208
			Pre	18	67
			Pre	251	233
			6	14	36
13	34	132			
20	271	644			
27	1639	3122			
Carzol + Lorsban	0.75	Sept. 1	6	193	168
	0.50				

1/ Treatment consisted of 1-5 acre plot.

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

3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6, 13, 20, 27 and August 3.

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

Aphid populations in grower portion of field utilized
in an insecticide timing experiment for lygus bug
control. Firebaugh, California. 1976. 1/

Treatment ^{2/}		Dates of applica- tion	Days after treat- ments ^{3/}	Number per 50 D-Vac Samples ^{4/}	
Insecticides	AI/acre lb.			Spotted Alfalfa aphid	Pea aphid
Carzol + Lorsban	0.75	June 30	Pre	283.5	23.0
			Pre	18.0	26.0
	Pre		54.0	16.0	
	Pre		29.0	16.0	
	0.50		6	3.0	4.5
Carzol + Lorsban + Fundal	0.50	July 17	13	8.5	7.5
	0.25				
	1.00		3	0.00	0.5
			10	10.5	3.5
Carzol + Lorsban	0.75	Aug. 5	17	14.5	19.5
	0.50				
			5	1.0	1.5
			12	4.0	22.5
	19	38.0	213.0		
	26	225.5	773.0		
	33	441.0	566.5		

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 on June 8, 15, 22, 29.

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

Aphid populations in an untreated seed alfalfa field clipped early (March 22) and late (April 29). Firebaugh, California. 1976. 1/

Date Sampled		Number Per 50 D-Vac Samples <u>2/</u>			
		Clipped March 22		Clipped April 29	
		Spotted alfalfa aphid	Pea aphid	Spotted alfalfa aphid	Pea aphid
April	20	115	825	78	918
	26	220	1968	215	1948
May	4	366	7513	139	1059
	11	114	233	64	139
	18	66	204	68	376
	24	58	81	26	80
June	2	18	174	14	189
	8	39	166	35	249
	15	49	178	34	180
	22	9	120	8	81
	29	46	16	28	10
July	6	35	40	14	14
	13	20	30	4	9
	20	11	95	16	63
	27	94	175	20	73
	3	79	28	34	163
August	10	58	369	33	239
	17	89	849	18	339
	24	0	560	9	273
	31	25	561	25	131
	7	74	236	66	13
September	14	33	79	45	38

1/ Each treatment replicated 4 times.

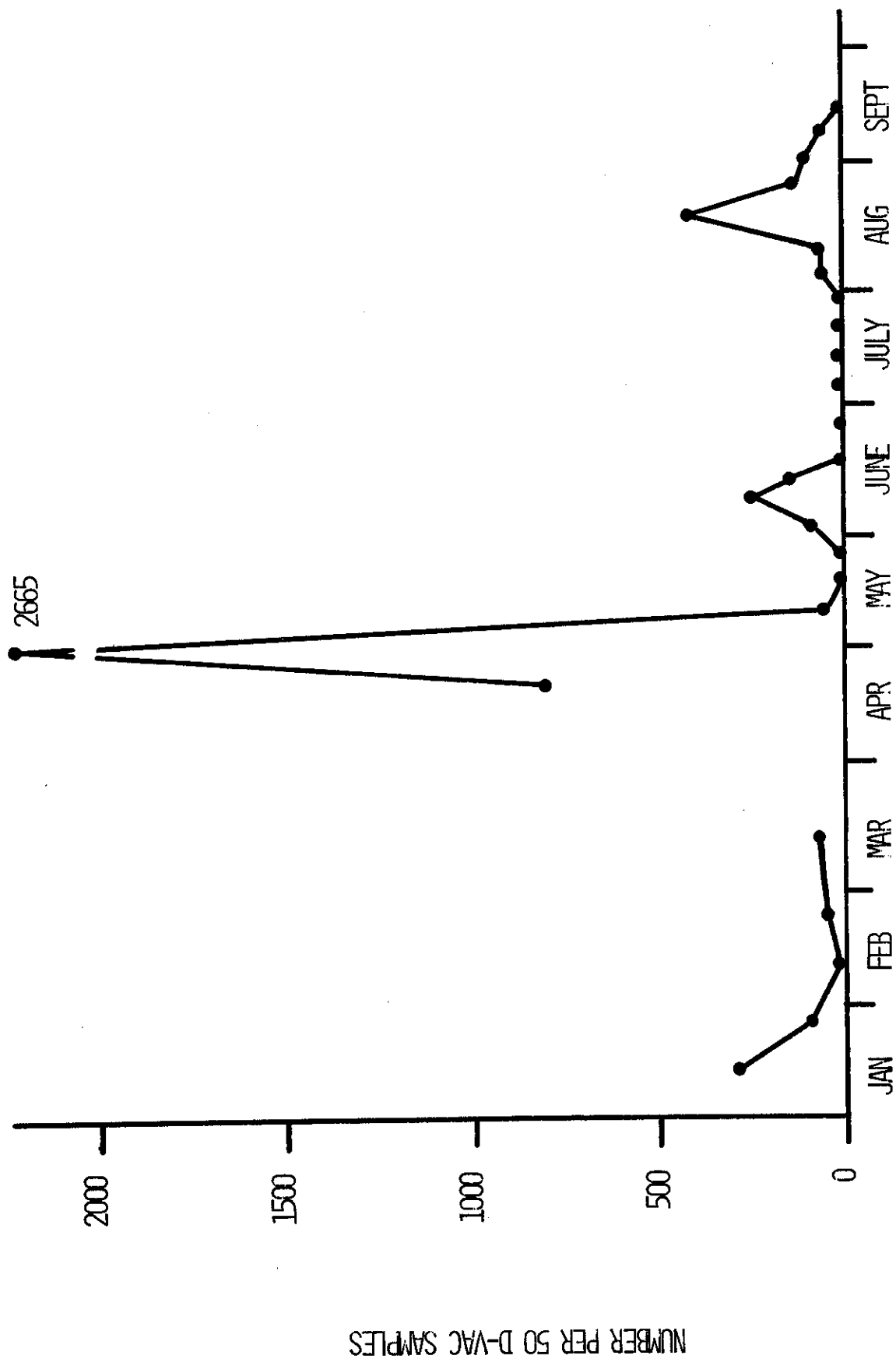
2/ Data based on four 5 suck D-Vac samples per treatment on each sampling date.

Aphid populations in an untreated seed alfalfa field.
Firebaugh, California. 1975-1976.

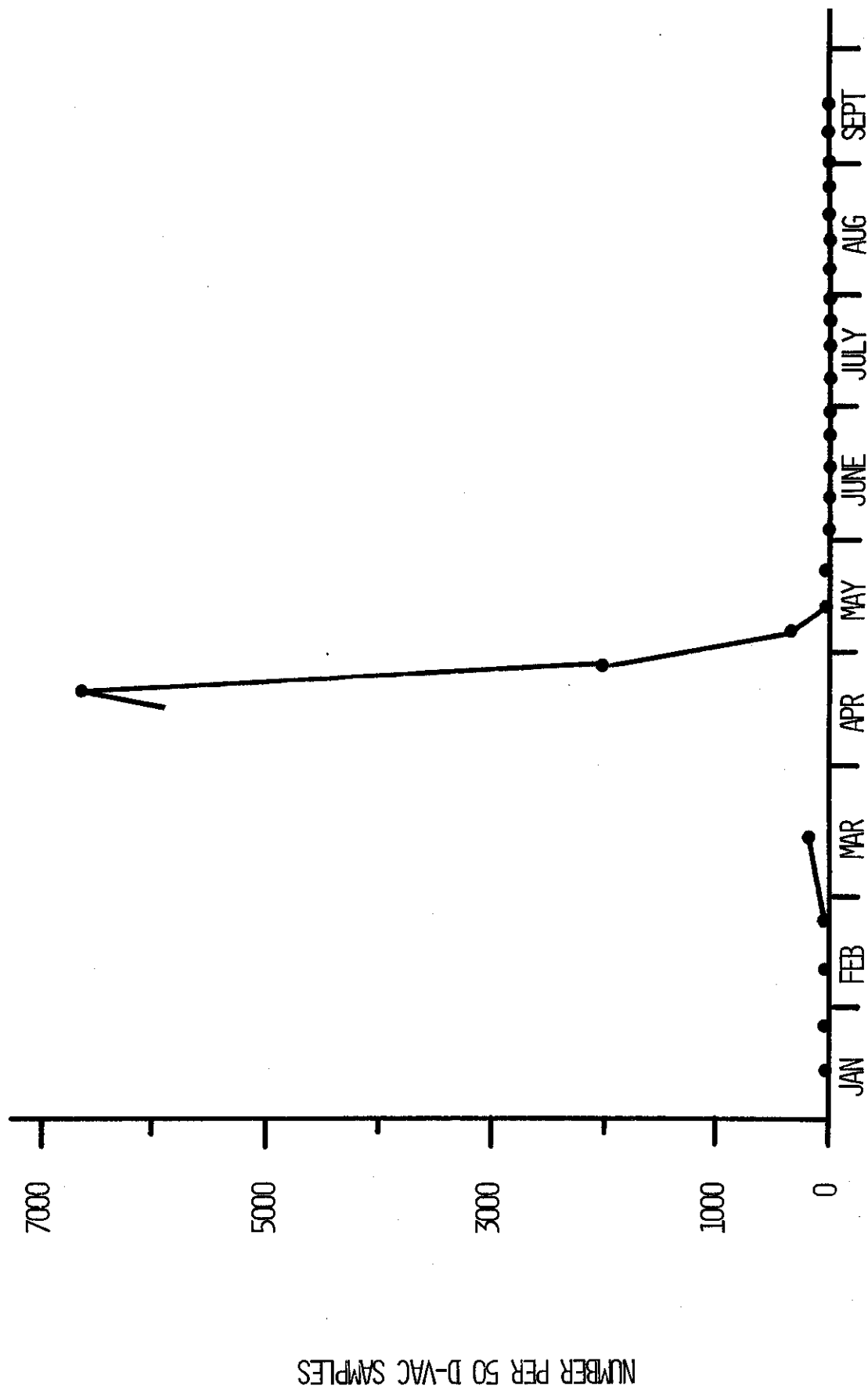
Date Sampled <u>1/</u>		Aphids per 50 D-Vac Samples <u>2/</u>		
		Spotted alfalfa aphid	Pea aphid	Blue alfalfa aphid
December	30, 1975	4	219	0
January	13, 1976	8	303	0
	27	6	110	3
February	11	5	23	2
	24	1	44	1
March	16	10	76	55
	30	-	-	-
April	20	115	825	6721
	26	315	2665	1925
May	4	48	2424	406
	11	11	40	2
	18	8	27	3
	24	22	19	2
June	2	7	74	0
	8	65	245	0
	15	130	145	0
	22	3	28	0
	29	4	4	0
July	6	14	12	0
	13	6	6	0
	20	1	25	0
	27	3	31	0
August	3	6	58	0
	10	15	62	0
	17	49	435	0
	24	0	133	0
	31	13	89	0
September	7	20	70	0
	14	8	18	0

1/ Entire field was clipped on March 22.

2/ Data based on two 5 suck D-Vac samples on each sampling date.



PEA APHID POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD. THE ENTIRE FIELD WAS CLIPPED ON MARCH 22 AND HALF ON APRIL 29. FIREBAUGH, CALIF.-ORNLIA, 1976.



BLUE ALFALFA APHID POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD.
 ENTIRE FIELD WAS CLIPPED MARCH 22 AND HALF ON APRIL 29. FIREBAUGH,
 CALIFORNIA, 1976.

Mite populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Firebaugh, California. 1976.

Treatment ^{1/}		Number of mites per leaf ^{2/}			
Insecticide	AI/acre lb.	August 17 Pre	August 24 6 days	August 31 14 days	September 9 21 days
Monitor	0.5	2.20	1.64	4.10	7.96
Bay Hox NTN 9306	1.0	0.66	3.04	5.96	21.06
Bay Hox 1901	1.0	0.90	0.42	3.00	5.76
Bay Hox 1901 + Guthion	1.0 0.75	1.34	1.42	3.50	8.32
Shell WL 43775	0.2	1.62	3.26	8.22	8.18
UC 21865	1.0	0.52	0.72	2.06	1.92

1/ Plot size: Each treatment 5 acres (165'x1320'). Sprays were applied at 10 GPA. UC 21865 was a 75% wettable powder while others were emulsifiable concentrates. Plots were treated August 18 from 3:00 to 5:30 AM.

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

Spider mite populations in a seed alfalfa field treated by aircraft for spider mite control. Firebaugh, California. 1976.

Treatment ^{1/}		Number per leaf ^{2/}					
Insecticides	AI/acre lb.	August 10 Pre		August 17 6 days		August 24 14 days	
		Mites	Eggs	Mites	Eggs	Mites	Eggs
Comite ^{3/}	1.0	7.36	18.88	0.90	7.38	1.24	1.50
Galecron ^{4/}	1.0	8.00	14.04	1.04	5.10	1.30	4.58
Carzol ^{4/}	1.0	0.90	3.48	1.30	5.96	3.82	12.14
Zardex	1.0	5.12	11.00	4.42	12.16	5.50	38.18

^{1/} Plot size: Each treatment 5 acres (156'x1320'). Sprays were applied at 10 GPA. Carzol was a 92% soluble powder while others were emulsifiable concentrates. Plots were treated August 11 from 2:00-3:00 AM.

^{2/} 50 Trifoliate leaves from each treatment on each sampling date.

^{3/} Sprint® a spreader sticker was added at the rate of 32 oz per 60 gal mix.

^{4/} P-90® a spreader sticker was added at the rate of 19 oz per 60 gal mix.

Spider mite populations in seed alfalfa plots where insecticides were applied at an average count of 8-12 lygus bugs per sweep. Firebaugh, California. 1976 1/

Treatment ^{2/}		Dates of applica- tions	Days after treat- ments ^{3/}	Number per leaf ^{4/}	
Insecticides	AI/acre lb.			Mites	Eggs
			Pre	1.73	3.79
			Pre	1.28	3.33
			Pre	9.80	18.05
			Pre	9.45	16.20
			Pre	6.70	13.63
Vydate +	0.5	July 14	Pre	10.09	16.01
Lorsban +	0.5		6	0.73	7.62
Galecron	1.0		13	0.32	3.96
			20	2.73	15.90
			27	3.72	18.62
Vydate +	0.5	Aug. 11			
Lorsban +	0.5				
Galecron	1.0		6	0.50	7.58
Vydate +	0.5	Aug. 25	13	0.29	14.44
Lorsban +	0.5				
Galecron	1.0		6	0.01	8.52
			13	0.85	7.21

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 8, 15, 22, 29 and July 6 and 13.

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 an average count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976 1/

Treatment ^{2/}		Dates of application	Days after treatment ^{3/}	Number per leaf ^{4/}	
Insecticides	AI/acre lb.			Mites	Eggs
			Pre	1.47	4.45
			Pre	1.02	2.42
			Pre	7.47	19.40
			Pre	11.81	19.14
			Pre	8.91	20.15
			Pre	8.50	14.41
Vydate +	0.5		Pre	7.08	20.35
Lorsban +	0.5	July 28	Pre	11.64	45.98
Galecron	1.0		6	1.61	36.78
			13	1.31	21.74
			20	2.44	34.08
			27	0.48	20.55
Vydate +	0.5	Aug. 25			
Lorsban +	0.5		6	0.02	12.73
Galecron	1.0		13	0.03	9.82

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 8, 12, 22, 29 and July 6, 13, 20, 27.

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

Spider mite populations in a seed alfalfa plot where insecticides were applied at a count of 8-12 lygus bugs per sweep. Firebaugh, California. 1976 1/

Treatment ^{2/}		Dates of application	Days after treatment ^{3/}	Number per leaf ^{4/}	
Insecticides	AI/acre lb.			Mites	Eggs
Carzol + Lorsban	0.75 0.50	July 14	Pre	0.98	1.76
			Pre	0.64	2.02
			Pre	6.94	17.46
			Pre	11.78	23.36
			Pre	7.46	11.42
			Pre	9.44	5.22
			6	1.40	1.40
			13	0.38	0.80
			20	1.26	4.26
Carzol + Lorsban	0.75 0.50	Aug. 4	6	0.26	1.38
			13	3.98	7.74
			20	0.92	9.90
Carzol + Lorsban	0.75 0.50	Aug. 25	6	1.64	8.10
			13	3.60	13.52

1/ Treatment consisted of 1-5 acre plot.

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

3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6 and 13.

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

Spider mite populations in seed alfalfa plot where insecticides were applied at a count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976 1/

Treatment ^{2/}		Dates of applica- tion	Days after treat- ment ^{3/}	Number per leaf ^{4/}	
Insecticides	AI/acre lb.			Mites	Eggs
Carzol + Lorsban	0.75	Aug. 4	Pre	1.86	7.94
			Pre	2.76	6.06
	0.50		Pre	4.56	11.84
			Pre	9.60	16.08
			Pre	9.46	15.68
			Pre	13.32	25.76
			Pre	9.98	16.80
			Pre	2.88	26.02
			Pre	9.56	25.84
			6	9.56	36.36
			13	1.28	6.56
20	2.42	19.44			
Carzol + Lorsban	0.75	Sept. 1	27	4.14	16.90
			0.50	6	1.66

1/ Treatment consisted of 1-5 acre plot.

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

3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6, 13, 20, 27 and August 3.

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

Spider mite populations in grower portion of field
utilized in insecticide timing experiment for lygus
bug control. Firebaugh, California. 1976 1/

Treatment ^{2/}		Dates of applica- tion	Days after treat- ment ^{3/}	Number per leaf ^{4/}	
Insecticides	AI/acre lb.			Mites	Eggs
Carzol + Lorsban	0.75 0.50	June 30	Pre	0.76	2.86
			Pre	0.18	0.84
			Pre	5.83	15.95
			Pre	5.91	18.69
			6	5.15	8.09
			13	9.47	13.62
Carzol +	0.50	July 17			
Lorsban +	0.25				
Fundal	1.00				
			3	0.92	15.44
			10	1.00	19.90
			17	0.20	6.78
Carzol +	0.75	Aug. 5			
Lorsban	0.50				
			5	2.50	43.50
			12	0.15	0.51
			19	0.13	9.56
			26	2.10	8.90
			33	1.48	5.58

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 on June 8, 15, 22, 29.

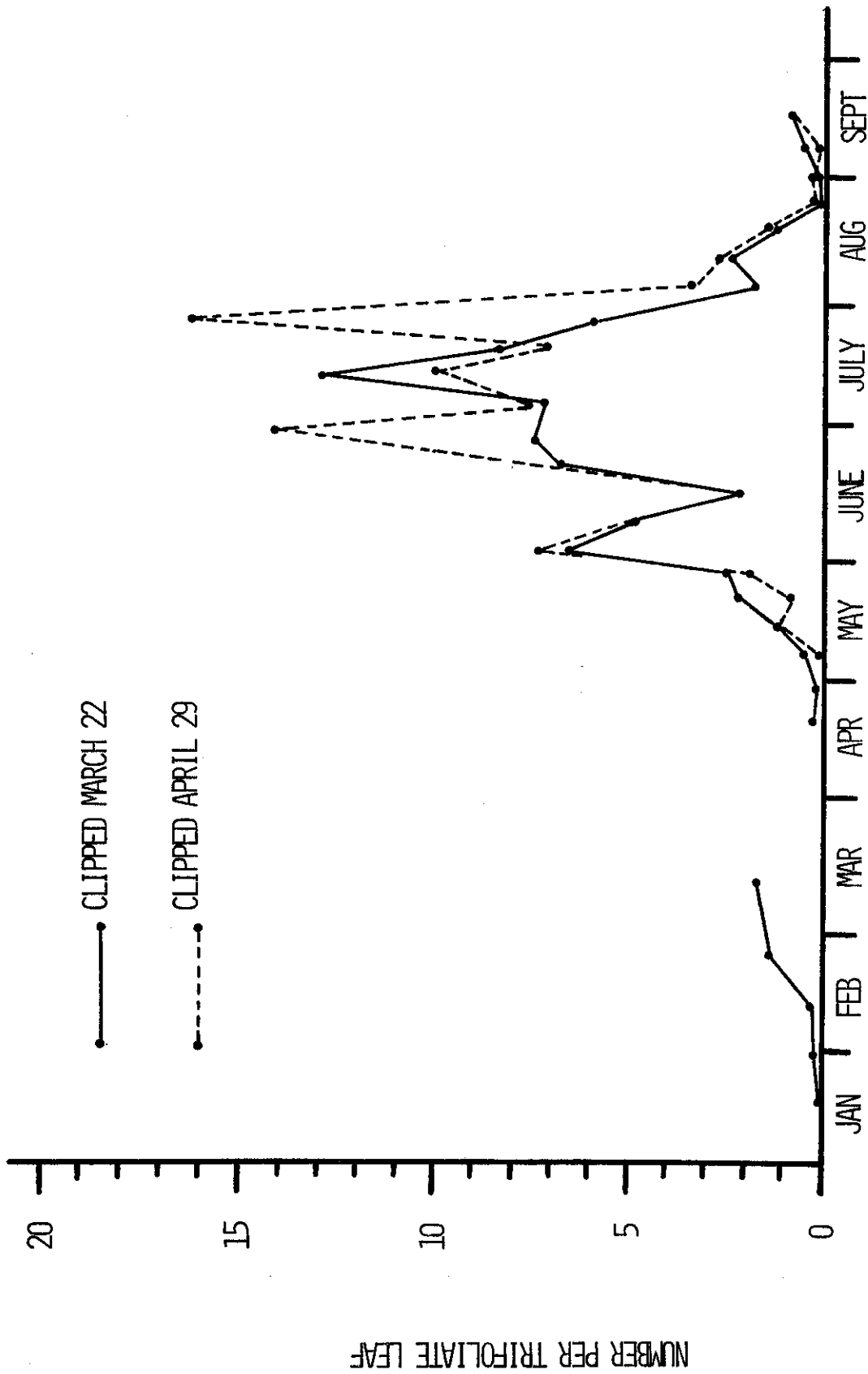
4/ Average of 50 trifoliolate leaves showing mite injury from each of the 2 replicates on each sampling date.

Spider mite populations in an untreated seed alfalfa field clipped early (March 22) and late (April 29). Firebaugh, California. 1976. 1/

Date Sampled		Number of mites per leaf <u>2/</u>			
		Clipped March 22		Clipped April 29	
		Mites	Eggs	Mites	Eggs
April	20	0.18	0.83	0.13	0.25
	26	0.13	0.05	0.08	0.08
May	4	0.55	2.65	0.15	1.68
	11	1.38	5.28	1.40	2.00
	18	2.10	5.70	0.85	8.55
	24	2.28	7.90	1.85	6.85
June	2	6.63	11.45	7.35	15.53
	8	4.75	15.20	4.90	22.70
	15	2.05	9.07	2.05	11.07
	22	6.67	7.90	9.97	10.50
	29	7.35	17.10	14.05	27.25
July	6	7.03	9.43	7.45	4.88
	13	12.85	27.12	10.05	18.82
	20	8.25	26.23	7.00	25.75
	27	5.85	16.52	16.10	29.32
August	3	1.68	3.92	3.42	12.58
	10	2.40	14.32	2.67	14.97
	17	1.20	1.53	1.35	9.13
	24	0.08	0.50	0.35	1.35
	31	0.05	0.00	0.13	0.40
September	7	0.58	2.18	0.13	1.15
	14	0.80	1.75	0.92	1.28
	21	0.15	0.45	0.15	0.15

1/ Each treatment replicated 4 times.

2/ 40 trifoliate leaves showing mite injury were examined on each sampling date.



SPIDER MITE POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD HALF OF WHICH WAS CLIPPED MARCH 22 AND HALF CLIPPED ON APRIL 29. FIREBAUGH, CALIFORNIA, 1976.

Predator and parasite populations in seed alfalfa plots treated by aircraft for aphid and lygus bug control. Firebaugh, California. 1976.

Insecticides	AI/acre lb.	Days after treatment	Number per 50 D-Vac Samples ^{2/}																Parasitic Wasps	Spiders																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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Monitor	0.5	Pre	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

^{1/} Plot size: Each treatment 5 acres (165'x1320'). Sprays were applied at 10 GPA. UC 21865 was a 75% wettable powder while other were emulsifiable concentrates. Plots were treated August 18 from 3:30 to 5:30 AM.

^{2/} 2-25 suck D-Vac samples per treatment on each sampling date.

Predator and parasite populations in seed alfalfa plots where insecticides were applied at an average count of 8-12 lygus bugs per sweep. Firebaugh, California 1976. 1/

Insecticides	Treatment ^{2/} AI/ acre	Dates of appli- cation	Days after treat- ment ^{3/}	Number per 50 D-Vac Samples ^{4/}																Parasitic Wasps	Spiders	
				Geocoris Nabis				Orius				Lacewing Syrphid				Cocci- nellidae						Collops
				A		N		A		N		A		L		A		L				
				A	N	A	N	A	N	A	L	A	L	A	L	A	L					
Vydate + Lorsban + Galecron	0.5		Pre	10	42	1	5	103	18	8	1	0	0	0	14	1	2	0	286	11		
			Pre	69	40	14	14	236	55	13	2	0	0	0	24	0	4	0	303	15		
			Pre	12	10	3	27	168	213	14	1	1	0	0	4	0	2	0	161	14		
			Pre	122	42	16	79	540	353	11	7	0	0	0	10	0	6	0	203	15		
			Pre	128	35	23	111	596	460	3	5	0	0	0	4	2	2	2	104	30		
	0.5	July 14	Pre	143	45	39	160	249	595	2	3	0	0	0	3	2	4	3	181	44		
Vydate + Lorsban + Galecron	1.0		6	4	2	0	4	5	5	0	11	0	0	0	0	0	1	0	7	10		
			13	6	10	2	15	17	28	0	10	0	0	0	0	0	5	1	70	28		
			20	2	6	0	5	21	18	1	7	0	0	0	0	0	1	6	26	26		
			27	3	6	3	6	20	32	1	7	0	0	0	0	0	5	3	10	18		
		0.5	Aug. 11	6	1	0	0	0	1	2	1	2	0	0	0	0	0	2	3	4	8	
	1.0		13	1	0	0	4	3	7	1	7	0	0	0	0	0	6	10	14	16		
Vydate + Lorsban + Galecron	0.5		6	0	0	0	0	3	1	1	2	0	0	0	0	0	2	2	1	9		
	0.5	Aug. 25	13	2	0	0	1	8	5	0	2	1	0	0	0	0	3	1	5	20		
	1.0																					

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 8, 15, 22, 29 and July 6 and 13.

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

Predator and parasite populations in seed alfalfa plots where insecticides were applied at an average count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976 1/

Insecticides	Treatment ^{2/} AI/ lb. acre	Dates of appli- cation	Days after treat- ment ^{3/}	Number per 50 D-Vac Samples ^{4/}																Parasitic Wasps	Spiders
				Geocoris Nabis				Orius				Lacewing Syrphid				Cocci- nellidae Collops					
				A	N	A	N	A	N	A	L	A	L	A	L	A	L	A	L		
			Pre	6	46	1	3	68	20	11	1	0	0	0	8	0	0	1	0	170	14
			Pre	75	28	13	41	267	90	11	2	4	0	0	26	0	4	0	0	558	16
			Pre	17	17	5	51	223	301	26	3	1	0	0	5	0	1	1	1	250	30
			Pre	174	86	35	76	610	491	13	6	0	0	0	12	1	2	0	0	252	24
			Pre	168	37	33	169	752	542	4	2	0	0	0	4	0	4	0	0	90	28
			Pre	125	34	36	127	257	472	2	2	0	0	0	5	0	3	0	0	114	36
Vydate +	0.5		Pre	57	14	20	71	65	138	3	11	1	0	2	3	2	1	1	47	21	
Lorsban +	0.5	July 28	Pre	61	102	13	125	54	95	2	6	0	0	0	0	3	4	2	157	34	
Galecron	1.0		6	0	2	0	3	2	0	0	7	0	0	0	0	1	1	5	14	41	
			13	1	1	0	11	4	4	1	7	0	0	0	0	0	2	8	13	53	
			20	1	1	0	3	4	4	2	7	0	0	0	0	0	1	13	22	25	
Vydate +	0.5		27	2	0	1	11	13	14	1	10	0	0	0	0	0	8	19	20	32	
Lorsban +	0.5	Aug. 25																			
Galecron	1.0		6	0	0	0	0	1	1	0	1	0	0	0	0	0	2	2	1	7	
			13	2	0	1	3	8	7	1	2	1	0	0	0	0	6	4	5	16	

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

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

3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6, 13, 20, 27.

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

predator and parasite populations in a seed alfalfa plot where insecticides were applied at a count of 8-12 lygus bugs persweep. Firebaugh, California. 1976 1/

Insecticides lb.	Treatment ^{2/} AI/ acre	Dates of appli- cation	Days after treat ^{3/} ment	Number per 50 D-Vac samples ^{4/}																Parasitic			
				Geocoris Nabis				Orius				Lacewing Syrphid				Cocci- nellidae				Collops		Wasps	Spiders
				A		N		A		N		A		L		A		L		A	L		
				A	N	A	N	A	N	A	L	A	L	A	L	A	L	A	L				
Carzol + Lorsban	0.75	July 14	Pre	1	56	3	1	73	15	9	0	0	0	0	14	0	0	0	0	92	32		
			Pre	57	29	11	17	240	89	16	1	0	0	0	16	0	1	0	236	15			
			Pre	12	29	2	44	247	293	22	5	0	0	0	4	0	1	0	163	16			
			Pre	67	41	15	67	475	415	5	1	0	0	0	6	0	2	0	50	18			
			Pre	110	14	26	61	488	561	1	3	0	0	0	7	0	6	0	49	33			
			Pre	99	24	23	130	176	403	1	1	0	0	0	0	0	3	1	85	18			
Carzol + Lorsban	0.50	July 14	6	0	0	0	2	2	4	1	14	0	0	0	0	0	2	1	0	2			
			13	2	7	0	16	19	15	0	13	0	0	0	0	0	2	1	45	16			
			20	0	1	0	15	26	26	1	4	0	0	0	0	0	4	5	23	24			
Carzol + Lorsban	0.75	Aug. 4	6	0	0	0	0	2	6	2	1	0	0	0	0	0	9	7	26	10			
			13	2	0	0	6	4	1	0	6	0	0	0	0	0	1	0	0	1			
			20	0	0	0	0	3	12	0	18	0	0	0	0	4	3	9	36	27			
Carzol + Lorsban	0.75	Aug. 25	6	0	0	1	0	8	5	3	0	0	0	0	0	4	11	16	7	6			
			13	0	0	0	9	16	8	6	4	2	0	0	0	2	17	8	3	12			

1/ Treatment consisted of 1-5 acre plot.

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

3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6 and 13.

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

Predator and parasite populations in seed alfalfa plot where insecticides were applied at a count of 16-24 lygus bugs per sweep. Firebaugh, California. 1976. 1/

Insecticides lb.	Treatment ^{2/} AI/ of appli- cation	Dates of treat- ment ^{3/}	Days after	Number per 50 D-Vac Samples ^{4/}																Spiders		
				Geocoris Nabis				Orius				Lacewing Syrphid				Cocci- nellidae Collops					Parasitic	
				A	N	A	N	A	N	A	N	A	L	A	L	A	L	A	L		Wasps	
Carzol + Lorsban	0.75 0.50 Aug. 4	Pre	12	28	0	2	159	24	24	1	0	0	0	0	24	0	2	0	227	16		
		Pre	82	68	13	9	297	84	16	1	0	0	0	16	0	1	0	236	15			
		Pre	14	5	0	12	53	44	1	0	0	0	0	6	0	1	0	73	5			
		Pre	125	49	23	55	320	262	7	2	0	0	0	19	0	2	0	96	26			
		Pre	145	54	24	85	591	339	4	8	1	0	0	1	3	1	55	33				
		Pre	171	38	46	126	225	468	1	0	0	0	0	3	1	5	0	111	24			
		Pre	58	4	14	50	32	75	1	13	0	0	0	0	0	1	12	10				
		Pre	40	48	8	83	55	57	0	12	1	0	0	0	4	1	36	51				
Carzol + Lorsban	0.50 Aug. 4	Pre	25	92	1	114	19	26	0	13	0	0	0	3	0	1	57	111				
		6	2	0	0	4	12	4	0	9	0	0	0	0	7	6	4	28				
		13	0	0	0	19	1	1	3	20	0	0	0	0	0	6	8	23				
		20	0	0	0	26	7	19	3	6	0	0	0	0	8	3	17	29				
		27	1	1	3	6	21	69	5	3	1	0	0	6	8	29	8	23				
		6	0	0	0	1	8	7	6	10	0	0	0	4	23	23	4	31				

- 1/ Treatment consisted of 1-5 acre plot.
- 2/ Applications were made by aircraft at 10 GPA prior to 4:30 AM.
- 3/ Pretreatment counts were made on June 8, 15, 22, 29 and July 6, 13, 20, 27 and August 3.
- 4/ 2-25 suck D-Vac samples on each sampling date.

Predator and parasite populations in grower portion of field utilized in insecticide timing experiment for lygus bug control. Firebaugh, California. 1976. 1/

Treatment ^{2/} AI/ lb. of Insecticides	Dates of appli- cation	Days after treat- ment ^{3/}	Number per 50 D-Vac Samples ^{4/}																Parasitic									
			Cocci-																Wasps	Spiders								
			Geocoris Nabis				Orius				Lacewing				Syrphid						nelliidae				Collops			
			A	N	A	N	A	N	A	N	A	L	A	L	A	L	A	L			A	L	A	L				
Carzol + Lorsban	0.75 0.50	June 30	Pre	9	56	3	7	83	66	9	0	0	0	0	0	28	2	1	0	308	15							
			Pre	82	85	14	19	278	70	8	2	0	0	0	17	0	1	0	328	62								
			Pre	25	24	8	30	301	266	26	0	1	0	0	5	1	1	0	388	21								
			Pre	105	68	17	50	377	200	14	3	0	0	0	1	0	2	0	146	13								
			6	60	14	4	27	171	130	0	2	0	0	0	1	0	2	1	21	33								
Carzol + Lorsban + Fundal	0.50 0.25 1.00	July 17	13	84	29	12	57	173	381	2	2	0	0	0	2	0	1	1	50	31								
			3	1	1	0	0	5	11	0	5	0	0	1	0	1	0	2	4									
			10	1	2	1	2	33	17	0	13	0	0	0	0	2	2	12	6									
			17	0	0	1	1	16	38	1	5	0	0	0	0	3	3	13	7									
			5	0	0	0	0	2	3	0	4	0	0	0	0	5	3	1	10									
Carzol + Lorsban	0.75 0.50	Aug. 5	5	0	0	0	0	2	3	0	4	0	0	0	0	0	0	5	3	1	10							
			12	0	0	1	1	2	1	0	1	0	0	0	0	5	0	3	3									
			19	4	0	0	3	11	16	2	10	0	0	0	0	10	22	16	16									
			26	1	0	1	2	33	28	0	1	1	0	0	1	10	14	11	2									
			33	1	1	3	4	7	62	1	2	1	0	1	4	7	9	16	1									

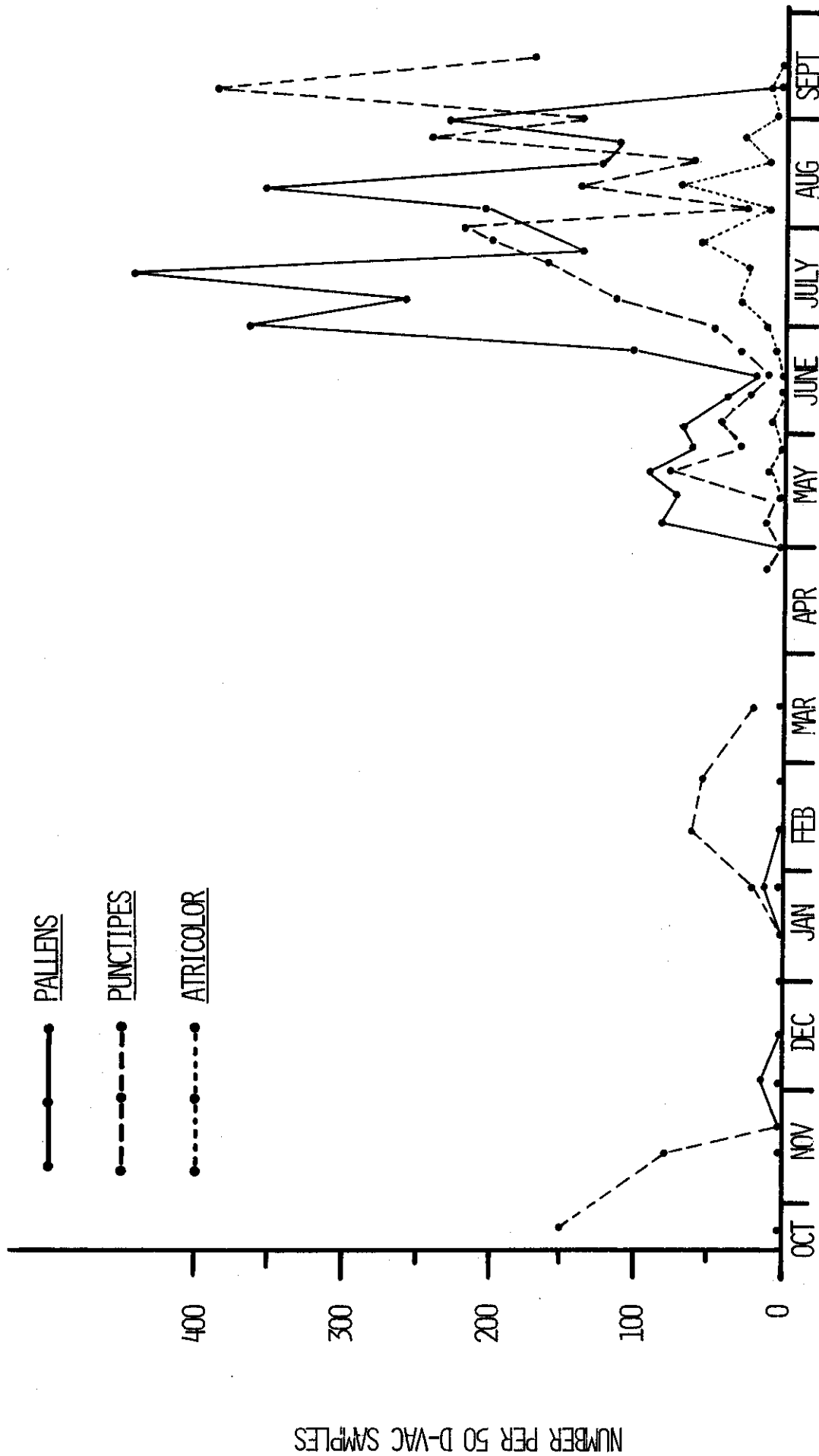
- 1/ Treatment evaluations were made in portion of field adjacent to insecticide timing experiment for lygus bug control.
- 2/ Applications were made by aircraft at 10 GPA.
- 3/ Pretreatment counts were made on June 8, 15, 22, 29.
- 4/ 4-25 suck D-Vac samples on each sampling date.

Predator and parasite populations in an untreated seed alfalfa field clipped back on March 22. Firebaugh, California. 1976. 1/

Date Sampled		Number per 50 D-Vac Samples ^{2/}											
		Lacewings				Syrphids		Coccinellidae		Collops		Spiders	Parasitic Wasps
		Brown		Green									
		A	L	A	L	A	L	A	L	A	L		
April	20	4	0	0	0	1	0	3	8	1	0	40	53
	26	4	0	1	1	0	0	1	15	0	0	16	31
May	4	9	0	3	1	0	0	3	134	11	0	59	196
	11	0	4	0	0	0	0	9	60	8	0	31	139
	18	16	3	1	1	1	0	39	4	9	1	44	206
	24	3	8	0	0	0	0	11	1	6	0	18	180
June	2	21	0	4	0	0	0	16	0	0	9	23	555
	8	19	0	1	3	1	0	34	1	4	1	48	826
	15	1	0	1	1	0	0	3	0	0	0	9	159
	22	25	0	0	20	1	0	10	4	0	9	80	911
	29	3	0	0	4	0	0	0	0	1	3	74	560
July	6	1	0	0	1	0	0	4	1	1	8	125	461
	13	1	0	0	3	0	0	1	0	5	1	74	448
	20	0	0	3	5	0	0	3	1	0	5	110	180
	27	3	0	3	5	0	0	0	1	5	4	164	181
August	3	0	0	0	1	0	0	0	3	1	4	124	140
	10	0	0	0	8	0	0	3	0	6	3	160	218
	17	4	0	1	3	0	0	0	5	0	8	206	150
	24	0	0	1	6	0	0	0	0	4	6	239	176
	31	0	0	0	1	0	0	0	0	8	1	305	134
September	7	0	0	0	0	0	0	0	0	1	6	219	316
	14	0	0	0	0	1	0	0	0	0	6	193	74

1/ The treatment consisted of 4 replicated plots which were all clipped back on March 22.

2/ Data based on four 10 suck D-Vac samples on each sampling date.



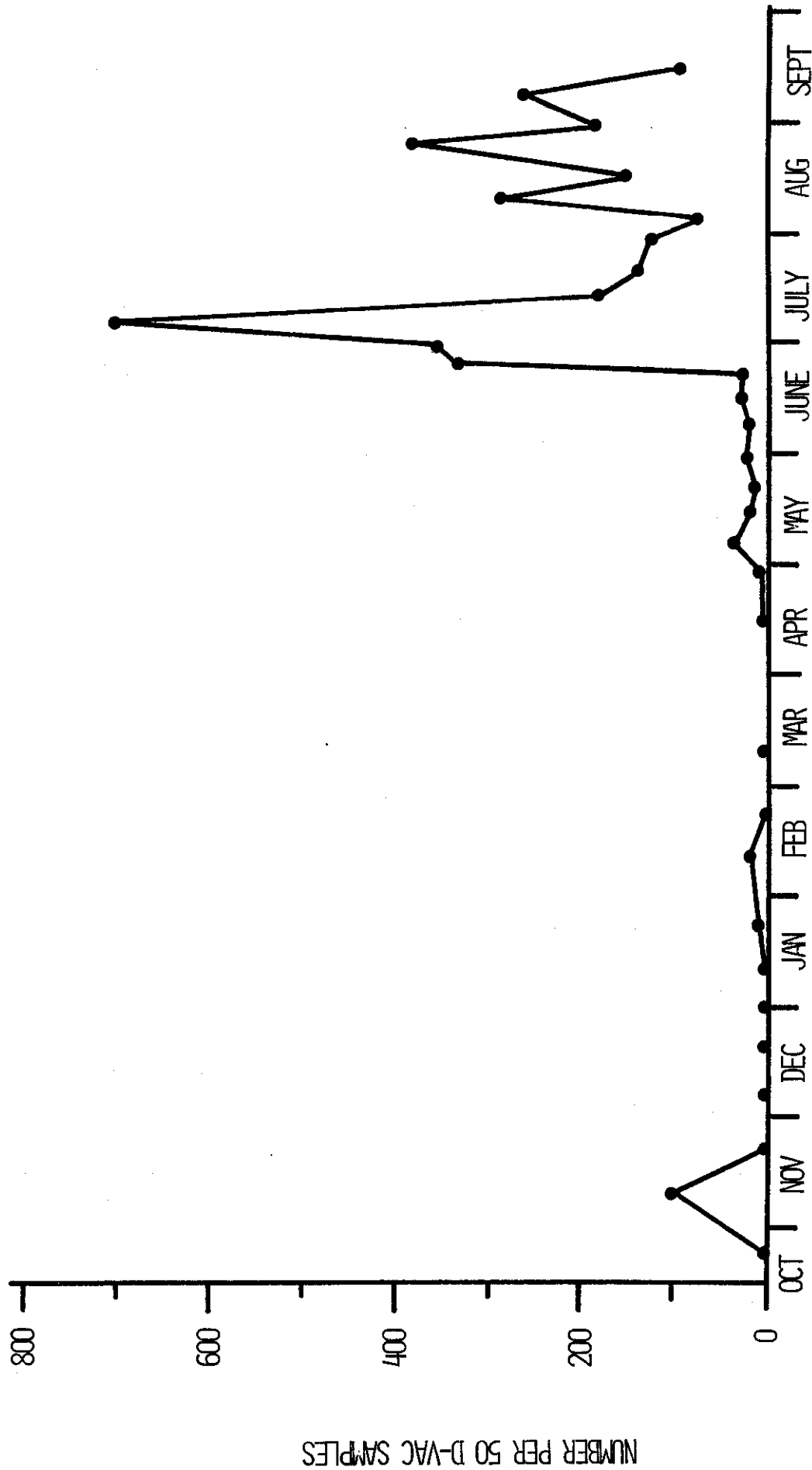
GEOCORIS SP. POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD CLIPPED
 ON MARCH 22. FIREBAUGH, CALIFORNIA. 1975-1976.

Predator populations in an untreated seed alfalfa field clipped on March 22.
Firebaugh, California. 1976. 1/

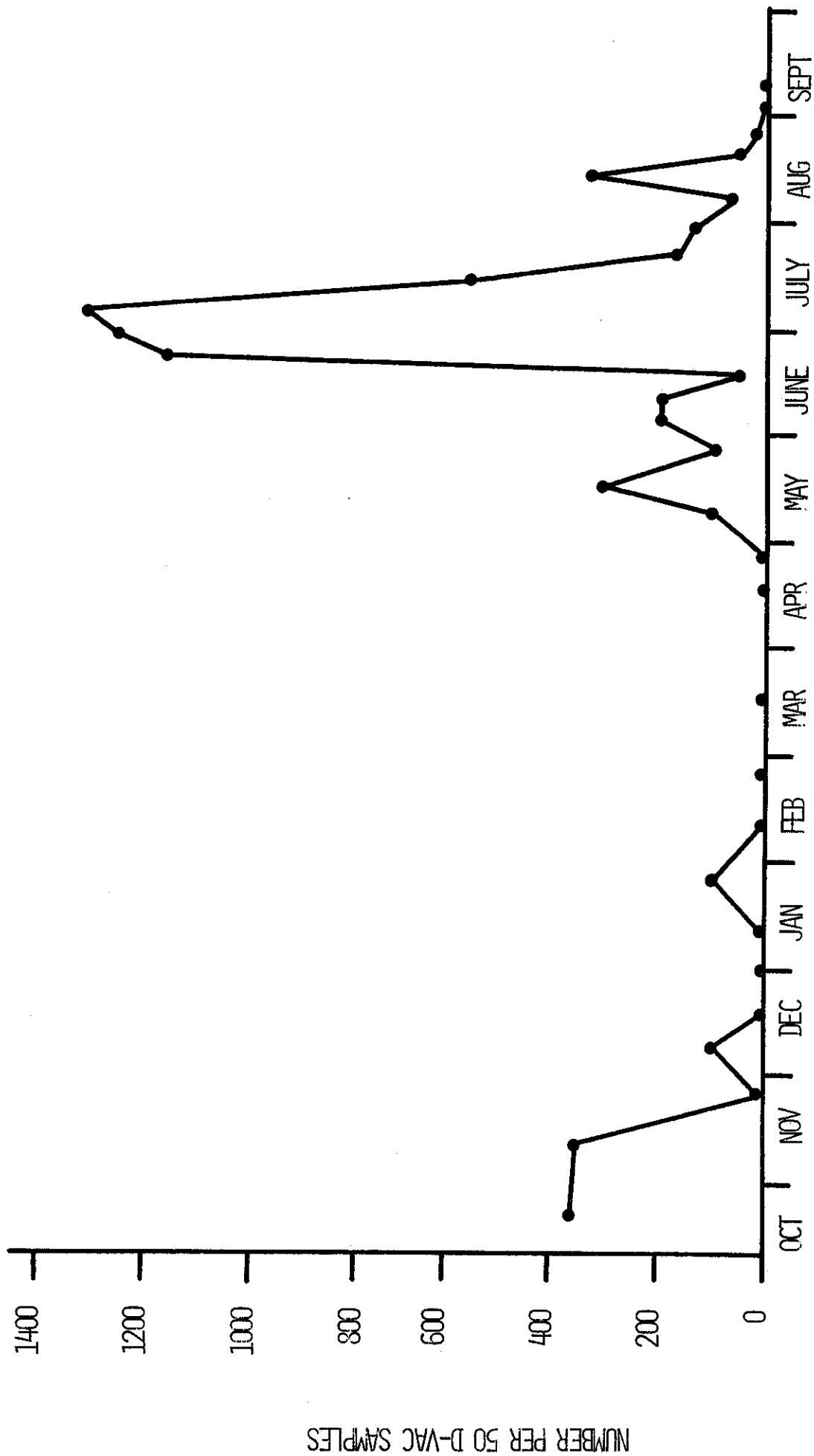
Date Sampled	Number Per 50 D-Vac Samples <u>2/</u>									
	Geocoris									
	atricolor		pallens		punctipes		Nabis		Orius	
	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs
Apr. 20	0	0	1	0	4	10	0	5	28	5
26	0	0	0	8	0	1	0	6	8	3
May 4	0	0	18	64	0	14	0	40	60	40
11	0	1	21	58	1	9	0	21	36	268
18	4	6	34	58	4	76	6	4	71	145
24	0	1	38	25	4	25	4	18	73	43
June 2	0	8	13	55	3	38	4	14	204	9
8	0	0	13	21	3	24	9	25	211	20
15	1	0	9	8	3	7	4	24	40	12
22	0	8	18	90	8	23	10	320	413	741
29	5	8	108	269	15	35	44	313	810	425
July 6	8	4	99	160	53	66	71	621	705	605
13	9	23	170	271	41	120	71	109	360	186
20	8	19	49	81	19	181	31	110	100	76
27	19	41	118	295	28	193	25	104	113	44
Aug. 3	1	9	61	146	3	19	3	71	45	24
10	21	53	153	205	26	120	53	234	144	201
17	3	5	60	64	10	53	10	146	16	36
24	5	26	60	50	46	199	60	323	6	19
31	3	5	98	128	23	124	24	156	1	0
Sept. 7	3	10	10	1	221	159	66	196	0	0
14	1	3	10	1	121	55	36	54	4	1

1/ The treatment consisted of 4 replicated plots all of which were clipped March 22.

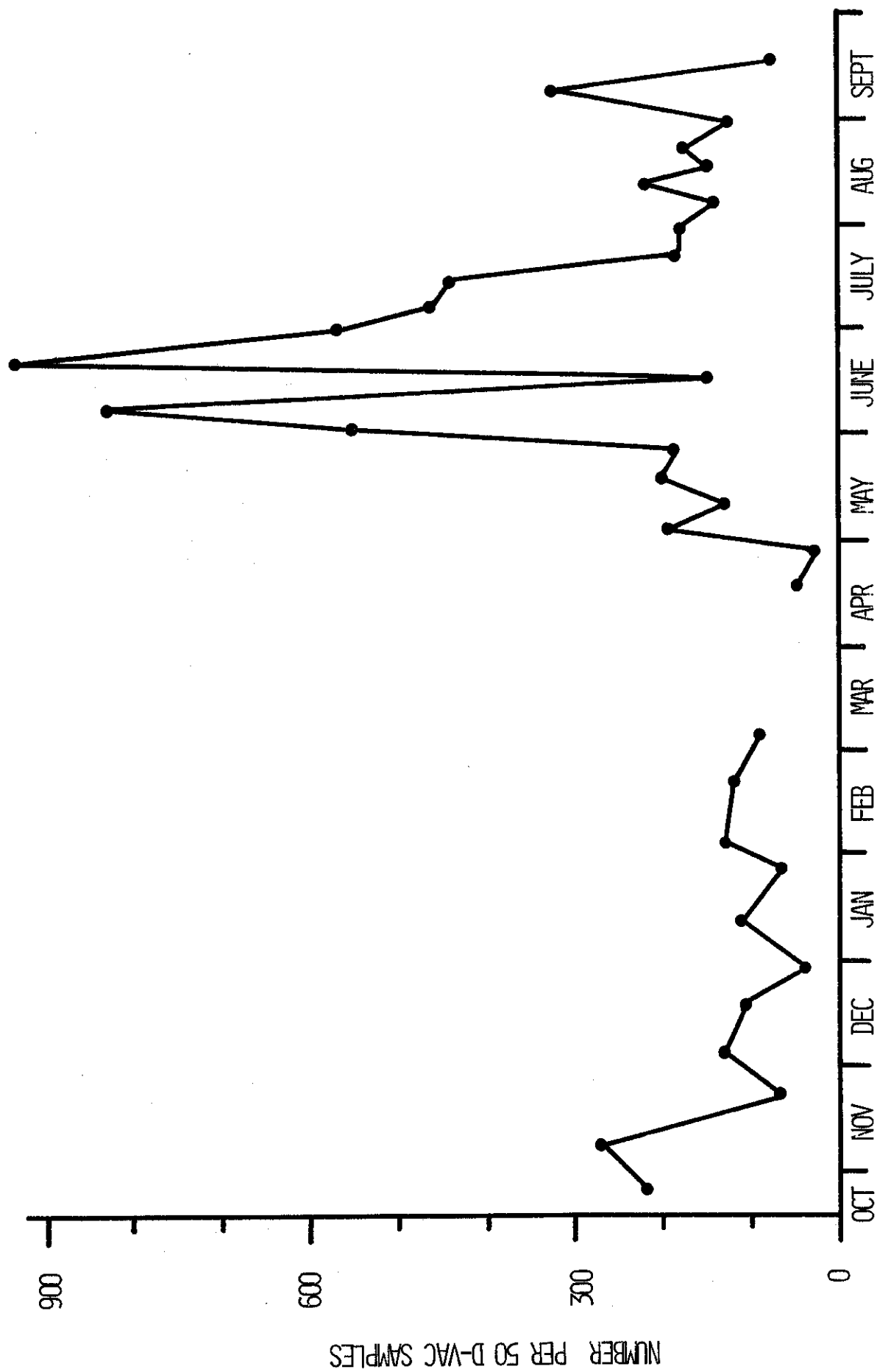
2/ Data based on four 10 suck D-Vac samples on each sampling date.



NABIS SP. POPULATION IN AN UNTREATED SEED ALFALFA FIELD CLIPPED MARCH 22,
FIREBAUGH, CALIFORNIA, 1975-1976.



Orius sp. populations in an untreated seed alfalfa field clipped on March 22. Firebaugh, California, 1976.



SPIDER POPULATION IN AN UNTREATED SEED ALFALFA FIELD CLIPPED MARCH 22.
FIREBAUGH, CALIFORNIA. 1976.

Predator populations in an untreated seed alfalfa field clipped on April 29.
Firebaugh, California. 1976. 1/

Date Sampled		Number Per 50 D-Vac Samples <u>2/</u>									
		Geocoris									
		atricolor		pallens		punctipes		Nabis		Orius	
		Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs	Adults	Nymphs
Apr.	20	0	0	9	0	4	18	0	15	55	11
	26	0	0	0	1	0	6	0	8	14	11
May	4	4	1	21	63	0	26	1	29	29	59
	11	4	8	43	81	0	28	1	16	33	103
	18	1	19	24	179	3	71	5	15	80	49
	24	1	9	28	95	3	66	4	3	44	13
June	2	0	5	23	95	3	196	11	18	76	14
	8	0	4	9	66	4	100	11	28	188	21
	15	1	0	61	97	19	94	9	124	292	46
	22	5	3	38	139	11	21	8	225	181	209
	29	5	10	88	235	25	39	35	263	521	395
July	6	10	14	90	161	33	40	53	171	623	411
	13	18	45	111	255	46	64	24	95	485	242
	20	9	41	60	150	21	190	29	103	160	194
	27	8	46	115	343	8	144	13	111	185	98
Aug.	3	3	16	60	224	0	29	9	86	99	48
	10	11	20	85	209	5	65	29	180	105	89
	17	1	10	73	38	16	83	10	90	40	56
	24	5	8	30	30	38	183	16	218	5	15
	31	4	3	85	175	6	56	21	146	3	4
Sept.	7	0	4	8	1	96	78	24	56	0	0
	14	3	1	18	1	120	64	23	51	4	0

1/ The treatment consisted of 4 replicated plots all of which were clipped April 29.

2/ Data based on four 10 suck D-Vac samples on each sampling date.

Predator and parasite populations in an untreated seed alfalfa field clipped back on April 29. Firebaugh, California. 1976. 1/

Date Sampled		Number per 50 D-Vac Samples <u>2/</u>											
		Lacewings				Syrphids		Coccinellidae		Collops		Spiders	Parasitic Wasps
		Brown		Green									
		A	L	A	L	A	L	A	L	A	L		
April	20	10	1	0	25	0	0	0	20	0	0	29	54
	26	9	0	0	0	0	0	3	10	0	1	18	70
May	4	9	1	0	5	0	0	1	76	5	0	24	83
	11	5	0	0	1	0	0	5	18	19	6	14	83
June	18	11	0	0	0	0	0	60	6	4	3	53	150
	24	3	0	0	0	0	0	28	0	1	0	23	110
	2	12	3	3	0	0	0	10	0	0	4	16	545
	8	33	0	8	1	1	8	21	0	4	4	38	849
	15	11	0	3	3	0	0	17	0	7	0	70	1022
	22	13	0	0	9	0	0	3	3	0	0	56	495
	29	1	0	0	4	0	0	1	1	8	1	55	385
July	6	1	0	1	3	0	0	0	0	1	1	411	108
	13	0	0	0	0	0	0	0	0	5	1	76	345
	20	0	0	0	6	0	0	0	1	0	8	109	209
August	27	0	0	0	8	1	0	0	3	6	9	103	135
	3	0	0	0	8	0	0	0	0	4	0	81	99
	10	0	0	0	5	0	0	3	5	1	0	207	160
	17	0	0	3	5	0	0	0	0	1	0	141	103
	24	0	0	0	0	0	0	0	0	9	10	159	166
September	31	0	0	0	0	0	0	0	0	6	3	204	63
	7	0	0	1	3	0	0	0	0	3	9	94	153
	14	0	0	0	0	0	0	0	0	1	5	204	60

1/ The treatment consisted of 4 replicated plots which were all clipped back on April 29.

2/ Data based on four 10 suck D-Vac samples on each sampling date.

Stink bug populations in seed alfalfa plots where insecticides were applied at counts of 8-12 and 16-24 lygus bugs per sweep. Firebaugh, California. 1976.

Treatment ^{1/}		Number per 25' of row ^{2/}					
Insecticide	AI/ acre lb.	July 27			September 8-15		
		Adults	Nymphs	Total	Adults	Nymphs	Total
Vydate + <u>3/</u> Lorsban 8-12 bugs/swp.	0.5 0.5	-	-	-	3	15	18
Vydate + <u>4/</u> Lorsban 16-24 bugs/swp.	0.5 0.5	0	17	17	10	27	37
Carzol + <u>5/</u> Lorsban 8-12 bugs/swp.	0.75 0.5	-	-	-	4	2	6

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

2/ 5 beating pan samples in each plot for each period. Samples were examined in laboratory after 24-hour berlese funnel separation.

3/ Plot was treated 3 times during the season - July 14, August 11 and August 25.

4/ Plot was treated 2 times during the season - July 28 and August 25.

5/ Plot was treated 3 times during the season - July 14, August 4 and August 25.

Conspere stink bug populations in 14 seed alfalfa fields.
Fresno County. California. 1976.

Field Location	Number per 25' of row ^{1/}					
	July 27			September 8-15		
	Adults	Nymphs	Total	Adults	Nymphs	Total
Firebaugh	0	17	17	10	27	37
Firebaugh	0	0	0	2	20	22
Firebaugh	0	0	0	8	14	22
Firebaugh	0	2	2	12	13	25
Firebaugh	0	2	2	0	6	6
Firebaugh	0	0	0	1	10	11
Firebaugh	-	-	-	0	2	2
Mendota	-	-	-	0	0	0
Helm	-	-	-	0	3	3
Five Points	-	-	-	0	1	1
San Joaquin	-	-	-	0	0	0
San Joaquin	-	-	-	0	0	0
San Joaquin	-	-	-	0	0	0
San Joaquin	-	-	-	0	1	1

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

Percentages of good and defective seeds in samples from 14 seed alfalfa fields surveyed for consperse stink bug.
Fresno County, California. 1976.

Field Location	Date Sampled	Total seeds examined ^{1/}	Good seed	Defective Seeds					
				Chalcid	Lygus	Stink bug	Shriveled	Water damaged	Green
Firebaugh	Sept. 21	1294	90.34	0.00	1.93	1.93	0.93	4.64	0.23
Firebaugh	Sept. 7	1398	83.76	0.00	4.65	3.08	0.93	5.94	1.64
Firebaugh	Sept. 27	5494	55.06	0.33	14.76	7.49	1.12	21.04	0.21
Firebaugh	Sept. 14	1394	87.02	0.07	3.59	1.72	1.43	5.88	0.29
Firebaugh	Sept. 7	1574	81.70	2.03	7.37	1.97	1.27	4.32	1.33
Firebaugh	Sept. 14	1165	78.11	0.00	3.26	3.78	0.00	13.22	1.63
Firebaugh	Sept. 14	1201	54.37	0.75	10.32	5.33	0.00	29.23	0.00
Mendota	Sept. 14	1538	78.41	0.78	6.44	2.27	0.72	11.05	0.32
Helm	Sept. 15	1474	78.02	0.00	6.31	2.58	0.68	12.35	0.07
Five Points	Sept. 15	1625	74.65	1.17	9.85	4.12	0.80	9.35	0.06
San Joaquin	Sept. 14	1548	79.01	0.06	9.37	3.23	0.71	7.17	0.45
San Joaquin	Sept. 15	1431	65.69	2.24	18.94	5.59	1.19	6.29	0.07
San Joaquin	Sept. 14	1497	83.30	0.27	5.48	2.40	1.00	6.88	0.67
San Joaquin	Sept. 14	1515	86.86	1.58	3.10	2.31	0.53	5.41	0.20

^{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 are based on four subsamples from each of the threshed 2-quart samples.

CO-OPERATIVE EXTENSION WORK IN AGRICULTURE AND HOME ECONOMICS, U. S.
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