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INSECT STUDY RESULTS 1978

SEED ALFALFA

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Research on insects affecting Seed Alfalfa 1978

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Introduction

Following the drouth of 1977 the winter of 1978 was one of exceptionally heavy rainfall. The rains persisted into the spring thus resulting in delays in normal cultural practices. In the Firebaugh area, where most of the experimental work with insects was conducted, many fields were clipped or otherwise started for seed as much as a month later than usual. The heavy rainfall promoted extensive growth of weeds both within the fields and in areas outside the fields such as roadsides, headlands and ditch banks but more importantly it resulted in much plant growth in the rangelands along the western edge of the valley. Heavy populations of insects such as lygus bugs, various Lepidoptera and aphids built up on these weed hosts and later migrated into cultivated fields. As a result, lygus bug populations developed early in seed fields and there was heavy pressure from large numbers of migrating adults. The spotted alfalfa aphid was more abundant than in recent years and in areas where trials were conducted, populations of the pea aphid were high. The western yellow stripped armyworm and the beet armyworm were prevalent in many fields. Populations of the consperse stink bug, on the other hand, were very low and spider mite populations were also generally very low.

Preliminary studies were conducted on the omnivorous leafroller, a moth that has been increasing in abundance in alfalfa seed fields during the past three years. The larvae web and roll the terminal leaves and blossoms of the plant and feed within the webbed plant parts. In addition to feeding damage the webbed flowers are impossible to pollinate. Populations of adult males of the omnivorous leafroller were monitored with traps baited with a female sex attractant from March to October in 2 alfalfa seed fields at Firebaugh, in 2 fields at Five Points and in one

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field in the San Joaquin area. In addition, leafroller populations were monitored from April through August in 5 seed fields at Corcoran.

During 1978, five separate experiments were conducted in which seven insecticides, five acaricides and four insecticide-acaricide combinations were evaluated for control of lygus bugs, the spotted alfalfa aphid, the pea aphid and spider mites. Stink bug populations were assessed in 12 alfalfa seed fields in the Firebaugh, Five Points and San Joaquin areas and seed samples were hand stripped from 18 alfalfa seed fields on the west side of Fresno County and at Corcoran for analysis of damage by the alfalfa seed chalcid.

Although data were obtained on several insect species in each of the experiments and surveys, the results are categorized and reported according to species rather than by individual experiments.

Lygus bugs

The results of the lygus bug studies are presented in Tables 1 through 8. The following insecticides and combinations were evaluated for control of lygus bugs; Monitor, Pydrin, Union Carbide 51762, Bendiocarb, Ambush, Carzol, Lorsban, Monitor + Lorsban, Monitor + Plictran, Carzol + Lorsban, Carzol + Comite. Plictran and Comite are acaricides and were included in the combinations to control spider mites. The materials were all applied as foliar sprays by aircraft in early morning prior to 5:30 A.M. The following briefly summarizes the results obtained with each of the materials in controlling lygus bugs.

Monitor was evaluated at a dosage of 0.33 lb AI/acre alone and with a buffering agent. Monitor was also evaluated at dosages of 0.33 and 0.5 lb AI/acre combined with Lorsban at 0.5 lb AI/acre. In June, during the period of heavy adult lygus migrations, lygus bug populations in plots treated with Monitor reached or exceeded pretreatment levels within 14 days after treatment. Later in the season, after the migrations moderated, lygus bug populations were controlled for approximately 21 days. There was no difference in lygus bug control obtained with the two rates of Monitor combined with Lorsban. There was also no difference in control between Monitor alone and with the addition of the buffering agent.

Pydrin and Ambush, two synthetic pyrethroid compounds, were applied at rates of 0.2 and 0.3 lb AI/acre respectively. Seven days after application Pydrin had reduced the lygus bug population approximately 83 per cent under pretreatment levels while Ambush had reduced the population

approximately 95 per cent. Before further evaluations of Pydrin could be made the plot was treated over with a Carzol-Lorsban combination. Lygus bug populations were monitored in the Ambush plot for 21 days after treatment. At the end of this time the lygus bug population was still 82 per cent under the pretreatment level.

Seven days after application, U.C. 51762 applied at 1.0 lb AI/acre had reduced the lygus bug population 71 per cent under the pretreatment level. However, the pea aphid population was extremely high (22,873/50 D-vac samples) in the area treated with U.C. 51762. As a result Carzol-Lorsban was applied over this treatment to control the aphid populations.

Bendiocarb, a carbamate insecticide developed by Fisons Corp., was applied at rates of 0.5 and 1.0 lb AI/acre. Seven days after application these treatments had only reduced lygus bug populations 30 and 54 per cent under pretreatment levels. Neither of these treatments could be evaluated beyond a 7-day postreatment period because of lygus bug and aphid populations that required further control.

Carzol 0.75 lb AI/acre was the standard against which the other materials were compared. Seven days after the application of Carzol no lygus bugs were taken in sweep counts and only one adult was found in 50 D-vac samples. It was necessary to apply Lorsban over the Carzol to control aphids. Twenty-one days after the original Carzol application the lygus bug population was still 98 per cent below the pretreatment level.

An experiment was conducted to develop additional information on economic population levels of lygus bugs and to evaluate a full season program utilizing Monitor in combination with Lorsban for aphid control and in combination with Plictran for control of spider mites. Applications were timed to coincide with hatching and nymphal development of lygus bugs and according to average lygus bug population levels of 4 to 6 and 8 to 12 bugs per 180° sweep with a standard insect sweeping net. Monitor was applied at 0.33 lb AI/acre in all applications except the last in which a dosage of 0.5 lb AI/acre was used. Lorsban in the combination was applied at a dosage of 0.5 lb AI/acre and Plictran at 0.75 lb AI/acre. The two treatment levels i.e., 4 to 6 and 8 to 12 bugs per sweep, were each replicated 4 times and the individual replicates were each 5 acres. Insect populations were sampled each week with a sweep net and with a D-vac suction machine. The insecticides were applied by aircraft in 10 gallons of water per acre prior to 5:30 A.M.

The results of this study are shown in Tables 3 through 6. Yields of harvested seed and an analysis of seed quality in this experiment are shown in Tables 7 and 8 respectively.

Lygus bug populations averaged approximately 4.5 bugs per sweep over the entire experimental area on June 7 when Monitor was applied to all plots. The plots were to be retreated when the lygus bug population reached levels of 4 to 6 or 8 to 12 bugs per sweep. During the course of the experiment, the populations slightly exceeded the planned levels in the 4 to 6 range. On two occasions populations reached 7.5 and 7.2 bugs per sweep when the intended maximum was 6. In both instances populations jumped from levels of 1.6 and 1.7 within 7-day periods. These populations consisted mainly of small and medium nymphs i.e., first through third instar. There was no difficulty in maintaining population levels in the 8 to 12 bugs per sweep range. Under these treatment regimes 5 insecticide applications were required to hold lygus bug populations within the 4 to 6 bug per sweep range. A total of four insecticide applications were required to hold lygus bug populations within the 8 to 12 bug per sweep range.

The 8 center rows of each replicate were harvested on September 27 and 28 with a commercial combine. The weights of field run seed are shown in Table 7. The average yield for four replications was 459.1 lbs/acre for the 4 to 6 bug per sweep treatment and 406.4 lbs/acre for the 8 to 12 bug per sweep treatment. These means were not significantly different at the 5% level of an F distribution test. Just prior to harvest four two 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, stinkbug and other damage. The results are presented in Table 8. There was no difference in seed quality between the two lygus bug treatment levels. The percentages of good seed in the 4 to 6 and the 8 to 12 bug per sweep levels were 93.52 and 93.58 respectively. The percentages of seeds damaged by lygus bug feeding in both treatments was 3.41.

Aphids

Data on control of aphids, Tables 9, 10, 11, were obtained for all materials evaluated for lygus bug control. The variety of alfalfa used in the lygus bug economic level study was Luna, susceptible to the spotted alfalfa aphid and the pea aphid. Of the insecticides evaluated in 1978

the only materials that effectively reduced aphid populations were Lorsban 0.5 lb AI/acre, Ambush 0.3 lb AI/acre and Pydrin 0.2 lb AI/acre. Lorsban combined with either Monitor or Carzol controlled both the spotted alfalfa aphid and the pea aphid, but appeared less effective against the pea aphid. In many instances pea aphid populations exceeded pretreatment levels 21 days after application of Lorsban while the spotted alfalfa aphid populations were still below pretreatment levels.

Pydrin was only evaluated over a 7-day posttreatment period and during this time reduced the spotted alfalfa aphid population 99 per cent and the pea aphid 96 per cent under pretreatment levels. Similar initial aphid population reductions resulted from the application of Ambush. Ambush appeared to be more effective in controlling the spotted alfalfa aphid than the pea aphid. Pea aphid populations reached pretreatment levels 14 days after the Ambush application but at 21 days after application the spotted alfalfa aphid population was still 86 per cent below the pretreatment level.

Monitor alone did not control the spotted alfalfa aphid and resulted in initial pea aphid population reductions of only 54 to 55 per cent. Fourteen days after the application of Monitor, pea aphid populations equalled or exceeded pretreatment levels.

Bendiocarb and U.C. 51762 did not control either the spotted alfalfa aphid or the pea aphid.

During the period February 21 through May 11, populations of the blue alfalfa aphid, the pea aphid and the spotted alfalfa aphid were monitored weekly in 2 alfalfa seed fields in each of three localities, Firebaugh, Five Points and San Joaquin. The varieites at Firebaugh were De Kalb 185 and UC Cargo. At Five Points CUF 101 and WL 310, and at San Joaquin CUF 101 and Tempo. None of these fields were treated with insecticides during the study period.

The populations were sampled with a D-vac suction machine taking 50 D-vac samples in each field on each sampling date. The results of these studies are shown in Tables 12 through 17. The blue alfalfa aphid was the predominant species present in all fields and represented from 95 to 99 per cent of the combined blue alfalfa aphid and pea aphid populations. In general, populations of the blue alfalfa aphid were not heavy. The heaviest populations were in the Firebaugh area with aphids in the De Kalb 185 variety reaching a peak of 24,441 per 50 D-vac samples on March 21. The field of

UC Cargo had a peak population of 19,110 aphids per 50 D-vac samples, also on March 21. Varieties with the lowest peak populations, 4,000 to 9,000 aphids per 50 D-vac samples were CUF 101 and Tempo. The blue alfalfa aphid populations reached peak numbers at Firebaugh and at Five Points from March 14 to March 28 and at San Joaquin on April 18. Populations of the blue alfalfa aphid declined sharply after the peaks and by May 11 populations were very low, ranging from 12 to 297 aphids per 50 D-vac samples.

Spider mites

The effects of insecticide applications on spider mite populations were evaluated in all experiments. In experiments conducted for lygus bug control it appeared that the Monitor-Lorsban combination was not highly effective in controlling spider mites although Monitor appeared to reduce and suppress the mite populations for 7 to 14 days after application. Pydrin, Ambush and UC 51762 did not control mites and appeared to induce rather sharp increases in numbers of mites and eggs following this application. Bendiocarb did not control spider mites.

Two experiments were conducted in which only acaricides were evaluated. One of these was not very successful because 7 days after application of the acaricides the grower treated over the plots with a combination of Monitor 0.5 lb AI/acre + Lorsban 0.5 lb AI/acre to control the western yellow stripped armyworm and aphids. The acaricides included in this trial were Comite, Vendex, Plictran, Union Carbide 55304, Carzol and Carzol + Comite. The results of this experiment are shown in Table 21. The spider mite populations were low in pretreatment counts and because there was only one evaluation made 6 days after application of the acaricides, before the Monitor-Lorsban was applied, it is difficult to evaluate the materials. The acaricides in the experiment all appeared to initially reduce the populations of mites and eggs. Counts made after the experiment was treated over with Monitor-Lorsban did not show any significant increases in mite or egg populations up to 27 days after the acaricides were initially applied.

In the second acaricide experiment, Carzol, Comite and Plictran were evaluated. The results of this test are shown in Table 22. Comite was the most effective of the acaricides evaluated in this trial. Seven days after application the mite populations were reduced 86 per cent under pretreatment levels and the populations continued to decline reaching 97 per cent under pretreatment levels 21 days after Comite was applied. Plictran initially reduced the

mite population 88 per cent under the pretreatment level. Twenty-one days after application the mites had increased but were still 24 per cent under the pretreatment level. Seven days after application Carzol had only reduced the spider mite population 59 per cent. The mite population then increased steadily and at 21 days after application had reached a level approximately four times that of the pretreatment level.

Effects of insecticides on beneficial insect species

Data were obtained in all experiments on the effects of the various insecticides and acaricides on the following groups of predatory and parasitic organisms, Orius (minute pirate bugs), Geocoris (big-eyed bugs) Nabis (damsel bugs), lacewings, syrphid flies, coccinellid beetles (lady beetles), collops beetles, parasitic wasps and spiders. Populations of most predatory species were low in the fields selected for study and with the exception of lacewings, parasitic wasps and spiders it was difficult to evaluate the effects of the materials on the beneficial species. The data obtained indicate that all of the insecticides used in the 1978 trials reduced predator and parasite populations. The results of these analyses are shown in Tables 23 through 25.

The alfalfa seed chalcid

A survey was conducted in the Firebaugh, San Joaquin, Five Points and Corcoran areas to evaluate alfalfa seed chalcid infestations. Samples of seed pods were hand stripped, before commerical harvest from 18 fields, 5 in the Firebaugh area, 5 from Corcoran and 4 each from Five Points and San Joaquin areas. Four one-quart samples of seed pods were taken from each field. The samples were hand threshed and lightly cleaned in a clipper seed cleaner. An average of approximately 1,400 seeds were examined from each field for seed chalcid damage. In addition, the seeds were examined for lygus bug and stink bug injury and for water damaged, green and shriveled seeds. The results are shown in Table 26. The heaviest chalcid damage occurred in the Corcoran fields where the percentages of damaged seeds in individual fields ranged from 1.6 to 10.6 and averaged 4.6. The percentages of damaged seeds in the Firebaugh, Five Points and San Joaquin fields ranged from 0 to 2.5 and averaged 0.3.

Seeds showing lygus bug injury ranged from 2.0 to 11.2 and averaged 5.4 for the 18 fields. The percentages of seeds showing damage attributed to stink bug feeding ranged from 0 to 0.9 and averaged 0.3.

Stink bug

Stink bug populations were measured on July 31 in 4 alfalfa seed fields near San Joaquin and in 4 fields near Five Points. On August 22, populations were measured in 4 fields in the Firebaugh area. Thus a total of 12 fields were surveyed in 1978. The stink bug populations were sampled using the "beating pan" technique whereby 25 feet of row were examined in each field on each sampling date. The results are shown in Table 27. The populations were extremely low. Only one consperse stink bug was found in a field at San Joaquin. The Say stink bug was present in four fields but in very small numbers. The largest population of this species consisted of 1 adult and 10 nymphs in five samples from a field near San Joaquin. A total of only 23 stink bugs were collected in the samples from all 12 fields.

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 83.5 to 96.1. The percentages of seeds with damage attributed to stink bug ranged from 0 to 0.9 and averaged 0.3.

A study was made of the germination of alfalfa seeds damaged by lygus bugs and by stink bugs. The per cent germination of damaged seeds was compared with that of undamaged seeds. The results are shown in Table 28. One hundred seeds in each of the three categories, lygus damage, stink bug damage, and undamaged were selected from samples from each of 10 fields. Thus a total of 1,000 seeds were tested for each category. The germination of the undamaged seed was 92.3 per cent while that of the lygus damaged seed was 8.7 per cent and that damaged by stink bugs was 78.2 per cent. Stink bugs appear to attack the more mature seeds. Thus even though stink bugs puncture the seed coat the damage to the seed is much less than the shrivelling and the toxic effects of lygus bug feeding.

The Omnivorous leafroller

The omnivorous leafroller is a relatively new insect in alfalfa seed fields although it has been associated with alfalfa and over 80 other host plants. It has been observed that populations of the omnivorous leafroller have been increasing in seed fields over the past three years.

The insect has no diapause and reproduces the year round, although its rate of reproduction is greatly slowed during the winter months. During the winter, populations consist mainly of larvae feeding in rolled leaves on the

plants. The female moths deposit eggs in masses on the leaves and the larvae web several leaves together within which they feed. Later the tips of the plants, including the buds and flower racemes, are webbed and tied together. The larvae destroy the blossoms and developing seed pods but more importantly such webbed blossoms are prevented from pollinating. Although damage would appear serious, little is known concerning actual losses caused by this insect. In 1978 studies were begun to learn something about the population dynamics of the leafroller in alfalfa seed fields and to assess the damage or losses that it might be causing. Populations were monitored by trapping adult male moths in traps baited with a female sex attractant or pheromone. Two types of traps were used, a commercial sticky trap (Pherocon®1C) and the U.C. water pan trap. The traps were hung or placed on stands so that they were at the tops of the alfalfa plants. The traps were serviced and catches recorded weekly or twice weekly. One sticky trap was placed in each of five alfalfa seed fields on the west side of Fresno County and examined weekly from March 7 through October 24. Four water pan traps were placed in each of five alfalfa seed fields at Corcoran. These traps were operated from April 17 through August 15. The results of the trapping in Fresno County are shown in Table 29. The population data for each of these 5 fields are also depicted in graphs that follow the tables. Population data for the Corcoran fields are presented in Tables 30 through 34. Graphs also accompany each table. Seasonal population means based on the number of moths per trap per day were calculated for each field and are shown on the graphs along with the population trends and peaks. Also shown on each graph are the dates of application and the insecticides used in each field. Just before harvest four 2 quart samples of seed pods were hand stripped from plants in each field. The samples were hand threshed and lightly cleaned in a clipper seed cleaner. Two subsamples from each of the threshed two quart samples were examined for evidence of feeding by larvae of the omnivorous leafroller. The results of the seed analyses for omnivorous leafroller damage are shown in Table 35. The percentages of seeds damaged by the omnivorous leafroller were very low ranging from 0 to 0.5. This probably does not represent the total loss. No areas in the fields were free of the leafroller and since all portions of each field were treated the same for pest control there was no way of measuring seed loss due to webbing of flower racemes and lack

of pollination. The following briefly summarizes some of the other findings of this first year study.

1. The omnivorous leafroller was present in all fields where traps were operated.
2. Moth populations were much lower in first year seed fields than in second and third year fields.
3. Although from 3 to 5 insecticide applications were made in each field none appeared to have had very prolonged effects on the moth populations.
4. In general the water pan traps caught more moths than the sticky traps. During periods of high moth populations the sticky surface of the Pherocon trap would become coated with moths, scales and dirt and would cease to capture moths. These traps became almost non-functional after 190 to 200 moths were captured. It was not unusual during periods of peak moth abundance in some fields to collect 200 moths per trap in one night. The water pan traps continued to collect moths as long as they contained water. During periods of high temperatures it was necessary to add water to the water pan traps in mid week.

Additional work is needed before the full impact of this insect on alfalfa seed production can be ascertained.

Summary and Conclusions

Populations of the pea aphid, the spotted alfalfa aphid, the western yellow stripped armyworm and lygus bugs were heavy in many alfalfa seed fields. Control of lygus bugs in early season was difficult because of large numbers of migrating adults.

Of the seven insecticides evaluated for control of insects affecting seed alfalfa those that were most promising for control of lygus bugs were Monitor, Ambush and Pydrin. Combinations of Monitor + Lorsban and Carzol + Lorsban effectively controlled lygus bugs, the spotted alfalfa aphid, the pea aphid and the yellow stripped armyworm. Combinations of Monitor + Plictran and Carzol + Comite effectively controlled lygus bugs and spider mites.

A lygus bug economic population level study in which treatments were applied when lygus bug populations reached 4 to 6 and 8 to 12 bugs per sweep did not result in differences in yields or seed quality between the two treatment levels. Five applications of Monitor or Monitor + Plictran or Monitor + Lorsban were required to maintain lygus bug populations in the

4 to 6 bug per sweep range for the season. Four applications of the above treatments were required to maintain lygus bug populations in the 8 to 12 bug per sweep range. It would appear from this experiment and others conducted in previous years that 6 to 8 bugs per sweep constitutes a safe and economic treatment level and that to be most effective insecticides should be applied after a hatch and before the nymphs reach the fourth and fifth instars.

The field used for the lygus bug economic population level study was of Luna variety and was susceptible to the pea aphid and the spotted alfalfa aphid. Both species were present in large numbers. Lorsban, Pydrin and Ambush were the only materials that controlled the aphids. Lorsban combined with either Monitor or Carzol, although controlling both the spotted alfalfa aphid and the pea aphid, appeared to be less effective against the pea aphid. Pydrin was only evaluated over a 7-day posttreatment period but during this time it controlled both the pea aphid and the spotted alfalfa aphid. Ambush also controlled both species but appeared to be more effective in controlling the spotted alfalfa aphid.

Bendiocarb and UC 51762 did not control either the spotted alfalfa aphid or the pea aphid.

Weekly surveys from February 21 through May 11 in untreated alfalfa seed fields showed the blue alfalfa aphid present in all fields representing from 95 to 99 per cent of the combined blue alfalfa aphid and pea aphid populations. In general the blue alfalfa aphid populations were not heavy in the area surveyed. The heaviest populations were in the Firebaugh area. Populations at Firebaugh and Five Points peaked from March 14 to March 28. In the San Joaquin area populations peaked on April 18. Populations declined sharply after the peaks and after May 11 were very low.

In general spider mite populations were low in those seed fields where studies were conducted. Of the specific acaricides tested those resulting in the best spider mite control were Comite and Plictran. Vendex, a Shell Product, and UC 55304 appeared promising and should receive further study.

A survey was conducted in 18 alfalfa seed fields in the Firebaugh, Five Points, San Joaquin and Corcoran areas to evaluate damage caused by the alfalfa seed chalcid. In addition, data were obtained on percentages of seeds showing feeding injury attributed to lygus bugs and stink bugs. The per cent of chalcid damaged seed in individual fields ranged from 0 to 10.6.

The average percentage of damaged seed at Corcoran was 5.4. The averages for Firebaugh, Five Points and San Joaquin were 0.5, 0.1 and 0.4 respectively. Seeds showing lygus bug injury ranged from 2.0 to 11.2 and averaged 5.4 per cent for the 18 fields. The percentages of seeds showing damage attributed to stink bug feeding ranged from 0 to 0.9 and averaged 0.3.

Stink bug populations were measured in 12 alfalfa seed fields in the Firebaugh, Five Points and San Joaquin areas on July 31 and August 22. Populations were extremely low. A total of only one consperse stink bug and 22 Say stink bugs were collected in samples from all 12 fields.

Seasonal population trends of the omnivorous leafroller were monitored by capturing male moths in sex attractant traps in 5 alfalfa seed fields in Fresno County and in 5 seed fields at Corcoran. The trapping period in Fresno County fields extended from March 7 through October 24 and at Corcoran from April 17 through August 15. The omnivorous leafroller was present in all fields where traps were operated. Peak numbers of moths per trap per night ranged from 49 to 908. The trapping data indicate three to four population peaks over the period March through October. Moth populations were much lower in first year seed fields than in second and third year fields. Although from 3 to 5 insecticide applications were made in each field none appeared to have had very prolonged effects on the moth populations. The percentages of seeds damaged by the omnivorous leafroller were very low in hand stripped samples, they ranged from 0 to 0.5 per cent. This does not represent the total loss. Undoubtedly important damage results from webbing and feeding within the flower racemes and the prevention of pollination due to larval webbing of the flowers. Further research is needed before the full impact of this insect on seed production can be ascertained.

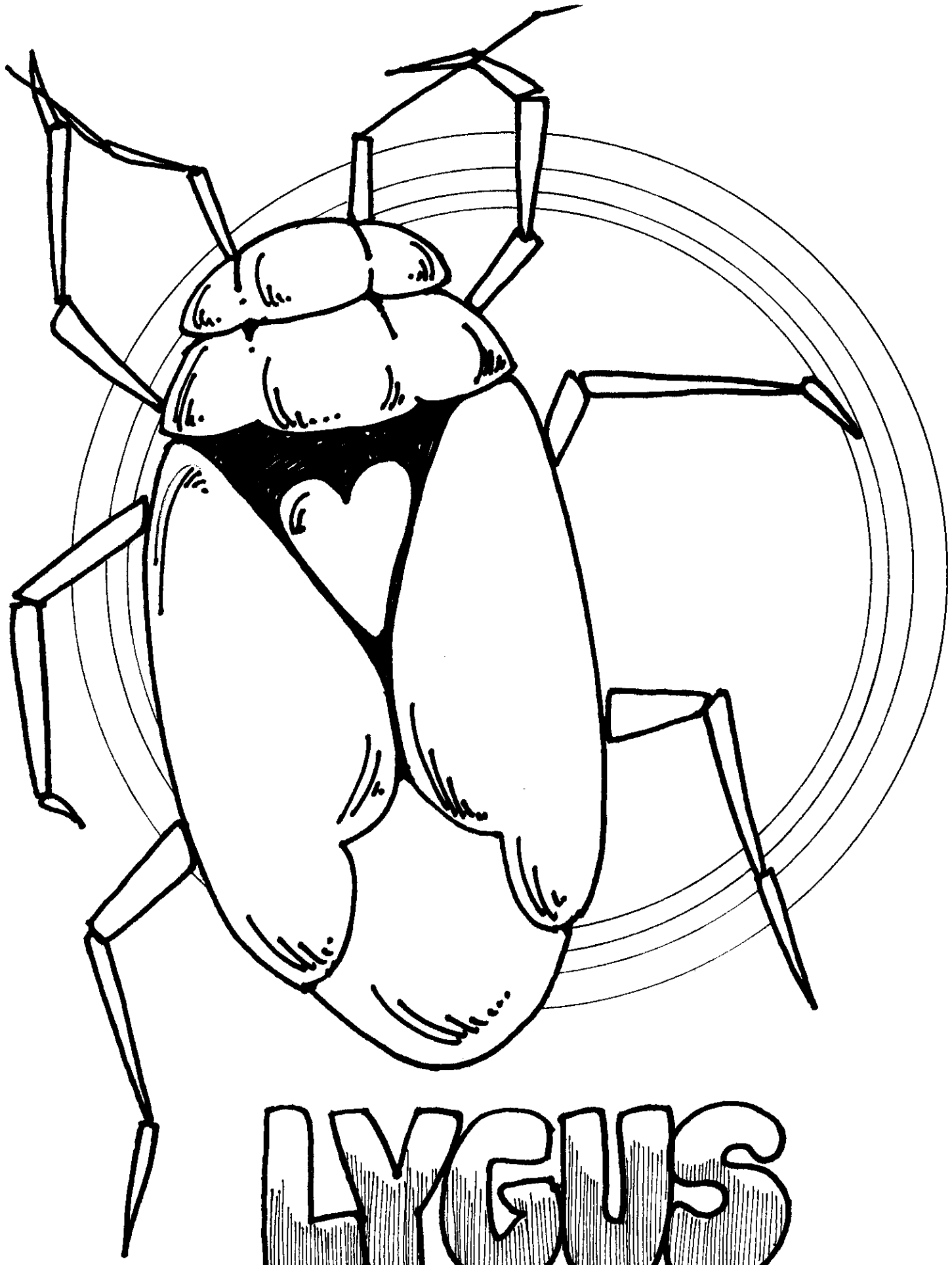

LYGUS

Table 1 - Lygus bug populations in seed alfalfa plots treated by aircraft for lygus bug control. Firebaugh, California. 1978.

Treatment[1]			Number of lygus bugs per sweep[3]					
			Adults	Nymphs				Adults +
Insecticides	AI/Acre lb.	Days after treatment[2]		Small	Medium	Large	Total	Nymphs
		Pre	0.6	5.0	0.2	0.0	5.2	5.8
		Pre	0.6	0.7	2.3	0.6	3.6	4.2
Monitor + Lorsban	0.33 0.50							
		7	0.1	0.1	0.0	0.0	0.1	0.2
		14	0.4	0.2	1.0	0.0	1.2	1.6
		21	0.7	0.4	2.5	1.6	4.5	5.2
		Pre	0.8	5.3	0.4	0.0	5.7	6.5
		Pre	0.2	0.6	5.1	1.2	6.9	7.1
Monitor + Lorsban	0.50 0.50							
		7	0.1	0.1	0.0	0.0	0.1	0.2
		14	0.2	0.0	0.6	0.0	0.6	0.8
		21	0.9	0.5	2.2	0.4	3.1	4.0
		Pre	0.6	4.9	0.9	0.0	5.8	6.4
		Pre	0.9	1.4	6.8	1.3	9.5	10.4
Pydrin	0.20							
		7	0.3	0.1	0.1	1.3	1.5	1.8
Carzol +(7/19) Lorsban	0.75 0.50							
		7	0.2	0.0	0.0	0.0	0.0	0.2
		14	0.1	0.3	0.1	0.0	0.4	0.5
		Pre	0.7	6.9	1.3	0.1	8.3	9.0
		Pre	0.7	0.8	11.5	1.4	13.7	14.4
UC 51762	1.00							
		7	1.4	0.0	0.1	2.7	2.8	4.2
Carzol +(7/19) Lorsban	0.75 0.50							
		7	0.1	0.0	0.1	0.0	0.1	0.2
		Pre	0.5	5.9	0.6	0.0	6.5	7.0
		Pre	1.1	1.9	12.2	0.7	14.8	15.9
Bendiocarb	0.50							
		7	2.4	0.0	0.3	8.4	8.7	11.1
Carzol +(7/19) Lorsban	0.75 0.50							
		7	0.4	0.0	0.0	0.0	0.0	0.4

Table 1 - (continued)

Treatment[1]			Number of lygus bugs per sweep[3]					
			Adults	Nymphs				Adults +
Insecticides	AI/Acre lb.	Days after treatment[2]		Small	Medium	Large	Total	Nymphs
		Pre	0.6	7.2	1.1	0.0	8.3	8.9
		Pre	0.4	1.0	12.8	1.1	14.9	15.3
Bendiocarb	1.00	7	1.2	0.0	0.1	5.8	5.9	7.1
Carzol + (7/19)	0.75							
Lorsban	0.50	7	0.5	0.0	0.0	0.0	0.0	0.5
		Pre	0.3	5.1	0.3	0.0	5.4	5.7
		Pre	0.8	1.4	9.0	0.9	11.3	12.1
Ambush	0.30	7	0.1	0.0	0.1	0.4	0.5	0.6
		14	0.6	0.0	0.3	0.0	0.3	0.9
		21	0.5	0.4	0.7	0.6	1.7	2.2
		Pre	0.2	7.4	0.4	0.0	7.8	8.0
		Pre	0.2	1.4	13.0	1.4	15.8	16.0
Carzol	0.75	7	0.0	0.0	0.0	0.0	0.0	0.0
Lorsban (7/19)	0.50	14	0.1	0.0	0.0	0.0	0.0	0.1
		21	0.1	0.0	0.1	0.1	0.2	0.3
		Pre	0.7	1.9	13.1	1.5	16.5	17.2
Monitor	0.33	7	0.3	0.0	0.0	0.0	0.0	0.3
		14	0.1	0.0	0.1	0.0	0.1	0.2
		21	0.4	0.4	2.8	1.0	4.2	4.6
		Pre	0.6	0.4	16.3	1.5	18.2	18.8
Monitor + Buffer	0.33 0.32 oz/gal	7	0.1	0.2	0.0	0.1	0.3	0.4
		14	0.6	0.3	1.0	0.0	1.3	1.9
		21	0.4	0.9	2.9	1.2	5.0	5.4

1/ Plot size: Each treatment 5 acres (165'x1320'). Sprays were applied by aircraft at 10 GPA. Bendiocarb and UC 51762 were wettable powders 76% and 75% respectively, Carzol was a 92% soluble powder while the others were emulsifiable concentrates. Plots were treated July 12 from 1:00 AM to 4:30 AM.

Table 1 - (continued)

[2]/ Pretreatment counts were made July 5 and July 11. The Pydrin and UC 51762 plots together with the two Bendiocarb plots were treated with Carzol + Lorsban 0.75 lbs. AI/A and 0.5 lbs. AI/A respectively on July 19. The Carzol plot was treated with Lorsban 0.5 AI/A on July 19.

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

Table 2 - Lygus bug populations in seed alfalfa plots treated by aircraft for lygus bug control. Firebaugh, California. 1978.

Treatment[1]		Days after treatment[2]	Number per 50 D-Vac Samples[3]									
			Adults			Nymphal Instars						Adults + Nymphs
Insecticides	AI/ Acre lb.		♂	♀	Total	1	2	3	4	5	Total	
		Pre	3	1	4	4	12	2	1	0	19	23
		Pre	6	5	11	4	7	18	11	6	46	57
Monitor + Lorsban	0.33 + 0.50	7	0	4	4	3	0	0	0	0	3	7
		14	1	3	4	7	6	4	1	0	18	22
		21	5	10	15	7	24	15	15	5	66	81
		Pre	3	8	11	25	26	3	0	0	54	65
		Pre	3	0	3	12	4	16	35	7	74	77
Monitor + Lorsban	0.50 + 0.50	7	1	1	2	1	0	0	0	0	1	3
		14	1	0	1	0	4	1	1	0	6	7
		21	5	3	8	11	10	14	12	4	51	59
		Pre	1	3	4	15	30	9	4	0	58	62
		Pre	7	4	11	16	13	39	36	11	115	126
Pydrin	0.20	7	8	6	14	0	0	2	2	12	16	30
Carzol + (7/19) Lorsban	0.75 + 0.50	7	3	0	3	0	0	0	0	0	0	3
		14	2	4	6	0	3	0	0	0	3	9
		Pre	3	4	7	57	24	1	1	0	83	90
		Pre	4	4	8	18	44	55	21	2	140	148
UC 51762	1.00	7	7	10	17	7	1	0	3	22	33	50
Carzol + (7/19) Lorsban	0.75 + 0.50	7	1	1	2	4	0	0	0	0	4	6
		14	6	5	11	0	3	7	2	0	12	23

Table 2 - (continued)

Treatment[1] Insecticides	AI/ Acre lb.	Days after treatment[2]	Number per 50 D-Vac Samples[3] Adults ♂	Adults ♀	Adults Total	Nymphal Instars 1	2	3	4	5	Nymphal Instars Total	Adults + Nymphs
		Pre	4	3	7	42	84	16	3	0	145	152
		Pre	10	4	14	17	36	40	84	26	203	217
Bendiocarb	0.50											
		7	23	13	36	1	0	0	3	56	60	96
Carzol (7/19)	0.75											
+	+											
Lorsban	0.50											
		7	4	2	6	0	1	1	0	0	2	8
		14	5	3	8	2	1	2	3	0	8	16
		Pre	2	2	4	76	44	2	0	0	122	126
		Pre	5	3	8	11	33	37	12	9	102	110
Bendiocarb	1.00											
		7	15	12	27	2	0	1	2	38	43	70
Carzol (7/19)	0.75											
+	+											
Lorsban	0.50											
		7	3	1	4	2	0	0	0	0	2	6
		14	3	9	12	1	2	8	6	0	17	29
		Pre	6	2	8	41	35	1	3	0	80	88
		Pre	6	4	10	0	4	48	27	4	83	93
Ambush	0.30											
		7	2	3	5	0	0	1	0	8	9	14
		14	3	9	12	3	9	0	1	0	13	25
		21	7	4	11	5	9	3	6	3	26	37
		Pre	1	0	1	55	73	8	0	0	136	137
		Pre	4	3	7	4	1	38	32	3	78	85
Carzol	0.75											
		7	1	0	1	0	0	0	0	0	0	1
Lorsban (7/19)	0.50											
		14	3	1	4	2	0	0	0	0	2	6
		21	6	1	7	5	4	7	4	0	20	27
		Pre	6	3	9	7	11	103	103	18	242	251
Monitor	0.33											
		7	5	4	9	9	0	0	0	0	9	18
		14	3	4	7	11	6	4	0	0	21	28
		21	6	4	10	9	11	24	9	2	55	65

Table 2 - (continued)

Treatment[1] Insecticides	AI/ Acre lb.	Days after treatment[2]	Adults ♂	Adults ♀	Adults Total	Number per 50 D-Vac Samples[3] Nymphal Instars 1	2	3	4	5	Total	Adults + Nymphs
		Pre	6	5	11	10	21	46	123	25	225	236
Monitor + Buffer	0.33 + 0.32 oz/gal	7	4	4	8	4	4	0	0	0	8	16
		14	2	2	4	17	3	4	1	1	26	30
		21	13	6	19	20	29	54	13	10	126	145

1/ Plot size: Each treatment 5 acres (165'x1320'). Sprays were applied at 10 GPA. Bendiocarb and UC 51762 were wettable powders 76% & 75% respectively, Carzol was a 92% soluble powder while the others were emulsifiable concentrates. Plots were treated July 12 from 1:00 AM to 4:30 AM.

2/ Pretreatment counts were made July 5 and July 11. The Pydrin and UC 51762 plots were treated with Carzol + Lorsban 0.75 lb. AI/A and 0.50 lbs. AI/A respectively on July 19. The Carzol plot was treated with Lorsban 0.5 lbs. AI/A on July 19.

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

Table 3 - Lygus bug populations in seed alfalfa plots where insecticides were applied at a count of 4-6 lygus bugs per sweep. Firebaugh, California. 1978[1].

Treatment[2]			Number of lygus bugs per sweep[4]					
			Adults	Nymphs				Adults +
Insecticides	AI/Acre lb.	Days after treatment[3]		Small	Medium	Large	Total	Nymphs
		Pre	1.44	0.22	1.86	0.93	3.01	4.45
Monitor (6/7)	0.33							
		7	0.80	0.21	0.01	0.03	0.25	1.05
		14	1.70	0.70	2.50	0.10	3.30	5.00
Monitor + (6/22) Plictran	0.33 + 0.75							
		6	1.10	0.20	0.10	0.20	0.50	1.60
		14	1.60	2.30	3.50	0.10	5.90	7.50
Monitor + (7/6) Plictran	0.33 0.75							
		6	0.60	0.10	0.00	0.00	0.10	0.70
		13	0.60	0.10	0.30	0.00	0.40	1.00
		20	0.80	0.20	0.60	0.10	0.90	1.70
Lorsban (7/19)	0.5							
		27	0.80	0.40	5.30	0.70	6.40	7.20
Monitor + (8/2) Lorsban	0.33 + 0.50							
		7	0.30	0.10	0.00	0.00	0.10	0.40
		14	0.40	0.10	1.30	0.20	1.60	2.00
		21	0.40	0.20	0.50	2.00	2.70	3.10
Monitor + (8/23) Lorsban	0.50 + 0.50							
		7	0.00	0.00	0.00	0.00	0.00	0.00
		14	-	-	wet	-	-	-
		21	0.10	0.00	0.00	0.00	0.00	0.10

1/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

2/ Applications were made by aircraft at 10 GPA prior to 5:30 AM. Plictran was a 50% wettable powder while Monitor & Lorsban were emulsifiable concentrates. The dates shown in ( ) are application dates.

3/ Pretreatment count was made on June 6.

4/ Average of 20 sweeps (10-2 sweep samples) per replication on each sampling date.

Table 4 - Lygus bug populations in seed alfalfa plots where insecticides were applied at a count of 4-6 lygus bugs per sweep. Firebaugh, California. 1978[1].

Treatment[2]			Number per 50 D-Vac Samples[4]									
			Adults			Nymphal Instars						Adults +
Insecticides	AI/Acre lb.	Days after treatment[3]	♂	♀	Total	1	2	3	4	5	Total	Nymphs
		Pre	12	14	26	1	3	4	7	5	20	46
Monitor (6/7)	0.33											
		7	7	10	17	2	3	1	0	0	6	23
		14	23	21	44	19	19	17	6	1	62	106
Monitor + (6/22) Plictran	0.33 + 0.75											
		6	5	4	9	4	2	0	0	0	6	15
		14	5	4	9	52	38	12	3	0	105	114
Monitor + (7/6) Plictran	0.33 + 0.75											
		6	1	1	2	4	1	0	0	0	5	7
		13	3	1	4	4	5	1	0	0	10	14
		20	2	2	4	8	6	1	1	1	17	21
Lorsban (7/19)	0.50											
		27	6	5	11	12	22	38	25	14	111	122
Monitor + (8/2) Lorsban	0.33 + 0.50											
		7	1	1	2	6	3	1	0	1	11	13
		14	1	2	3	1	7	10	5	2	25	28
		21	2	2	4	3	9	1	2	8	23	27
Monitor + (8/23) Lorsban	0.50 + 0.50											
		7	0	1	1	2	0	0	0	0	2	3
		14	- - - - - - - - - - - - W E T - - - - - - - - - -									
		21	1	1	2	0	0	0	1	0	1	3

1/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

2/ Applications were made by aircraft at 10 GPA prior to 5:30 AM. Plictran was a 50% wettable powder while Monitor and Lorsban were emulsifiable concentrates. The dates shown in ( ) are application dates.

3/ Pretreatment count was made June 6.

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

Table 5 - Lygus bug populations in seed alfalfa plots where insecticides were applied at a count of 8-12 lygus bugs per sweep. Firebaugh, California. 1978[1].

Treatment[2]			Number of lygus bugs per sweep[4]					
			Adults	Nymphs				Adults + Nymphs
Insecticides	AI/Acre lb.	Days after treatment[3]		Small	Medium	Large	Total	
		Pre	1.74	0.19	1.74	0.93	2.86	4.6
Monitor (6/7)	0.33							
		7	0.83	0.21	0.01	0.00	0.22	1.05
		14	2.15	0.83	2.06	0.15	3.04	5.19
		21	3.00	1.20	3.80	3.90	8.90	11.90
Monitor + (6/29) Plictran	0.33 + 0.75							
		7	1.60	1.10	0.40	0.20	1.70	3.30
		13	1.70	1.50	5.60	0.10	7.20	8.90
Monitor + (7/12) Lorsban	0.33 + 0.50							
		6	0.30	0.10	0.00	0.00	0.10	0.40
		13	0.50	0.10	1.10	0.10	1.30	1.80
		20	0.60	0.20	2.30	1.40	3.90	4.50
Lorsban (8/2)	0.50							
		28	0.90	0.40	0.40	0.10	0.90	1.80
		35	0.50	0.60	6.60	0.80	8.00	8.50
Monitor + (8/16) Lorsban	0.50 + 0.50							
		7	0.10	0.00	0.00	0.00	0.00	0.10
		14	0.00	0.00	0.00	0.00	0.00	0.00
		21	-	-	wet	-	-	-
		28	0.10	0.00	0.00	0.00	0.00	0.10

1/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

2/ Applications were made by aircraft at 10 GPA prior to 5:30 AM. Plictran was a 50% wettable powder while Monitor & Lorsban were emulsifiable concentrates. The dates shown in ( ) are application dates.

3/ Pretreatment count was made on June 6.

4/ Average of 20 sweeps (10-2 sweep samples) per replication on each sampling date.

Table 6 - Lygus bug populations in seed alfalfa plots where insecticides were applied at a count of 8-12 lygus bugs per sweep. Firebaugh, California. 1978[1].

Treatment[2]			Number per 50 D-Vac Samples[4]									
			Adults			Nymphal Instars						Adults +
Insecticides	AI/Acre lb.	Days after treatment[3]	♂	♀	Total	1	2	3	4	5	Total	Nymphs
		Pre	14	14	28	0	3	5	8	8	24	52
Monitor (6/7)	0.33											
		7	8	8	16	2	2	1	1	0	6	22
		14	33	26	59	10	35	23	9	1	78	137
		21	13	2	15	12	9	6	14	8	49	64
Monitor + (6/29) Plictran	0.33 + 0.75											
		7	12	9	21	32	12	2	1	2	49	70
		13	3	0	3	18	28	5	3	1	55	58
Monitor + (7/12) Lorsban	0.33 + 0.50											
		6	2	1	3	2	0	0	0	0	2	5
		13	3	1	4	4	6	3	0	0	13	17
		20	5	4	9	11	24	14	11	11	71	80
Lorsban (8/2)	0.50											
		28	3	5	8	24	16	2	0	0	42	50
		35	1	1	2	7	12	44	20	8	91	93
Monitor + (8/16) Lorsban	0.50 + 0.50											
		7	0	1	1	1	0	0	0	0	1	2
		14	0	1	1	0	1	0	0	0	1	2
		21	- - - - - - - - - - W E T - - - - - - - - - -									
		28	0	1	1	1	1	0	0	0	2	3

[1]/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

[2]/ Applications were made by aircraft at 10 GPA prior to 5:30 AM. Plictran was a 50% wettable powder while Monitor and Lorsban were emulsifiable concentrates. The dates shown in ( ) are application dates.

[3]/ Pretreatment count was made June 6.

[4]/ 2-25 suck D-Vac samples per replicate on each sampling date.

Table 7

Weights of harvested alfalfa seed in the insecticide timing experiment for lygus bug control. Firebaugh, California. 1978.

Treatment[1]	Field run seed lbs. per acre[2] Replications 1	2	3	4	Average of 4 replications[3]
Monitor + Lorsban 4-6 bugs/sweep	481.6	378.1	444.4	532.5	459.1
Monitor + Lorsban 8-12 bugs/sweep	383.0	363.6	405.6	473.5	406.4

1/ The entire plot was treated with Monitor on June 7. The 4-6 lygus bug level plots were retreated with Monitor + Plictran on June 22 and July 6. They were retreated with Lorsban July 19 and with Monitor + Lorsban on August 2 and August 22, for a total of 5 Monitor applications. The 8-12 lygus bug level plots were retreated on June 29 with Monitor Plictran and on July 12 with Monitor + Lorsban these plots were subsequently retreated with Lorsban on August 2 and Monitor + Lorsban on August 16 for a total of 4 Monitor applications.

2/ Calculated weights based on the harvest of the center 8 rows of each replicate. Harvest was on September 27 and 28 with a commercial harvester.

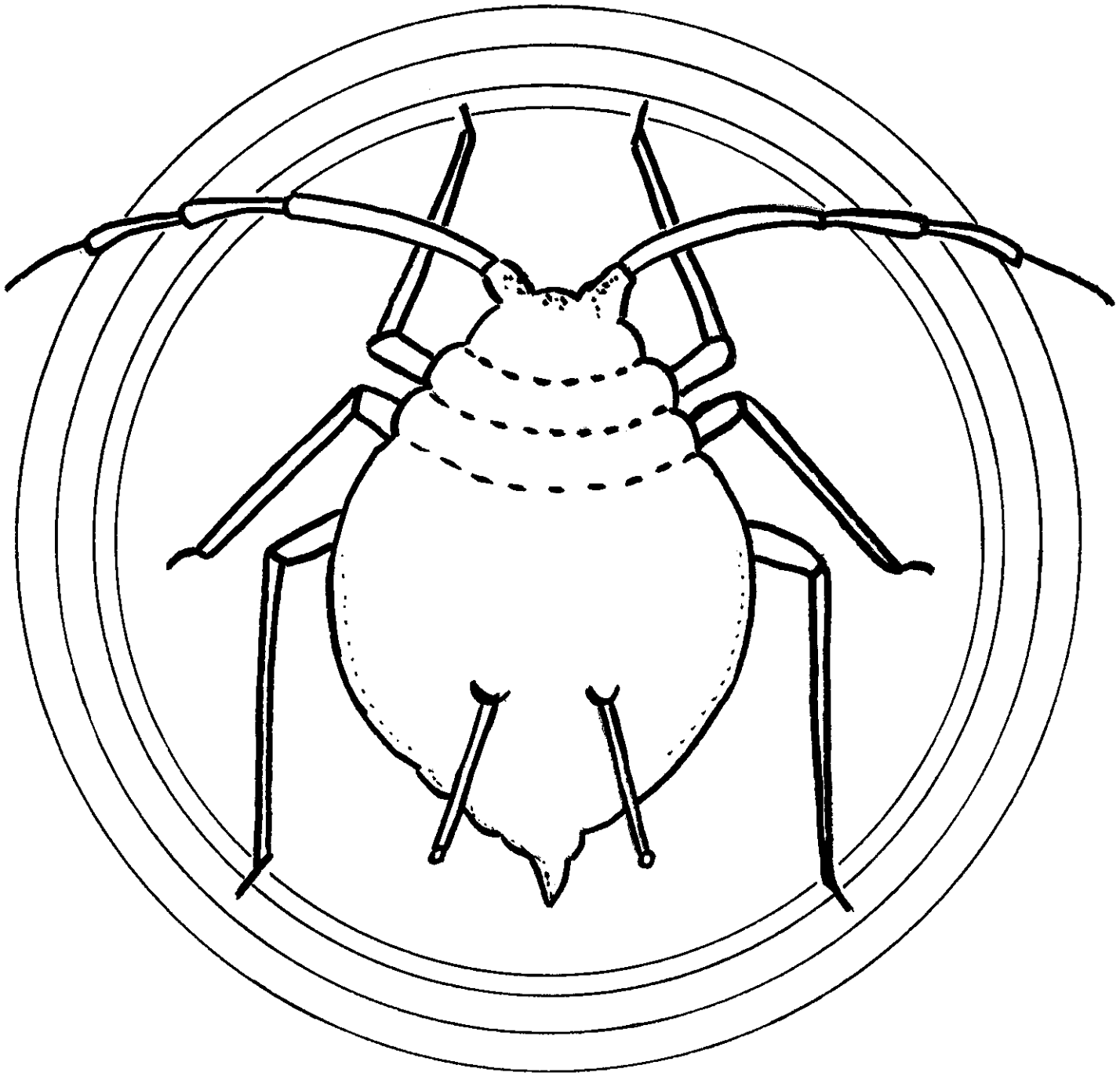
3/ Neither of the means are significantly different at the 5% level of an F distribution test.

Table 8 - Good and defective seeds in samples from insecticide timing experiment for Lygus bug control. Firebaugh, California, 1978.

Treatment[1/]	AI/A lb.	Replications[2/]	Total Seed Examined	Good Seed	Defective Seeds					
					Chalcid	Lygus bug	Stink-bug	Shriveled	Water Damage	Green
Monitor + Lorsban 4-6 bugs/ sweep	0.33 0.50	1	1582	1499	3	36	2	3	16	23
		2	1337	1250	1	55	1	0	5	25
		3	1515	1395	0	58	0	1	35	26
		4	1402	1314	1	50	3	0	9	25
		Total	5836	5458	5	199	6	4	65	99
		%	100.00	93.52	0.09	3.41	0.10	0.07	1.11	1.70
Monitor + Lorsban 8-12 bugs/ sweep	0.33 0.50	1	1504	1416	1	31	2	4	13	37
		2	1381	1289	0	57	1	0	6	28
		3	1500	1386	0	61	1	0	26	26
		4	1422	1343	0	49	2	0	11	17
		Total	5807	5434	1	198	6	4	56	108
		%	100.00	93.58	0.02	3.41	0.10	0.07	0.96	1.86

1/ Plots treated at a count of 4-6 lygus bugs/sweep received a total of 5 applications of Monitor. Plots treated at a count of 8-12 lygus bugs/sweep received a total of 4 applications of Mointor.

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



APHID

Table 9 - Aphid populations in seed alfalfa plots treated by aircraft for lygus bug control. Firebaugh, California. 1978.

Treatment[1]				Number per 50 D-Vac Samples[3]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[2]	Spotted alfalfa aphid	Pea aphid
			Pre	10,351	69
			Pre	37,154	668
Monitor	0.33				
+	+	July 12			
Lorsban	0.50				
			7	102	33
			14	236	387
			21	1,538	2,198
			Pre	3,838	415
			Pre	29,517	1,895
Monitor	0.50				
+	+	July 12			
Lorsban	0.50				
			7	33	59
			14	24	416
			21	252	4,252
			Pre	1,400	1,152
			Pre	7,721	5,963
Pydrin	0.20	July 12			
			7	68	246
Carzol	0.75				
+	+				
Lorsban	0.50				
			7	0	32
			14	13	221
			Pre	74	657
			Pre	816	4,407
UC 51762	1.00	July 12			
			7	1,956	22,873
Carzol	0.75				
+	+	July 19			
Lorsban	0.50				
			7	9	406
			14	16	2,384

Table 9 - (continued)

Treatment[1]				Number per 50 D-Vac Samples[3]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[2]	Spotted alfalfa aphid	Pea aphid
			Pre	12	711
			Pre	253	4,651
Bendiocarb	0.50	July 12			
			7	802	23,094
Carzol	0.75				
+	+	July 19			
Lorsban	0.50				
			7	5	574
			14	46	3,927
			Pre	11	428
			Pre	207	2,208
Bendiocarb	1.00	July 12			
			7	534	12,384
Carzol	0.75				
+	+	July 19			
Lorsban	0.50				
			7	4	219
			14	81	2,431
			Pre	17	212
			Pre	531	892
Ambush	0.30	July 12			
			7	12	67
			14	13	888
			21	72	9,063
			Pre	68	77
			Pre	899	624
Carzol	0.75	July 12			
			7	1,876	3,643
Lorsban	0.50	July 19			
			7	62	915
			14	647	3,275
			Pre	-	-
			Pre	162	1,708
Monitor	0.33	July 12			
			7	1,048	785
			14	2,305	1,687
			21	12,648	8,452

Table 9 - (continued)

Treatment[1]				Number per 50 D-Vac Samples[3]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[2]	Spotted alfalfa aphid	Pea aphid
Monitor + Buffer	0.33 + 0.32 oz/gal	July 12	Pre	-	-
			Pre	344	1,513
			7	365	682
			14	1,827	1,669
			20	23,322	10,841

1/ Plot size: Each treatment 5 acres (165'x1320'). Bendiocarb and UC 51762 were wettable powders 76% and 75% respectively. Carzol was a 92% soluble powder while the others were emulsifiable concentrates.
Sprays were applied at 10 GPA. Plots were treated July 12 from 1:00 AM to 4:30 AM.

2/ Pretreatment counts were made on July 5 and July 11. The Pydrin and UC 51762 plots were treated with Carzol + Lorsban 0.75 lbs. AI/A and 0.50 lbs. AI/A respectively on July 19. The Carzol plot was treated with Lorsban 0.5 lbs. AI/A on July 19.

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

Table 10 - Aphid populations in seed alfalfa plots where insecticides were applied at a count of 4-6 lygus bugs per sweep. Firebaugh, California. 1978.[1]

Treatment[2]				Number per 50 D-Vac samples[4]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[3]	Spotted alfalfa aphid	Pea aphid
			Pre	0	7.0
Monitor	0.33	June 7			
			7	1.1	7.8
			14	18.5	88.6
Monitor + Plictran	0.33 + 0.75	June 22			
			6	85.5	41.0
			14	478.5	1,653.8
Monitor + Plictran	0.33 + 0.75	July 6			
			6	1,550.8	997.7
			13	711.0	4,232.2
			20	55.3	1,051.1
Lorsban	0.50	July 19			
			27	1,630.7	12,749.3
Monitor + Lorsban	0.33 + 0.50	August 8			
			7	97.0	348.1
			14	107.5	859.0
			21	2,016.3	1,723.8
Monitor + Lorsban	0.50 + 0.50	August 23			
			7	2.2	18.5
			14	wet	wet
			21	77.0	94.5

1/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

2/ Applications were made by aircraft at 10 GPA prior to 5:30 AM. Plictran was a 50% wettable powder while Monitor and Lorsban were emulsifiable concentrates.

3/ Pretreatment count was made June 6.

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

Table 11 - Aphid populations in seed alfalfa plots where insecticides were applied at a count of 8-12 lygus bugs per sweep. Firebaugh, California. 1978[1].

Treatment[2]				Number per 50 D-Vac Samples[4]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[3]	Spotted alfalfa aphid	Pea aphid
			Pre	0.0	4.1
Monitor	0.33	June 7			
			7	1.3	8.1
			14	45.3	114.3
			21	31.1	182.8
Monitor + Plictran	0.33 + 0.75	June 29			
			7	379.1	1,536.3
			13	1,502.4	2,750.3
Monitor + Lorsban	0.33 + 0.50	July 12			
			6	83.7	104.4
			13	188.0	355.6
			20	2,159.5	6,832.8
Lorsban	0.50	August 2			
			28	10.3	865.6
			35	10.6	1,081.5
Monitor + Lorsban	0.50 + 0.50	August 16			
			7	18.0	17.0
			14	3.7	14.2
			21	wet	wet
			28	89.2	256.3

1/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

2/ Applications were made by aircraft at 10 GPA prior to 5:30 AM. Plictran was a 50% wettable powder while Monitor and Lorsban were emulsifiable concentrates.

3/ Pretreatment count was made June 6.

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

Table 12 - Aphid populations in a commercial seed alfalfa field. Firebaugh, California. 1978[1].

Field Location Variety	Date Sampled	Blue alfalfa aphid			Pea aphid			Spotted alfalfa aphid		
		Wingless	Winged	Total	Wingless	Winged	Total	Wingless	Winged	Total
1 Firebaugh DeKalb 185	Feb. 21	549	14	563	72	0	72	10	0	10
	Feb. 28	3,625	32	3,657	29	0	29	3	0	3
	Mar. 7	5,337	86	5,423	103	7	110	9	0	9
	Mar. 14	15,289	371	15,660	182	13	195	0	0	0
	Mar. 21	23,769	672	24,441	397	0	397	0	0	0
	Mar. 28	2,170	310	2,480	4	0	4	0	0	0
	April 4	275	21	296	0	0	0	0	0	0
	April 11	215	167	382	7	0	7	0	0	0
	April 18	121	45	166	10	0	10	0	0	0
	April 25	742	51	793	83	0	83	0	0	0
	May 2	1,129	19	1,148	60	0	60	0	0	0
	May 11	9	3	12	22	6	28	0	0	0

[1]/ Counts based on 50 D-Vac samples. Samples were examined in laboratory after 24-hour berlese funnel separation.

Table 13 - Aphid populations in a commercial seed alfalfa field. Firebaugh, California. 1978[1].

Field Location Variety	Date Sampled	Blue alfalfa aphid			Pea aphid			Spotted alfalfa aphid		
		Wingless	Winged	Total	Wingless	Winged	Total	Wingless	Winged	Total
	Feb. 21	549	14	563	37	0	37	10	0	10
	Feb. 28	2,595	29	2,624	211	0	211	6	0	6
	Mar. 7	545	0	545	103	7	110	9	0	9
	Mar. 14	758	4	762	38	0	38	42	0	42
	Mar. 21	18,201	909	19,110	1,075	51	1,126	28	0	28
2 Firebaugh UC Cargo	Mar. 28	2,244	252	2,496	16	0	16	0	0	0
	April 4	- - - - - - - - - - - - - - - - - - W E T - - - - - - - - - - - - - - - - - -								
	April 11	116	278	394	2	0	2	0	0	0
	April 18	- - - - - - - - - - - - - - - - - CLIPPED BACK - - - - - - - - - - - - - - - - -								
	April 25	- - - - - - - - - - - - - - - - - - W E T - - - - - - - - - - - - - - - - - -								
	May 5	1,491	153	1,644	0	0	0	0	0	0
	May 11	98	11	109	36	4	40	0	0	0

[1]/ Counts based on 50 D-Vac samples. Samples were examined in laboratory after 24-hour berlese funnel separation.

Table 14 - Aphid populations in a commercial seed alfalfa field. Five points, California. 1978[1].

Field Location Variety	Date Sampled	Blue alfalfa aphid			Pea aphid			Spotted alfalfa aphid		
		Wingless	Winged	Total	Wingless	Winged	Total	Wingless	Winged	Total
3 Five points CUF 101	Feb. 21	3,869	132	4,001	14	0	14	0	0	0
	Feb. 28	7,395	58	7,453	41	0	41	0	0	0
	Mar. 7	8,505	230	8,735	25	0	25	0	0	0
	Mar. 14	8,653	710	9,363	134	13	147	0	0	0
	Mar. 21	2,296	428	2,724	0	0	0	0	0	0
	Mar. 28	704	35	739	22	0	22	0	0	0
	April 4	12	3	15	0	0	0	0	0	0
	April 11	72	14	86	2	0	2	0	0	0
	April 18	278	32	310	25	0	25	0	0	0
	April 25	31	1	32	15	0	15	0	0	0
	May 5	16	10	26	13	0	13	0	0	0
	May 11	134	19	153	22	6	28	0	0	0

1/ Counts based on 50 D-Vac samples. Samples were examined in laboratory after 24-hour berlese funnel separation.

Table 15 - Aphid populations in a commercial seed alfalfa field. Five Points, California. 1978[1].

Field Location Variety	Date Sampled		Blue alfalfa aphid			Pea aphid			Spotted alfalfa aphid		
			Wingless	Winged	Total	Wingless	Winged	Total	Wingless	Winged	Total
4 Five Points WL 310	Feb.	21	4,164	10	4,174	9	0	9	0	0	0
	Feb.	28	1,290	11	1,301	59	3	62	0	0	0
	Mar.	7	3,228	22	3,250	16	0	16	0	0	0
	Mar.	14	1,028	37	1,065	8	0	8	0	0	0
	Mar.	21	2,088	102	2,190	0	0	0	0	0	0
	Mar.	28	15,000	420	15,420	20	0	20	0	0	0
	April	4	1,561	153	1,714	0	0	0	0	0	0
	April	11	1,504	313	1,817	41	6	47	0	0	0
	April	18	- - - - - - - - - - - - - - - - - - CLIPPED BACK - - - - - - - - - - - - - - - - - -								
	April	25	- - - - - - - - - - - - - - - - - - CLIPPED BACK - - - - - - - - - - - - - - - - - -								
	May	2	244	29	273	99	0	99	0	0	0
	May	11	259	38	297	80	6	86	0	0	0

[1]/ Counts based on 50 D-Vac samples. Samples were examined in laboratory after 24-hour berlese funnel separation.

Table 16 - Aphid populations in a commercial seed alfalfa field. San Joaquin, California. 1978[1],

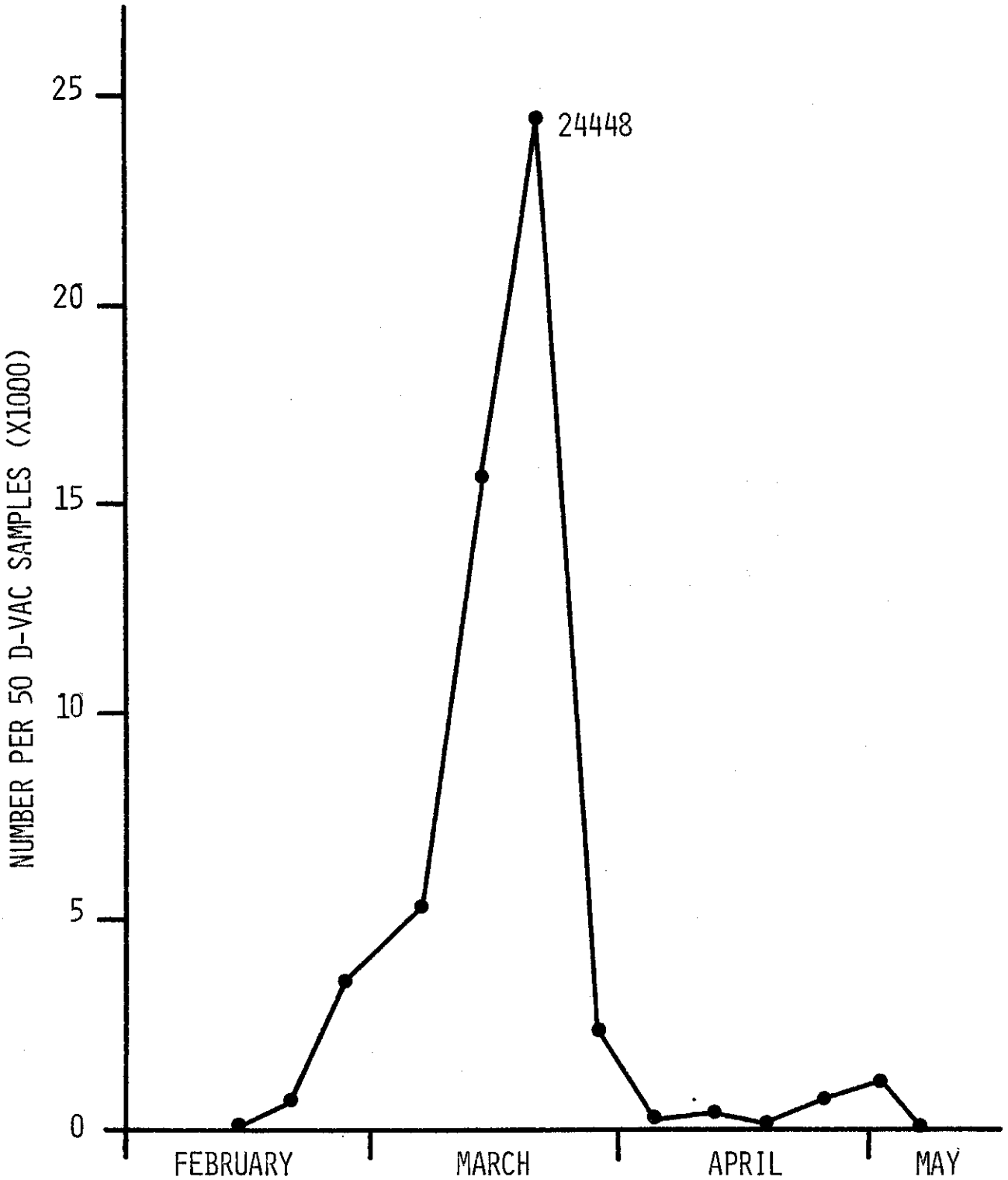
Field Location Variety	Date Sampled	Blue alfalfa aphid			Pea aphid			Spotted alfalfa aphid		
		Wingless	Winged	Total	Wingless	Winged	Total	Wingless	Winged	Total
5 San Joaquin CUF 101	Feb. 21	2,257	53	2,310	31	0	31	0	0	0
	Feb. 28	2,714	38	2,752	12	0	12	0	0	0
	Mar. 7	- - - - - - - - - - - - - - - - - - W E T - - - - - - - - - - - - - - - - - -								
	Mar. 14	3,456	266	3,722	61	0	61	0	0	0
	Mar. 21	16	16	32	0	0	0	0	0	0
	Mar. 28	112	100	212	10	0	10	2	0	2
	April 4	691	63	754	29	0	29	0	0	0
	April 11	1,983	102	2,085	40	0	40	0	0	0
	April 18	3,856	248	4,104	0	0	0	0	0	0
	April 25	1,232	120	1,352	6	0	6	0	0	0
	May 5	1,117	51	1,168	132	6	138	0	0	0
	May 11	10	48	58	25	22	47	0	0	0

1/ Counts based on 50 D-Vac samples. Samples were examined in laboratory after 24-hour berlese funnel separation.

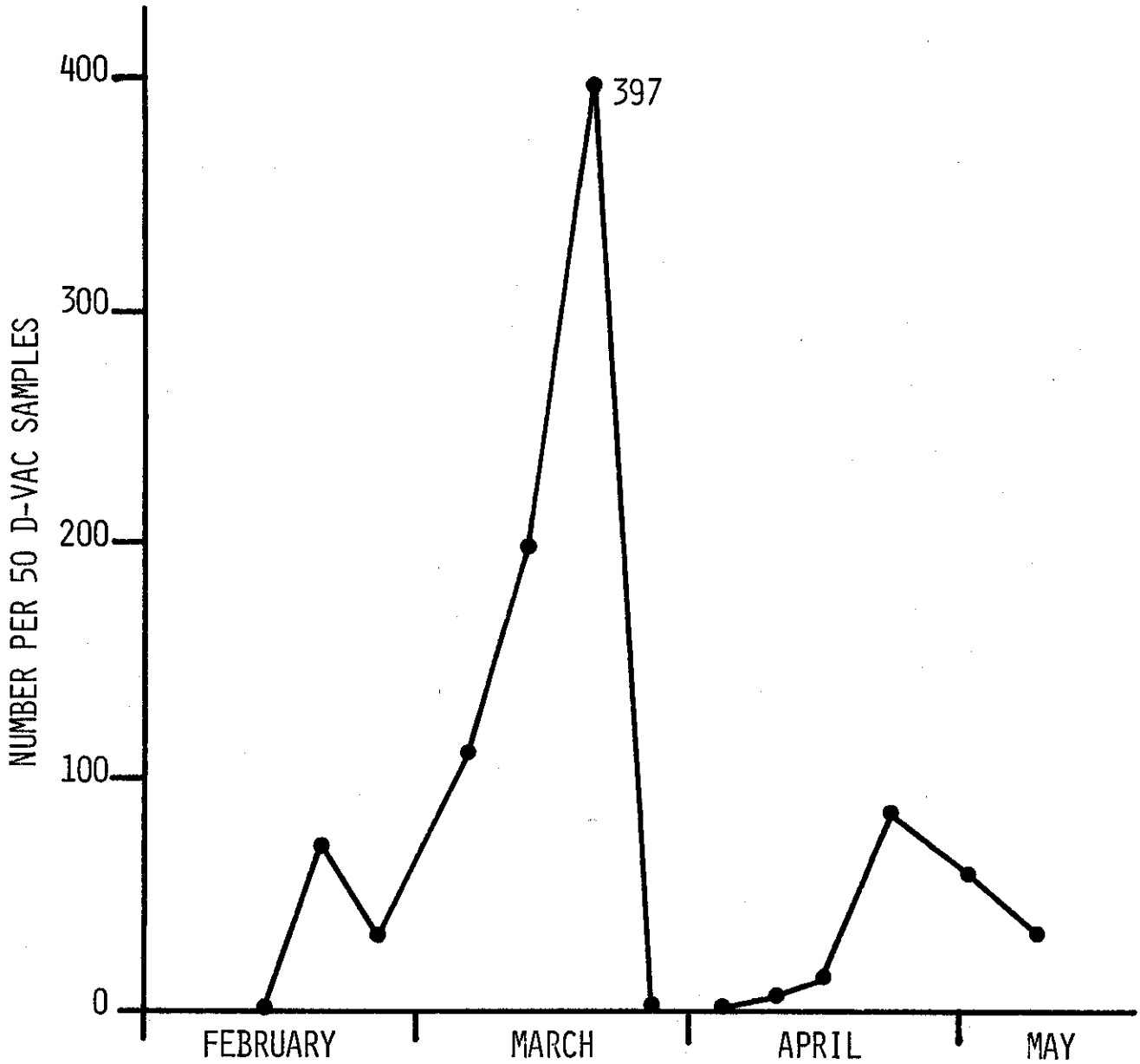
Table 17 - Aphid populations in a commercial seed alfalfa field. San Joaquin, California. 1978[1].

Field Location Variety	Date Sampled	Blue alfalfa aphid			Pea aphid			Spotted alfalfa aphid		
		Wingless	Winged	Total	Wingless	Winged	Total	Wingless	Winged	Total
6 San Joaquin Tempo	Feb. 21	17	1	18	3	0	3	0	0	0
	Feb. 28	0	0	0	0	0	0	0	0	0
	Mar. 7	543	7	550	33	0	33	2	0	2
	Mar. 14	1,503	13	1,516	48	0	48	0	0	0
	Mar. 23	22	31	53	0	0	0	1	0	1
	Mar. 28	575	227	802	16	3	19	1	0	1
	April 4	992	114	1,106	14	0	14	0	0	0
	April 11	5,182	426	5,608	143	0	143	0	0	0
	April 18	8,921	140	9,061	51	0	51	13	0	13
	April 25	4,504	200	4,704	96	0	96	0	0	0
	May 2	660	58	718	304	16	320	0	0	0
	May 11	4	10	14	2	2	4	0	0	0

[1]/ Counts based on 50 D-Vac samples. Samples were examined in laboratory after 24-hour berlese funnel separation.



BLUE ALFALFA APHID POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD. FIREBAUGH, CALIFORNIA. 1978.



PEA APHID POPULATIONS IN AN UNTREATED SEED ALFALFA FIELD.
FIREBAUGH, CALIFORNIA. 1978.

Table 18 - Spider mite populations in seed alfalfa plots treated by aircraft for lygus bug control. Firebaugh, California. 1978.

Treatment[1]				Number per leaf[3]	
Insecticides	AI/Acre lb.	Dates of application	Days after Treatment[2]	Mites	Eggs
Monitor + Lorsban	0.33 + 0.50	July 12	Pre	2.4	3.6
			Pre	1.8	11.2
			7	5.0	0.6
			14	5.0	32.2
			21	16.3	20.3
Monitor + Lorsban	0.50 + 0.50	July 12	Pre	1.7	4.9
			Pre	3.6	12.9
			7	4.4	3.6
			14	3.0	20.2
			21	13.3	19.4
Pydrin	0.20	July 12	Pre	1.1	7.2
			Pre	3.9	15.6
			7	11.1	18.3
Carzol + Lorsban	0.75 + 0.50	July 19	7	2.7	4.1
UC 51762	1.00	July 12	Pre	4.3	4.4
			Pre	3.7	9.0
			7	9.5	18.4
Carzol + Lorsban	0.75 + 0.50	July 19	7	1.0	1.1

Table 18 - (continued)

Treatment[1]				Number per leaf[3]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[2]	Mites	Eggs
			Pre	3.6	7.6
			Pre	2.4	8.0
Bendiocarb	0.50	July 12			
			7	6.7	18.6
Carzol	0.75				
+	+	July 19			
Lorsban	0.50				
			7	2.7	4.1
			Pre	1.2	4.4
			Pre	5.0	21.2
Bendiocarb	1.00	July 12			
			7	6.2	13.9
Carzol	0.75				
+	+	July 19			
Lorsban	0.50				
			7	0.5	0.9
			Pre	1.8	1.3
			Pre	1.4	2.3
Ambush	0.30	July 12			
			7	15.7	32.8
			14	10.6	33.8
			21	12.3	25.1
			Pre	1.5	2.8
			Pre	1.7	4.6
Carzol	0.75	July 12			
			7	1.6	3.1
Lorsban	0.50	July 19			
			14	2.1	5.8
			21	5.8	11.7
			Pre	2.9	11.3
			Pre	5.9	4.6
Monitor	0.33	July 12			
			7	2.0	9.7
			14	7.8	15.6

Table 18 - (continued)

Treatment[1]				Number per leaf[3]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[2]	Mites	Eggs
			Pre	4.8	18.8
			Pre	7.1	2.5
Monitor + Buffer	0.33 + 0.32 oz.gal	July 12			
			7	2.7	14.4
			14	12.4	21.1

1/ Plot size: Each treatment 5 acres (165'x1320'). Bendiocarb and UC 51762 were wettable powders 76% and 75% respectively. Carzol was a 92% soluble powder while the others were emulsifiable concentrates. Sprays were applied at 10 GPA. Plots were treated on July 12 from 1:00 AM to 4:30 AM.

2/ Pretreatment counts were made on July 5 and July 11. The Pydrin and UC 51762 plots were treated with Carzol + Lorsban 0.75 lbs. AI/A and 0.50 lbs. AI/A respectively on July 19. The Carzol plot was treated with Lorsban 0.5 AI/A on July 19.

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

Table 19 - Spider mite populations in seed alfalfa plots where insecticides were applied at a count of 4-6 lygus bugs per sweep. Firebaugh, California. 1978[1].

Treatment[2]				Number per leaf[4]	
Insecticides	AI/acre lb.	Dates of application	Days after treatment[3]	Mites	Eggs
			Pre	5.25	8.87
Monitor	0.33	June 7			
			7	3.77	4.70
			14	4.51	11.35
Monitor + Plictran	0.33 + 0.75	June 22			
			6	4.10	12.00
			14	3.40	4.70
Monitor + Plictran	0.33 + 0.75	July 6			
			6	1.20	1.90
			13	0.40	0.80
			20	1.70	5.20
Lorsban	0.50	July 19			
			27	1.90	9.40
Monitor + Lorsban	0.33 + 0.50	August 8			
			7	1.80	6.10
			14	1.70	5.40
			21	2.68	4.34
Monitor + Lorsban	0.50 + 0.50	August 23			
			7	2.72	3.18
			14	wet	wet
			21	0.90	1.10

1/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

2/ Applications were made by aircraft at 10 GPA prior to 5:30 AM. Plictran was a 50% wettable powder while Monitor and Lorsban were emulsifiable concentrates.

3/ Pretreatment count was made June 6.

4/ 50 trifoliate leaves were examined in each replicate on every sampling date.

Table 20 - Spider mite populations in seed alfalfa plots where insecticides were applied at a count of 8-12 lygus bugs per sweep. Firebaugh, California. 1978[1].

Treatment[2]				Number per leaf[4]	
Insecticides	AI/acre lb.	Dates of application	Days after treatment[3]	Mites	Eggs
			Pre	5.22	9.15
Monitor	0.33	June 7			
			7	4.22	3.85
			14	4.79	9.01
			21	6.50	22.40
Monitor + Plictran	0.33 + 0.75	June 29			
			7	4.20	12.00
			13	2.30	4.10
Monitor + Lorsban	0.33 + 0.50	July 12			
			6	0.60	1.20
			13	1.90	8.50
			20	4.30	11.30
Lorsban	0.50	August 2			
			28	3.90	8.50
			35	2.50	7.10
Monitor + Lorsban	0.50 + 0.50	August 16			
			7	1.08	1.11
			14	3.46	4.18
			21	wet	wet
			28	1.20	1.90

1/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

2/ Applications were made by aircraft at 10 GPA prior to 5:30 AM. Plictran was a 50% wettable powder while Monitor and Lorsban were emulsifiable concentrates.

3/ Pretreatment count was made June 6.

4/ 50 trifoliate leaves were examined in each replicate on every sampling date.

Table 21 - Spider mite populations in seed alfalfa plots treated by aircraft for spider mite control. Firebaugh, California. 1978[1].

Treatment[2]				Number per Leaf[4]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[3]	Mites	Eggs
			Pre	0.9	1.4
Comite	1.69	August 2			
			6	0.1	0.0
Monitor	0.50				
+	+	August 9			
Lorsban	0.50				
			13	0.0	0.0
			20	0.0	0.0
			27	0.0	0.0
			Pre	2.0	5.4
Vendex	1.00	August 2			
			6	0.3	0.3
Monitor	0.50				
+	+	August 9			
Lorsban	0.50				
			13	0.1	0.0
			20	0.1	0.0
			27	0.1	0.0
			Pre	7.1	22.1
Plictran	0.75	August 2			
			6	0.1	0.2
Monitor	0.50				
+	+	August 9			
Lorsban	0.50				
			13	0.0	0.0
			20	0.0	0.0
			27	0.0	0.1
			Pre	8.5	15.2
Plictran	0.50	August 2			
			6	0.6	0.4
Monitor	0.50				
+	+	August 9			
Lorsban	0.50				
			13	0.0	0.1
			20	0.0	0.0
			27	0.0	0.0

Table 21 - (continued)

Treatment[2]				Number per Leaf[4]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[3]	Mites	Eggs
			Pre	6.0	12.6
UC 55304	0.46	August 2			
			6	0.0	0.4
Monitor	0.50				
+	+	August 9			
Lorsban	0.50				
			13	0.2	0.3
			20	0.0	0.0
			27	0.0	0.0
			Pre	7.1	16.5
UC 55304	0.25	August 2			
			6	0.3	1.4
Monitor	0.50				
+	+	August 9			
Lorsban	0.50				
			13	1.1	0.5
			20	0.3	0.3
			27	0.1	0.0
			Pre	5.5	11.8
Carzol	0.75	August 2			
			6	0.6	1.6
Monitor	0.50				
+	+	August 9			
Lorsban	0.50				
			13	0.2	2.3
			20	0.6	0.1
			27	0.1	0.1
			Pre	2.0	8.2
Carzol	0.75				
+	+	August 2			
Comite	1.69				
			6	0.6	0.3
Monitor	0.50				
+	+	August 9			
Lorsban	0.50				
			13	0.0	0.0
			20	0.1	0.5
			27	0.0	0.0

1/ Plot size: Each treatment consisted of 5 acres (165'x1320').

2/ Plictran and Vendex were 50% wettable powders, Carzol was a 92% soluble powder while Comite and UC 55304 were emulsifiable concentrates. Sprays were applied at 10 GPA prior to 5:00 AM.

3/ Pretreatment count was made August 2.

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

Table 22 - Spider mite populations in a seed alfalfa field treated by aircraft for spider mite control. Firebaugh, California. 1978[1].

Treatment[2]				Number per Leaf[4]	
Insecticides	AI/Acre lb.	Dates of application	Days after treatment[3]	Mites	Eggs
Carzol	0.75	September 5	Pre	4.4	8.5
			Pre	5.1	13.7
			Pre	6.9	8.4
			7	2.8	8.4
			14	14.8	35.5
			21	28.4	23.1
Plictran	0.75	September 5	Pre	6.2	15.6
			Pre	7.1	18.2
			Pre	8.3	11.9
			7	1.0	2.3
			14	1.1	1.2
			21	6.3	16.8
Comite	1.69	September 5	Pre	3.4	7.9
			Pre	7.1	20.5
			Pre	4.4	5.9
			7	0.6	1.6
			14	0.2	0.1
			21	0.1	0.0

1/ Plot size: Each treatment consisted of 5 acres (165'x1320').

2/ Carzol was a 92% soluble powder, Plictran was a 50% wettable powder and Comite was an emulsifiable concentrate. Sprays were applied at 10 GPA prior to 5:00 AM.

3/ Pretreatment counts were made August 15, 22 and 29.

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

Table 23 - Predator and parasite populations in seed alfalfa plots treated by aircraft for lygus bug control. Firebaugh, California. 1978.

Treatment[1] Insecticides	AI/ Acre lb.	Days after treatment[2]	Number per 50 D-Vac Samples[3]															
			Geocoris		Nabis		Orius		Lacewing		Syrphid		Cocci-nellidae		Collops		Parasitic Wasps	Spiders
			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
Monitor + Lorsban	0.33 + 0.50	Pre	0	0	0	0	4	0	4	2	0	0	0	0	0	0	51	239
		Pre	5	0	1	0	3	0	1	5	0	0	1	0	0	0	51	57
		7	0	0	0	0	1	0	1	9	0	0	0	0	3	0	2	8
		14	0	0	0	1	1	0	1	1	0	0	0	1	0	0	25	5
		21	1	0	0	2	0	0	3	0	0	0	0	0	0	0	2	5
Monitor + Lorsban	0.50 + 0.50	Pre	0	0	0	0	4	3	2	3	0	0	0	0	0	0	34	230
		Pre	2	0	0	1	5	0	5	4	0	0	0	0	1	0	46	137
		7	0	0	0	0	0	0	1	9	0	0	0	0	2	0	2	36
		14	0	0	0	0	1	0	0	2	0	0	0	0	0	0	17	31
		21	0	0	0	0	0	0	3	2	0	0	0	0	0	0	6	20
Pydrin	0.20	Pre	1	0	2	4	3	0	10	2	0	0	0	0	0	0	69	419
		Pre	3	0	0	4	4	1	1	21	0	0	0	0	1	0	49	245
Carzol + Lorsban	0.75 (7/19) + 0.50	7	0	0	0	0	0	0	0	12	0	0	0	0	0	0	2	4
		7	0	0	0	0	0	0	4	18	0	0	0	0	0	0	1	15
		14	0	1	0	0	0	0	1	3	0	0	0	0	0	0	5	7

Table 23 - (continued)

Treatment[1]		Days after treatment[2]	Number per 50 D-Vac Samples[3]															
			Geocoris		Nabis		Orius		Lacewing		Syrphid		Cocci-nellidae		Collops		Parasitic Wasps	Spiders
Insecticides	AI/ Acre lb.		A	N	A	N	A	N	A	L	A	L	A	L	A	L		
		Pre	0	0	6	9	1	1	7	6	0	0	0	0	0	0	27	457
		Pre	2	0	1	1	3	0	3	18	0	0	0	0	0	0	35	245
UC 51762	1.00																	
		7	0	0	1	2	1	1	0	43	0	0	0	0	0	0	4	67
Carzol + (7/19) + Lorsban	0.75 + 0.50																	
		7	0	0	0	0	1	0	3	5	0	0	0	0	0	0	4	33
		14	0	1	0	0	0	0	3	0	0	0	0	0	1	0	3	64
		Pre	1	0	2	12	0	1	9	5	0	0	0	0	0	0	16	435
		Pre	4	1	2	3	3	1	5	7	0	0	0	0	1	0	40	283
Bendiocarb	0.50																	
		7	0	0	0	0	1	0	1	2	0	0	0	0	0	0	3	69
Carzol + (7/19)	0.75																	
Lorsban	0.50																	
		7	0	0	0	0	0	0	0	6	0	0	0	0	0	0	3	43
		14	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2	127
		Pre	0	0	2	5	5	0	3	2	0	0	0	0	0	0	29	298
		Pre	0	0	3	0	3	1	4	12	0	0	0	0	0	0	35	213
Bendiocarb	1.00																	
		7	0	0	1	0	0	0	0	4	0	0	0	0	0	0	1	119
Carzol + (7/19) + Lorsban	0.75 + 0.50																	
		7	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	26
		14	1	0	0	0	0	0	2	0	0	0	0	0	0	0	1	119

Table 23 - (continued)

Treatment[1] Insecticides	AI/ Acre lb.	Days after treatment[2]	Number per 50 D-Vac Samples[3]															
			Geocoris		Nabis		Orius		Lacewing		Syrphid		Cocci-nellidae		Collops		Parasitic Wasps	Spiders
			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
Ambush	0.30	Pre	0	0	0	6	1	0	9	3	0	0	0	0	0	0	22	335
		Pre	2	0	0	1	1	0	4	17	0	0	0	0	0	0	4	163
		7	0	0	0	2	0	0	1	7	0	0	0	0	0	0	1	8
		14	5	0	0	0	2	0	0	10	0	0	0	0	0	0	15	19
		21	5	0	0	0	2	0	7	3	0	0	0	0	0	0	7	4
Carzol	0.75	Pre	2	0	3	4	1	0	3	5	0	0	0	0	0	0	12	296
		Pre	4	0	2	1	1	1	4	4	0	0	0	0	0	0	12	214
Lorsban (7/19)	0.50	7	0	0	1	0	0	0	0	10	0	0	0	2	0	0	8	40
		7	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	26
		14	0	2	0	0	0	0	4	0	0	0	0	1	0	0	1	28
Monitor	0.33	Pre	2	0	1	1	4	1	6	9	0	0	0	1	0	0	50	309
		7	1	0	0	3	1	0	0	21	0	0	0	0	0	0	4	141
		14	0	0	0	0	0	0	0	3	0	0	0	0	0	0	28	112
		21	0	0	0	1	0	0	6	4	0	0	0	2	1	0	8	86
Monitor + Buffer	0.33 + 0.32 oz/gal	Pre	3	3	2	0	6	1	6	8	1	0	1	0	0	0	65	397
		7	0	0	1	4	0	1	1	8	0	0	0	0	0	0	3	143
		14	0	0	0	1	0	0	1	6	0	0	0	0	1	0	16	69
		21	1	0	0	3	0	0	6	8	0	0	0	0	0	0	20	186

[1]/ Plot size: Each treatment 5 acres (165'x1320'). Sprays were applied by aircraft at 10 GPA. Bendiocarb and UC 51762 were wettable powders 76% and 75% respectively, Carzol was a 92% soluble powder while the others were emulsifiable concentrates.
Plots were treated July 12 from 1:00 AM to 4:30 AM.

[2]/ Pretreatment counts were made July 5 and July 11. The Pydrin, UC 51762 plots together with the two Bendiocarb plots were treated with Carzol + Lorsban 0.75 lbs. AI/A and 0.50 lbs. AI/A respectively on July 19. The Carzol plot was treated with Lorsban 0.50 lbs. AI/A on July 19.

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

Table 24 - Predator and parasite populations in seed alfalfa plots where insecticides were applied at a count of 4-6 lygus bugs per sweep. Firebaugh, California. 1978[1].

Treatment[2]		Days after treatment[3]	Number per 50 D-Vac Samples[4]															
Insecticides	AI/ Acre lb.		Geocoris		Nabis		Orius		Lacewing		Syrphid		Cocci-nellidae		Collops		Para-sitic Wasps	Spiders
			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
		Pre	1.6	3.6	15.8	122.6	175.1	17.1	0.0	0.1	0.0	0.0	11.9	0.0	0.0	0.0	126.3	24.6
Monitor (6/7)	0.33																	
		7	0.0	0.0	0.8	3.0	2.8	3.5	0.8	0.6	0.0	0.0	1.5	0.0	0.0	0.0	207.8	82.3
		14	0.0	0.0	3.3	6.5	9.8	16.5	0.8	3.1	0.0	0.0	1.8	0.0	0.0	0.0	169.0	171.8
Monitor + (6/22) + Plictran	0.33 + 0.75																	
		6	0.0	0.0	0.3	0.3	2.8	2.8	0.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0	34.5	26.0
		14	0.0	0.0	4.3	6.8	6.5	2.0	4.8	4.0	0.0	0.0	0.0	0.0	0.0	0.0	34.0	135.0
Monitor + (7/6) + Plictran	0.33 + 0.75																	
		6	1.0	0.0	0.8	0.5	0.8	0.0	1.2	8.4	0.0	0.0	0.0	1.2	0.0	0.0	20.0	27.0
		13	0.4	0.0	0.2	2.5	0.2	0.2	0.8	11.0	0.0	0.0	0.0	0.0	0.8	0.0	15.2	42.8
		20	0.0	0.0	0.2	1.5	0.2	0.2	2.6	2.5	0.0	0.0	0.0	0.5	0.0	0.0	4.5	10.5
Lorsban (7/19)	0.50																	
		27	0.6	0.0	0.5	3.0	0.8	0.5	9.2	5.5	0.0	0.0	0.0	4.0	1.2	0.0	8.5	71.5
Monitor + (8/2) + Lorsban	0.33 + 0.50																	
		7	0.3	0.0	0.3	0.5	0.3	0.5	3.3	11.8	0.0	0.0	0.3	0.0	0.3	0.0	2.5	9.8
		14	0.3	0.0	0.3	0.0	0.0	0.0	2.3	7.8	0.0	0.0	0.0	0.0	0.5	0.3	8.3	37.3
		21	0.0	0.0	0.0	0.2	0.0	0.0	3.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0	1.8	14.5
Monitor + (8/23) + Lorsban	0.50 + 0.50																	
		7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	8.8	0.0	0.0	0.0	0.0	0.0	0.0	1.2	6.5
		14	- W E T -															
		21	0.0	0.0	0.5	0.0	0.2	0.0	2.7	7.2	0.0	0.0	0.0	0.0	0.5	0.0	6.0	7.5

1/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

2/ Applications were made by aircraft at 10 GPA prior to 5:30 AM.

3/ Pretreatment count was made June 6.

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

Table 25 - Predator and parasite populations in seed alfalfa plots where insecticides were applied at a count of 8-12 lygus bugs per sweep. Firebaugh, California. 1978[1].

Treatment[2]		Days after treatment[3]	Number per 50 D-Vac Samples[4]															
Insecticides	AI/ Acre lb.		Geocoris		Nabis		Orius		Lacewing		Syrphid		Cocci-nellidae		Collops		Para-sitic Wasps	Spiders
			A	N	A	N	A	N	A	L	A	L	A	L	A	L		
		Pre	1.6	4.0	14.8	31.8	155.3	13.5	0.0	0.1	0.0	0.0	9.4	0.0	0.3	0.0	108.5	24.9
Monitor (6/7)	0.33																	
		7	0.3	0.0	1.0	5.0	3.5	4.5	0.6	1.3	0.0	0.0	1.8	0.0	0.0	0.0	196.3	64.0
		14	0.0	0.0	3.8	8.0	13.0	24.5	1.6	1.0	0.0	0.0	5.3	0.0	0.0	0.0	232.5	237.5
		21	0.5	0.3	2.0	1.3	11.5	19.3	1.5	0.8	0.0	0.0	0.5	0.0	0.0	0.0	92.8	46.8
Monitor + (6/29) + Plictran	0.33 + 0.75																	
		7	0.5	0.0	2.5	6.5	7.5	4.0	6.8	4.1	0.0	0.0	0.0	0.3	0.3	0.0	48.8	144.8
		13	1.0	0.7	0.2	4.2	1.5	4.0	1.3	16.2	0.0	0.0	0.2	0.0	0.0	0.0	28.8	59.5
Monitor + (7/12) + Lorsban	0.33 + 0.50																	
		6	0.2	0.0	0.0	0.2	0.5	0.0	1.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	2.5	36.0
		13	0.4	0.0	0.0	0.2	0.2	0.0	2.8	1.2	0.0	0.0	0.0	0.0	0.0	0.0	19.8	38.8
		20	0.4	0.0	0.5	0.8	0.2	0.0	3.8	4.8	0.0	0.0	0.0	1.0	0.8	0.0	8.8	58.5
Lorsban (8/2)	0.50																	
		28	0.8	0.0	0.0	1.0	0.8	0.5	2.3	57.8	0.0	0.0	0.0	0.5	0.8	0.0	4.5	9.3
		35	0.3	0.0	0.3	0.3	0.5	0.3	4.0	9.0	0.0	0.0	0.0	0.0	0.5	0.0	8.0	9.5
Monitor + (8/16) + Lorsban	0.50 + 0.50																	
		7	0.0	0.0	0.0	0.5	0.0	0.2	1.0	10.5	0.0	0.0	0.0	0.2	0.0	0.0	0.5	5.8
		14	0.0	0.0	0.0	0.0	0.0	0.0	3.0	13.2	0.0	0.0	0.0	0.0	0.0	0.0	2.2	10.2
		21	- W E T -															
		28	0.2	0.0	0.8	0.5	0.2	0.0	3.7	7.2	0.0	0.0	0.0	0.0	0.2	0.2	4.5	4.8

1/ Plot size: The treatment was replicated 4 times, each replicate consisted of 5 acres.

2/ Applications were made by aircraft at 10 GPA prior to 5:30 AM.

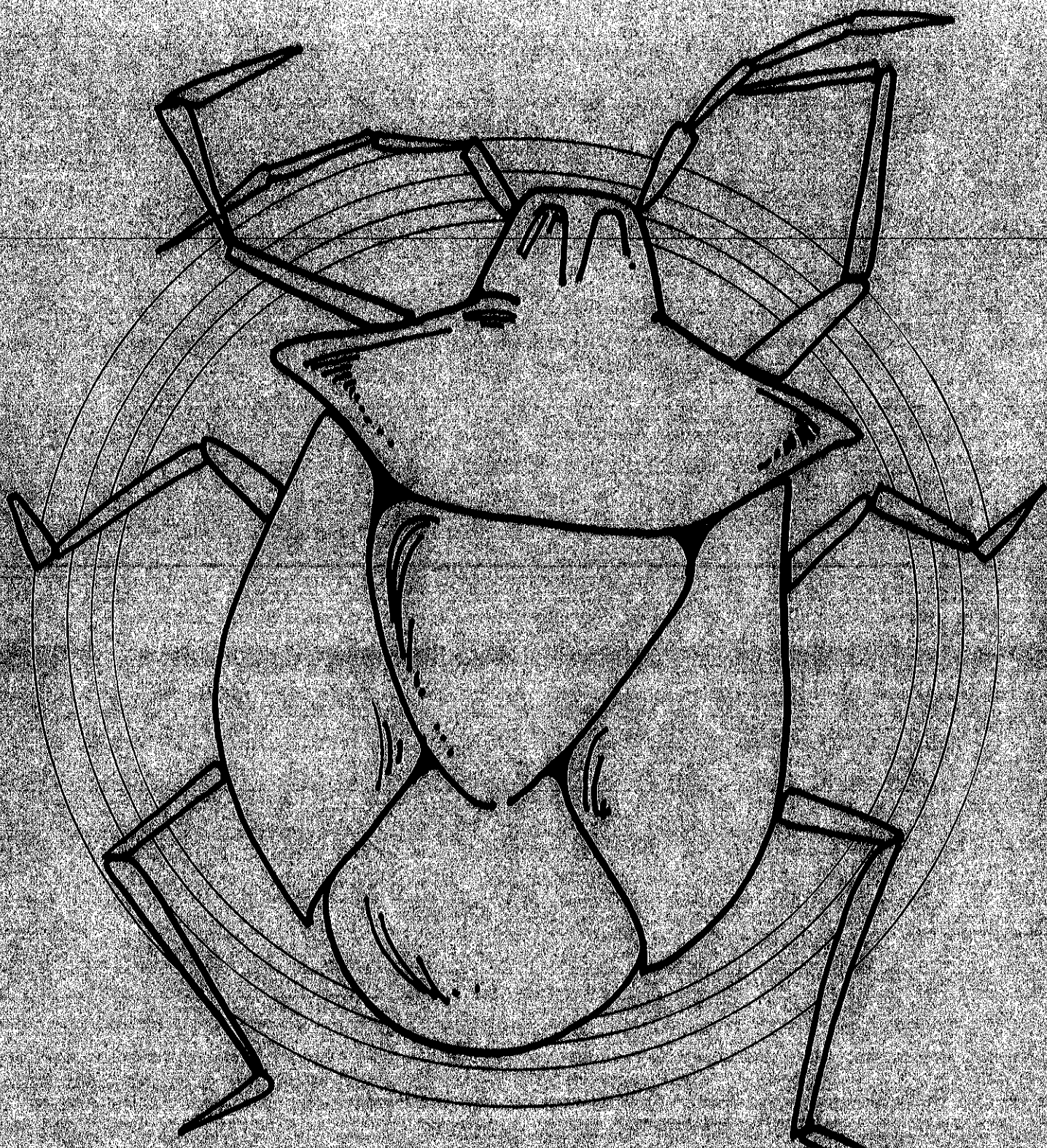
3/ Pretreatment count was made June 6.

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

Table 26 - Percentages of good and defective seeds in samples from 18 seed alfalfa fields surveyed for chalcid damaged seed. 1978.

Location	Field No.	Seeds Examined[1]	Good Seed	Defective Seeds						
				OLR	Chalcid	Lygus bug	Stink bug	Shriveled	Water damage	Green
Firebaugh	A	1377	87.0	0.4	0.0	2.4	0.1	0.0	9.1	0.9
Firebaugh	B	1471	89.0	0.1	2.5	3.2	0.4	0.1	4.6	0.1
Firebaugh	C	1472	94.6	0.2	0.0	2.0	0.2	0.4	2.0	0.6
Firebaugh	D	1413	83.8	0.0	0.1	4.4	0.1	0.8	4.2	6.6
Firebaugh	T	1455	93.5	0.0	0.1	3.4	0.1	0.1	0.1	1.8
------Average------		1437.6	89.7	0.2	0.5	3.1	0.2	0.2	4.1	2.0
Five Points	E	1656	96.1	0.1	0.1	2.3	0.2	0.0	0.6	0.6
Five Points	F	1693	94.6	0.1	0.1	2.4	0.3	0.1	1.4	1.0
Five Points	G	1290	89.6	1.0	0.2	5.2	0.6	0.0	1.5	1.9
Five Points	H	1555	87.5	0.2	0.0	9.1	0.2	0.0	2.4	0.6
------Average------		1548.5	92.2	0.3	0.1	4.6	0.3	0.0	1.5	1.0
San Joaquin	I	1258	92.4	1.4	0.0	2.4	0.0	0.0	1.3	2.5
San Joaquin	J	1393	93.6	0.2	0.4	3.8	0.2	0.0	1.4	0.4
San Joaquin	K	1442	85.4	0.0	0.6	11.2	0.9	0.0	0.8	1.1
San Joaquin	L	1348	89.3	0.0	0.6	8.5	0.5	0.0	0.9	0.2
------Average------		1360.2	90.1	0.4	0.4	6.6	0.4	0.0	1.1	1.0
Corcoran	M	1250	85.1	0.1	5.1	4.6	0.3	0.0	4.0	0.9
Corcoran	N	1287	46.3	0.1	3.6	10.6	0.5	0.0	37.2	1.7
Corcoran	O	1394	87.9	0.1	1.6	5.4	0.0	0.0	2.2	2.8
Corcoran	P	1474	55.2	0.0	10.6	9.6	0.2	0.0	24.3	0.1
Corcoran	Q	1368	86.3	0.2	1.8	8.0	0.1	0.0	2.8	0.8
------Average------		1354.6	72.1	0.1	4.6	7.7	0.2	0.0	14.1	1.2
4 area average		1422.0	85.7	0.2	1.5	5.4	0.3	0.1	5.5	1.3

[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 two subsamples from each of the threshed 2-quart samples.



STINKBUG

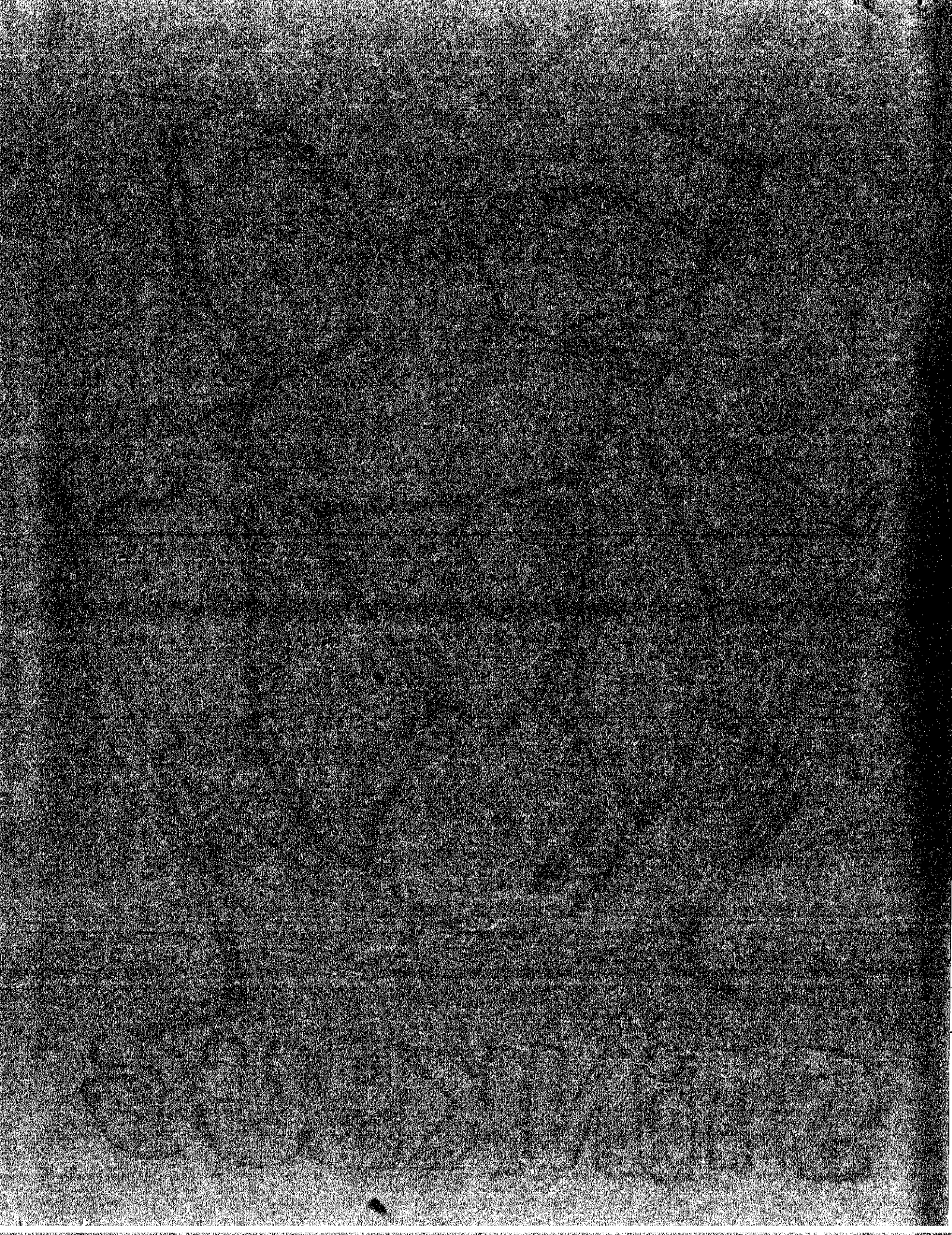


Table 27 - Stinkbug populations in 12 seed alfalfa fields. Fresno County, California. 1978.

Field Number and Location	Number per 25 ft. of row[1]					
	Consperse stinkbug			Says stinkbug		
	Adults	Nymphs	Total	Adults	Nymphs	Total
1 Five Points[2]	0	0	0	0	0	0
2 Five Points[2]	0	0	0	0	0	0
3 Five Points[2]	0	0	0	0	0	0
4 Five Points[2]	0	0	0	0	0	0
5 San Joaquin[2]	0	1	1	0	0	0
6 San Joaquin[2]	0	0	0	0	0	0
7 San Joaquin[2]	0	0	0	0	0	0
8 San Joaquin[2]	0	0	0	1	10	11
9 Firebaugh[3]	0	0	0	0	0	0
10 Firebaugh[3]	0	0	0	0	1	1
11 Firebaugh[3]	0	0	0	1	2	3
12 Firebaugh[3]	0	0	0	1	6	7
Total	0	1	1	3	19	22

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

2/ Samples collected July 31.

3/ Samples collected August 22.

Table 28 - Percent germination of alfalfa seeds damaged by different insects. Fresno Co., California. 1978[1].

Field ID Number 1977	Lygus damaged seed		Stinkbug damaged seed		Good seed	
	Germinated[2]	Not Germinated	Germinated[2]	Not Germinated	Germinated[2]	Not Germinated
34A	22	78	69	31	98	2
8A	19	81	83	17	90	10
27D	8	92	77	23	89	11
14D	6	94	71	29	89	11
18D	6	94	86	14	96	4
22B	5	95	60	40	88	12
24D	5	95	85	15	94	6
10D	8	92	84	16	96	4
40	4	96	79	21	93	7
19	4	96	88	12	90	10
Mean percentages	8.7	91.3	78.2	21.8	92.3	7.7

1/ Germination test was conducted by California Crop Improvement Association.

2/ The germinated column includes germinated + hard seed.

Table 29

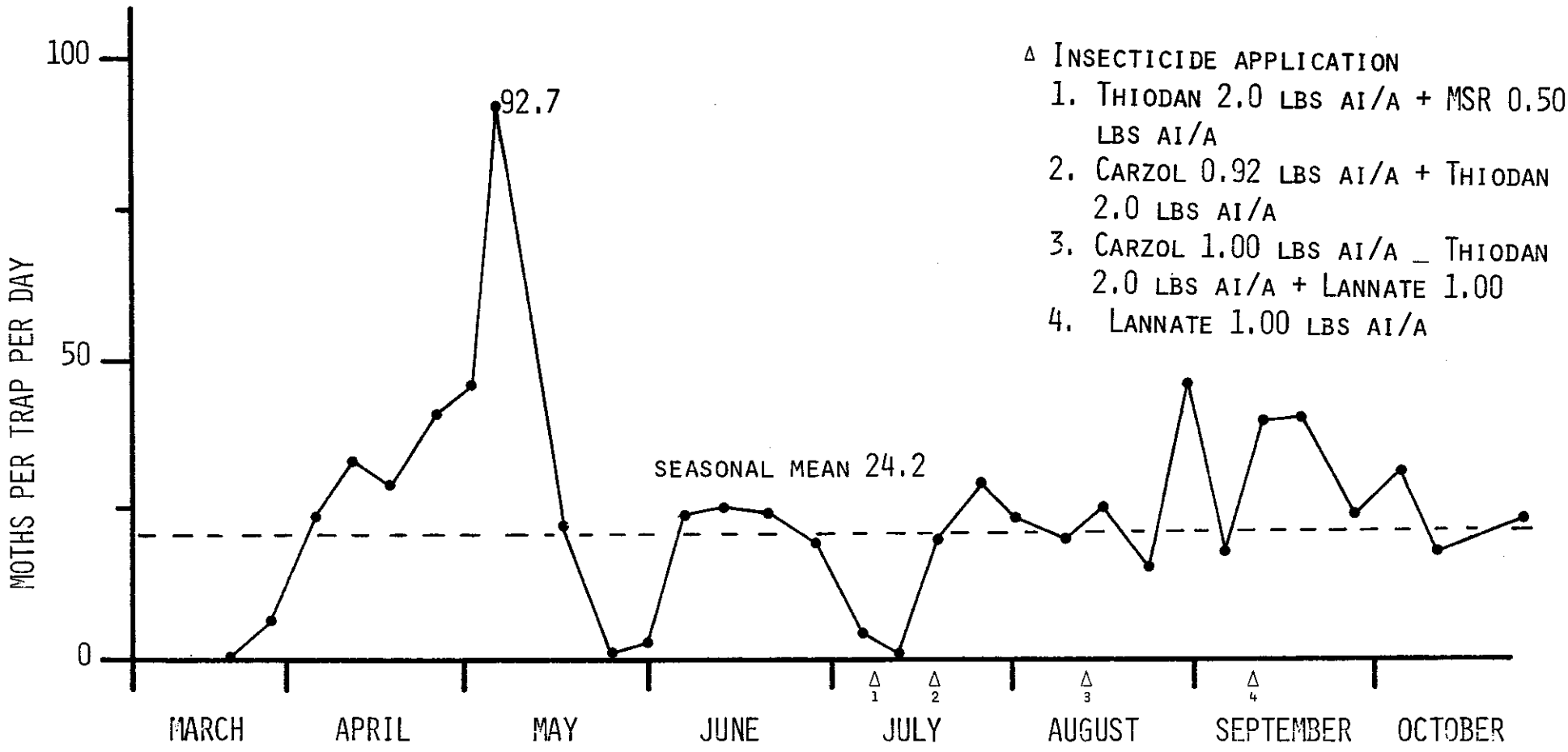
Populations of male Omnivorous Leafroller moths caught in Pherocon® 1C sticky traps in 5 commercial seed alfalfa fields. Fresno County, California. 1978[1].

Collection Date[2]		Field 1		Field 2		Field 3		Field 4		Field 5	
		Trap catch	Moths/ day	Trap catch	Moths/ day	Trap catch	Moths/ day	Trap catch	Moths/ day	Trap catch	Moths/ day
March	14	1	0.1	0	0.0	1	0.1	0	0.0	0	0.0
	21	5	0.7	35	5.0	-	-	119	17.0	30	4.3
	28	45	6.4	44	6.3	-	-	166	23.7	52	7.4
April	4	170	24.3	99	14.1	170	24.3	229	32.7	33	5.7
	12	268	33.5	250	31.2	289	36.1	368	46.0	109	13.6
	18	171	28.5	186	31.0	193	32.2	233	38.8	202	33.7
	25	292	41.7	198	28.3	118	16.8	177	25.3	250	35.7
May	2	326	46.6	372	53.1	123	17.6	361	51.6	395	56.4
	5	278	92.7	200	66.7	188	62.7	378	126.0	280	93.3
	16	242	22.0	39	3.5	14	1.3	239	21.7	137	12.4
	24	4	0.5	12	1.5	13	1.6	168	21.0	31	3.9
	30	14	2.3	86	14.3	15	2.5	42	7.0	15	2.5
June	6	173	24.7	151	21.6	136	19.4	134	19.1	133	19.0
	13	175	25.0	111	15.8	119	17.0	103	14.7	109	15.6
	20	171	24.4	207	29.6	117	16.7	193	27.6	145	20.7
	27	134	19.1	101	14.4	137	19.5	241	34.4	137	19.6
July	5	31	3.9	22	2.7	30	3.7	222	27.7	51	6.4
	11	6	1.0	42	7.0	3	0.5	162	27.0	96	16.0
	18	145	20.7	98	14.0	62	8.8	157	22.4	113	16.1
	25	197	28.1	137	19.6	199	28.4	212	30.3	113	16.1
August	1	161	23.0	169	24.1	165	23.6	172	24.6	121	17.3
	8	144	20.6	117	16.7	-	-	-	-	-	-
	15	172	24.6	278	39.7	-	-	-	-	-	-
	22	107	15.3	168	24.0	-	-	-	-	-	-
	29	326	46.6	144	20.6	-	-	-	-	-	-
Sept.	5	120	17.1	179	25.6	119	17.0	276	39.4	96	13.7
	12	291	41.6	76	10.8	-	-	-	-	-	-
	19	287	41.0	233	33.3	94	13.4	469	67.0	169	24.1
	26	171	24.4	162	23.1	171	24.4	138	19.7	281	40.1
October	4	249	31.1	133	16.6	221	27.6	138	17.2	90	11.2
	10	106	17.6	166	27.6	107	17.8	119	19.8	127	21.2
	17	-	-	-	-	109	15.6	135	19.3	16	2.2
	24	165	23.6	204	29.1	175	25.0	219	31.3	154	22.0

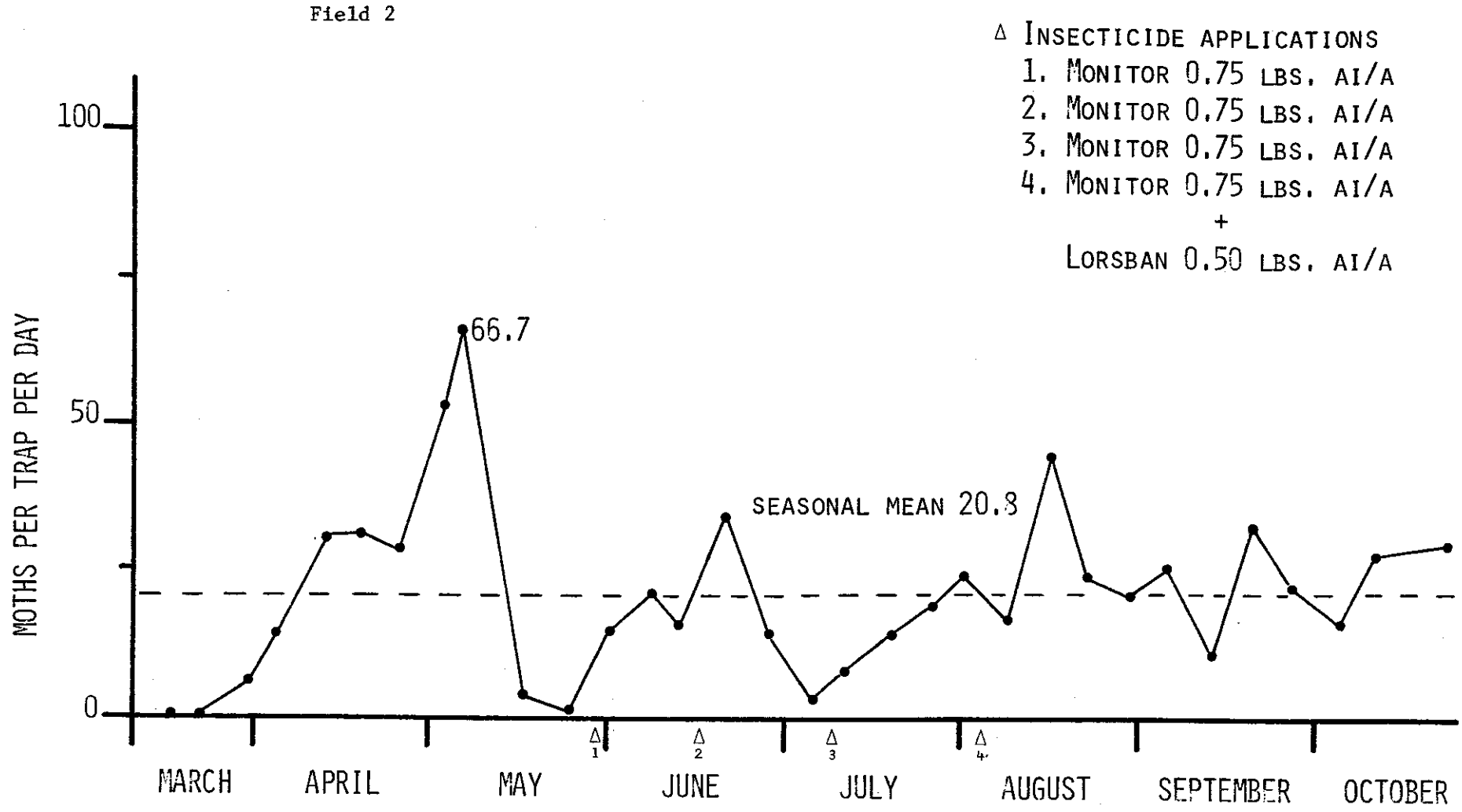
1/ Pherocon® OLR caps were used and changed every 5 weeks throughout the trapping season.

2/ Traps were started March 7, the collection periods are 6 to 8 days prior to the collection dates.

Field 1

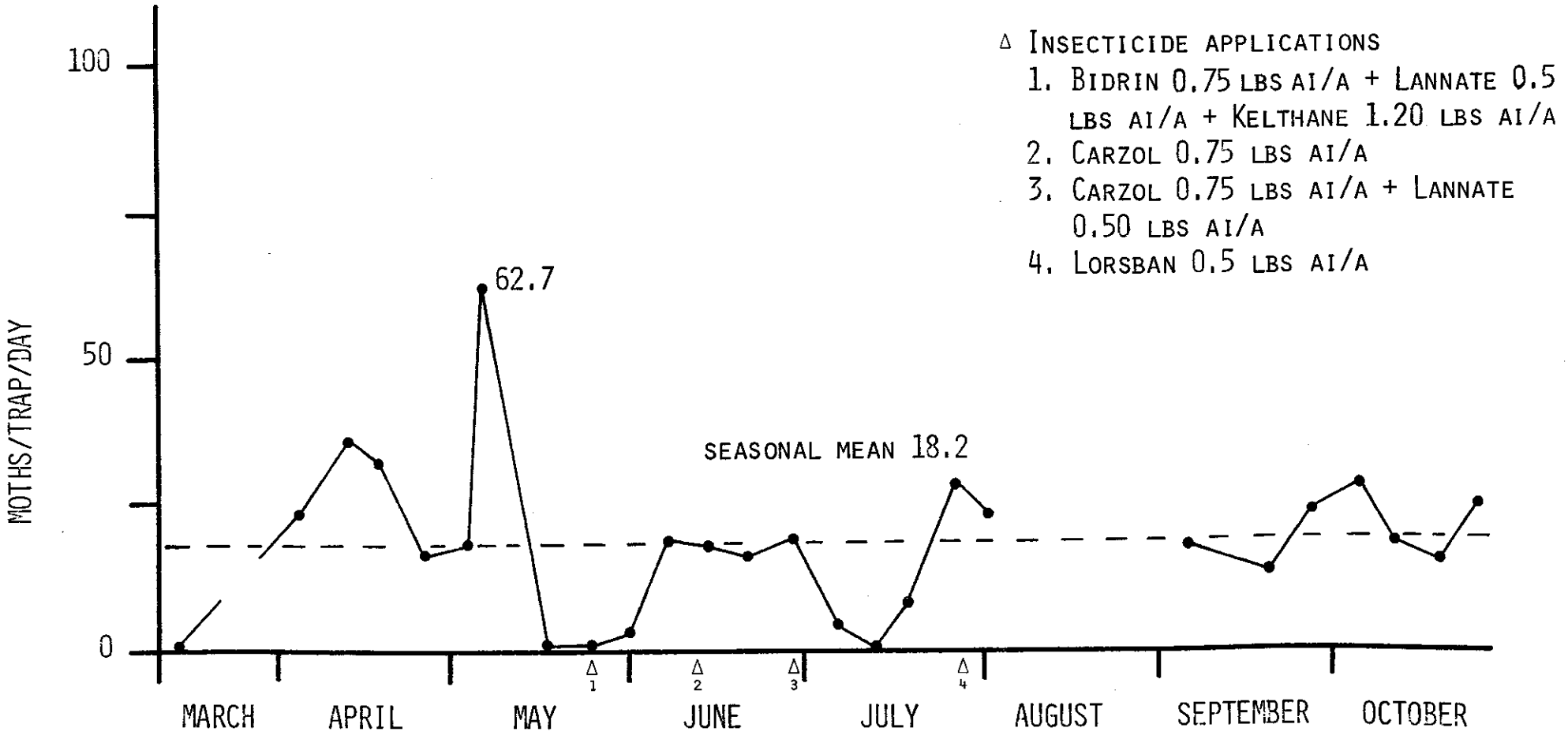


POPULATIONS OF MALE OMNIVOROUS LEAFROLLER MOTHS CAUGHT IN PHEROCON® 1C STICKY TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. FIREBAUGH, CALIFORNIA. 1978.



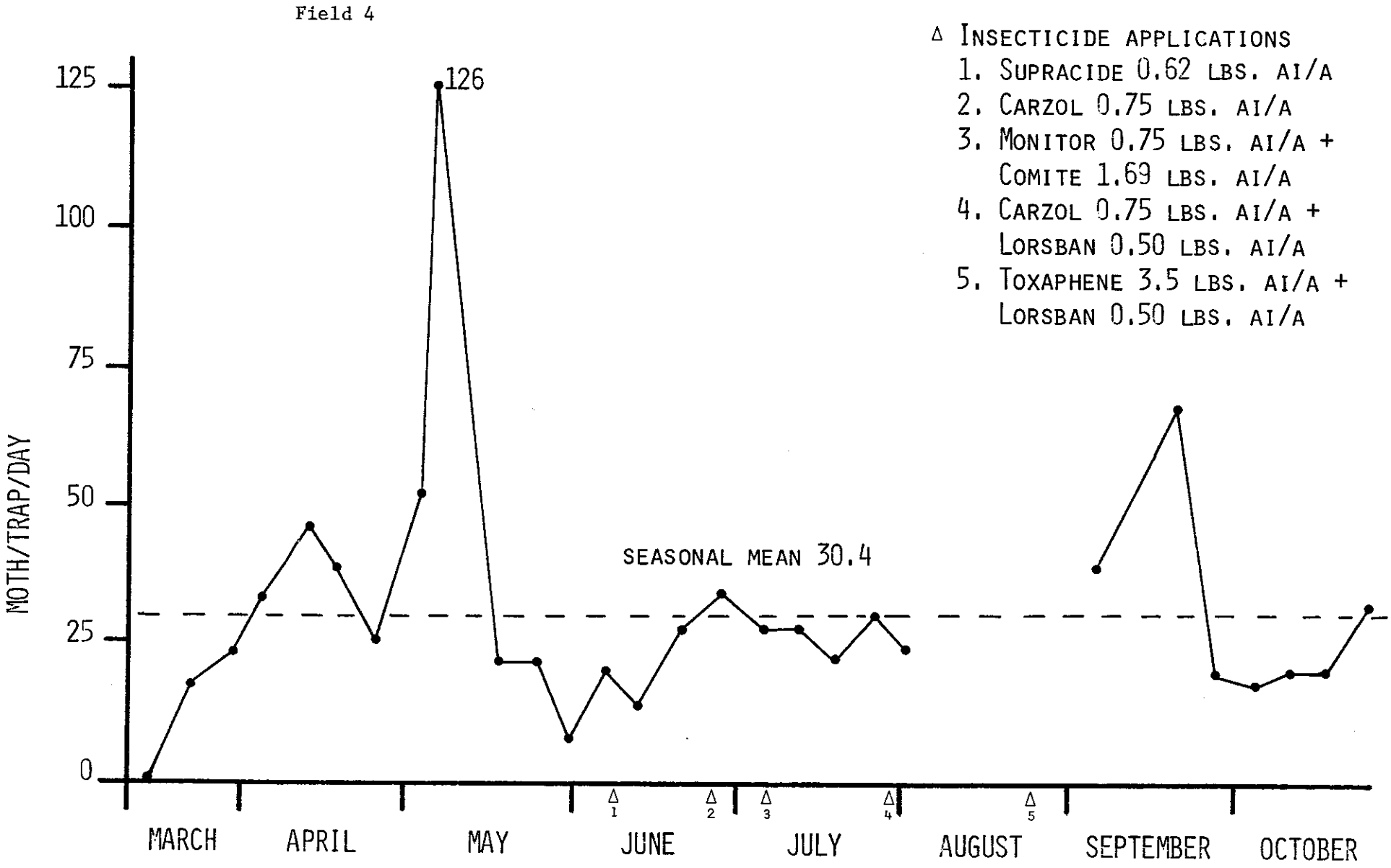
POPULATIONS OF MALE OMNIVOROUS LEAFROLLER MOTHS CAUGHT IN PHEROCON® 1C STICKY TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. FIREBAUGH, CALIFORNIA. 1973.

Field 3

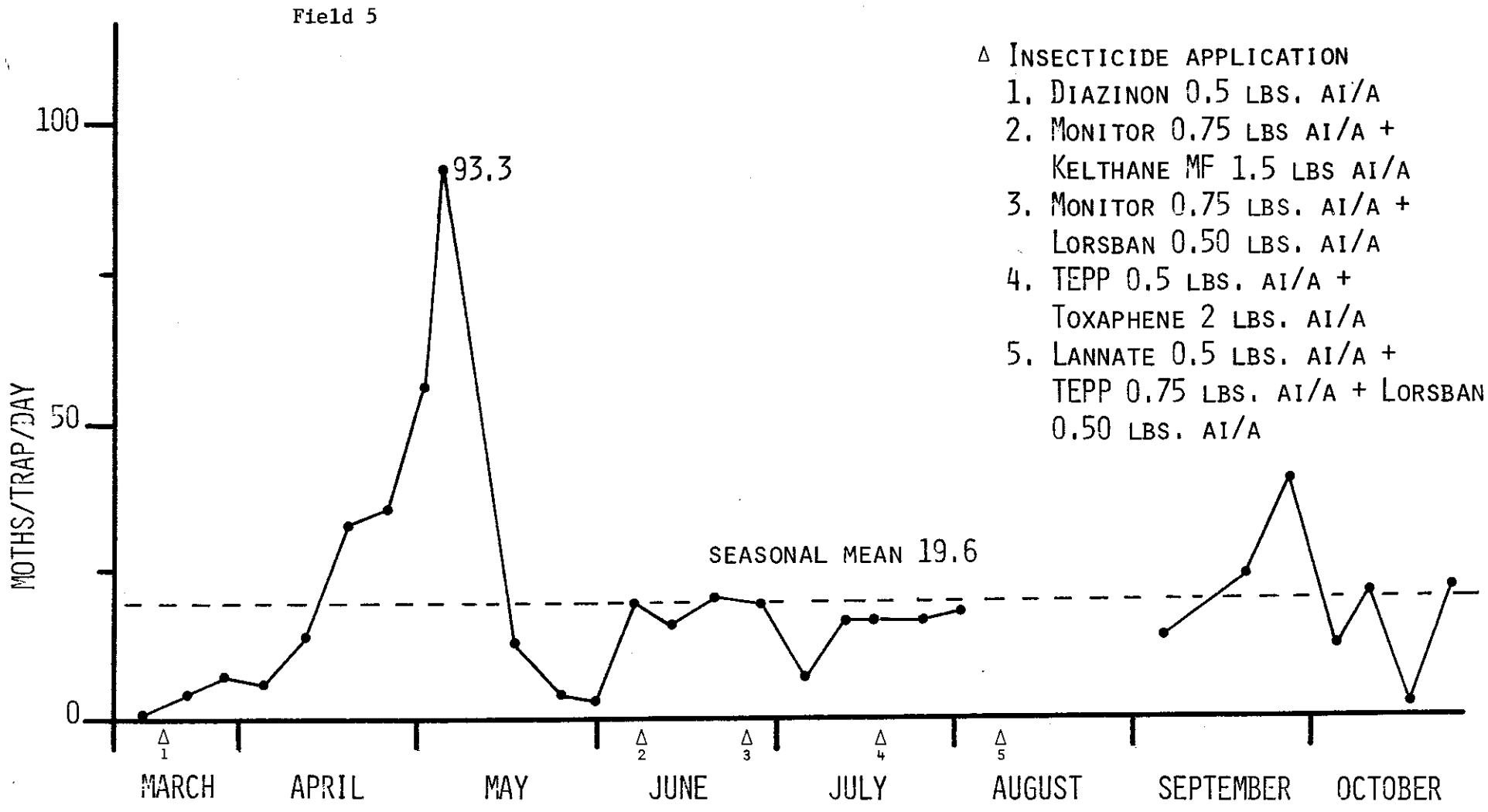


POPULATIONS OF MALE OMNIVOROUS LEAFROLLER MOTHS CAUGHT IN PHEROCON® 1C STICKY TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. FIVE POINTS, CALIFORNIA. 1978.

Field 4



POPULATIONS OF MALE OMNIVOROUS LEAFROLLER MOTHS CAUGHT IN PHEROCON® 1C STICKY TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. FIVE POINTS, CALIFORNIA. 1978.



POPULATIONS OF MALE OMNIVOROUS LEAFROLLER MOTHS CAUGHT IN PHEROCON® 1C STICKY TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. SAN JOAQUIN, CALIFORNIA. 1978.

Table 30

Populations of male omnivorous leafroller moths caught in U.C.D. pheromone water pan traps in a first year commercial seed alfalfa field. Corcoran, California. 1978[1].

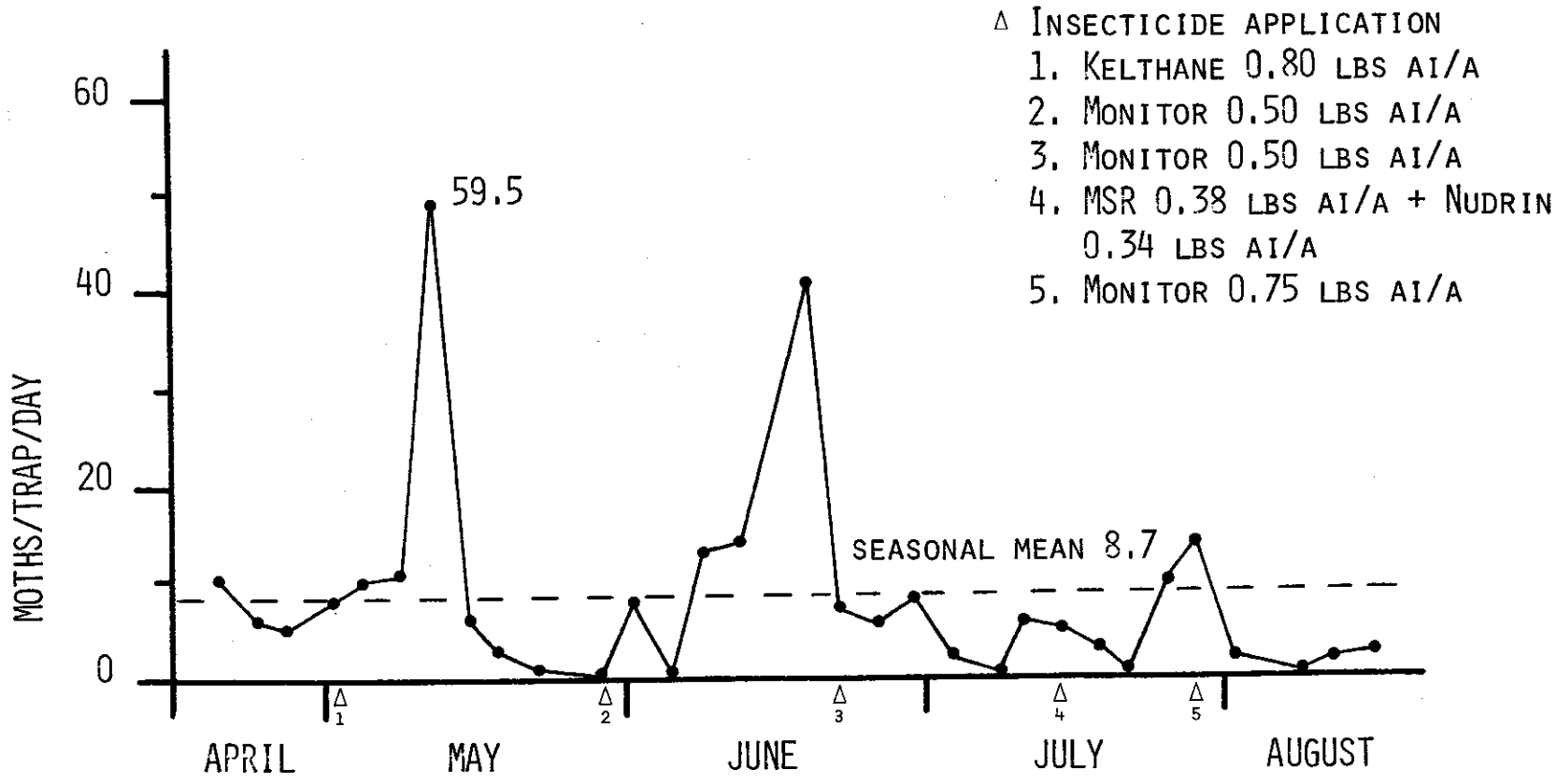
Collection Date		Male O.L.R. moths/trap/collection period[2]					OLR Daily ave/trap[3]
		Trap 1	Trap 2	Trap 3	Trap 4	Ave/trap	
April	20	22	58	21	25	31.5	10.5
	24	39	28	12	20	24.8	6.2
	27	17	29	13	4	15.8	5.3
May	1	32	55	17	29	33.3	8.3
	4	45	43	16	18	30.5	10.2
	8	52	68	22	32	43.5	10.9
	11	156	478	40	40	178.5	59.5
	15	33	30	12	33	27.0	6.7
	18	6	16	3	11	9.0	3.0
	22	8	-	10	5	5.8	1.4
	25	-	-	-	-	-	-
	29	3	3	0	3	2.3	0.6
June	1	37	15	22	21	23.8	7.9
	5	5	4	2	3	3.5	0.9
	8	72	25	33	31	40.3	13.4
	12	52	45	64	62	55.8	13.9
	15	-	-	-	-	-	-
	19	363	232	186	364	286.3	40.9
	22	-	10	20	32	20.7	6.9
	26	41	17	8	-	22.0	5.5
	30	54	11	42	19	31.5	7.9
July	3	11	3	5	2	5.3	1.8
	8	6	1	-	4	3.7	0.7
	10	24	10	10	6	12.5	6.3
	14	33	9	15	17	18.5	4.6
	18	17	11	3	19	12.5	3.1
	21	3	2	2	8	3.8	1.3
	25	43	38	30	52	40.8	10.2
	28	53	68	26	25	43.0	14.3
August	1	15	8	5	8	9.0	2.3
	8	7	3	2	7	4.8	0.7
	11	4	4	5	9	5.5	1.8
	15	9	6	7	14	9.0	2.3

1/ Pherocon® caps were used and changed every 5 weeks throughout the trapping season.

2/ Traps were started April 17, the collection period is the 3 or 4 days prior to the collection date.

3/ Seasonal mean 8.7.

1ST YEAR SEED ALFALFA FIELD



POPULATIONS OF MALE O.L.R. MOTHS CAUGHT IN U.C.D. PHEROMONE WATER PAN TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. CORCORAN, CALIFORNIA. 1978.

Table 31

Population of male omnivorous leafroller moths caught in U.C.D. pheromone water pan traps in a first year commercial seed alfalfa field. Corcoran, California. 1978[1].

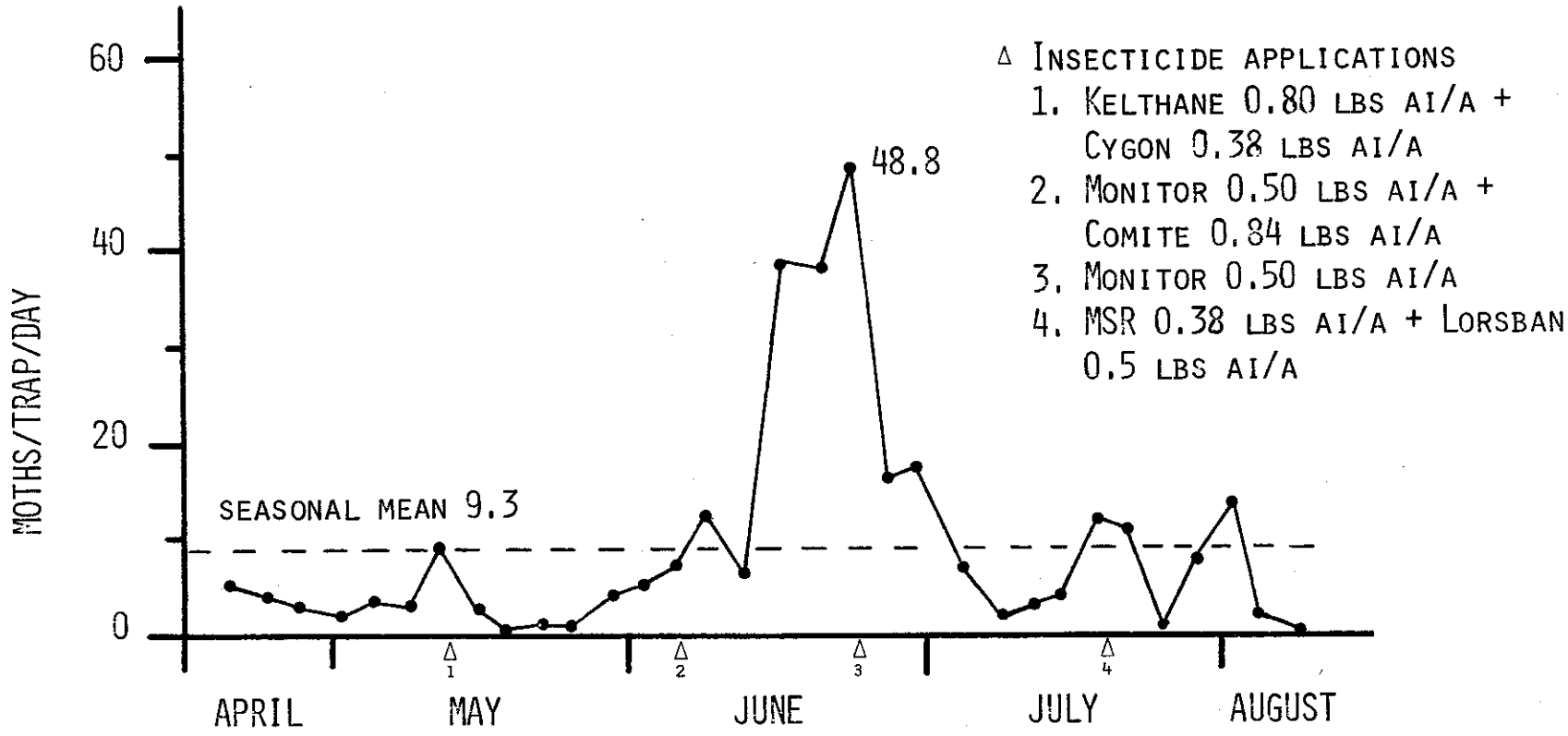
Collection Date		Male O.L.R. moths/trap/collection period[2]					OLR Daily ave/trap[3]
		Trap 1	Trap 2	Trap 3	Trap 4	Ave/trap	
April	20	-	12	-	18	15.0	5.0
	24	12	17	30	8	16.8	4.2
	27	8	10	9	7	8.5	2.8
May	1	4	15	7	4	7.5	1.9
	4	10	11	13	9	10.8	3.6
	8	5	21	19	6	12.8	3.2
	11	13	31	41	23	27.0	9.0
	15	5	11	21	4	10.3	2.6
	18	2	3	2	3	2.5	0.8
	22	10	13	3	5	5.3	1.3
	25	5	5	1	4	3.8	1.3
	29	29	-	-	5	17.0	4.3
June	1	23	21	11	28	20.8	5.2
	5	44	25	34	14	29.3	7.3
	8	42	63	22	23	37.5	12.5
	12	33	10	36	17	24.0	6.0
	16	197	142	150	135	156.0	39.0
	20	173	170	144	129	154.0	38.5
	23	162	123	115	186	146.5	48.8
	27	-	65	-	-	65.0	16.3
	30	83	6	105	17	52.8	17.6
July	4	26	16	58	11	27.8	6.9
	8	16	1	7	-	8.0	2.0
	11	17	1	17	6	10.3	3.4
	14	22	5	12	4	10.8	3.6
	18	44	51	57	36	47.0	11.8
	21	29	38	46	19	33.0	11.0
	25	0	2	8	6	4.0	1.0
	28	32	31	28	11	25.5	8.5
August	1	60	65	68	35	57.0	14.3
	4	3	17	2	2	6.0	2.0
	8	3	2	5	3	3.3	0.8

1/ Pherocon® OLR caps were used and changed every 5 weeks throughout the trapping season.

2/ Traps were started April 17, the collection period is 3 or 4 days prior to the collection date.

3/ Seasonal mean 9.3.

1ST YEAR SEED ALFALFA FIELD



POPULATION OF MALE O.L.R. MOTHS CAUGHT IN U.C.D. PHEROMONE WATER PAN TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. CORCORAN, CALIFORNIA. 1978.

Table 32

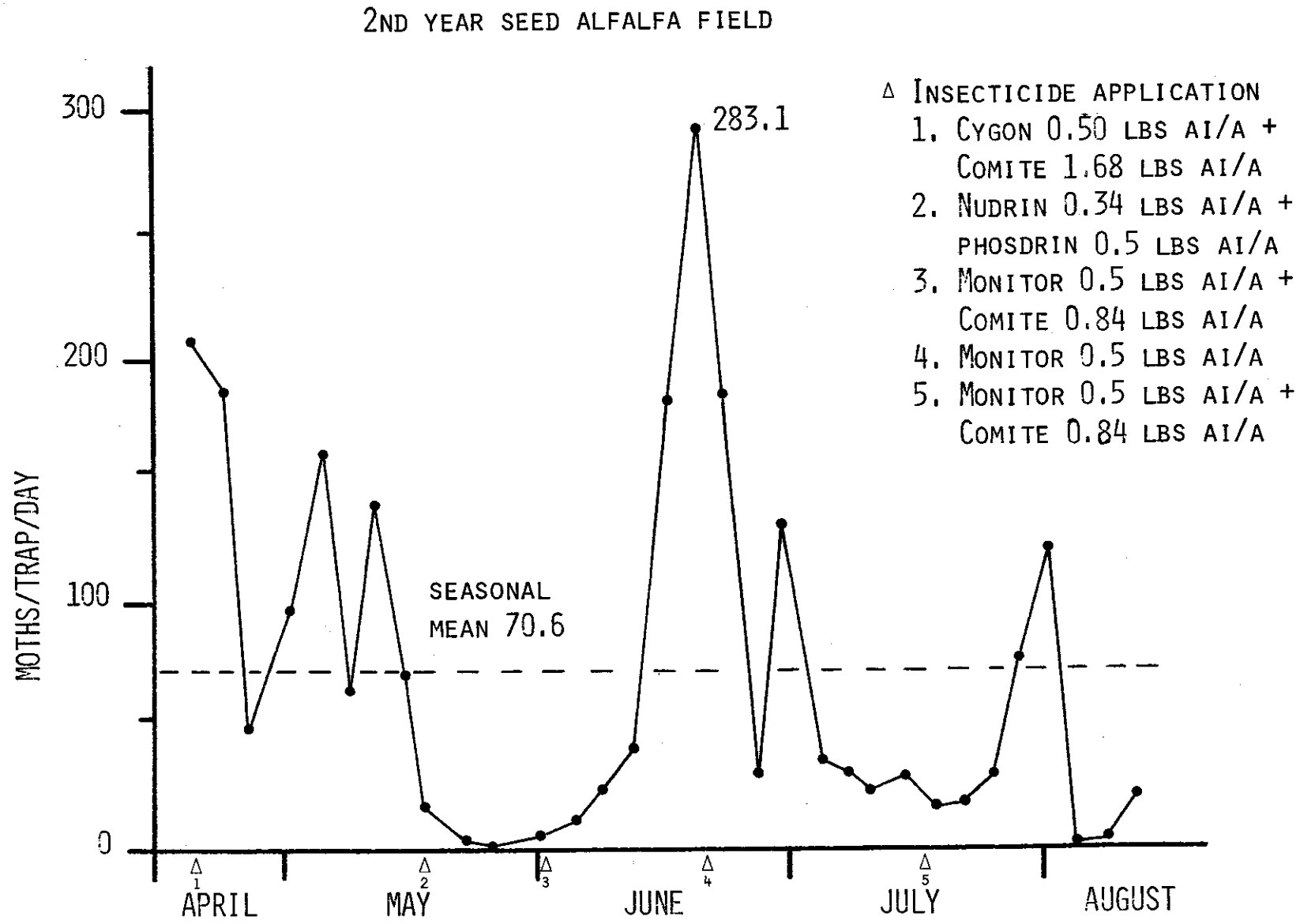
Populations of male omnivorous leafroller moths caught in U.C.D. pheromone water pan traps in a second year commercial seed alfalfa field. Corcoran, California. 1978[1].

Collection Date		Male O.L.R. moths/trap/collection period[2]					OLR Daily ave/trap[3]
		Trap 1	Trap 2	Trap 3	Trap 4	Ave/trap	
April	20	824	595	392	675	621.8	207.2
	24	882	337	598	1140	739.3	184.8
	27	191	101	131	169	148.0	49.3
May	1	307	180	498	577	390.5	97.6
	4	282	258	711	650	475.3	158.4
	8	177	126	485	243	257.8	64.4
	11	357	97	504	716	418.5	139.5
	15	219	98	385	405	276.8	69.2
	17	19	14	27	74	33.5	16.8
	22	8	38	8	6	15.0	3.0
	25	-	4	8	-	3.0	1.0
	29	-	-	-	-	-	-
June	1	7	29	40	12	22.0	5.5
	5	25	92	24	13	38.5	9.6
	8	59	66	57	62	61.0	20.3
	12	157	139	220	148	166.0	41.5
	16	915	733	668	531	711.8	177.9
	20	1217	1565	799	949	1132.5	283.1
	23	725	-	475	405	535.0	178.3
	27	170	-	-	72	121.0	30.3
	29	-	334	193	-	263.5	131.8
July	4	405	256	138	62	215.3	35.9
	7	72	87	-	127	95.3	31.8
	10	33	71	76	-	60.0	20.0
	14	50	181	51	119	100.3	25.1
	18	21	163	25	58	66.8	16.7
	21	37	87	34	-	52.7	17.6
	25	124	105	62	130	105.3	26.3
	28	219	238	226	227	227.5	75.8
August	1	538	553	381	436	477.0	119.3
	4	2	5	4	8	4.8	1.6
	8	32	16	12	12	18.0	4.5
	11	60	48	84	4	49.0	16.3

1/ Pherocon® OLR caps were used and changed every 5 weeks throughout the trapping season.

2/ Traps were started April 17, the collection period is 3 or 4 days prior to the collection date.

3/ Seasonal mean 70.6.



POPULATIONS OF MALE O.L.R. MOTHS CAUGHT IN U.C.D. PHEROMONE WATER PAN TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. CORCORAN, CALIFORNIA. 1978.

Table 33

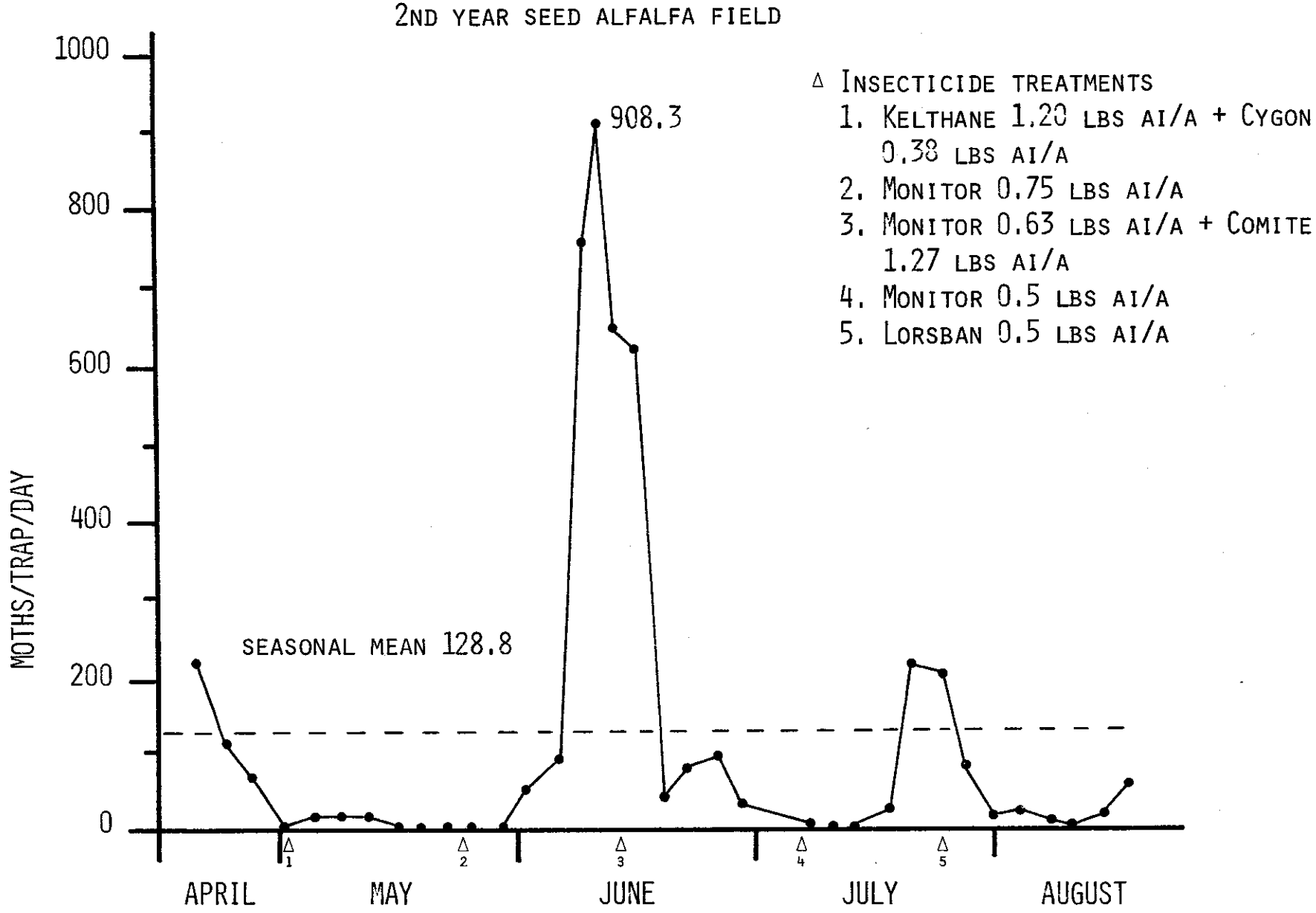
Population of male omnivorous leafroller moths caught in U.C.D. pheromone water pan traps in a second year commercial seed alfalfa field. Corcoran, California. 1978[1].

Collection Date		Male O.L.R. moths/trap/collection period[2]					OLR Daily ave/trap[3]
		Trap 1	Trap 2	Trap 3	Trap 4	Ave/trap	
April	20	646	884	607	580	679.3	226.4
	24	233	435	608	522	449.5	112.4
	27	8	418	447	8	220.3	73.4
May	1	27	11	13	-	17.0	4.3
	4	46	33	51	93	55.8	18.6
	8	84	84	72	98	84.5	21.1
	11	66	69	46	67	62.0	20.7
	15	36	33	16	27	28.0	7.0
	18	9	14	11	10	11.0	3.7
	22	-	34	36	-	35.0	8.8
	25	24	15	13	32	21.0	7.0
	29	11	5	8	3	6.8	1.9
June	1	126	140	286	110	165.5	55.2
	5	689	318	172	335	378.5	94.6
	8	1994	-	-	2590	2292.0	764.0
	10	-	1130	2503	-	1816.5	908.3
	12	872	816	1329	2140	1289.3	644.6
	15	3122	1611	1337	1448	1879.5	626.5
	19	234	206	181	62	170.8	42.7
	22	459	165	227	161	253.0	84.3
	26	465	347	408	266	371.5	92.9
	29	151	70	94	98	103.3	34.4
July	3	-	-	-	-	-	-
	7	115	63	185	-	34.0	8.5
	10	5	1	9	11	6.5	2.2
	13	17	29	27	31	26.0	8.7
	17	19	39	223	118	99.8	24.9
	20	341	190	679	1312	630.5	210.2
	24	541	249	1211	1225	806.5	201.6
	27	128	119	662	62	242.8	80.9
	31	159	12	6	136	78.3	19.6
August	3	55	45	34	166	75.0	25.0
	7	29	8	21	169	56.8	14.2
	10	14	2	15	33	16.0	5.3
	14	58	56	46	190	87.5	21.8
	17	250	107	65	279	175.3	58.4

1/ Pherocon® OLR caps were used and changed every 5 weeks throughout the trapping season.

2/ Traps were started April 17, the collection period is 3 or 4 days prior to the collection date.

3/ Seasonal mean 128.8.



POPULATION OF MALE O.L.R. MOTHS CAUGHT IN U.C.D. PHEROMONE WATER PAN TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. CORCORAN, CALIFORNIA. 1978.

Table 34

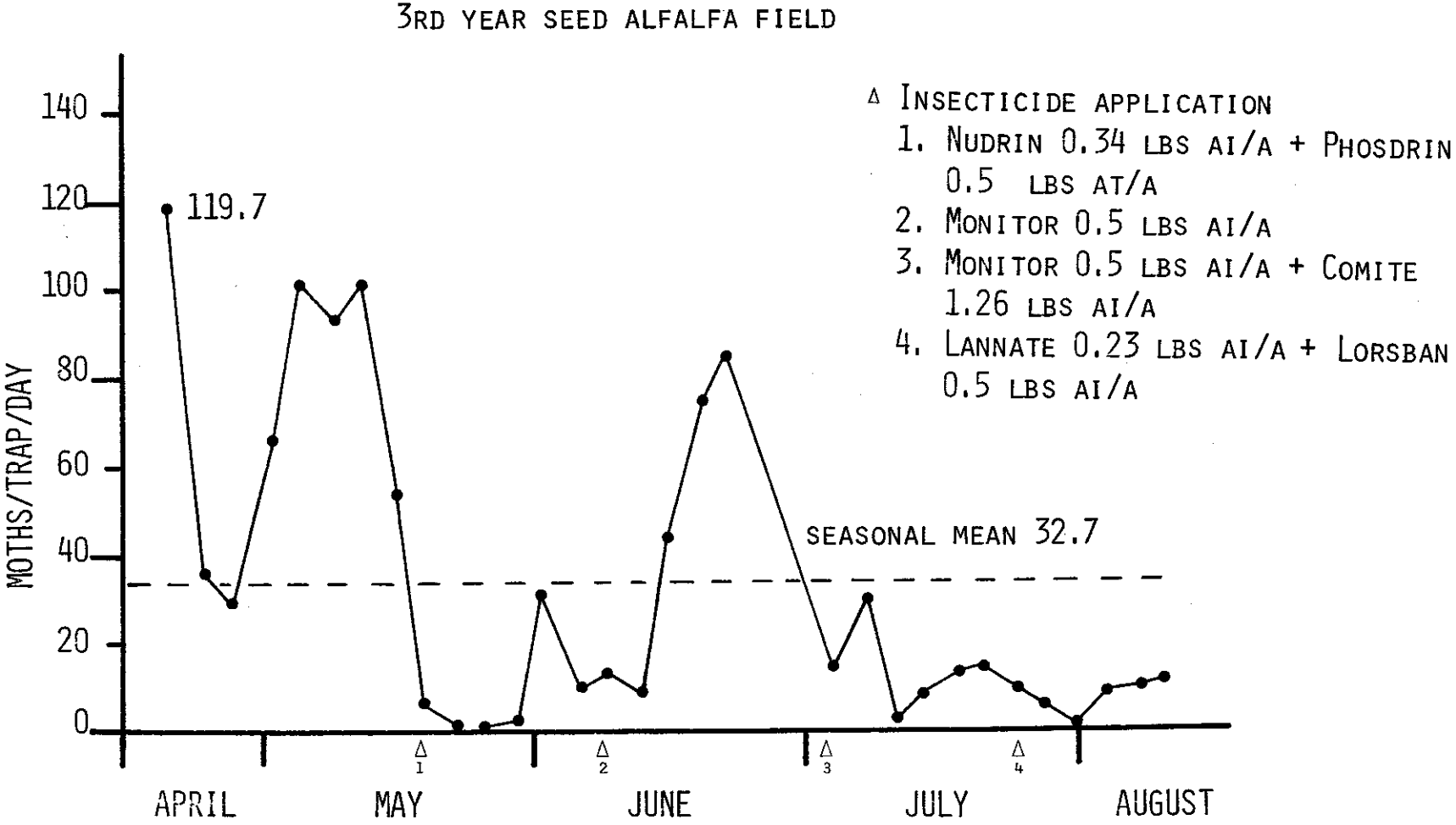
Populations of male omnivorous leafroller moths caught in U.C.D. pheromone water pan traps in a third year commercial seed alfalfa field. Corcoran, California. 1978[1].

Collection Date		Male O.L.R. moths/trap/collection period[2]					OLR Daily ave/trap[3]
		Trap 1	Trap 2	Trap 3	Trap 4	Ave/trap	
April	20	572	99	108	657	359.0	119.7
	24	132	52	132	261	144.3	36.1
	27	85	17	83	163	87.0	29.0
May	1	266	141	228	425	265.0	66.3
	4	166	166	509	372	303.3	101.1
	8	138	147	649	554	372.0	93.0
	11	127	242	407	459	308.8	102.9
	15	111	187	253	322	218.3	54.6
	18	10	18	18	28	18.5	6.2
	22	3	11	9	8	7.8	1.9
	25	-	4	-	4	2.0	0.7
	29	-	-	12	4	8.0	2.0
June	1	19	78	227	51	93.8	31.3
	5	25	92	24	13	38.5	9.6
	8	3	37	37	86	40.8	13.6
	12	2	59	18	61	35.0	8.8
	15	4	187	190	148	132.3	44.1
	19	3	507	451	254	303.8	75.9
	22	12	237	400	405	263.5	87.8
	26	-	-	-	-	-	-
July	3	-	-	-	92	92.0	13.1
	7	115	63	185	-	121.0	30.3
	10	0	3	11	7	5.3	1.8
	13	0	13	55	31	24.8	8.3
	17	3	55	106	41	51.3	12.8
	20	3	40	109	32	46.0	15.3
	24	4	34	92	24	38.5	9.6
	27	25	26	18	8	19.3	6.4
	31	6	4	6	1	4.3	1.1
August	3	8	15	64	25	28.0	9.3
	7	32	60	53	14	39.8	9.9
	10	12	52	36	27	31.8	10.6

1/ Pherocon® OLR caps were used and changed every 5 weeks throughout the trapping season.

2/ Traps were started April 17, the collection period is 3 or 4 days prior to the collection date.

3/ Seasonal mean 32.7.



POPULATIONS OF MALE O.L.R. MOTHS CAUGHT IN U. C. D. PHEROMONE WATER PAN TRAPS IN A COMMERCIAL SEED ALFALFA FIELD. CORCORAN, CALIFORNIA. 1978.

Table 35 - Percentages of good and defective seeds in samples from 9 fields surveyed for OLR. 1978.

Location	Field No.	OLR Seasonal Mean[3]	Defective Seeds[1]								Good Seed
			OLR	Chalcid	Sucking Insects			Shriveled	Water	Green	
					All	Lygus bug	Stink bug				
Firebaugh	2	20.8	0.1	2.5	3.6	3.2	0.4	0.1	4.6	0.1	89.0
Five Points	3	18.2	0.2	0.0	9.3	9.1	0.2	0.0	2.4	0.6	87.5
Five Points	3[2]	18.2	0.5	0.3	10.1	9.6	0.5	0.0	1.8	0.8	86.5
Five Points	4	30.4	0.1	0.1	2.7	2.4	0.3	0.1	1.4	1.0	94.6
San Joaquin	5	19.6	0.0	0.6	12.1	11.2	0.9	0.0	0.8	1.1	85.4
Corcoran	1[4]	8.7	0.1	5.1	4.9	4.6	0.3	0.0	4.0	0.9	85.1
Corcoran	2[4]	9.3	0.0	10.6	9.8	9.6	0.2	0.0	24.3	0.1	55.2
Corcoran	3[5]	70.6	0.1	3.6	11.1	10.6	0.5	0.0	37.2	1.7	46.3
Corcoran	4[5]	128.8	0.2	1.8	8.1	8.0	0.1	0.0	2.8	0.8	86.3
Corcoran	5[6]	32.7	0.1	1.6	5.4	5.4	0.0	0.0	2.2	2.8	87.9

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 two subsamples from each of the threshed 2-quart samples.

2/ Control for OLR was experimentally omitted in this part of field 3.

3/ Mean numbers of male moths per trap per night in sex pheromone baited traps. Pherocon® 1C sticky traps were used in Firebaugh, Five Points and San Joaquin. U.C.D. water pan traps were used in Corcoran.

4/ First year seed alfalfa field.

5/ Second year seed alfalfa field.

6/ Third year seed alfalfa field.

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:

Ambush®	Plictran®
Bendiocarb®	Pydrin®
Carzol®	Union Carbide 51762
Comite®	Union Carbide 55304
Lorsban®	Vendex®
Monitor®	

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

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