Control of Lygus Bugs in Alfalfa Seed Fields With DDT Dusts Requires Care in Application

Ray F. Smith

Within the past fifteen or more years considerable evidence has been obtained which definitely places lygus bugs as one of the more important factors affecting the yield of alfalfa seed.

Lygus bugs are the most important factor in reducing alfalfa seed yields in many fields.

Extensive investigations on the control of lygus bugs have been conducted during the past two years in various parts of the state by the University of California in cooperation with various county officials and the farmers of the areas. One objective of this study has been to develop a suitable control method for lygus bugs so that this one uncertainty may be eliminated from alfalfa seed production.

Proper Timing of DDT Dust Applications

The basis of good control of lygus bugs is the proper timing of DDT dust applications. At present this must be based on the trend of the lygus bug population count.

Population counts are determined by taking two sweeps of a standard insect net at representative spots in the field and counting all the bugs in the net. An average of several counts should be taken for each type of growing condition in the field to determine whether dusting is necessary. Most comparable counts are obtained between 9:00 a.m. and 4:30 p.m. The alfalfa should be dry, no strong wind blowing, and the temperature not greatly exceeding 100° F. For further instruction, consult your farm advisor.

Control Applications

Lygus bugs are not likely to cause any material damage until an average of at least five can be collected per sweep of an insect net. Severe loss of seed is not likely to result until the population reaches a much higher level. The objective should be to time the control measures so as to keep the population below five per sweep.

Results over the past two years have indicated that at 30 pounds per acre, 5 per cent DDT and 10 per cent DDT are better than 3 per cent DDT both in initial control and residual action. There is apparently no marked difference between 5 per cent and 10 per cent DDT in the control of lygus bugs. Where 10 per cent DDT is used, the hazard to bees and other beneficial insects may prove to be greater. The lowest possible concentration and poundage which will give satisfactory control should be used.

The incorporation of 50 per cent or more sulfur in the dust mixture gives some increase in control, but since sulfur will cause injury to alfalfa flowers in hot weather, its use is not recommended.

Recommended Pounds per Acre of 5 per cent DDT Dust

Type of Duster	Bud Stage Dusting	Bloom Stage Dusting	
	All Fields	Growth Normal	Growth Unusually Heavy
Ground Machine	25	20	25
Airplane	30	25	30

Hazard of DDT Residue

If the straw remaining after seed harvest is burned or is used as fertilizer, there will be no problem of DDT residue. In spite of the fact that we do not expect toxic effects in animals fed this straw, there is still a problem involving human health. The Federal Food and Drug Administration has not placed a tolerance for DDT in meats or milk. Until a tolerance is set, the feeding of straw from alfalfa seed fields which were dusted with DDT cannot be recommended.

Relation of DDT Applications to Beneficial Insects

There are two groups of beneficial insects in alfalfa seed fields. One group is the parasites and predators which destroy harmful insects. These beneficial insects fortunately are less affected by DDT than lygus bugs at dosages of 30 pounds of 5 per cent DDT dust per acre. For this reason it would seem wise to maintain this favorable balance by holding the amount and concentration of DDT to the absolute minimum that will give satisfactory control of lygus bugs.

The other group of beneficial insects is the pollinating insects. Shortly after dusting blooming alfalfa fields with DDT, markedly fewer bees are present in the treated portions of the fields than in the untreated portions, or than were in the field the day before dusting. On the day after dusting, this reduction is less marked and within another day or two is no longer evident.

Ultimately, especially when the lygus bug population is high at time of dusting, more bees are usually found in the treated area than at any time previously.

After dusting, some bees may be observed which are behaving abnormally and are presumably being affected by DDT. When such bees are placed in cages, some of them may die. Whether or not they would die if left in the open fields has not been determined. No significant number of dead bees has been observed in fields after dusting, even in row plantings where the ground can readily be observed. Nor are unusual accumulations of dead bees observed in apiaries coincident with dusting programs in California.

In view of the present uncertainties as to the effect of DDT on bees, the following recommendations are made.

Control Recommendations

Dust in the bud stage if the nymphal lygus bug population exceeds the adult population and the total count exceeds two per sweep. Dusts should be applied to alfalfa seed fields only when proven to be necessary. This is especially true when fields are in bloom, since any hazard to bees would be greatest at this time.

Rates of application—pounds per acre and per cent of DDT in the dust—should be kept as low as satisfactory control will permit. Five per cent DDT in talc or pyrophyllite at the poundage given in the table is recommended at the present time.

Every effort should be made to obtain a thorough, even, application of dust and to keep drift to a minimum.

Although our work during the past two years has shown that best control will result from dusting in bloom, we cannot recommend it because we do not know for sure that it will not harm the pollinators.

Since some dust may be applied in the bloom stage, the following suggestions are made in the hope that any loss to bees will be minimized. In early bloom to full bloom, it is suggested that dust only be applied if the nymphal population exceeds the adult population and the total count exceeds five per sweep in short-cycle fields—having a total blooming period of less than 30 days on the basis of previous history—or ten per sweep in long-cycle fields—having a total blooming period of over 30 days on the basis of previous history.

In late bloom, it is suggested that dust only be applied when there is considerable secondary growth and the field is expected to continue to bloom for some time. Do not dust in this stage unless the count exceeds 10 to 15 per sweep. Do not dust a field which has started to dry up.

If alfalfa is to be dusted in bloom, beekeepers in the vicinity should be given advance notice and the applications should be made before 6:30 a.m.

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Bees Valuable to Growers for Aid As Pollinizers

J. E. Eckert

To insure the adequate pollination of plants that are benefitted by insect pollination, colonies of honeybees should be located in or near orchards or fields at the rate of one or more strong colonies per acre.

Colonies are generally placed in groups of from 10 to 20 in orchards and in larger groups for the pollination of field crops.

Precautions Needed

Because of the widespread use of poisons in the control of injurious insects, and because many poisons are also toxic to pollinating and other beneficial insects as well, chemical control programs should include the maximum protection of those insects that add materially to the production of a majority of our agricultural crops.

This can be done by following a few general rules:

1. Arsenicals should not be applied to fruit bloom, truck crops, alfalfa, corn or other crops while a majority of the plants are in bloom.

2. Eliminate the use of arsenicals, especially in dust form and substitute DDT or other materials that are less toxic to honeybees.

3. Mists or sprays should be used wherever possible in order to confine the poisons to the fields treated.

4. Beekeepers whose colonies are in the vicinity of fields or orchards to which chemicals are to be applied should be notified a few days in advance if the chemicals might be injurious to pollinating insects.

5. Beekeepers should become familiar with the chemical control programs of the territory in which they locate their colonies and should register the number of colonies and their location each spring, or whenever they move their colonies, with the Agricultural Commissioner of the county in which their colonies are located.

Growers who profit by the pollination services of the honeybee usually get beekeepers to locate colonies in or near their fields and generally pay a per colony rental as a recognition of the services rendered.

It is back-breaking work to move heavy colonies of bees and a nominal rental aids the beekeeper in meeting his moving expenses.

The growers of almonds, plums, prunes, apples, pears, cherries, alfalfa, and other legume seed, avocados and many other fruit vegetable and seed crops get far greater returns from the pollination services of the honeybee than the beekeeper receives from the honey, beeswax, bees and queens he is able to produce.

The products of the hive produced by the beekeeper are merely by-products as far as agricultural returns are concerned and agriculture gains more by protecting the beekeeping industry from injury from chemicals than the beekeepers themselves.

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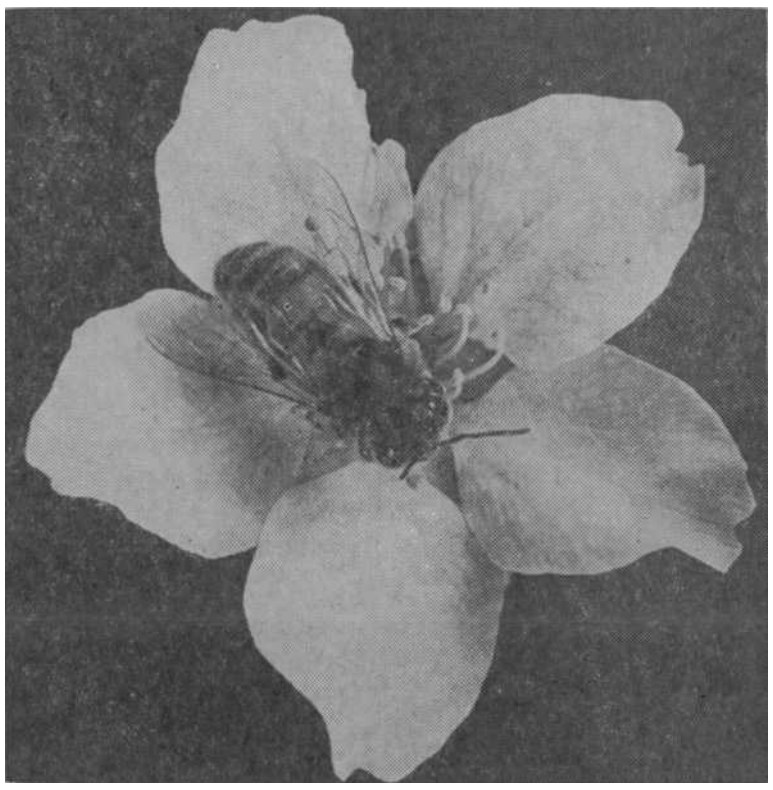

The pollinization services of the honeybee are of greater value to agriculture in general than are their products to the beekeeper.

Poultry Disease Investigations Seeking Solution to Problems Of Chicken and Turkey Raisers

(Continued from page 1)

The number of birds removed as culls following the onset of the disease was significantly larger in the non-vaccinated groups.

The results do not show that the vaccine was superior to that used in preceding years as regards its ability to protect against field infection.

These vaccination experiments emphasize the necessity of subjecting experimental vaccines to trial on the farms for final determination of their effectiveness.

Evidence suggesting that the disease may be transmitted by eggs from infected flocks has been obtained recently which supports similar evidence reported by other investigators.

The virus was isolated from the unabsorbed yolk of four-day old chicks which were hatched from eggs laid by an infected breeding flock when the egg yield was at the lowest point.

The virus was isolated also from the pooled contents of eight infertile eggs laid by a flock in which the disease was present.

Attempts to isolate the virus from developing embryos in eggs from three flocks following recovery from the disease resulted in failure.

Lymphomatosis

In current experiments efforts are being made to obtain definite evidence that this very prevalent disease of chickens is caused by a filterable agent or virus.

Attempts have been made to isolate a virus by subjecting mascerated tumors to filtration and ultracentrifugation to separate out all tumor cells.

About 400 chicks have been injected with various preparations which might be expected to contain virus if it was present in the tumor tissue. These birds are now from five to ten months of age and none of them have shown evidence that the material injected has produced lymphomatosis. They are still too young to conclude that this will not occur.

Pox in Turkeys

Investigations to determine if the necessity of revaccination for pox of turkeys kept for breeding could be avoided by using vaccine made from virus of turkey instead of chicken origin, gave negative results. A high percentage vaccinated with the turkey virus vaccine were again susceptible when tested six months after vaccination.

Hexamatiasis in Turkeys

The importance of wild birds in the infection of turkeys with hexamatiasis was emphasized by the occurence of a severe epidemic of the disease in one section of the state after the poults were put out on the range.

Pheasants and quail were incriminated as the sources of the infection in these outbreaks. These birds as well as chukars can be carriers.

Several sulfonamides were tried for the treatment of hexamatiasis in poults under field conditions but none was found to be of practical value. Mercuric chloride was tried and proved to be toxic for poults and valueless as a treatment.

Salmonellosis (Paratyphoid) of Turkeys

New evidence of the importance of reptiles and wild birds as complicating factors in protecting turkeys against paratyphoid is constantly being uncovered.

Approximately 25 per cent of all snakes caught on ranches have been found to be carriers of one of five different types of the paratyphoid organism. All of these types of the organism have been found to be the cause of disease in turkeys.

A young blue jay caught on a turkey ranch was also found to be a paratyphoid carrier.

Air Sac Infection in Turkeys

A field survey conducted in cooperation with a large hatchery yielded evidence that this type of respiratory disease of turkeys is not likely to result from transmission of the infection through hatching eggs.

Trials of Sulfonamides and Penicillin

Silver nitrate—four per cent solution—has been extensively used for several years in the treatment of sinusitis of turkeys. This chemical has been compared with several others of possible value for treating the disease and was superior to all of them.

Sulfamerazine—0.25 per cent in the mash—was found to be of possible benefit as a treatment of air sac infection which often accompanies sinusitis of turkeys. It did not effect a permanent cure and in this respect resembles sulfathiazole as a treatment of coryza in chickens.

Sulfathiazole was found to be unsuitable for turkeys because mash containing it is distasteful to the birds and, in non-toxic doses, it is ineffective as a treatment of any disease of turkeys for which it has been tried.

Sulfamethazine given to chickens, as 0.5 percent of the mash, proved ineffective as a treatment for infectious coryza. The loss in appetite and body weight of birds given the medicated mash for fourteen days indicates that the drug is somewhat toxic for chickens.

Pencillin injected into the breast muscle of chicken with infections coryza in three daily doses of 1,000, 10,000, 50,000, or 100,000 units had no beneficial effect on the course of the disease.

The foregoing report represents research by participating members of the staff of the Department of Veterinary Sciences: R. A. Bankowski, J. R. Beach, P. D. DeLay, K. D. DeOme, W. R. Hinshaw, E. McNeil.

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Donsing Breeding Farm and Hatchery, Rio Linda $1,000.00
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DAVIS

Ailing House Termite Inspection Bureau, Berkeley 500.00
Division of Entomology and Parasitology.

California Committee on Relation of Electricity to Agriculture 2,500.00
For electricity applications to agriculture.