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Insect Control In The Production Of Alfalfa Seed

By Ephriam Hixson
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There is much interest in insecticides to control insects which affect alfalfa seed production. This interest has been created by the high price of seed and by the stories from other states of phenomenal seed yields after using certain insecticides on the crop. These stories from the various experiment stations are well grounded in fact. It should be borne in mind, however, that some of their problems differ from that of adjacent states. Alfalfa seed production has been on the decline for some years, and that has been the story in every alfalfa seed-producing state in the Union. The reason back of these declines may be many. Certainly one of them in certain areas is due, at least in part, to harmful insects.

The problems of alfalfa seed production are many. Anyone who has tried to produce seed knows that weather is of extreme importance. There is seed-producing weather and there is weather in which seed is not produced. Then there is the problem of pollination. Alfalfa is dependent upon insects for pollination, and it is one of the most difficult of legumes to obtain proper pollination. This is apparently due to the difficulty of obtaining pollen from alfalfa compared to other competing plants which may be in blossom at the same time. Many workers

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feel that the wild native bees are more important in the production of alfalfa seed than are honey bees. The percentage of flowers they trip is certainly much higher than in the case of honey bees. However, the honey bee should not be completely disregarded as a possible source of cross pollination on this particular crop. It is an insect that can be readily controlled, and the population can be regulated.

Of the injurious insects that are known to be destructive of alfalfa seed, grasshoppers probably rank at the top; then there are lygus¹ bugs of various species. Other insects which may be of some importance are thrips, leafhoppers, certain stink bugs, and possibly some beetles that are present in alfalfa fields. Many of these insects have not been studied; therefore, there is no assurance that they are important. It is definitely known, however, that lygus bugs will not only cause the blossoms to fall by their feeding, but will cause the seeds to dry up or turn brown and not be viable. The controls which have been set up have been built up largely around the lygus bugs. The lygus bugs come into fields, and are most abundant during the time when the plant is in blossom. The adults fly into the fields and into weedy vegetation surrounding fields. When these areas dry up in the summer the entire population will move into the alfalfa fields. Here they lay their eggs and the nymphs begin their feeding. The nymphal population usually reaches the greatest number about the time the plants come into bloom. In the areas of the country where lygus bugs are considered of prime importance, the population will vary from 4 to 10 bugs per sweep of a 15-inch insect net. No such population as that has been recorded in Nebraska. Usually there is one or two per sweep in the preliminary sampling that has been done in our alfalfa fields. There may be peculiar circumstances when more will be found. Unless the lygus bug population in alfalfa is larger than it has been possible to

¹Pronounced lie-gus

find so far, the tremendous increase in yields that other institutions have been able to get with insecticides may not be possible in this state.

The most effective insecticides so far tested for lygus bugs is a 10 per cent DDT applied at the rate of 20 pounds per acre as a dust at the pre-bloom period; that is, at the time the blossom heads have emerged but the first blossoms have not opened. It is important to avoid making applications of insecticides when the plants are in bloom, because of the pollinating insects. Where grasshoppers are a problem, unfortunately, DDT is not effective. Even at concentrations of 20 per cent, it has not been effective. Some of the newer insecticides have been effective against this particular insect, and they have likewise been effective against lygus bugs. The two best of these that have been tested enough to get sufficient results to report on are benzene hexachloride and chlordane. Benzene hexachloride dust used at the rate of 30 pounds per acre of a 1 per cent gamma isomer material, has given excellent control of grasshoppers. The residual kill, however, has been only three or four days. In the case of chlordane, 1 pound of the technical material per acre, which would mean 20 pounds of a 5 per cent dust, has given excellent control of grasshoppers with a residual kill of as long as 20 days. The emulsions of chlordane have been more effective than the dusts. In this case, 2 pounds of a 50 per cent wettable material, or the equivalent as an emulsion, are used in 100 gallons of water applied at the rate of 100 gallons per acre. These applications should be made at the pre-bloom stage, just as was indicated for the use of DDT. There is no evidence that two applications are any better than one; however, if grasshoppers are migrating in, the second application should be used. A new material known as Toxaphene, which was introduced as 3956, has shown much promise in control of grasshoppers. However, sufficient tests have not been run at this time to make recommendations on its use.

PRECAUTIONS: It should be borne in mind that these insecticides mentioned are all poisonous. The intake of them by an animal may be injurious to the animal's health if the insecticide is present in greater quantities than seven parts per million. In the straw from fields dusted or sprayed with various insecticides, the amount of residue present has invariably been greater than this. The greatest fear at the present time in the use of these insecticides is the fact that animals eating contaminated feed tend to store DDT in the fat, and particularly in milk fat, in quantities which may be dangerous to health of individuals who use the milk. What the long-range effect will be on the animals is not known at this time. In view of our knowledge of the insecticides, the straw from alfalfa fields treated to control insects should not be used as feed, and certainly these insecticides should not be used on meadows upon which livestock is being pastured. The grower should not believe that the mere application of one or another insecticide at the pre-bloom period will automatically make a seed crop. The insecticides are designed for the purpose of destroying injurious insects which affect seed production. Whether the field is capable of making a seed crop is probably the point, and if other conditions are such that seed will not be produced, then all the insecticides in the world will not make a seed crop. The grower should bear this point in mind -- that there is nothing magic about these insecticides in making seed; they simply are used to save the crop.