

# Insect Pests of Alfalfa Seed

proper timing of control measures  
increases yield and quality of alfalfa seed

Ray F. Smith, L. D. Anderson, and H. T. Reynolds

**Maximum alfalfa seed yields** can be obtained when harmful insects are controlled and pollinating insects are abundant.

Lygus bugs are the most important pests of alfalfa seed in California. They are sucking insects whose feeding may prevent the buds from producing flowers, or cause the flowers to drop, and the developing seeds to shrivel.

Under California conditions, lygus bugs usually are not very abundant in alfalfa until the fields come into bloom. With the first appearance of bloom, they start to increase and the numbers reach a maximum at full bloom. With the decline in bloom the numbers of lygus bugs decrease and relatively few are present in a field by the time the seed has reached maturity.

The number of lygus bugs in a field is determined by making sweeps through the plants with an insect net. The insect net should have a 24-inch handle and a hoop 15 inches in diameter. The net bag is made of muslin and is about 24 inches deep. The lower edge of the net is held eight to 10 inches into the alfalfa and the sweeps are made through a half circle from one side of the sweeper to the other. Counts of lygus bugs per sweep should be

made at several positions in the field. The average of such counts are used in timing the insecticide applications.

Under most conditions, it is time to apply treatment in the prebloom stage if the population exceeds two lygus bugs per sweep. Where lygus bugs are a chronic and severe problem, it may be more practical to treat at a lower count. Such an insurance treatment will decrease the number of applications required when the alfalfa is in bloom. However, it can not be depended upon to give adequate control and a second treatment may be needed.

In the period from early to full bloom, treatment should only be applied if the number of nymphs—wingless forms—exceed the adults—fully winged—and the total count per sweep exceeds five.

When a field is past full bloom, it usually is not necessary to treat. Under some conditions, such as where there is considerable secondary bloom and the lygus bugs are abundant—over 10 per sweep—it may be desirable to treat in late bloom. If the above directions are followed, one treatment usually will be sufficient to give control of harmful insects. Neighboring fields of alfalfa hay and sugar beet seed are sources of lygus bugs and, if possible,

treatment should be delayed until after these crops are harvested. Certified alfalfa seed is considerably more valuable than common seed and in this case treatments probably should be applied at lygus bug population levels slightly below those mentioned above.

No material should be applied to alfalfa seed in bloom which has proven harmful to the beneficial pollinators. For this reason parathion, benzene hexachloride and chlordane should not be used. DDT is recommended as the best material when considered from the standpoints of protection of the beneficial pollinators and adequate control of lygus bugs. Under most circumstances the application of DDT as a spray is as effective as or better than the application as a dust. Dusts are suggested where the plants are badly lodged. When compared with dusts, sprays have a longer residual action, that is, they kill lygus bugs over a longer period of time, and they leave more residue on the straw after harvest.

In the prebloom stage, the dosages recommended are one and one-quarter pounds of actual DDT per acre when applied as a spray and 30 pounds of 5% DDT when applied as a dust. When it is

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## GRAPES

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Hall—noted the very large berries. The Muscat Cannon Hall seemed to correspond exactly with the California-grown Muscat of Alexandria tetraploid. This surmise proved to be correct. The fruit of this giant variety and the usual type from which it came are illustrated on page 5.

Here was the first example that a tetraploid grape—at least under certain special cultural conditions—might become commercially useful.

In 1942 some cultivated varieties imported from Japan likewise proved to be tetraploids, and they were traced as being the giant forms of the well-known American varieties, Campbell, Catawba, Delaware and Niagara.

Recently the most widely grown Concord-type grape grown in California, the Pierce or California Concord, has been determined as a tetraploid.

Tetraploids and diploids differ in their behavior, but it soon became apparent that under some conditions at least, a giant variety might be produced which had desirable growth, fruited regularly and exhibited the sought-for increase in berry size.

No generalizations in behavior can be predicted. The important point is that the effects of chromosome doubling are dependent on the particular variety concerned. The Muscat tetraploid actually sets better-filled clusters than the diploid from which it arose, but the giant Zinfandel shows quite the reverse.

These differences extend to growth habit as well. The tetraploid Niagara has a sufficient number of canes and leaves to afford the fruit good protection from the sun, but the giant Flame Tokay seldom matures any clusters that are not partly or wholly sunburned.

It must be concluded that the characteristics of tetraploids—good or bad—are not only traceable to the increase in

chromosome number—but also to the new relationships that this process sets up between the number and balance of the hereditary units or genes.

Recombining these hereditary units can be expected to modify profoundly the characteristics of the tetraploids. This has been done by growing many hybrids between various tetraploids. Among such plants appear segregates that resemble externally and behave like diploids—and yet the doubled chromosome number is maintained.

Even more important, large berry size and good fruitfulness sometimes appear in such modified tetraploids.

Two new varieties being propagated at Davis—for introduction—are expected to be the vanguard of a new *tetra* race of grapes.

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## ALFALFA

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necessary to treat in bloom the dosages recommended are one pound of actual DDT per acre when applied as a spray and 25 pounds of 5% DDT when applied as a dust.

### Hazard to Bees

Toxaphene has shown considerable promise when applied as a spray. This is the safest material to use as far as bees are concerned. When applied in the early morning before the bees are in the field, there will be little loss of bees. Unfortunately, considerably more poundage per acre of this insecticide is required to obtain adequate control than in the case of DDT. However, it may be used in bloom if the hazard to bees is especially great, or if either grasshoppers or yellow-striped armyworms are a problem. Two to three pounds per acre of actual toxaphene applied as spray is recommended.

Applications of insecticides to alfalfa seed usually are most easily applied by airplane dusters or sprayers. When treating fields in bloom, the applications should be made in the early morning before bees come into the field.

Chaff from fields treated with either DDT or toxaphene should not be fed to dairy animals or to meat animals within 60 days of slaughter.

In the desert areas, lygus bug control has been more difficult during the hottest summer months. Inasmuch as honeybees do not work as effectively during very hot periods and insect pest control is more difficult, it is suggested that in these regions the alfalfa seed crop be arranged so that it blooms from June to early July. In these areas, late seed fields always should be treated in prebloom and it may be necessary in some cases to treat a second time with one and one-half pounds of DDT per acre in an emulsive spray.

Where red spiders are a problem, 50% sulfur should be incorporated in the DDT dusts. In the desert areas, various species of stink bugs are occasionally a problem in late bloom. BHC dust containing 2% gamma isomer applied at the rate of 25 pounds per acre has proven effective in most cases but should be used with extreme caution since it is very harmful to bees.

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