

ALFALFA INSECT IDENTIFICATION AND CONTROL

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Alfalfa is attacked by insect pests throughout the year. The kinds of pests which may be present in an alfalfa field may vary considerably from season to season and from year to year. A field of alfalfa hay that is not examined periodically for insects may be damaged or even destroyed before control measures can be applied. In addition, profitable high quality hay production requires the grower to know the significance and abundance of both the harmful and beneficial insects in his field.

All alfalfa hay pests are attacked by natural enemies including parasites, predators and disease-producing organisms. These natural enemies often prevent pests of alfalfa from increasing to damaging levels. Treatment of alfalfa hay with broad-spectrum insecticides (toxic to many kinds of insects) can upset the natural balance and may result in outbreaks of pests other than those for which the treatment was intended. This may lead to the need for repeated treatments.

When chemical treatment becomes necessary, chemicals should be carefully chosen and applied thoroughly at exactly the recommended dosages. Overtreatment not only may be harmful to beneficials, but also may result in excessive insecticidal residues on the hay and may injure the plant.

The following are some of the more important insect pests of alfalfa hay in California. Information regarding life cycles, description of pest insects for aid in identification, type of damage they cause, and preferred methods of control is given.

The EGYPTIAN ALFALFA WEEVIL, (*Hypera brunneipennis*), is a dark gray weevil about one-quarter inch long. The adults overwinter in any available secluded place such as along fence borders, under the bark of trees or piled wood and in field trash. In southern desert valleys, they emerge in late December or early January and move into alfalfa fields. Soon after emergence, the adult females begin inserting their eggs into the stems of alfalfa. The eggs hatch in a few days and the young larvae make their way into the terminals of alfalfa.

The legless larvae are about three-eighths inch long when fully grown. They are pale green with a thin white line down the center of the back and have a brown head. The larvae complete their growth in about three to four weeks, drop to the ground, spin a cocoon and pupate. There is only one generation per year.

The adults usually do not feed on the alfalfa to any significant degree but the weevil larvae damage the alfalfa by feeding on the terminal buds and upper leaves first and then gradually moving down the plant. Damage is usually confined to the first cutting of alfalfa but sometimes persists into the second or third cuttings.

After larvae begin to appear, fields should be checked at 2 to 4 day intervals. Chemical control should be considered when larval count reaches an average of 20 per sweep of a standard insect net.

On short alfalfa early in the season or on stubble following cutting which cannot be checked with a sweep net, treatment is indicated when growth is retarded because of weevil feeding.

Furadan[®] (carbofuran), malathion, Methoxychlor, or Lannate[®] (methomyl) will all provide satisfactory control of the weevil larvae. Supracide[®] is preferred since research has shown that it causes a minimum of harm to parasites and predators especially those attacking the spotted alfalfa aphid and pea aphid.

The PEA APHID, (*Acyrtosiphon pisum*), is a large green pea aphid about one-sixth inch long. Although all young are wingless, the adults may be winged or wingless. Cast off white skins shed by nymphs are quite noticeable on aphid infested alfalfa. This

aphid concentrates its attack on the terminals and upper portion of the stem and leaves. A generation may develop in about 10 days and, there may be 20 generations annually.

The pea aphid damages alfalfa by sucking the juice from the tender parts of the plant. Severe infestation will cause stunting and may even kill plants. Infestations are greatest in cool weather during the spring and early summer, although damage has been noted in the fall months.

An introduced wasp has become established as an effective parasite of the pea aphid. Large golden brown aphid mummies on the upper surfaces of alfalfa leaves indicate the presence of this beneficial insect. If mummies are abundant, it is likely that the aphid is under biological control and caution should be exercised in treating for aphid control.

When severe infestations occur, damage may be avoided by early cutting. If harvest is more than 14 days away and population levels have reached an average of 40 to 50 aphids per 10-inch high stem, or 70 to 80 aphids per 20-inch high stem, then chemical treatment may be considered.

Systox[®] is the preferred insecticide because of low toxicity to beneficial insects. It is less apt to "trigger" outbreaks of other pests than use of materials such as parathion, methyl parathion, or malathion. Phosdrin[®] will provide good control of pea aphids but because of its short residual effect, should only be used during the period (1 to 21 days before harvest) when Systox cannot be used.

The SPOTTED ALFALFA APHID, (*Therioaphis trifolii*), is a small pale yellow or grayish aphid. On its back are 4 to 6 rows of black spots bearing small spines. It may or may not have wings. In contrast to the common green pea aphid, the spotted alfalfa aphid is about two-thirds smaller, jumps when disturbed, excretes large amounts of honey dew, and begins its infestation on the lower part of the plant concentrating on the undersides of the leaves.

In most alfalfa growing areas, the widespread planting of resistant varieties along with the activity of predators, fungus disease and introduced parasites has reduced this aphid to minor pest status. However, in the absence of these beneficial actions, severe aphid infestation may occur which can retard growth, reduce yield and feed value, and may even kill plants. A black fungus which grows on the honey dew excreted by the aphid reduces palatability. In the Antelope Valley and southern California desert areas, severe infestations may occur from late July through September.

This aphid has developed a high degree of resistance to organophosphorus compounds in many areas. Therefore, the best way to avoid an aphid problem is the planting of resistant alfalfa varieties. In localized areas where susceptible varieties are planted, fields should be checked two or three times a week during critical periods.

Aphid counts should be made by carefully cutting a stem close to the ground with a sharp knife and then counting the aphids. This procedure should be repeated, cutting a number of stems at several locations in the field. If the counts average 20 or more aphids per stem on summer hay, or 40 aphids per stem on spring hay, a chemical treatment is usually required. Treatment should also be considered when overwintering populations after last cutting reach 50 to 60 aphids per stem. In Imperial Valley treatment is usually required on reseeded alfalfa when populations reach 20 aphids per stem.

In areas of nonresistant aphids, an application of Systox[®] (demeton) will protect a cutting from further aphid attack and will allow predators and parasites to survive. Phosdrin[®] (mevinphos) will control the aphid where treatment is required close to harvest.

The Egyptian Alfalfa Weevil and the Spotted Alfalfa Aphid may show up simultaneously along with pea aphids in first or second cutting alfalfa. As suggested above, both weevil and aphids are easily controlled with several chemicals, but care should be taken to avoid treatments highly toxic to beneficial insects (including honey bees foraging for pollen from wild mustard, etc.). Unnecessary applications of some organophosphates may "trigger" pest insect outbreaks which would not normally occur.

When considering treatment for aphids alone, size up the situation with an objective eye. Be aware of the fact that aphid resistance to insecticides continues to be a problem - early season treatments should be avoided whenever possible. You may find that a large percentage of the aphids have been hit by a fungus disease and are dead, obviously not causing a problem. Closer examination may reveal aphids which are not diseased but rather look like a shell or mummy - all puffed up like a balloon and tan in color. Aphids appearing this way have been parasitized by tiny wasps. Lady beetles, lady beetle larvae, and green lacewing larvae may also be present in abundance feeding on the aphids.

On new stands of seedling alfalfa, fields must be examined carefully for aphids as soon as seedlings break surface of ground. Treatment with Systox[®] is recommended when one adult aphid per seedling is present on the average, and plants have less than 5 true leaves. On large seedlings treat when 10 to 30 aphids per stem are present.

The adult butterflies of the ALFALFA CATERPILLAR, (Colias eurytheme), are yellowish-orange or whitish with a black border on the wings. The female butterflies lay their eggs singly on the upper surfaces of the leaves of short alfalfa. In 3 to 7 days, these eggs hatch into green caterpillars which begin feeding on the plant. When full-grown, the caterpillars are about one and one-half inches in length and can be distinguished from the other common caterpillars in alfalfa by their velvety-green bodies and the white stripe along each side.

Alfalfa caterpillar populations usually result from a flight of butterflies into the field when the alfalfa is less than six inches high. Damaging populations may occur during the period from late June through September. The caterpillars damage the alfalfa by feeding on the leaves, at first giving them a "shot-holed" appearance and later may strip the leaves and sometimes consume the stems.

Factors that contribute to economic populations are: slow and uneven growth of the crop, lack of parasites, and hot, dry weather. Infestations vary greatly from season to season and from one field to another. Consequently, during the critical summer period the fields must be checked at least once a week to detect developing populations.

An important parasite of the alfalfa caterpillar is Apanteles, a dark brown to black wasp about one-quarter inch long. This wasp stings the very small alfalfa caterpillar and lays an egg inside. The egg hatches and the wasp larva consumes the body contents of the caterpillar. A parasitized caterpillar dies before it reaches one-half inch in length. A parasitized caterpillar is recognized by being lighter than normal in color, somewhat shiny rather than velvety on the surface and swollen toward the rear. By grasping the caterpillar at each end of the swelling and pulling it apart, the small, shiny, white parasite will pop out and be seen.

Damage may sometimes be avoided by early cutting of the crop. This not only may save the present crop, but also protect later ones. Cutting should be timed to avoid serious damage and yet obtain satisfactory yield. However, if an average count of 10 or more nonparasitized caterpillars per sweep of a standard insect net are found, and cutting is impractical, a chemical treatment will be necessary.

Dylox[®] (trichlorofon) will provide satisfactory control and is preferred over other chemicals because of low toxicity to beneficial insects. A spray containing Bacillus thuringiensis will also control the caterpillars and has several advantages such as complete preservation of beneficial insects, no undesirable residue on hay, and no time limitations.

It should be noted that B. thuringiensis is less effective for control of the beet armyworm. When chemical treatment for alfalfa caterpillar is desirable and high populations of the beet armyworm are also present in the field, methyl parathion or Dibrom[®] will provide adequate control of both pests. Recent research has shown that Lannate[®] is effective on beet armyworm.

The BEET ARMYWORM, (Spodoptera exigua), is a small mottled gray or dusky winged moth. It appears in the spring and the females deposit pale greenish or pinkish, striated eggs in small or large masses, covered with white cottony material on alfalfa.

The eggs hatch in a few days and the tiny caterpillars begin feeding on the plant. The caterpillars become full-grown in about two to three weeks and are about one and one-quarter inch long. They may be olive green to almost black in color down the middle of the back with a yellow stripe on each side of the body.

The beet armyworm may cause severe injury to alfalfa hay during the summer and fall in southern California. The caterpillars feed voraciously on the plants. Treatments are usually required when counts of beet armyworm caterpillars reach 15 or more per sweep of a standard insect net when the caterpillars are at least one-half inch in length.

Early cutting will give satisfactory control if the infestation appears late in the cutting cycle. If cutting is impractical, a ground or air application of Dibrom[®] or methyl parathion will control the beet armyworm. Recent research has shown that Lannate[®] will also effectively suppress beet armyworm.

The VARIEGATED CUTWORM, (Peridroma Saucia), occasionally attacks seedling alfalfa and may also cause damage by destroying foliage on older stands of alfalfa. The adult moth of the variegated cutworm has grayish-brown wings with dark mottling and a wing expanse of about 1½ inch.

The females lay whitish-gray eggs in rows in large irregular masses on leaves and stems of plants, limbs and trunks of trees and other convenient places in the spring. Full-grown caterpillars are about one and one-half inches long and may be yellow to brown with a row of four to six dull yellow or pink diamond-shaped spots down the back. When disturbed, the caterpillars roll up in a characteristic C-shaped pattern.

Damage to the alfalfa results from the general and destructive feeding of the caterpillars. Injurious populations usually occur within a period of from April to late June. If chemical treatment is to be considered, treat infested fields with insecticide-treated baits. Results of research work have shown that the application of 5% Sevin bait or 5% Dylox bait will give satisfactory control of cutworms in alfalfa. Dylox (trichlorofon) will give good control when applied as a spray in late evening or at night when the cutworms are on the plants. (During daylight hours the worms hide in the soil, in cracks, and under trash.)

GRASSHOPPERS occasionally become major pests of alfalfa hay production. Populations may develop in surrounding uncultivated areas and move into cultivated fields, or others will prefer cultivated alfalfa fields as a common breeding ground for development.

Grasshopper eggs hatch in April or May and the young grasshoppers develop through five nymphal instars until full-grown. This development requires from 6 to 7 weeks. About late July, mating commences and females begin ovipositing eggs in the soil. Egg laying continues through September and by late October the adults are usually gone. The eggs remain in the soil throughout the winter until hatching time in April to begin a new generation.

Damaging populations of grasshoppers will rapidly consume alfalfa resulting in loss of yield. Economically significant injury levels vary with the growth of the crop and the stage of development of the grasshoppers. But in general, populations of 15 or more grasshoppers per square yard are considered severe and control measures are recommended.

Sevin[®] (carbaryl) Diazinon[®], Malathion, Phosdrin[®] (mevinphos) or Dibrom[®] (naled) spray will give good control of grasshoppers in alfalfa fields. These materials should be applied when honey bees are not in flight in the field. Being highly toxic to bees, they should not be applied when the field is in bloom. Other controls such as baits are not satisfactory where succulent alfalfa is available to the grasshoppers, but it is sometimes practical to bait the field following harvest.

SPIDER MITES, THRIPS, LYGUS BUGS, TREEHOPPERS, LEAFMINERS, LEAFHOPPERS, SOWBUGS SLUGS and other pests may be abundant in alfalfa fields. Only rarely do they cause economic damage to the hay crop in southern California.