

Pesticide Certification Information

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**FIELD CROP
INSECT PESTS**

**WEST VIRGINIA UNIVERSITY
EXTENSION SERVICE
AN EQUAL OPPORTUNITY/
AFFIRMATIVE ACTION INSTITUTION**

FIELD CROP INSECT PESTS

PESTS OF ALFALFA

POTATO LEAFHOPPER

These small, pale-green sucking insects migrate into fields about mid-June. New seedlings are often seriously injured, and second and third cuttings of established stands are frequently damaged. Leafhoppers are probably the most destructive insect pest of alfalfa. They are responsible for reduced yields of second and third cuttings of as much as 1/4 to 1/2 ton per acre. A loss of up to five percent of the protein content of alfalfa is not uncommon.

Symptoms (yellow, stunted plants) do not show up until it is too late to protect the crop. It is, therefore, important to keep a close check for infestations of this pest. Check new seedlings regularly beginning in mid-June, and check second and third cuttings when the new growth is about four inches tall. With an insect net, make a sweep through the alfalfa at ten different places in the field. An average of one or more leafhoppers per sweep of the net indicates a population high enough to warrant control measures on established fields; five leafhoppers in ten sweeps should be the signal to treat new seedlings.

When populations are high enough to warrant control, spray new seedlings if there are two or more weeks to go before cutting. Second and third cuttings should be treated when the new growth is approximately four to six inches high.

ALFALFA WEEVIL

The larvae of the alfalfa weevil are very small, yellowish-green to light-green worms with black heads. They feed on the leaflets of the growing tips from late April to early June. Light to moderate feeding causes a silvery cast at the tops of the plants. Large populations of larvae often cause severe defoliation.

Overwintering is either as eggs in alfalfa stems or as adult weevils. Most eggs are deposited during April and May. Damage is usually confined to the first cutting and to new growth of the second cutting.

On fields that are near harvest and show injury, harvest as soon as possible. If the field shows damage several weeks before harvest, delay the spray application until 75 percent of the plant tips show slight feeding injury. Stubble may need spraying if larvae and adults are numerous enough to hold back the new growth.

ALFALFA LEAF BLOTCH MINER

The adult stage of the insect is a dull-black, humpbacked fly less than one-fourth the size of a housefly. The insects pass the winter as small, dark-brown, capsule-like pupae in rubbish on the ground. Adult flies emerge in May and make pinhole punctures in the alfalfa leaflets as they feed and deposit eggs. It is not unusual to see 50 or more such pinholes in a leaflet. Eggs are deposited between the upper and lower surfaces within leaflets.

The tiny, cream-colored maggots eat the tissue between the leaf surfaces, but do not eat through to the surface. The mines are narrow at first and gradually broaden out into an irregular-shaped blotch. Several blotches may be found on the same leaflet. This injury looks worse than it is; to date, the actual reduction in Total Digestible Nutrient (TDN) from this pest has not been substantiated. An infestation must have more than 50 blotches per stem before any economic loss can be measured.

Each year there are three generations and possibly a partial fourth. Adult fly populations are lowest during the first week of June and reach fairly high peaks in mid-July and again in mid-August.

Damage solely from the leaf blotch miner is not likely to be a serious problem. However, when the miner and alfalfa weevil are working on the same field, damage can be severe.

Harvesting at the proper time will likely keep the leaf blotch miner in check.

SPITTLEBUG

Small grain stubble is a favored site for fall egg laying, so the greatest spittlebug populations will usually be in new seedings where oats were used as a companion crop. Injury is done by the nymphs and only to the first cuttings. An average of 3/4 to one nymph per stem can reduce the yield enough to warrant control measures.

The small, greenish, slimy nymphs start hatching in late April; their presence on plants is noted by the small, white mass of spittle surrounding them. Nymphs suck sap from the plants and use it for food and to produce spittle for protection. Typical spittlebug damage is stunted plants with small and crinkled leaflets.

Adult spittlebugs appear usually in mid-June and are present through the summer. They are weathered brown, hard shelled, and about the size and shape of a grain of wheat. The adults do not damage field crops.

PEA APHID

Green pea aphids can be found in every alfalfa field in the state from April to October, but are seldom abundant enough to cause serious damage. The greatest populations have appeared in the eastern half of the state during April and May, and in some years, threatening populations have built up during August. The aphid population is usually kept in check by a fungus disease and by parasites and predators.

Pea aphids are sucking insects 1/8 inch in diameter. They normally feed in colonies near the tops of the plants. Heavily infested plants will be shiny from the honeydew secreted and dropped to the leaflets below.

Chemical control is not suggested unless the aphids exceed 30 per sweep of an insect net with more than 10 days until harvest.

EUROPEAN ALFALFA BEETLE

This beetle and its larvae look like half-grown Mexican bean beetles; the number of black spots on the back varies. Like the Mexican bean beetle, the European alfalfa beetle also belongs to the lady beetle family, but feeds on plants instead of insects.

PESTS OF CORN

SEED CORN MAGGOT

Seed and root maggots are always present, but cool, moist conditions are most favorable to their development. Some damage is expected every year. The maggots work and feed on the sprouting seed; the result is either a weakened plant or one that dies before it gets out of the ground.

The gray adult flies are similar to houseflies in general appearance, but are smaller. They are most active in April and May, but are present throughout the season; there are three or more generations per year.

It is the first generation maggot about which corn producers are concerned. Average reduction of stored plant from this pest is in the five- to ten percent range, but in some fields, the number of seedlings destroyed may be as high as 75 to 90 percent.

Any planting scheme that will hasten germination and growing will help reduce maggot injury. As no-tillage can be expected to slow germination, more maggot damage can be expected in no-till fields than in conventional fields.

For control, a commercial planter-box seed-treating preparation containing a mixture of insecticide and fungicide can be used. All corn seed should be protected with a fungicide before planting; therefore, if an insecticide seed protectant without fungicide is used, the seed should have already been treated with a fungicide. Follow label directions for dosage.

CORN ROOTWORM

The damage caused by the northern corn rootworm is of two distinct types:

- (1) damage to the roots by the larvae from mid-June to mid-July, and
- (2) interference with pollination in late July and early August by the adult beetles feeding on the silks.

The actual damage done by rootworms may be greater than the visible superficial injury. The openings in the roots caused by insects allow a means through which stalk-rot organisms can enter the plant.

Fields cut early in September for silage will have fewer corn rootworm eggs than fields with standing corn.

Limited work comparing the liquid and granular insecticides shows granules slightly superior to the liquids for controlling this pest. The emulsifiable concentrates of the highly toxic insecticides will be extremely dangerous to handle. Cost per acre is in favor of the liquid formulations.

Soil applications at planting are designed to reduce larval damage to roots. Such treatments will have no effect on adult beetles attacking the silks in late July and in August.

No special control is suggested against rootworm beetles unless the average number of beetles per ear is more than five and the crop is less than 50 percent in silk. If the beetles appear early or if the corn is late in silking, beetles feeding on the silks can interfere with pollination.

CORN FLEA BEETLE

The major damage from corn flea beetles is Stewart's Disease (bacterial wilt). Bacteria overwinter in the gut of the beetle; the beetles are carriers of the disease. Flea beetles are tiny, black, hard-shelled, chewing insects. They emerge from their hibernating quarters at about the time

corn plants are in the spike and two-leaf stages. The actual feeding on the leaves is usually not serious. Flea beetles are usually most abundant following mild winters. When average temperatures for the months of December, January, and February total 90° F or more, trouble from flea beetles and bacterial wilt can be expected.

Although corn varieties exhibit a wide range of tolerance to bacterial wilt, most varieties adapted to Pennsylvania do not break down completely when infected with the disease. Yields will be reduced.

EUROPEAN CORN BORER

It is difficult to justify the cost of treatment for corn borers on field corn. None of the approved insecticides is good enough to do an acceptable job with one or even two applications, and losses average only two to three percent.

Other than using tolerant hybrids, no special controls are suggested for borers in field corn except under very heavy infestations. If more than 75 percent of the plants show moderately heavy feeding on the whorl in late June, chemical treatment should be used.

The riddled leaves in the whorl of plants in late June always appear much worse than are the actual losses. Larvae that enter the stalks may cause some stalks to break over and some shanks to break away from the stalk, but this seldom reaches serious levels.

Corn borers have two generations per year; moths emerge in June and again in late July and early August. The first generation larvae (borers) that appear in June are responsible for more damage to corn than are those of the second generation.

GARDEN SYMPHYLAN

Damage from garden symphylans appears to be more widespread each year. Although they are distributed throughout the state, the largest areas of infestation are scattered through the eastern half of the state.

The small, white, centipede-like animals live in the soil and are about 1/3 inch long when fully grown. They attack the roots of several plants, but corn is one of their favorite hosts. They cut off the hair roots and often chew into larger roots and tubers. Only brown stubs remain where feeder roots should be. Fields are seldom uniformly infested; symphylans are usually concentrated in irregular-shaped areas of less than an acre. All crops in the infested areas are badly stunted.

The first symptoms of garden centipede or symphylan damage are poorly growing plants in small irregular areas in the field. Suspected plants should be dug up with a shovel, and the soil around the roots should be sifted to see if any symphylans are present.

STALK BORER

In late fall, the adult moths deposit their eggs on grasses and dried leaves of corn plants. The newly hatched larvae enter the nearest suitable host in May. Usually, grasses are the first plants attacked, but the borers soon move to young corn plants. The borers may enter the corn stalks at the base and work their way up through the stalk or climb up the stalk to feed on the rolled leaves at the top. Corn plants are usually attacked when they are between two inches and two feet high.

The larvae have a dark-brown head and a purplish body with white stripes. A purple-brown band circles the middle.

PESTS OF OATS

CEREAL LEAF BEETLE

Both the adult beetles and the larvae feed on the oat leaves, but most of the damage is caused by the slug-like larvae. The larvae start feeding about mid-May, and by late May, typical damage is readily noticed. The larvae eat away elongated stripes of the upper leaf surface parallel to the veins. Such injury results in a white, frosted appearance to the tops of the plants. Damaged leaf areas eventually turn a rusty brown color.

The larvae are 1/16 to 1/4 inch long, humpbacked, greenish-yellow, slimy, and slug-like. Most of them will appear black because they cover themselves with a glob of slimy, black fecal matter.

Research has shown that an average of one larvae per stem of oats will reduce the yield about three bushels per acre. Approximately five larvae per stem are required for complete defoliation. Young larvae have a fairly high normal mortality rate, so it is not profitable to spray oat fields to control cereal leaf beetles unless the larval population averages more than one per stem.

PESTS OF SOYBEANS

SEED MAGGOTS

Several species of root maggots attack the germination of beans in the soil. (Refer to the "Corn" information for more about this pest.) Damaged seeds or seedlings fail to produce a healthy plant. The reduction in stand from attack by maggots may be as high as 75 percent, but is commonly 10 to 15 percent. Since some damage occurs in every field each year, all seed should be treated with an insecticide before planting.

The same planter-box seed treater used for corn may be used for soybeans. Follow label directions for dosage.

GREEN CLOVERWORM

The worms are about an inch long when fully grown, and they loop when they move. Their feeding in the plant leaves a ragged appearance. Damage usually begins to appear in late July, and the injury peak is in early August.

The green cloverworm is present each year; it feeds on a wide variety of plants but is seldom a destructive pest. A fungus disease has been effective in reducing the number of larvae.

The insect passes the winter either as a pupa or adult moth. The moths are dark brown with lighter markings on their wings. The wingspread is approximately 1 1/4 inches. At least two generations are produced per year. The second generation of worms causes the most defoliation to soybeans.

Bean plants can withstand some defoliation; six to ten worms per foot of row should be present before control measures are used.

JAPANESE BEETLE

This coppery green beetle is abundant during July and August and will feed on a variety of plants. Their feeding on the leaves of soybeans causes a typical skeleton pattern. They eat the upper portion of leaves between the veins. The skeletonized portion of the leaf soon turns brown.

The larvae are white grubs resembling June beetle grubs. They are white, plump larvae and are always in a C-shaped curve. They have six legs and are about 3/4 inch long when full grown.

The grubs feed on grass roots and are very destructive to lawns and other turf areas. There is only one generation per year.

Practically every soybean field in the state will have some leaf damage by Japanese beetles, but the extent of the feeding is usually so minor that the yield is seldom affected. Soybean plants can tolerate up to 20 percent defoliation without any appreciable economic loss.

Control measures for Japanese beetles on soybeans may become necessary if more than 25 percent of the plants are defoliated.

MEXICAN BEAN BEETLE

These small, yellow to bronze beetles with black spots are the same as those that feed on the leaves of garden beans. Mexican bean beetle larvae do more damage than do the adults. The larvae are bright yellow covered with many branched spines. They skeletonize the undersides of leaves. The eggs are also bright yellow and are easily seen in tight clusters on the undersides of leaves.

Mexican bean beetles have not been a serious pest of soybeans, although a few can be found in almost every field.

THRIPS

These tiny (about 1/16 inch) cream-colored rasping insects are sometimes abundant enough to cause damage to the foliage and tender stems. The insects scrape the surface of the leaf or stem and feed on sap that comes from the ruptured cells. Such damage first shows up as white stippling that soon turns to copper or brown. Heavily damaged leaves and stems cannot function properly, and bean yields are reduced.

Infestations are seldom of any great importance, and control measures are needed only occasionally.

PESTS OF WHEAT

HESSIAN FLY

The tiny, fragile, black flies are seldom noticed even when they are active in the field in April and September. The pupal stage is most easily found on the wheat stem. The Hessian fly damage is the lodging or breaking-over of wheat stems a short time before harvest. In the bent or broken area of the stem, dark-brown fly puparium can be found. These pupae are called flax-seeds because of their close resemblance in size, shape, and color to true flaxseed.

Plants that lodge before harvest produce heads that are small, contain chaffy grain, and are often poorly filled.

There are two generations of Hessian fly per year. However, if moisture is abundant in July and August, a supplementary generation may be produced. Flies are active and lay eggs in late August and in September. Maggots develop on newly emerging wheat plants in the fall and change to pupae by November to pass the winter. The spring brood of flies active in April gives rise to the maggots that weaken the stems.

For many years, the only effective control of this pest was to plant wheat after the "fly-free" date in late September or early October to avoid the fall generation of flies. Many good, adapted, resistant varieties are now available.