Alfalfa Insect Pests

Bee Kind! Honeybees often visit alfalfa fields. The insecticides listed in this section, with the exception of Bt, are HIGHLY TOXIC to honeybees. Avoid spraying when bees are present, by shifting application timing to early or late in the day. Even better, if the crop is in bloom, cut alfalfa to reduce pest numbers rather than spray.

Alfalfa Blotch Leafminer (ABL)

ABL has no history of being a pest in Michigan

Description: Adult = gnat-like fly; larvae = small maggot within leaf tissue.

Life cycle: Overwinters as pupa in soil. Adults become active in the spring at temps over 45°F. Females lay eggs on leaves. Larvae feed internally between upper and lower leaf tissue. Two to five generations per year, usually one generation per cutting.

Type of damage: Females create pinholes in leaves with ovipositor (egg laying device) and drink the plant juices. Larvae create distinctive mines as they feed internally on the leaf.

Management: Biological ~ Populations in the eastern U.S. are controlled by parasitoid wasp. Cultural ~ Cutting kills larvae. Chemical ~ Rarely justified and NOT recommended.

Sampling/scouting: Examine 20 stems in 5 different locations of the field; look for pinholes and C-shaped leaf mines.

Threshold: Rough guideline - pinholes on most leaves plus small mines present and more than two weeks before next cutting.

Notes: Non-native. First detected in the U.S. in 1968 and in Michigan in 1983.

List of registered insecticides, *RUP (rate per acre):

Baythroid 2* & XL* (2.0 to 2.8 oz)
Chlorpyrifos 4E*/Govern 4E*/Nufos 4E* (1 to 2 pts)
Cobalt* (19 to 38 oz)
Lambda-Cy EC* (3.84 oz)
Lannate LV* (1.5 to 3.0 pt) or SP* (0.5 to 1.0 lb)
Lorsban 4E* or Advanced* (1 to 2 pt)
Proaxis* (3.84 oz)
Silencer* (3.84 oz)
Warrior w/ ZeonTech* (3.84 fl oz)

Alfalfa Weevil

A key alfalfa pest kept in check by biological control, although in recent years reports of AW damage have increased.

Description: Adults gray-brown snout beetle, dark stripe down back; larvae green with white stripe down back and black head.

Life cycle: Overwinters as adult in fields, fence rows, wood lots, etc. Emerges in early spring. Adults feed on new growth. Eggs laid in holes chewed on stem by females. Small larvae feed on leaf tips; larger larvae eat entire leaf. Larvae pupate in cocoons on plant. New adults emerge in mid-June/ July, feed a short time, then become inactive until following season. One generation per year.

Type of damage: Defoliation, primarily by larvae. Large larvae skeletonize leaves.

Management: Biological control is highly effective. Several species of parasitoid wasp usually provide adequate control. Timely cutting kills most larvae, pupae, some adults. Consider cutting rather than spraying to preserve natural enemies.

Sampling/ scouting: Early season, use sweep net to detect adult emergence, then begin larval scouting.

* Feeding. Before first cutting, sample 20 stems in 5 different locations of the field, look for larvae and damage. After first cutting, check stubble or regrowth for larvae. Threshold: Before first cutting, 40% of stems damaged, plus live larvae present; after first cutting, 25% or more of new tips damaged, or 6 to 8 larvae per square foot of regrowth.

* Stem-and-Bucket method. Pick 10 stems randomly as you walk. Place them upside down in a bucket. Shake vigorously to dislodge large larvae, then pull apart the stem tips to find small larvae missed by shaking. Threshold: alfalfa less than 12 inches = 1 or more larvae per plant; 12-16 inch alfalfa = 2-4 larvae per plant; 16+ alfalfa = consider cutting. Check regrowth for larvae.

List of registered insecticides, *RUP (rate per acre):

Ambush 25W* (6.4 to 12.8 oz)
Arctic 3.2 EC* (4 to 8 oz)
Baythroid 2* & XL* (1.6 to 2.8 oz)
Chlorpyrifos 4E*/Govern 4E*/Nufos 4E* (1 to 2 pts)
Cobalt* (19 to 38 oz)
Imidan 70W (1.0 to 1.33 lb)
Lambda-Cy EC* (2.56 to 3.84 oz)
Lannate LV* (1.5 to 3.0 pt) or SP* (0.5 to 1.0 lb)
Lorsban 4E* or Advanced* (1 to 2 pt)
Malathion 5 EC (1.5 to 2.0 pts) or 57EC (1.5 to 2.25 pts)
Malathion 8F (1 to 2 pts) or ULV (1 pt)
Mustang Max EC or EW* (2.24 to 4 oz)
Perm-UP 3.2 EC* (4 to 8 oz)
Pounce 3.2 EC* (4 to 8 oz) and 25WP* (6.4 to 12.8 oz)
Proaxis* (2.56 to 3.84 oz)
Sevin 4F and XLR Plus (1.5 qt)
Sevin 80S and 80WSP (1.87 lb)
Silencer* (2.56 to 3.84 oz)
Warrior w/ ZeonTech* (2.56 to 3.84 oz)

Aphids - pea aphid & spotted alfalfa aphid

Although aphids are common in alfalfa, they rarely cause damage.

Description: Small oval to pear shaped soft-bodied insects. Color varies from bright green to pink to brown. Pea aphids have long cornicles ("tail pipes").

Life cycle: Aphids present during the field season are all female, and do not need to mate to reproduce; females produce live young. Multiple, overlapping generations.

Type of damage: Suck plant sap from leaves and stems. Heavy infestation may lead to stunting, curling of leaves, and general weakening of plants.

Conditions favoring damage: Pea aphid - cool, wet weather; spotted alfalfa aphid - hot, dry weather.

Management: Biological - natural enemies (ladybugs, lacewings, and wasps) and fungi generally keep populations in check.

Threshold: 1 or more colonies on plants less than 6 inches; 1 or more colonies per stem for larger plants (colony = 30 or more aphids)

List of registered insecticides, *RUP (rate per acre):

Ambush 25W* (3.2 to 12.8 oz)
Arctic 3.2EC* (2 to 8 oz)
Baythroid 2* & XL* (2.8 oz)
Cobalt* (13 to 26 oz)
Dimethoate 4EC (0.5 to 1 pt) or 5lb (6.4 to 12.8 oz)
Lambda-Cy EC* (2.56 to 3.84 oz)
Lannate LV* (1.5 to 3 pt) or SP* (0.5 to 1 lb)
Lorsban 4E* or Advanced* (1 to 2 pt)
Malathion 5EC (1.5 to 2.0 pts) or 57EC (1.5 to 2.25 pts)
Malathion 8F (1 to 2 pts) or 8 Aquamul (1.25 to 2 pts)
Mustang Max EC or EW* (2.24 to 4 oz)
Perm-UP 3.2 EC* (2 to 8 oz)
Pounce 3.2EC* (2 to 8 oz) or 25WP* (3.2 to 12.8 oz)
Proaxis* (2.56 to 3.84 oz)
Silencer* (2.56 to 3.84 oz)
Warrior w/ ZeonTech* (2.56 to 3.84 oz)

Armyworms

Armyworm outbreaks occasionally occur in multiple crops, in years with heavy flights north into Michigan

Description: Caterpillars variable in color (black/brown/green). Narrow light stripe across back and broad stripes running down sides of body.

Life cycle: Move north into Michigan each spring. 2-3 generations per year.

Type of damage: Defoliation by larvae.

Threshold: Treat when there are four or more armyworms per foot of row.

List of registered insecticides, *RUP (rate per acre):

Agree WG (0.5 to 2 lbs)
Ambush 25W* (3.2 to 12.8 oz)
Arctic 3.2EC* (2 to 8 oz)
Baythroid 2* & XL* (1.6 to 2.8 oz)
Biobit HP (0.5 to 2.0 lbs)
Chlorpyrifos 4E*/Govern 4E*/Nufos 4E* (1 to 2 pts)
Cobalt* (19 to 38 oz)
Dipel DF (1 to 2 lb)
Javelin (0.25 to 1.5 lb)
Lannate LV* (1.5 to 3 pt) or SP* (0.25 to 0.5 lb)
Lorsban 4E* or Advanced* (1 to 2 pt)
Malathion 5EC (2 pts) or 57EC (2 to 2.25 pts)
Malathion 8 Aquamul (1.25 to 2 pts) or 8F (1 to 2 pts)
Mustang Max EC or EW* (2.8 to 4 oz)
Perm-UP 3.2 EC* (2 to 8 oz)
Pounce 3.2 EC (2 to 8 oz)* or 25WP* (3.2 to 12.8 oz)
Proaxis* (2.56 to 3.84 oz)
Sevin 4F and XLR Plus (1.0 to 1.5 qt)
Sevin 80S and 80WSP (1.25 to 1.875 lb)
Silencer* (2.56 to 3.84 oz)
Warrior w/ ZeonTech* (2.56 to 3.84 oz)
Xentari (0.5 to 2 lbs)

Clover Root Curculio

No history of being a pest in Michigan.

Description: snout beetle; black/brown, 1/8th inch long.

Life cycle: Adults overwinter. Females lay eggs in spring or fall on lower plant surface or soil; larvae enter soil and feed on roots. One generation per year.

Type of damage: Larvae feed on nodules and small rootlets, chew furrows on main root, and leave extensive scarring. Pathogens may enter these wounds. Can shorten stand life and enhance winter kill. Damage primarily occurs during the first year of the stand, with little or no damage happening in later years.

Conditions favoring damage: A new seeding planted in or near an old infested field is at greater risk. Drought stress increases stand loss from this insect.

Management: Cultural, not chemical. Isolate new seedings away from old stands. Rotate old stands of alfalfa or clover to a non-legume crop (eg not soybean). Spring seed versus fall seed to avoid fall dispersing beetles.

Cutworms

Cutworm risk is highest in new seedings. Not a problem in established fields.

Description: Caterpillar is up to 2 inches long. Variable coloration (black, tan, greenish-yellow), with a row of light yellow spots down the back.

Life cycle: Adults migrate into Michigan in early spring and lay eggs on legumes. Several generations per season.

Type of damage: Larvae feed on leaves and stems. Greatest risk for damage is in new seedings or regrowth.

Management: Cultural - if larvae are large (1.5-2 inches), delay cutting of established stand until after pupation, to avoid concentrated feeding on regrowth**.**

Threshold: Feeding on 5% or more of plants.

List of registered insecticides, *RUP (rate per acre):

Ambush 25W* (3.2 to 12.8 oz)
Arctic 3.2EC* (2 to 8 oz)
Baythroid 2* & XL* (0.8 to 1.6 oz)
Chlorpyrifos 4E*/Govern 4E*/Nufos 4E* (1 to 2 pts)
Cobalt* (13 to 26 oz)
Lambda-Cy EC* (1.92 to 3.2 oz)
Lannate LV* (0.75 to 3 pts) or SP* (0.25 to 1 lb)
Lorsban 4E* or Advanced* (1 to 2 pt)
Mustang Max EC or EW* (2.24 to 4 oz)
Perm-UP 3.2 EC* (2 to 8 oz)
Pounce 3.2EC* (2 to 8 oz) or 25WP* (3.2 to 12.8 oz)
Proaxis* (1.92 to 3.2 oz)
Sevin 4F and XLR Plus (1.0 to 1.5 qt)
Sevin 80S and 80WSP (1.25 to 1.875 lb)
Silencer* (1.92 to 3.2 oz)
Warrior w/ ZeonTech* (1.92 to 3.2 oz)

Grasshoppers

Grasshoppers are common in agricultural fields, but cause damage only during occasional outbreak years.

Life cycle: Eggs overwinter in soil; nymphs hatch in June. As nymphs grow, feeding damage increases. Females lay eggs in soil in late summer.

Type of damage: Defoliation by nymphs and adults.

Conditions favoring damage: Unplowed or fallow areas are preferred egg-laying sites, and may contribute to populations in nearby fields. Dry, warm weather enhances nymph survival.

Management: Biological - A fungal pathogen kills many eggs and nymphs under wet spring conditions. Natural enemies (birds, rodents, amphibians) also feed on grasshoppers, but may not keep up during outbreaks.

Threshold: 8 or more per square yard for plants less than 6 inches; 16 or more per square yard for taller plants.

List of registered insecticides, *RUP (rate per acre):

Baythroid 2* & XL* (2.0 to 2.8 oz)
Chlorpyrifos 4E*/Govern 4E*/Nufos 4E* (0.5 to 1 pts)
Cobalt* (7 to 13 oz)
Dimethoate 4EC (0.5 to 1 pt) or 5lb (6.4 to 12.8 oz)
Imidan 70W (1 to 1.33 lbs)
Lambda-Cy EC* (2.56 to 3.84 oz)
Lorsban 4E* or Advanced* (0.5 to 1 pt)
Malathion 5EC (1.5 to 2.0 pt) or 57EC (1.5 to 2.25 pt)
Malathion 8 Aquamul (1.25 to 2.0 pts)
Malathion 8F (1.0 to 2.0 pts)
Malathion ULV (0.5 pts)
Mustang Max EC or EW* (2.24 to 4 oz)
Proaxis* (2.56 to 3.84 oz)
Sevin 4F and XLR Plus (0.5 to 1.5 qt)
Sevin 80S and 80WSP (0.625 to 1.875 lb)
Silencer* (2.56 to 3.84 oz)
Warrior w/ ZeonTech* (2.56 to 3.84 oz)

Leaf Beetles - Japanese beetle, bean leaf beetle, corn rootworm adults, cucumber beetle

Although common visitors in alfalfa fields, these beetles do not typically cause economic damage in Michigan.

Life cycle: These beetles originate in other crops, i.e., bean leaf beetles from soybean, rootworm from corn, cucumber beetles from cucurbits, and Japanese beetle from many host plants. One generation per year.

Type of damage: Defoliation

Management: Rarely cause enough damage to warrant treatment.

Threshold: Rough guideline is to treat areas where nearly all leaf tips show damage from leaf-feeding beetles.

List of registered insecticides, *RUP (rate per acre):

Ambush 25W* (6.4 to 12.8 oz)
Arctic 3.2EC* (4 to 8 oz)
Chlorpyrifos 4E*/Govern 4E*/Nufos 4E* (0.5 to 1 pt)
Cobalt* (19 to 38 oz)
Lambda-Cy EC* (2.56 to 3.84 oz)
Lorsban 4E* or Advanced* (0.5 to 1 pt)
Pounce 3.2EC* (4 to 8 oz) or 25WP* (6.4 to 12.8 oz)
Proaxis* (2.56 to 3.84 oz)
Pyganic EC1.4 (16 to 64 oz) or EC5.0 (4.5 to 18 oz)
Sevin 4F and XLR Plus (1.0 qt)
Sevin 80S and 80WSP (1.25 lb)
Silencer* (2.56 to 3.84 oz)
Warrior w/ ZeonTech* (2.56 to 3.84 oz)

Potato leafhopper (PLH)

The key insect limiting stand health and yield in Michigan alfalfa fields.

Description: Small, bright green, torpedo shaped insects. Fast moving, in a "crab-like" fashion. Nymphs resemble adults but are lime green/yellow, much smaller, lack wings.

Life cycle: Adults are carried into Michigan from the south on weather fronts in May/early June. Females lay eggs inside stems. Nymphs hatch in 7-10 days, begin feeding immediately, and reach adult stage in 2-3 weeks. Multiple overlapping generations.

Type of damage: Sucking pest. Both adults and nymphs remove plant sap and inject toxic saliva as they feed. Typical symptom is "hopperburn". Other symptoms include stunting, curling, and slow development, especially of new seedings.

Conditions favoring damage: Dry conditions (drought) enhance PLH damage.

Management: Biological = a naturally occurring fungal pathogen reduces PLH numbers under favorable conditions. Cultural = timely cutting kills eggs and many nymphs. Consider early cutting rather than spraying. Varietal selection = tolerant "hairy" alfalfa varieties are available, but may need to be treated under high population pressure. Chemical = Most insecticides are effective against PLH.

Sampling/scouting: Begin scouting in early June. Take 5 sets of 20 sweeps in several parts of the field. Count adults and nymphs.

Threshold: Varies with plant height in inches:

Under 3 inches = 20 adult PLH/ 100 sweeps
3 to 8 inches = 50 adult PLH/ 100 sweeps
8 to 12 inches = 100 adults and/or nymphs/ 100 sweeps
Over 12 inches = 200 adults and/or nymphs/ 100 sweeps

Note: Hopperburn may be confused with drought damage or boron deficiency.

List of registered insecticides, *RUP (rate per acre):

Ambush 25W* (3.2 to 12.8 oz)
Arctic 3.2EC* (4 to 8 oz)
Baythroid 2* & XL* (0.8 to 1.6 oz)
Chlorpyrifos 4E*/Govern 4E*/Nufos 4E* (1 to 2 pts)
Cobalt* (7 to 13 oz)
Dimethoate 4EC (0.5 to 1 pt) or 5lb (6.4 to 12.8 oz)
Imidan 70W (1 to 1.33 lbs)
Lambda-Cy EC* (1.92 to 3.2 oz)
Lorsban 4E* or Advanced* (0.5 to 1 pt)
Malathion 5 EC (1.5 to 2.0 pts) or 57 EC (1.5 to 2.25 pts)
Malathion 8 Aquamul (1.25 to 2 pts) or 8F (1.0 to 2.0 pts)
Mustang Max EC or EW* (2.24 to 4 oz)
Perm-UP 3.2 EC* (4 to 8 oz)
Pounce 3.2EC* (4 to 8 oz) or 25WP* (6.4 to 12.8 oz)
Proaxis* (1.92 to 3.2 oz)
Pyganic EC1.4 (16 to 64 oz) or EC5.0 (4.5 to 18 oz)
Sevin 4 F and XLR Plus (1.0 qt)
Sevin 80 S and 80 WSP (1.25 lb)
Silencer* (1.92 to 3.2 fl oz)
Warrior w/ ZeonTech* (1.92 to 3.2 fl oz)

Plant Bugs - alfalfa and tarnished

Although common in alfalfa, high populations are necessary to cause damage - rarely achieved in Michigan fields.

Description: 1/8th to 1 inch long, oval "true bugs". Alfalfa PB is greenish. Tarnished PB is dark brown with yellow V-shaped mark on back. Nymphs resemble adults, but lack wings.

Life cycle: Adults overwinter. Eggs laid into plant tissue. Multiple generations.

Type of damage: Adults and nymphs suck plant sap and inject a toxic saliva during feeding, resulting in a characteristic crinkling of leaves.

Management: Cultural – cutting will reduce populations. Check regrowth and treat if necessary.

Sampling/ scouting: Take 5 sets of 20 sweeps in different parts of the field.

Threshold: Rough guideline ~ plants less than 6 inches, two or more per sweep; larger plants, five or more per sweep.

List of registered insecticides, *RUP (rate per acre):

Ambush 25W* (6.4 to 12.8 oz)
Arctic 3.2EC* (4 to 8 oz)
Baythroid 2* & XL* (1.6 to 2.8 oz)
Chlorpyrifos 4E*/Govern 4E*/Nufos 4E* (1 to 2 pts)
Cobalt* (19 to 38 oz)
Dimethoate 4EC (0.5 to 1 pt) or 5lb (6.4 to 12.8 oz)
Lambda-Cy EC* (2.56 to 3.84 oz)
Lannate LV* (1.5 to 3 pt) & SP* (0.5 to 1.0 lb)
Lorsban 4E* or Advanced* (1 to 2 pts)
Malathion 5 EC (1.5 to 2.0 pts) or 57 EC (1.5 to 2.25pts)
Malathion 8F (1.0 to 2.0 pts)
Mustang Max EC or EW* (2.8 to 4 oz)
Perm-UP 3.2 EC* (4 to 8 oz)
Pounce 3.2EC* (4 to 8 oz) or 25WP* (6.4 to 12.8 oz)
Proaxis* (2.56 to 3.84 oz)
Sevin 4F and XLR Plus (0.5 to 1.5 qt)
Sevin 80S and 80WSP (1.25 to 1.875 lb)
Silencer* (2.56 to 3.84 oz)
Warrior w/ ZeonTech* (2.56 to 3.84 fl oz)

Slugs

Only a problem in new seedings, under cool and wet conditions.
Type of damage: Feeding in new seedings, possibly to the point that replanting is necessary.
Conditions favoring damage: New seedings planted into heavy sod or crop residue. Fields with a recent history of slug damage. Cool, wet conditions.
Threshold: No thresholds are established for slugs in alfalfa. Consider treatment if slug damage threatens to reduce stand density below an acceptable level.

List of registered insecticides, *RUP (rate per acre):
Deadline MPs 4% bait (10 to 40 lbs)
Snail & Slug Pellets (various manufactures and rates)

Spittlebugs

Spittlebugs are very noticeable in alfalfa, but rarely in high enough numbers to cause concern.
Description: Small, orange/greenish insects, 3/8 inch long. Nymphs hide in frothy spittle mass.
Life cycle: Overwinter as eggs. Nymphs emerge and feed in the spring. Adults do not produce spittle. One generation per year.
Type of damage: Sucking pest. Removes plant sap.
Management: Chemical control is rarely, if ever, needed. Alfalfa can tolerate a large number of spittlebugs.
Sampling/ scouting: Examine 20 plants in 5 different locations for spittle masses.
Threshold: One or more spittlebugs (spittle mass) per stem.

List of registered insecticides, *RUP (rate per acre):
Ambush 25W* (6.4 to 12.8 oz)
Arctic 3.2EC* (4 to 8 oz)
Baythroid 2* & XL* (0.8 to 1.6 oz)
Chlorpyrifos 4E*/Govern 4E*/Nufos 4E* (1 to 2 pts)
Cobalt* (19 to 38 oz)
Imidan 70W (1 to 1.33 lbs)
Lambda-Cy EC* (2.56 to 3.84 oz)
Lorsban 4E* or Advanced* (1 to 2 pts)
Malathion 5EC (1.5 to 2.0 pts) or 8F (1.0 to 2.0 pts)
Mustang Max EC or EW* (2.24 to 4 oz)
Perm-UP 3.2 EC* (4 to 8 oz)
Pounce 3.2EC* (4 to 8 oz) or 25WP* (6.4 to 12.8 oz)
Proaxis* (2.56 to 3.84 oz)
Warrior w/ ZeonTech* (2.56 to 3.84 fl oz)

Webworms

CDD has never seen large numbers of webworms in Michigan alfalfa.
Description: Larvae - slender, greenish-black or pink caterpillars, with 6 dark spots on each body segment.
Life cycle: 2-3 generations per year.
Type of damage: Ties leaves together with silk, feeds within the webbing.
Management: Cultural - cutting destroys larvae. Chemical - insecticides generally not needed; may not be effective because larvae hide in webbing.
Sampling/ scouting: Examine 20 stems in 5 locations of the field, or take 100 sweeps.
Threshold: Rough guidelines - one or more webworms per plant; 25% of tips infested; or 5-6 larvae per sweep.

List of registered insecticides, *RUP (rate per acre):
Ambush 25W* (3.2 to 12.8 oz)
Arctic 3.2EC* (2 to 8 oz)
Baythroid 2* & XL* (1.6 to 2.8 oz)
Cobalt* (19 to 38 oz)
Lambda-Cy EC* (1.92 to 3.2 oz)
Mustang Max EC or EW* (2.24 to 4 oz)
Perm-UP 3.2 EC* (2 to 8 oz)
Pounce 3.2EC* (2 to 8 oz) or 25WP* (3.2 to 12.8 oz)
Proaxis* (1.92 to 3.2 oz)
Pyganic EC1.4 (16 to 64 oz) or EC5.0 (4.5 to 18 oz)
Sevin 4F and XLR Plus (0.5 to 1.5 qt)
Sevin 80S (1.25 to 1.875 lb)
Silencer* (1.92 to 3.2 fl oz)
Warrior w/ ZeonTech* (1.92 to 3.2 fl oz)

White grubs - in newly established seedings

White grubs have been a localized problem in last few years. They can only be managed in new seedings, at planting.

Description: White, C-shaped larvae of scarab beetles (includes Japanese, June, European chafer beetles). Up to one inch long in last instar. Orange to brown head. In alfalfa, June beetle seems to be the most common problem.

Life cycle: True white grubs remain in larval stage for several years in undisturbed grassy areas and fallow fields. To attack a new alfalfa seeding, larvae must be present in the field prior to establishment.

Type of damage: Grubs feed on germinating seeds and young plants, killing plants and reducing stand.

Conditions favoring damage: Fields following an established grass stand, or planting into fallow areas.

Management: Fall or spring plowing prior to establishment may reduce grub numbers. Establishing a new seeding in the spring will avoid Japanese beetle and chafer feeding, but June beetle larvae may still be present.

List of registered insecticides, *RUP (rate per acre):

Lorsban 15G* (6.7 lbs/ acre) Apply in-furrow or broadcast-incorporate before planting

Winter cutworm (*Noctua pronuba*)

The first report of economic damage in the U.S. by this insect was in northern Michigan in fall 2007.

Life cycle: Adults (yellow underwing moths) begin to emerge in May, but some may emerge later in the summer. Moths fly at night through October. Caterpillars are found perhaps as early as July, but are commonly found by August and September. Winter cutworms can withstand very cold conditions, feeding in fields well into fall, when nighttime temperatures dip below freezing. Even during the winter, caterpillars emerge and feed on warm days. Feeding also occurs in early spring until caterpillars pupate.

Type of damage: Defoliation by caterpillars in the fall. The direct impact of defoliation damage has not been quantified. Fields in fall 2007 greened up in the spring, but stand yield and longevity may have been reduced. There also may be an impact of removing crop residue, leading to reduced snow cover and potential winter kill of crowns.

Conditions favoring damage: In 2007, economic damage was found in fields only in the upper 1/3 of the lower peninsula.

Management: No insecticide labels specifically list winter cutworm as a target pest. Experience in 2007-08 showed that products that control other cutworm species kill *Noctua pronuba*, even when sprayed in late fall under cool conditions.

Insecticide list [may not be supported by manufacturer], *RUP (rate per acre):

Ambush 25W* (3.2 to 12.8 oz)
Arctic 3.2EC* (2 to 8 oz)
Baythroid 2* & XL* (0.8 to 1.6 oz)
Cobalt* (13 to 26 oz)
Lambda-Cy EC* (2.56 to 3.84 oz)
Lannate LV* (0.75 to 3 pts) or SP* (0.25 to 1 lb)
Mustang Max EC or EW* (2.24 to 4 oz)
Perm-UP 3.2 EC* (4 to 8 oz)
Pounce 3.2EC* (2 to 8 oz) or 25WP* (3.2 to 12.8 oz)
Proaxis* (1.92 to 3.2 oz)
Sevin 4F and XLR Plus (1.0 to 1.5 qt)
Sevin 80S and 80WSP (1.25 to 1.875 lb)
Silencer* (1.92 to 3.2 oz)
Warrior w/ ZeonTech* (1.92 to 3.2 oz)

Insecticides Registered for Alfalfa

Trade Name	Common name	Class	Recommended for:	PHI days	REI hrs	Precautions and Remarks
Ambush 25W **(RUP)**	permethrin	Pyr	Alfalfa weevil, aphids, armyworm, cutworm, leaf beetles, PLH, plant bug, spittlebug, webworm	0 ≤6.4 oz 14 >6.4 oz	12	Maximum of 12.8 oz formulated product per cutting.
Arctic 3.2 EC **(RUP)**	permethrin	Pyr	See Pounce 3.2 EC	14 >0.1 lb	12	See Pounce 3.2 EC
Baythroid 2 and XL **(RUP)**	cyfluthrin & beta-cyfluthrin	Pyr	ABL, alfalfa weevil, aphids, cutworm, grasshopper, PLH, plant bugs, spittlebug, webworm	7	12	One application per cutting.
Bt (Agree WG, Dipel, Javelin, Xentari)	*Bacillus thurin-giensis*	Bio	Armyworm,	0	4	Use only to control small armyworms when populations are low. Full coverage is important.
Chlorpyrifos 4E **(RUP)**	chlorpyrifos	OP	See Lorsban	See Lorsban	24	See Lorsban
Cobalt **(RUP)**	chlorpyrifos + gamma cyhalothrin	OP Pyr	ABL, alfalfa weevil, aphids, armyworm, cutworm, grasshopper, leaf beetles, PLH, plant bug, spittlebug, web worm.	7 < 13 oz 14 at 13-26 oz 21 > 26 oz	24	Phytotoxicity symptoms are possible on young, tender, rapidly-growing alfalfa.
Deadline M-Ps	metalde-hyde	--	Snails, slugs	- -	12	Broadcast by ground or air every 3 to 4 weeks during season as needed. For best results apply in the evening, preferably after a rain or irrigation. Use caution around pets – may be fatal to dogs.
Dimethoate 4EC, 5lb	dimethoate	OP	Aphids, grasshoppers, PLH, plant bug	10	48	Maximum 1 application per cutting. Dimethoate is systemic and full coverage is not required.
Govern 4E **(RUP)**	chlorpyrifos	OP	See Lorsban	See Lorsban	24	See Lorsban
Imidan 70W	phosmet	OP	Alfalfa weevil, grasshopper, PLH, spittlebug	7	24	Maximum of 1 application per cutting.
Lambda-Cy 3.2 EC	lambda-cyhalothrin	Pyr	ABL, alfalfa weevil, aphids, armyworm, cutworm, grasshopper, leaf beetles, PLH, plant bug, spittlebug, webworm	1 forage 7 hay	24	Max 3.84 oz per cutting and 15.36 oz per season.
Lannate LV & SP **(RUP)**	methomyl	Carb	Alfalfa weevil, aphids, armyworm, plant bug	7	48	Maximum 3.6 lbs active ingredient per acre per season.
Lorsban 4E and Lorsban Advanced (**RUP)**	chlorpyrifos	OP	ABL, alfalfa weevil, aphids, armyworm, cutworm, grasshopper, leaf beetles, PLH, plant bug, spittlebug	7 at 0.5 pt 14 at 1 pt 21 > 1 pt	24	Maximum 1 application per cutting and 4 applications per season. Retreatment interval = 10 days.

Trade Name	Common name	Class	Recommended for:	PHI days	REI hrs	Precautions and Remarks
Malathion 5EC, 8 Aquamul, 57EC, 8F	malathion	OP	Alfalfa weevil, aphids, armyworm, grasshopper, PLH, plant bug, spittlebug	0 for ECs 0 to 7 for Aquamul	12	
Malathion - ULV	malathion	OP	Alfalfa weevil, grasshopper	0	12	
Mustang Max EC or EW **(RUP)**	zeta-cypermethrin	Pyr	Alfalfa weevil, aphids, armyworm, cutworm, grasshopper, PLH, plant bug, spittlebug, webworm	3 cutting, grazing	12	Do not make applications fewer than 7 days apart. Maximum 4 oz per cutting, 12 oz per season.
Nufos 4E **(RUP)**	chlorpyrifos	OP	See Lorsban	See Lorsban	24	See Lorsban
Perm-UP 3.2 EC **(RUP)**	permethrin	Pyr	See Pounce	0 at 4 oz 14 > 4 oz	12	Apply only to pure alfalfa stands. Max 8 oz per cutting.
Pounce (**RUP)** 3.2EC, 25WP	permethrin	Pyr	Alfalfa weevil, aphids, armyworm, cutworm, leaf beetles, PLH, plant bug, spittlebug, webworm	0 at 0.1 lb 14 > 0.1 lb	12	Maximum of 0.2 lb active ingredient per cutting. Several generics are available.
Proaxis (**RUP)**	gamma-cyhalothrin	Pyr	ABL, alfalfa weevil, aphids, armyworm, cutworm, grasshopper, leaf beetles, PLH, plant bug, spittlebug, webworm	1 forage 7 hay	24	Maximum 0.24 pints per acre per cutting, 0.96 pints per acre per season.
Pyganic EC1.4, EC5.0	pyrethrum	Bio	leaf beetles, PLH, webworm	0	12	Listed by the Organic Materials Review Institute (OMRI) for use in organic production.
Sevin 4 F, XLR Plus, 80S, 80WSP	carbaryl	Carb	Alfalfa weevil, armyworm, cutworm, grasshoppers, leaf beetles, PLH, plant bug, webworm	7	12	Do not apply to small plants if they are wet or rain is expected within 48 hrs (may bleach tender foliage). Maximum 1 application per cutting.
Silencer (**RUP)**	lambda-cyhalothrin	Pyr	ABL, alfalfa weevil, aphids, armyworm, cutworm, grasshopper, leaf beetles, PLH, plant bug, webworm	1 forage 7 hay	24	Max 3.84 oz per cutting and 15.36 oz per season.
Snail and Slug Pellets 3.5 % bait	metalde-hyde	--	Snails, slugs	- -	12	May apply every 2 weeks as needed. Do not allow pellets to contact edible portion of plant. Keep children, pets, and poultry away from treated areas.
Warrior w/ ZeonTech (**RUP)**	lambda-cyhalothrin	Pyr	ABL, alfalfa weevil, aphids, armyworm, cutworm, grasshopper, leaf beetles, PLH, plant bug, spittlebug, webworm	1 forage 7 hay	24	Max 3.84 oz per cutting and 15.36 oz per season.