

AGRICULTURAL GUIDE

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Insect Control

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Control of the Variegated Cutworm and Fall Armyworm in Alfalfa

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The variegated cutworm and the fall armyworm are both serious pests of alfalfa. Although both are the larvae of moths and feed on alfalfa stems and leaves, they are usually pests at opposite ends of the growing season. While the variegated cutworm overwinters in Missouri, the fall armyworm migrates into Missouri each summer. As a result, variegated cutworms frequently damage alfalfa in the spring, while the fall armyworm can cause serious damage to alfalfa in the fall (especially in fall-seeded stands). Failure to control outbreaks of these pests can lead to reduced yields and loss of stands.

Variegated cutworm

Life history. The variegated cutworm is present throughout the growing season but is most troublesome in the spring. This insect overwinters in Missouri as a pupa and may have three or four generations per year. Variegated cutworm moths lay their eggs in patches on stems and leaves in the field, on twigs and branches, or on fences and buildings. The larvae feed at night and hide under surface litter or in the soil during the day. In general, the most serious attack of the variegated cutworm is on the first cutting stubble. Consecutive generations can be found throughout the season. These larvae have six growth stages or instars. Usually, when the larvae are first noticed, they are already in the later instars.

Identification and damage. These larvae are about 2 inches long when fully grown and range in color from black to light greenish-yellow or tan. They have a distinctive row of light yellow diamond-shaped spots down the middle of their backs (Figure 1).



Figure 1. Variegated cutworm larvae with conspicuous row of white spots down the middle of the back.

The feeding damage from this pest consists of cut stems and irregular holes in leaves and on stems. Untreated infestations will produce brown areas in the field where the stubble fails to regrow properly. This results from cutworms feeding on new growth, and that prevents green shoots from growing. Damage is usually more severe on young stands of alfalfa.

Control. The time to treat for variegated cutworms is when an average of three or more cutworm larvae per square yard occur. These larvae feed at night and are difficult to find during the day. Probe through the loose soil and debris to locate the larvae. Look in several locations throughout the field. The best time to look is under the cut hay just before harvest. Larvae will often gather under the windrow and are easy to detect. However, when counting larvae under a windrow, the threshold should be raised to six cutworms per square yard to compensate for the effect of the windrow concentrating the larvae. All too frequently, a grower's first awareness of variegated cutworms is when the stubble fails to regrow properly. At this time, the larvae are large, and control measures are less effective.

The best time to spray is immediately after the hay has been removed. *Never* spray cut hay that is still in the field. Ten to 12 gallons of spray mixture per acre should provide effective control in stubble.

Use any of the insecticides listed in Table 1.

Table 1. Insecticides recommended for variegated cutworm on alfalfa.

Insecticide	Formulation	Actual rate of insecticide per acre	Rate of formulation per acre	Required pre-harvest-grazing interval (days)
Sevin (carbaryl)	80% S	1.5 lb.	1-7/8 lb.	0
Sevimol 4 (carbaryl)	4 lbs./gal. suspension in molasses	1.5 lb.	1-1/2 qts.	0
Sevin XLR (carbaryl)	4 lbs./gal. suspension	1.5 lb.	1-1/2 qts.	0
Dylox (trichlorfon)	40% L	.5 lb.	1 pt.	0
	80% S	.5 lb.	.5 lb.	0
Lannate or Nudrin (methomyl)	1.8 L (RU) ¹	.45 lb.	1 qt.	7
	90% WP ²	.45 lb.	.5 lb.	7
Lorsban ³ (chlorpyrifos)	4 E	1.0 lb.	2 pt.	21

Precautions: Do not apply trichlorfon more than three times per cutting with the last application up to the day of harvest. Read and follow all label directions.

¹Any compound followed by RU (Restricted Use) means that all or some uses of this product have been restricted by the EPA. Any applicator must be certified and registered before purchasing restricted use products.

²Available in water soluble bags. Bags must not be broken open; therefore, spray tank gallonage must match available bag sizes (1/2 lb., 2 lbs., 10 lbs. or any combination).

³This compound is labeled for variegated cutworm control but has not been evaluated in Missouri. Do not make more than four applications per year.

Insect control procedures are subject to change during the growing season. Therefore, this chart is intended for use during the 1984 season only.

Fall armyworm

Life history. The fall armyworm cannot overwinter in Missouri because of the cold temperatures. Each spring, the adult moths begin their migration northward from the Gulf Coast states. Populations build, and the most damaging attack is on alfalfa in August and September by the adults arriving in midsummer.

They lay large clusters of eggs on the alfalfa at night. These eggs hatch in about a week and the larvae begin feeding on the plant. Unlike the variegated cutworm, fall armyworms stay on the plant during the day. When the larvae are full grown, they leave the plant to pupate. Those generations that occur as fall-seeded alfalfa is germinating are most damaging.

Identification and damage. Severe damage of established alfalfa stands is rare; however, fall seedlings can be destroyed by this pest. Heavy feeding damage results in defoliation of the plant, and seedlings may be cut off. Even if only the bud is eaten, the seedling has been killed.

The moth of the fall armyworm is about 3/4 inch long with a wingspread of 1 to 1 1/2 inches. The hind wings are light gray. The front wings are dark grey with lighter and darker splotches and a noticeable whitish area near the extreme tip.

The larvae are about 1 1/4 inches long when full grown. They are smooth-skinned and vary consid-



Figure 2. Fall armyworm larvae.

erably in color, from light tan or green to almost black (Figure 2). Running from head to tail are three very thin yellow-white lines. On each side is a wide, dark strip, and below this a wider, wavy yellow stripe, splotched with red. The armyworm and fall armyworm look similar. But generally, a prominent, white, inverted "Y" on the front of head singles out the fall armyworm (Figure 3). On some individual larvae, this characteristic may be difficult to detect.

Control. There is no specific threshold for fall armyworm control in Missouri. However, you should check

Table 2. Insecticides recommended for fall armyworm control on alfalfa.

Insecticide	Formulation	Actual rate of insecticide per acre	Rate of formulation per acre	Required pre-harvest-grazing interval (days)
Lannate or Nudrin (methomyl)	1.8 L (RU) ¹	.45 lb.	1 qt.	7
	90% WP ²	.45 lb.	.5 lb.	7
malathion	57% EC	20 oz.	1 qt.	0
methoxychlor	24% EC	1.5 lb.	3 qt.	7
	50% WP	1.5 lb.	3 lb.	7
Sevin (carbaryl)	80% S	1.5 lb.	1-7/8 lb.	0
Sevimol 4 (carbaryl)	4 lb/gal suspension in molasses	1.5 lb.	1-1/2 qts.	0
Sevin XLR (carbaryl)	4 lb/gal suspension	1.5 lb.	1-1/2 qts.	0

Precautions: Do not spray malathion unless temperatures are above 60 degrees F and expected to remain so for one or two days following treatment. Read and follow all label directions.

¹Any compound followed by RU (Restricted Use) means that all or some uses of this product have been restricted by the EPA. Any applicator must be certified and registered before purchasing restricted use products.

²Available in water soluble bags. Bags must not be broken open; therefore, spray tank gallonage must match available bag sizes (1/2 lb., 2 lbs., 10 lbs. or any combination).

Insect control procedures are subject to change during the growing season. Therefore, this chart is intended for use during the 1984 season only.

all fall-seeded alfalfa fields on a regular basis until a hard frost occurs. Check for signs of defoliation on seedlings in several locations throughout the field. If a high percentage of seedlings are damaged and the worms present are an inch long or smaller, then you can expect serious stand damage. The large investment required to establish alfalfa necessitates insect control if stand establishment is in jeopardy. Occasionally, established alfalfa stands will be attacked on the third or later cuttings.

Seedling alfalfa requires plenty of water to assure good coverage. Use a minimum of 20 gallons of water with any of the insecticides listed in Table 2. Avoid spraying when temperatures are below 60 degrees F. To avoid drift, spray only when wind velocity is less than 10 miles per hour.

Precautions

Always handle insecticides with caution. Read, understand, and follow the directions on the label concerning use and safety measures. Wear the protective clothing and devices that are suggested on the label. Avoid breathing vapors and dust or contact with the skin. If the insecticide concentrate contacts or contaminates the skin, wash the affected area with soap and plenty of water immediately and change clothing.

Store insecticides in their original container with

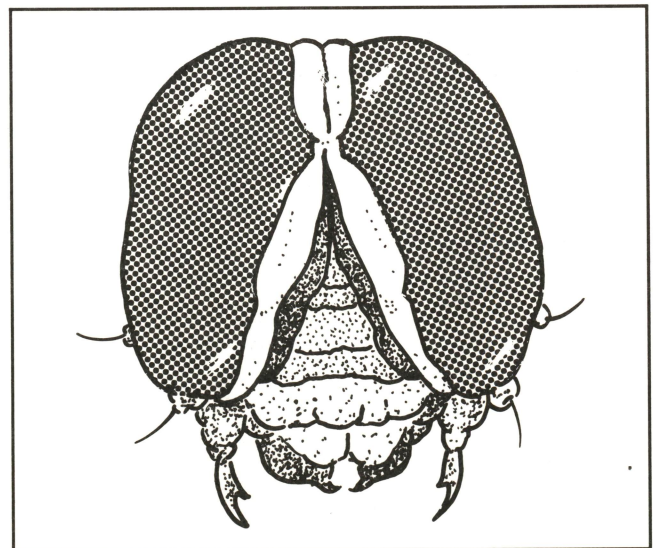


Figure 3. Head of fall armyworm showing the inverted "Y."

legible label securely attached. The storage area should be dry and locked at all times when not actually in use.

Promptly and properly dispose of empty containers as directed on the label. Burn combustible containers, but do not stand in the smoke or breathe fumes from the fire. Crush containers that will not burn and bury them under 18 to 24 inches of soil in an area where drainage will not contaminate surrounding crops, water, or wildlife habitat.

Missouri control recommendations are revised annually and are subject to possible change during the growing season. Therefore, this guide is intended for use during the 1984 season only.