

Alfalfa Caterpillar/Butterfly

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Description and Biology of the Pest

The first sign of a potential alfalfa caterpillar (*Colias eurytheme*) outbreak is the influx of large numbers of yellow or white butterflies in late spring or early summer. The butterfly reaches 1 inch long with a 2 inch wingspan. Its wings are yellow, orange, or white with a black border on the upper surface and are solid white or yellow on the underside. When butterflies are seen flying over a field of tall alfalfa, they have probably just emerged from that field. They will remain to feed on flowers and mate, but the females will move into alfalfa less than 6 inches tall to lay eggs. White 1/16 inch long eggs are laid singly, standing on end on the upper leaf surface, and hatch into small 1/2 inch long, brown larvae with black heads in 3 to 10 days.

The alfalfa caterpillar soon turns green and grows rapidly to 1 1/2 inches long in approximately 2 weeks, depending on the temperature. Seven generations occur between May and October. Older, larger caterpillars have a prominent white stripe which runs along each side of the body. The alfalfa caterpillar can be distinguished from the beet armyworm by its hairy or velvety green body surface. Viewed with a hand lens, the beet armyworm has a smooth body. The alfalfa caterpillar pupa hangs from alfalfa stems by silken threads or rests on leaves. The caterpillar overwinters as a pupa which changes from a gray green to yellow color as it transforms into the butterfly that emerges the following spring. The life cycle of the alfalfa caterpillar is closely synchronized with the hay cutting cycle, taking about one cutting cycle to complete. Four to seven generations occur between May and October.

Damage

Alfalfa caterpillars consume large portions of foliage or entire leaves. Larger larvae are the most destructive. In contrast to beet armyworms, alfalfa caterpillars do not skeletonize leaves and will consume the leaf midrib, nor do they cause flagging in which alfalfa terminals dry up and turn whitish-grey in color. Alfalfa caterpillar feeding damage is most severe when eggs are laid in recently cut fields, and large populations of developing larvae defoliate the crop before it reaches maturity. When infestations occur in half to full grown plants, growers can harvest early to avoid serious damage.

Biological and Cultural Controls

Conserve and encourage natural enemies of the alfalfa caterpillar by avoiding unnecessary insecticide applications. General predators including damsel bugs (*Nabis* spp.), big eyed bugs (*Geocoris* spp.), and spiders will consume eggs and larvae of the alfalfa caterpillar. The most important natural enemies of the alfalfa caterpillar are naturally occurring insect pathogens and parasitic wasps including *Trichogramma semifumatum* and *Cotesia medicaginis*. *C. medicaginis* is a dark brown to black wasp about 1/4 inch long that oviposits eggs inside early instar caterpillars. The egg hatches, and the wasp larvae consume the body contents of the caterpillar before it reaches 1/2 inch long. Parasitized larvae are lighter in color, somewhat shiny lacking their velvety body surface, and swollen toward the rear. If the parasitized caterpillar is pulled apart at this swollen region, the shiny white parasite larvae is exposed.

Naturally occurring insect pathogens of the alfalfa caterpillar include the bacteria *Bacillus thuringiensis* (Bt) and a virus. Dead bodies of caterpillars infected with either disease are dark colored, and limp, often hanging from



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leaves. Bt insecticide can give satisfactory control of the alfalfa caterpillar, has no effect on beneficial insects, and has a 0 day post harvest interval. Upon ingesting Bt, the caterpillars cease feeding but may remain on plants 3 to 4 days before dying. Bt application does not provide satisfactory control of the beet armyworm. Effective cultural control can be achieved by cutting the crop early to avoid serious damage, yet achieving acceptable hay yields.

Monitoring and When to Treat

When yellow and white alfalfa butterflies first appear in May, start checking fields for alfalfa butterflies. Large numbers of yellow or white butterflies flying above short alfalfa provides a good warning signal for possible problems later in the cutting cycle. Take sweep net samples starting when the alfalfa is half grown (more than 6 inches tall). Monitor fields weekly from June through September. Make 5 sweep counts at four or five locations in the field,

noting the percentage of parasitized and diseased caterpillars. Check two or three times a week if heavy populations begin to develop. Check caterpillars for parasitism by pulling heads off larvae, squeezing out the body contents, and looking for *Apanteles* larvae. Treat for alfalfa caterpillars when 5 to 10 non-parasitized or disease free caterpillars are collected per 90 degree sweep (or 10 per 180 degree sweep) more than 1 week prior to cutting alfalfa. Once alfalfa enters summer slump, and hay tonnage and quality decline, growers may not be able to justify the cost of insecticide applications for caterpillar control.

References

IPM Manual Group. 1985. Integrated pest management for alfalfa hay. UC Davis Press.
 Meister Publishing. 1997. Insect Control Guide. Wiloughby, OH

Currently Registered Insecticides for Alfalfa Caterpillar in Arizona

Insecticide	Preharvest Interval	Other Restrictions/Remarks
Bacillus thuringiensis, Bt (Biobit, DiPel, Javelin)	0 days	Caterpillars cease feeding, but may remain for 3-4 days
Carbaryl (Sevin)	3 days (4L, 50W, 80S) 7 days (Oil ULV)	Do not apply to wet foliage Apply only once per cutting
Chlorpyrifos (Lock-On, Lorsban)	½ pint = 7 days 1 pint = 14 days 2 pints = 21 days	One application per cutting Four applications per season
Cyfluthrin (Baythroid 2)	7 days	One application per cutting 11.2 fluid oz/acre/season limit
Cyhalothrin (Warrior)	7 days	One application per cutting 0.96 fluid oz/acre/season limit
Malathion (Cythion)	0 days (EC) 7 days (Cythion)	Do not apply when bees are working fields.
Methomyl (Lannate)	7 days	Ten applications per crop (3.6 lbs. a.i./acre/crop).
Methyl Parathion (Pencap-M)	15-20 days	Do not apply during bloom. Hazardous to bees.
Permethrin (Ambush, Pounce)	<0.1 lb. a.i. = 0 days >0.1 lb. a.i. = 14 days	0.2 lb. a.i./acre/ cutting limit. Toxic to bees and fish (see label).

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