

# Egyptian Alfalfa Weevil

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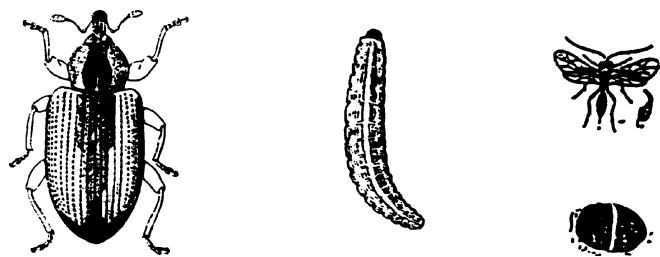
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## Description and Biology of the Pest

Adult Egyptian alfalfa weevils (*Hypera brunneipennis*) are light brown with dark brown and grey markings down their backs and are about 0.2 inches long. Adult weevils emerge from a summer resting state called aestivation in late fall or winter and begin to migrate to alfalfa fields to feed, mate and lay eggs. The female chews a hole in the stem then inserts her eggs into the center of the stem. Smooth, shiny, yellow eggs are laid in living or dead stems three to six inches above the soil surface or in plant debris on the ground. Eggs hatch in five to ten days. The legless larvae are initially tiny, yellowish green in color and reach a length of 0.25 inch when fully grown. Mature larvae are pale or light green with a thin white stripe down the center of their back and have a dark brown to black head. Larval development takes about three weeks and normally is completed at about the time of the first hay cutting. After the larvae have ceased feeding, they usually drop to the ground to spin a round closely woven white cocoon for pupation. Pupation lasts from ten days to several weeks, then emerging adult weevils feed for two to four weeks before they enter aestivation in weedy areas near alfalfa fields. The adults remain inactive at these sights until late fall or winter when temperatures rise above 42° F.



## Damage

Egyptian alfalfa weevil feeds on alfalfa plant terminals on the first growth after winter. Adult feeding seldom causes significant damage to alfalfa but results in characteristic linear scars on stems. Weevil larvae damage alfalfa by feeding on

terminal buds and leaves first and gradually moving down the plant. First and second instar larvae feed on young developing leaves. Third and fourth instar larvae cause the most damage by feeding on interveinal alfalfa leaf tissue, skeletonizing, bronzing, and subsequently defoliating plants. Defoliation reduces alfalfa tonnage and quality, reduces the photosynthetic capacity of the plant, and the damage to regrowth buds can stunt growth and kill alfalfa stems. Weevil damage is often most severe under windrows lying in the field for several days because harvesting moves weevil larvae into a concentrated area under cut hay where they feed on new growth. Typically, the alfalfa weevil can cause damage to the first and occasionally to second and third hay cuttings.

## Biological and Cultural Controls

Larvae of beneficial insects including lacewings and lady beetles attack some alfalfa weevil larvae. Two parasitic wasps have been successfully introduced into areas throughout the range of the alfalfa weevil. *Bathyplectes curculionis* parasitizes larvae of the alfalfa weevil. This parasitic wasp has spread over much of the alfalfa weevils range since its introduction, however, it is generally unable to suppress the weevil population below economic thresholds. The distinctive brown, egg-shaped pupa of this wasp has a broad white stripe around its middle and is found within the white cocoon of the parasitized weevil. Peak activity of this parasitic wasp is during winter or when alfalfa weevil larval populations peak. *Microctonus aethiopoulos* is another introduced parasitic wasp that attacks adult female weevils, drastically reducing fall egg-laying. However this parasitic wasp has not established itself in desert alfalfa growing regions.

Cultural controls of the alfalfa weevil consist of practices which produce dense vigorous alfalfa growth to reduce losses from alfalfa weevil damage and early harvest. No varieties are resistant to the alfalfa weevil; however, well-adapted varieties that produce rapid spring growth and recovery can tolerate some weevil damage. Serious alfalfa weevil damage can sometimes be prevented by cutting the crop as soon as most of the plants are in the bud stage or by sheeping off alfalfa during fall and winter. As alfalfa reaches the bud stage in late winter, harvesting is normally more profitable than treating with insecticide. Sanitation and weed control in fields and right of ways adjacent to alfalfa fields can help reduce overwintering/aestivating adult weevil populations.

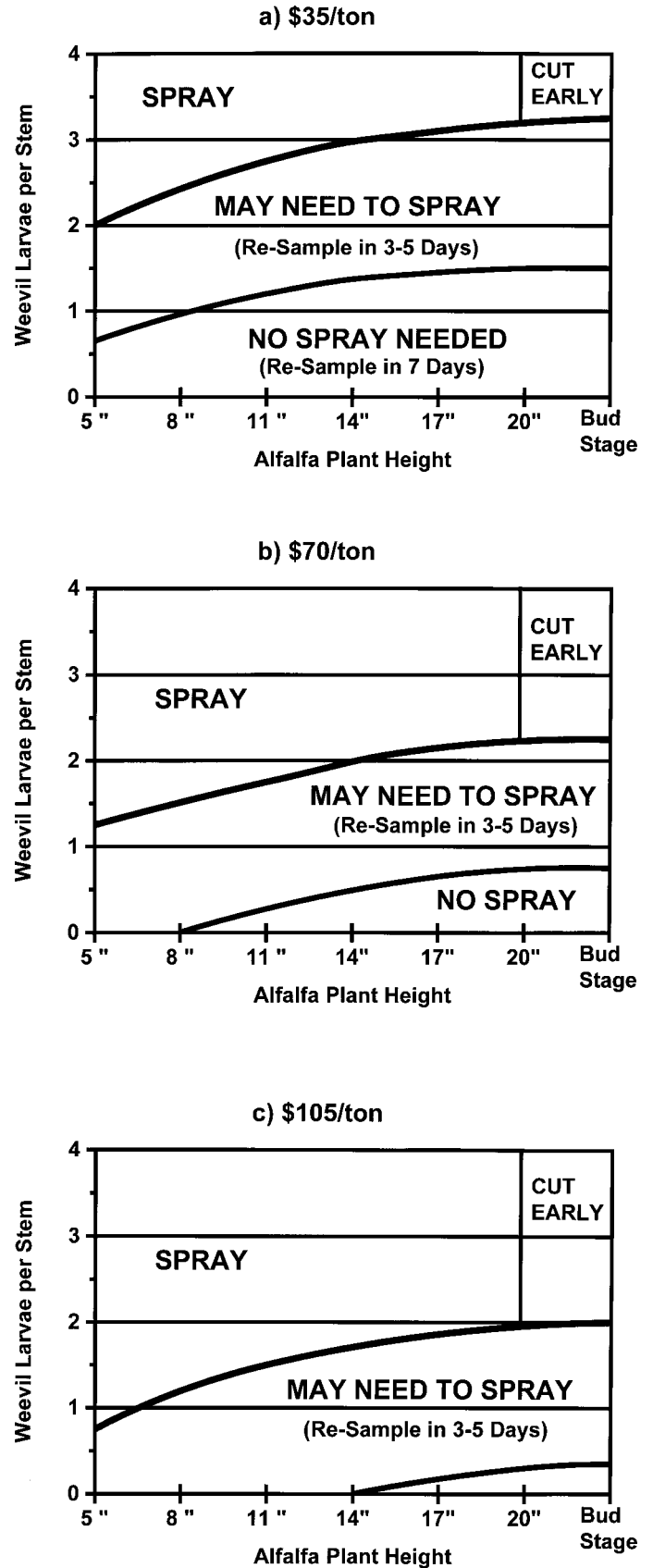
## Monitoring and When to Treat

Although weevil larvae can first appear in January, peak populations normally occur sometime between February 22 and March 23 in western Arizona deserts. This period of peak larval activity correlates close with the accumulation of from 445 to 495 heat units (HU) since January 1 (86/45° threshold) and/or 800 HUs following a 42° F event. Check fields with a sweep net every two to four days after weevil larvae begin to appear. Divide each field into four or more quadrants and take five sweeps of each section. Treat the field when an average sweep count of 20 larvae per 180° or 5 to 10 larvae per 90° sweep are found, especially when aphids are also present in high numbers. Instead of using an insecticide, many alfalfa growers choose to harvest hay early, before larval populations reach damaging levels, which also helps protect beneficial insect populations. A good winter weed control program can tend to increase the number of weevils collected in a sweep net sample, yet these fields may not show evidence of alfalfa damage, nor require chemical control.

If sweep net counts are 10 to 15 larvae per 180° sweep (5-8 per 80° sweep) just before cutting, then applying malathion under the windrows may be considered. This treatment reduces feeding damage to new alfalfa regrowth and preserves plant vigor, however use malathion only. Carbofuran, phosmet, or methoxychlor cannot be used. At harvest under the windrow insecticide applications require mounting a spray unit on the swather. Another option is to apply an alfalfa stubble treatment with permethrin plus carbofuran immediately after removing bales from the field.

Sampling with a sweep net does not provide reliable alfalfa weevil population estimates on young alfalfa plants or stubble following cutting. Another sampling technique developed by the University of Nebraska (Danielson, et. al., 1996), the stem count method, takes into consideration the price and maturity of alfalfa to help make treatment decisions for alfalfa weevil control. An additional advantage of this method is that it can also be used to monitor alfalfa aphids. Check alfalfa plants in each of four quadrants. In each quadrant, carefully cut 30 to 40 alfalfa stems off at ground level with a sharp knife. Shake the stems or rap them sharply onto a clean white surface such as a net, paper, or into a plastic bucket. This will dislodge most of the alfalfa weevil larvae that can easily be counted. While counting larvae, note the presence or absence of lady beetle larvae, lacewing larvae, and parasitized alfalfa weevil pupae. Further inspect each stem by prying open small new leaves and searching the spaces between them. Record the total number of weevil larvae counted per stem and the length of each stem, then calculate the average number of alfalfa weevils per stem and stem length (plant height). The following charts show when alfalfa should or should not be treated with an insecticide to control weevils based on plant height, weevil numbers, and crop value:

## Alfalfa Weevil Stem Count Method



## Currently Registered Insecticides for Alfalfa Weevil in Arizona

Insecticide	Preharvest Interval	Other Restrictions/Remarks
Carbaryl (Sevin)	3 days (7 days for OilULV)	Do not apply to wet foliage or two days prior to irrigation to avoid injury
Carbofuran (Furadan )	½ pint = 7 days 1 pint = 14 days 2 pints - 28 days	One application per season. Move bees for seven days.
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 fluidoz/acre/season limit.
Cyhalothrin (Warrior )	7 days	Move bees for two to three days 0.96fluid pt/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).
Methoxychlor	7 days	Apply at 7 to 14 day intervals.
Methyl Parathion (Penncap- M)	15 days	Do not apply during bloom. Hazardous to bees.
Permethrin (Ambush, Pounce)	<0.1 lb. a.i. = 0 days >0.1 lb. a.i. = 14days	0.2 lb. a.i./acre/ cutting limit. Toxic to bees and fish (see label).
Phosmet (Imidan)	14 days	One application per cutting. Do not apply at bloom

## References

- Danielson, S., Tom Hunt, and Keith Jarvi. 1996. NebGuide: Managing the alfalfa weevil. Guide G94-1208-A. University of Nebraska, Lincoln, NE.
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- Summers, C.G., K.S. Hagen, and V.M. Stern. 1995. UC IPM Pest Management Guidelines, Alfalfa pest management guidelines. University of CA, Davis.

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