Insect Pest Management in Alfalfa Production

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Alfalfa IPM

**Major pests**
- Weevils (Egyptian and alfalfa)
- Summer worms
- Aphids

**Occasional pests**
- Cutworms
- Leafhoppers
- Threecornered alfalfa hopper
- Ground mealybugs
- Clover root curculio
- Spider mites
Prevention: Keep pests out of field

- Crop rotation
- Prepare a good, level seed bed
- Plant early in the fall
- Maintain good plant health
- Clean equipment between fields (stem nematode control)
• Use certified seed

• Select pest and disease resistant varieties

National Alfalfa and Forage Alliance, NAFA http://www.alfalfa.org

UC Davis alfalfa website: http://alfalfa.ucdavis.edu
Monitor and record pest and beneficial insects for economic threshold levels


**Weevil Monitoring**

**Supplement to UC IPM Pest Management Guidelines: Alfalfa**

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<th>Grower</th>
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Monitor fields with a sweep net weekly when weevil larvae begin to appear. As threshold populations are approached, monitor every 2 to 4 days to see if population crashes due to natural enemies, or until a treatment decision is made.

1. Divide each field into 4 or more areas.
2. Take 5 sweeps per section.
3. Stop and count the number of alfalfa larvae per sweep; divide this number by 5 to get the average.
4. Base population estimates on the average of all sweeps in the field.
5. Consider early harvest or treatment if the average sweep count is 20 larvae per sweep.

Sweeping does not provide reliable populations estimates on young plants or on stubble immediately following a cutting—so look for damage; if 20 to 25% of the terminals show damage, treatment should be considered.

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**Total larvae:**

Average number of larvae = Total number of larvae / total sweeps

**Threshold:**

Harvest early or treat if average is greater than or equal to 20 larvae.
**Control:** Use least toxic pesticides that minimize impacts to beneficial insects

- **Biopesticides**
  Microbial insecticides for summer worms (less toxic, affect target pest, fast breakdown)
  Grandevo & Venerate (microbials, no efficacy on weevils)

- **Plant Incorporated Protectants**
  Increased tannins for weevil resistance and better feed value (less bloat).
Major Pests:

Weevils (Egyptian and Alfalfa)

- Yield and quality loss, 1st and sometimes 2nd cutting
- 1 generation/year (sometimes 2)
- Adults leave field for summer, re-infest in fall (lay eggs in old stems)
- Threshold: 20 larvae per sweep
Biocontrol:

• No effective insect natural enemies for Egyptian alfalfa weevil (0 - 5% parasitism in fields in 2017)

• Soil dwelling fungus, *Zoophthora, sp.*
• Grazing or sheeping-off during winter can reduce weevils

• Overseed clovers or grasses (changes forage quality; know markets).
• Insecticides: 4 MOA’s for weevils in alfalfa

  ➢ OP’s: chlorpyrifos- Lorsban, Malathion
  ➢ Pyrethroids: Mustang, Warrior, Baythroid
  ➢ Steward
  ➢ Entrust (organic, suppression only, 70%)

• Pyrethroid resistance, intermountain area; no efficacy with Malathion

• Experimental products (unregistered): Endigo, Belay, Besiege
Armyworm and alfalfa caterpillars

- Summer pests. Early harvest. Yield may be reduced.
- Biocontrol: Parasitic wasps (monitor to watch level of control*)
- Threshold: 10 worms/sweep
- Insecticides: Coragen, Intrepid, Steward, Bt’s (XenTari, Agree)

*1 parasitized worm/10, may not need to spray
Aphids

Pea and blue alfalfa aphid
Spring, Fall

Spotted alfalfa aphid
Summer

Cowpea aphid
Anytime
Aphids

- Resistant varieties: Blue, pea, and spotted (not cowpea).
- Monitor pests and beneficial insects for thresholds.
- Early harvest (may impact yield)
- Insecticides: Sivanto, Beleaf* (*62 day PHI)
Occasional pests:

Cutworms

• Control weeds around farm where cutworms may build up.

• Monitor for pest under plant debris and loose soil, particularly in seedling stands.

• Insecticides: Steward, Bait (Stiletto-permethrin)
Leafhoppers- *Empoasca*

- Damage: Yellow leaf tip. Inject toxin when feeding that will stunt plants.
- Summer pest
- Infest fields from edges (if detect early, possibly only spray field margin).
- Threshold 5/sweep
- Sivanto, OP’s, pyrethroids
Threecornered alfalfa hopper

- Adults girdle stems when feeding and laying eggs
- Yellowing of foliage
- Threshold: >3/sweep, no toxins
- Sivanto, OP’s, pyrethroids
Ground mealybug

- Insects feed on roots
- Primarily in the Sac Valley on heavier soils
- Management: Crop rotation (wheat, corn, and dry beans)
Clover root curculio

- Weevil pests feed on alfalfa roots causing stand losses.
- Seldom of concern in California. Found in lighter soils.
- Crop rotation (specific to alfalfa).
Spider mites

- Damage: yellowing of leaves, webbing.
- Control: Watch water, mites favored by water stress.

Miticide: Onager controls eggs and immature mites and sterilizes females