



PRODUCTION

Alfalfa: Weeds, Diseases and Insects no. 0.706

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Weeds, diseases and insects all can affect yield and quality of alfalfa hay. Controls include production practices, biological controls and pesticides.

Quick Facts...

Weed control in established stands of alfalfa can be accomplished with several herbicides.

Root and crown diseases are of significant economic importance in Colorado. Foliar diseases usually are not major factors in reducing yields.

Alfalfa weevil and blister beetle are the most important insect pests of alfalfa in Colorado.

Weed Control

Weeds in new alfalfa stands reduce yield and crop quality. Weeds in established stands decrease crop quality and occasionally decrease yield. The major weeds in new seedings are annuals, such as green foxtail, pigweed, lambsquarters, sunflower and sometimes yellow foxtail. Winter annuals, such as flixweed, blue mustard, shepherdspurse, other mustards and downy brome, are more likely to cause serious weed problems in established stands. Perennial weeds, such as foxtail barley and dandelion, also are common problems in established alfalfa. Control noxious weeds, such as field bindweed and Canada thistle, before rotating to alfalfa because there are no good control methods to suppress them in alfalfa.

The best method to control annual weeds when establishing alfalfa is to use a preplant-incorporated or postemergence herbicide. Apply Eptam (EPTC) or Balan (benefin) before weeds germinate and emerge. Apply them to the soil surface and incorporate them to a depth of 2 to 3 inches. These herbicides control annual grasses such as green foxtail and some broadleaf weeds like pigweed. Apply postemergence herbicides after weeds and alfalfa have emerged. Most require that alfalfa have at least three trifoliolate leaves. Pursuit (imazethapyr) controls broadleaf weeds, such as pigweed, as well as grassy weeds like green foxtail. Buctril (bromoxynil) controls annual broadleaf weeds but not grassy weeds. Pursuit and Buctril must be applied to small weeds or control will be poor. Poast can control grassy weeds but not broadleaf weeds.

To control winter annual weeds in established stands, use herbicides such as Velpar (hexazinone), Lexone or Sencor (metribuzin), Gramoxone Extra (paraquat), Pursuit (imazethapyr) and Sinbar (terbacil). Flixweed is the biggest winter annual weed problem for most established stands in Colorado. All these herbicides do a good to excellent job of controlling it. Zorial (norflurazon) also is registered for use in established alfalfa and readily controls downy brome, annual foxtails, sandbur and other annual grassy weeds. Apply Zorial pre-emergence in fall or early winter and incorporate it with irrigation or precipitation. Foxtail barley is exceptionally difficult to control in alfalfa. Our best recommendation is to apply Kerb (pronamide) in fall or very early winter. It also must be incorporated with irrigation or dependable precipitation.

More detail regarding herbicides can be found in *Colorado Weed Management Guide* (XCM-205). It is updated annually. Before using any herbicide to control weeds, review the label thoroughly!

Disease Control

The pathogens responsible for bacterial wilt, fusarium wilt and phytophthora root rot are common in Colorado. Once the plant has contracted the disease, there is no cure. Most varieties have at least moderate resistance.

Two types of diseases attack mature alfalfa stands: foliar diseases and root and crown diseases. Foliar diseases (various leaf spot and black stem diseases) usually are not major factors in reducing yields in Colorado. The best methods to control them are disease resistant varieties, crop rotation and timely harvest. Most new varieties have some foliar disease resistance. Periodic field surveys will reveal the presence and severity of foliar diseases. If excessive leaf drop occurs in the lower canopy, harvest the alfalfa as soon as possible to minimize further loss and reduce disease pressure. Under most conditions, crop rotation and harvesting at or prior to the 1/10 bloom stage will control foliar diseases in Colorado.

Root and crown diseases are of significant economic importance in Colorado because they can reduce plant vigor and lower winter survival rates. Over time, this decreases crop yields and shortens stand life. Once the plant has contracted a disease, there is no cure. Genetic resistance is the best protection. The pathogens responsible for root and crown diseases, such as bacterial wilt, fusarium wilt and phytophthora root rot, are prevalent in Colorado. Fortunately, most varieties have at least moderate resistance.

Seedling diseases, such as seedling blight and damping off, can be problems if cool, wet weather persists over long periods during establishment. Fungicide seed treatments help reduce the incidence of seedling disease.

Insect Management

Alfalfa weevil is the most serious insect pest of alfalfa. Other pests include pea aphids, blister beetles and alfalfa stem nematode.

While several insects pests attack alfalfa in Colorado, the key problem is alfalfa weevil. Pea aphids and blister beetles are less important but are of some concern. Alfalfa stem nematode occurs to varying degrees in most alfalfa-growing areas of the state. Information on field biology, economic importance and management of key pests is found below. Insecticide recommendations are not given because they quickly become outdated. See the *High Plains Integrated Pest Management Guide for Colorado, Western Nebraska and Wyoming (564A)* for products currently available.

Alfalfa Weevil

Field biology. Adult weevils are approximately 3/16 inch long and light brown with a dark brown stripe down the back. The adult weevils overwinter in the crowns of alfalfa plants and in debris in and around field edges. When temperatures warm to about 48 degrees F (9 degrees C) in the spring, the weevils become active and start laying eggs. Females chew holes in alfalfa stems where they lay 10 to 40 small oval eggs per hole. Egg laying begins in early spring and decreases through June. Larvae are pale green with a white stripe on the back and a shiny black head. Fully grown larvae are up to 3/8 inch long. Young larvae feed in the tightly folded leaves of stem buds. Larger larvae move onto open leaves near the terminals. Peak damaging larval populations often coincide with the first cutting of the crop.

Pupation occurs in plant crowns and soil debris. New adults feed for a short time, then become inactive. A second generation of larvae has been observed but is not considered to be important.

Heavily infested stands have a grayish or frostlike appearance due to the dried, defoliated leaves. At high weevil densities, foliage can be stripped, leaving only skeletonized and ragged leaf fragments and stems. Yield losses of 30 to 40 percent are possible. Hay quality is lowered due to loss of leaf tissue, leaving only stems. Damage to regrowth buds also may occur when plants first come out of dormancy and after first cutting. This may retard plant growth, allow weed establishment and reduce yield.

Management. Early harvesting and chemical control are common and effective management strategies. If an economic infestation of larger larvae is found when the plants are at 10 percent bud stage or later, early cutting is an alternative to insecticides. If pest density is high and larval survival under the windrow is high, stubble treatment still may be necessary. Rapid hay removal helps avoid survival under windrows. If feasible, green chopping provides very good control. Consider chemical treatment if one of the following conditions is met:

- The dynamic threshold described in the *High Plains Integrated Pest Management Guide* is exceeded.
- An average of more than 20 larvae is found from 100 half-circle sweeps with a standard 15-inch insect sweep net.
- More than one-third of the terminals show feeding damage.

If early harvest is used to manage alfalfa weevil, failure of the stand to green up within a week is a strong indication of good larval survival and the need to treat the stubble.

Additional control options. Certain cultivars are resistant to alfalfa weevil. They compensate for damage with more axillary branching and associated buds, which continue to grow after defoliation. This resistance is useful against moderate weevil infestations. Consider the use of a resistant cultivar if it is known to perform well in your area.

Alfalfa weevils have many natural enemies, including lady bird beetles, green and brown lacewings, damsel bugs and parasitic wasps. Parasitic wasps are considered the most effective but generally are not effective enough in our area to replace chemical control or early harvest. Biological control is much more effective in the eastern United States, perhaps because of climatic differences. Commercially available biological control agents are not known to be effective against alfalfa weevil. For more information, see fact sheet 5.500, *Alfalfa Weevil*.

Pea Aphid

Pea aphid and, much less frequently, spotted alfalfa aphid or blue alfalfa aphid may damage stands by stunting and wilting plants. Pea aphid outbreaks are most common following insecticide applications. Aphid damage is generally rare, due to effective biological control and resistant cultivars. Aphid-resistant alfalfas help avoid outbreaks associated with chemical control of alfalfa weevil. Consider chemical control if there are more than 10 aphids per stem two weeks before cutting. For more information, see 5.531, *Aphids in Alfalfa*.

Blister Beetles

Adult blister beetles are strongly attracted to alfalfa and other blooming hosts. Damage is not important, but the presence of blister beetles, especially the large, striped swarming types, is a concern for producers who sell hay to horse owners. Blister beetles produce cantharidin, a defense chemical toxic to livestock, particularly horses. Harvest practices that trap or crush beetles (wheel traffic over mowed forage, crimping and cutting) can result in contaminated hay. To minimize blister beetle risk:

- Use first cutting hay. It is the least likely to have blister beetles.
- Avoid later cuttings, especially from fields near rangeland.
- Control flowering weeds; harvest prior to bloom. Blister beetles are attracted to blooms.
- Use harvest equipment and practices that give beetles the best chance for survival. Beetles are very active and survivors will quickly leave the field, taking the cantharidin with them.
- Use self-propelled swathers without conditioning rollers but with windrowing attachments. They are safer than mower conditioners and sicklebar mowers.

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References

Publications available from The Other Bookstore, 115 General Services Bldg., Colorado State University, Fort Collins, CO 80523-4061; 970-491-6198:

XCM-205. Colorado Weed Management Guide. 1998

564A. High Plains Integrated Pest Management Guide for Colorado, Western Nebraska and Wyoming. 1998.

0.703, Alfalfa Production. 1999.

5.500, Alfalfa Weevil. 1998.

5.524, Blister Beetles in Forage Crops. 1998.

5.531, Aphids in Alfalfa. 1995.

- Avoid hay from the ends of the fields where the machinery is turned around. Beetles may be crushed by the tires.
- Do not use insecticides. This prevents beetles (and their cantharidin) from leaving the field.

For more information, see 5.524, *Blister Beetles in Forage Crops*.

Alfalfa Stem Nematode

The alfalfa stem nematode is a microscopic round worm that enters the plant on the developing bud tissue. It occurs to varying degrees in most alfalfa-growing areas of the state. Initial symptoms include stunting, swelling of the stem tissue, and shortened internodes. Some affected shoots appear white with very little stunting. This is called “white flagging” and is especially prominent on regrowth after the first cutting. White flagging and stand loss usually are the first symptoms readily recognized.

Rotation with nonhost crops, such as small grains, dry beans or corn, usually reduces the nematode population below detection levels. However, recontamination by machinery, animals and irrigation water can quickly lead to reinfestation of a field. Genetic resistance is available in some commercial alfalfa varieties.

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