Alfalfa Disease & Pest Guide

Growers guide to terms, characteristics and tips on managing common threats to alfalfa crop yields.
A measure of the alfalfa plant’s ability to survive the winter without injury. It is measured on a scale of 1 to 6 with 1 being most hardy and 6 being least hardy.

Alfalfa breeders have broken the relationship between winterhardiness and fall dormancy. This means growers can now choose varieties with low winterhardiness and higher fall dormancy, increasing yield. Varieties today allow growers to choose varieties that meet their winter survival and dormancy requirements.

**Winter Injury Symptoms:**
- Buds and stems formed in fall for spring regrowth are dead
- Two layers of growth. Shoots come from new growth 3 or 4 inches below fall growth

Reference: Dr. Dan Undersander and the Alfalfa Management Guide.
Fall dormancy is how tall alfalfa grows in the month following September 1 cutting. The more dormant types will remain short and have low yields, despite the growing conditions. The less dormant varieties will green up quickly in the spring and yield more in the fall.

There is no longer a direct relationship between winterhardiness and fall dormancy.

When selecting varieties, choose varieties that:
- Meet the winterhardiness requirements for your area
- Have the lowest fall dormancy conducive for your area
- Recover quickly between cuttings to increase total yield
Production Tips:

**Soil Selection**
- Choose a field with good drainage
- Test the soil for pH and fertility
- Soils should have a pH of 6.5 or above
- If soil pH is below 6.5, an application of lime may be required 12 months ahead of seeding to raise soil pH

**Soil Test**
- Soil test for phosphorus (P), potassium (K) and other elements like sulfur
- Your local soil testing lab can make best recommendations for fertility
- P and K can be applied anytime prior to and/or at seeding
- Soil and plant tissue tests can also guide ongoing topdressing ratios throughout the life of the stand

**Seeding**
- With proper management, alfalfa can be seeded conventionally, into reduced tillage or into no-till
- Seed a minimum of 15 pounds per acre
- Spring seedings can begin as soon as frost is out of the ground, seeding early will help improve first year yields
- Fall seedings should occur at least 6 weeks before the historic freeze date for performance the following year
Seeding Depth
• Start with a firm seed bed
• Seed to soil contact and proper seeding depth makes the difference in stand performance
• Plant 1/4 to 1/2 inch deep in heavier soils
• Plant 1/2 to 3/4 inch deep in sandy soils

Harvest
• Cut first year spring seeded stands at early to mid-bloom (about 70-80 days after seedings)
• Subsequent harvests can be made 25 to 28 days later
• Established stands (second year or older) can be harvested more frequently without severe stand damage
• Most growers like to start first harvest on established stand with a bud cut and following harvests at early bloom (about 26-30 days in most areas)
• Traffic Tested™ varieties have been proven to withstand more frequent harvests
Disease & Pest Resistance Ratings

Alfalfa varieties are tested and rated for resistance to diseases and pests that can lower yield and quality potential. These ratings are:

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S - susceptible
(5% or less completely resistant plants)

LR - low resistance
(6-14% completely resistant plants)

MR - moderate resistant
(15-30% completely resistant plants)

R - resistance
(30-50% completely resistant plants)

HR - highly resistant
(51% or more resistant plants)
Phytophthora Root Rot

**Definition:** a common fungal disease of alfalfa. Most common in poorly drained, clay loam or heavy soils.

**Primary Occurrence:** Entire U.S. is susceptible. Prevalent among new seedlings in wet soils. Rapid growth in 70-75 degree soil.

**Symptoms:**
- Infected seedlings are stunted, grow slowly due to a reduced root system and eventually begin to wilt
- Established plants may develop reddish-brown, water-soaked lesions on the roots
- Root lesions turn black, and taproot may rot entirely

**How to Prevent:** Crop rotation has little effect on this disease. Use highly resistant varieties and seed treatments. Maintaining good soil fertility, remove excess moisture through improved tile drainage and minimize plant stresses.
Aphanomyces Root Rot

**Definition:** a major disease in alfalfa seedlings, particularly wet, saturated soil conditions.

**Primary Occurrence:** Wet soils. Race 1 is found in most areas of the U.S. Race 2 has been found in area east of the Rocky Mountains.

**Symptoms:**
- Seedlings develop yellow cotyledons
- Roots and stems initially appear gray and water-soaked, turn light to dark brown.

**How to Prevent:** Fungicide seed treatments are not effective against Aphanomyces root rot. It is best managed by using resistant varieties. Race 2 is more virulent. Many alfalfa varieties are resistant to race 1, but few are resistant to race 2.
**Anthracnose**

**Definition:** a serious stem and crown rot disease, which can kill individual plants and cause rapid stand decline.

**Primary Occurrence:** Moderate levels across U.S., severe in lower coastal range of California and Arizona and Southeast.

**Symptoms:**
- Large, sunken, oval to diamond straw-colored lesions on plant stems
- Lesions may enlarge, and girdle killing one to several stems on plants
- Crown of infected plant turns blue-black, plant produces fewer stems and eventually dies

**How to Prevent:** The key to anthracnose control is the use of resistant varieties. If Anthracnose is present in the field, harvest the infected field last and disinfect the machinery when finished.
Verticillium Wilt

**Definition:** a disease that causes serious stand thinning and yield loss in third year or older alfalfa fields.

**Primary Occurrence:** Severe occurrences found in northern U.S. and most of the West; moderate in mid-south and coastal plains.

**Symptoms:**
- Dead leaves on green stems
- Progressively, leaves turn yellow then become bleached
- Common to see reddish tint on only one side of plant
- Symptoms most visible in spring and fall

**How to Prevent:** The use of resistant varieties is the most effective way to control this disease. To prevent spreading the disease from older fields to newer fields, harvest younger nondiseased fields first. Clean machinery after harvest.
Definition: A bacterial disease is most common on plants growing in low, poorly drained areas of the field. It is spread from plant to plant via surface water and contaminated implements. More common in wet areas.

Primary Occurrence: Found in much of the U.S., moderate in arid climates.

Symptoms:
- Plants initially wilt during moisture stress then recover
- Appears yellow and slightly dwarfed or straw-colored and dead
- Slow growth after first cutting
- Produce small leaves and are bunchy in appearance
- Leaves that are thickened and cup upward or curl

How to Prevent: Plant resistant varieties, harvest healthy fields first clean machinery after harvest.
Fusarium Wilt

**Definition:** Vascular disease causing gradual stand thinning. Often confused with Verticillium wilt.

**Primary Occurrence:** Severe conditions found in much of the U.S., moderate in mid-South, Southwest and West regions.

**Symptoms:**
- Initially plants turn yellow-green, scattered throughout the stand
- Severely infected plants are stunted with many spindly stems and small distorted leaves
- Taproot cross sections show a ring of yellowish brown discoloration near outer edge

**How to Prevent:** Prevention starts with a variety resistant to Fusarium Wilt. To prevent spreading the disease from older fields to newer fields, harvest younger nondiseased fields first. Sweep machine clean of leaves and stems after harvesting infected fields. Disinfect the cutter bar.
**Phoma Crown Rot**

**Definition:** a slow rot in the tap root and crown area that can be attributed to many pathogens.

**Primary Occurrence:** Affects entire U.S. usually most severe where machine traffic or grazing is heavy.

**Symptoms:**
- Begins as a small cone-shaped discoloration below the base of a cut stem
- Rotted areas enlarge and may merge until the central portion of the crown is destroyed
- Often leaves a rim of living crown tissues and stems

**How to Prevent:** Use well-adapted, hardy varieties. Traffic Tested™ America’s Alfalfa varieties are bred to yield while withstanding heavy traffic that causes phoma crown rot. Control other diseases and pests that leave the plant vulnerable and weak.
Root-lesion Nematode

**Definition:** Nearly microscopic roundworms that live in soil and plant tissues.

**Primary Occurrence:** Moderately present in eastern half of the U.S. and western coastal areas.

**Symptoms:**
- Plants appear unhealthy and stunted
- Usually appear in spotty areas among healthy stands
- Reduced root growth and black or brown lesions on the root surface

**How to Prevent:** Crop rotation is not effective for lesion nematode management. Leaving a field fallow, followed by treatment with a nematicide, can reduce lesion nematode populations. Using seed with a high resistance is the most effective management tool.
Definition: Tiny round worms that feed on the roots of alfalfa plants.

Primary Occurrence: Southern California and Arizona most severely affected. Exist in soil areas with hot climates and short winters. Most abundant in sandy loam soils.

Symptoms:
- Stunted growth and roots that branch profusely
- Many small galls may develop that can be similar or smaller in size than Rhizobia nodules
- Galls caused by root knot nematodes are accompanied by lateral root growth, unlike galls caused by beneficial nitrogen-fixing bacteria.

How to Prevent: Select resistant alfalfa varieties. Rotate crops with corn or cereal grains if broadleaf weeds are controlled.
**Stem Nematode**

**Definition:** Nearly microscopic round worm that enters the alfalfa plant and lives in the stems and leaves, usually above ground.

**Primary Occurrence:** Moderate throughout U.S.; severe in West and inland mid-South areas.

**Symptoms:**
- Seedlings are swollen and deformed
- Stem buds of older plants are stunted, swollen, brittle and easily break off
- Bases of stems become brown to black
- White stems and leaves (white flagging) develop on some plants

**How to Prevent:** Rotate fields with non host crops (barely, wheat, corn, or sorghum). Use resistant varieties. Cut new clean fields first.
Potato Leafhopper

**Definition:** Tiny pale, light green insect with wings that feed on and lay eggs in stems and leaves.

**Primary Occurrence:** Severe in central regions and moderate in eastern U.S.

**Symptoms:**
- Damage starts as a V-shaped pattern at the tips of leaves
- Causes alfalfa yellowing, known as “hopper burn”
- Extensive hopperburn can reduce long-term yield and plant stand health

**How to Prevent:** Prevent infestation with highly resistant varieties. If present in fields, reduce population with insecticides and early cuttings.
Definition: Large green aphids with long legs, antennae, cornicles, and cauda. The antennae of the blue alfalfa aphid are uniformly brown.

Primary Occurrence: Occurs in several western states.

Symptoms:
- Slow growth
- Reduced yields
- Presence of black fungus, sooty mold grows on the honeydew excreted by the aphid

How to Prevent: Prevention and control are the same for pea and blue alfalfa aphids. Plant resistant varieties and encourage populations of natural enemies (lady bugs, damsel bugs, and green lacewing). Insecticides often kill natural predators and are less effective long term.
Definition: Tiny aphid is light yellowish green or straw colored, with rows of dark spots on its back. The spotted alfalfa aphid is the most devastating aphid pest of seedling alfalfa.

Primary Occurrence: Throughout the U.S. Most severe in the arid areas of western and southwestern U.S.

Symptoms:
- Plants begin to wilt
- Healthy plants begin to yellow and turn brown
- Seedlings start to die off and lower productivity of established fields

Pea Aphid

**Definition:** Large green aphid, antennae have narrow dark bands at the tip of each segment. Builds up large populations which cover the stems and terminal buds during cool, wet springs.

**Primary Occurrence:** Moderate in Northeast and upper Midwest, severe across the rest of the U.S.

**Symptoms:**
- Causes plants to wilt
- Plants are stunted with yellowish, light colored tops
- Large infestations produce excessive honeydew, which may interfere with harvesting

**How to Prevent:** Plant resistant varieties and encourage populations of natural enemies (lady bugs, damsel bugs, and green lacewing). Insecticides often kill natural predators and are less effective long term.
Weed Management

Weeds are a major problem in newly sown fields as well as established fields. Weeds will rob nutrients from the ground while decreasing quality and palatability. The most important element in weed management is establishing and maintaining vigorous alfalfa stands.

To keep weeds at bay, you should:
• Maintain proper soil fertility and pH
• Prepare seedbed properly
• Choose a variety that will grow well
• Consider herbicide tolerant varieties
• Establish an appropriate cutting schedule

When using herbicides, always remember to read the product label for application instructions.
Before Planting: It is important to eliminate perennials before planting alfalfa seeds. Herbicides may be applied in the fall and spring, with fall being recommended in most cases. Some herbicides can damage or kill alfalfa seedlings when used too close to alfalfa seeding.

Ask your local America’s Alfalfa dealer for a Genuity® Roundup Ready® Alfalfa Management Guide to learn about how to incorporate herbicide resistant varieties in your operation.

Follow label instructions for recommendations on proper application techniques and plant back timing for your area.

Seeding Year: Tilling your fields as close to planting as possible will allow your alfalfa a head start, while uprooting existing weeds. For direct seeded alfalfa planted in the spring, herbicides are usually suggested to control weeds. There are many types and brands of herbicides. Follow instructions on the package to avoid killing or damaging the newly planted seeds.
Established Alfalfa: Weeds will start to take over fields if plant growth has slowed due to poor soil fertility, disease, insect problems and winter injury.

Keeping a weed-free stand improves:
• Stand purity and quality. Some weeds can decrease forage quality and make the alfalfa nearly unpalatable. Weed-free bales are more saleable than weed-filled bales
• Consistency in bales. The nutrition offered in each bale will be more uniform