2. Do not use alfalfa hay with dodder in it.
3. Do not graze dodder areas and then put animals on clean land.
4. Avoid spreading dodder seed in irrigation water.
5. Cut dodder-infected plants before the dodder develops seeds.

Alfalfa — Downy Mildew

Cause This disease, caused by the fungus-like microorganism *Peronospora trifoliorum*, is favored by cool, wet springs. Losses usually are restricted to the first cutting, and severe damage is seldom noted. The fungus overwinters in crown buds or as dormant spores in old, dead leaves. Only young tissue is susceptible to this fungus.

Symptoms New growth becomes pale green to yellowish green; leaflets may roll or twist down. A delicate, violet-gray, moldy growth may be abundant on leaf undersides in cool, wet weather.

Cultural control
1. Plant resistant cultivars.
2. When disease is severe, cut early to reduce foliage loss. Cutting also removes disease tissue and increases air circulation.

Chemical control
1. Seed treatment will suppress early season downy mildew the first crop year. Treat seed with:
   a. Apron products such as Apron XL LS at 0.64 fl oz/100 lb seed plus a dye. For control of *Pythium* only. See label for reentry restrictions.
   b. Maxim XL at 0.167 to 0.334 fl oz/100 lb seed. Requires additional Apron XL LS. Also for control of pathogenic *Fusarium*, *Pythium*, and *Rhizoctonia* spp. See label for reentry restrictions.
2. For foliar application
   a. MilStop (85% potassium bicarbonate) at 2 to 5 lb/A. **Oregon and Washington Only.** 1-hr reentry.
   b. Quadris Flowable at 6 to 15.5 fl oz/A on 7- to 14-day intervals. Do not make more than two (2) foliar applications of Quadris or other Group 11 fungicides per acre per season. Do not apply more than 15.5 fl oz/A per cutting. Do not apply within 14 days of harvest for forage and hay. 4-hr reentry.

Alfalfa — Leaf Spots and Blotches

Cause Several fungal leaf spots occur on alfalfa. The most prevalent ones in the Pacific Northwest are common leaf spot caused by *Pseudopeziza medicaginis*, rust caused by *Uromyces striatus*, Stemphylium leaf spot caused by several species of *Stemphylium* (teleomorph = *Pleospora* spp.), and Stagnospora leaf spot caused by *Stagnospora meliloti* (=*Phoma meliloti;* teleomorph = *Leptosphaeria pratensis*).

Symptoms

Pseudopeziza leaf spot—small, more or less discrete circular spots with a toothed edge.

Rust—small reddish brown circular pustules (uredinia) on both leaf surfaces. Elongate pustules may occur on stems. Plants may defoliate prematurely. Alternate host is leafy spurge or cypress spurge.

Stagnospora—leaf spots are circular or angular and pale buff with a light brown margin.

Stemphylium—leaf spots are irregularly shaped, brown, with a darker border surrounded by a yellow halo. It commonly develops only in wet, cool weather.

Cultural control
1. Plant adapted recommended cultivars.
2. For some leaf spots, resistant cultivars are available.
3. Cut early when the disease is severe.

Chemical control Control with fungicidal sprays is possible for some of these diseases and may benefit seed crops.
1. Copper materials can aid but beware of build up of copper in soils.
   a. Champ Formula 2 at at 1.33 pints/A, 10 to 14-days prior to harvest. 24-hr reentry.
   b. Kocide 2000 at 1.5 lb/A, 10 to 14-days prior to harvest. 24-hr reentry.
   c. Nordox 75 WG at 1.25 to 2.5 lb/A, 10 to 14-days prior to harvest. 24-hr reentry.

Alfalfa — Nematode (Bulb and Stem)

Cause *Ditylenchus dipsaci* is a nematode that lives principally in the stem portions of plants. It can persist in soil without a susceptible crop for at least 2 years. Flooding of affected areas helps to disseminate nematodes and increase damage. Most damage is done by nematode feeding in winter.

Symptoms Diseased plants are severely stunted, and stems and leaves show distortion and basal swelling. In warm weather, "white flags" develop as leaves become distorted and turn white. Infected stems become brittle and break off easily at the crown.

Severely infected plants die. Blank spaces become evident in the field 2 or 3 years after planting and may be invaded by weeds. Damage is most apparent when growth begins in spring, especially after a warm, wet winter.

Sampling Stem nematodes infect the aboveground portions of plants but also may be found in soil. Affected plant crowns with attached stems are required for diagnosis. Take samples any time in the growing season, but late spring may be an ideal time to look for first signs of affected plants. Later these plants may be stunted and overgrown by adjacent plants or weeds and may be missed, allowing the infection to spread.

Cultural control
1. Use resistant cultivars. The cultivars 'Archer,' 'Lahontan,' 'Washoe,' and others are usually resistant to both the stem nematode and bacterial wilt. Relative resistance ratings of varieties are provided by the National Alfalfa and Forage Alliance (alfalfa.org).
2. Rotate with non-leguminous crops for 2 to 4 years, depending on severity of infection. Volunteer plants must be eliminated.
3. Prevent nematode infestations by avoiding use of tail water from old alfalfa fields.
4. Cut alfalfa only when the top 2 to 3 inches of soil are dry.
5. Burn stubble in fall rather than spring (seed production only).
6. Clean equipment before moving from infected to clean fields.

Alfalfa — Nematode (Lesion)

Cause *Pratylenchus* spp., chiefly *P. penetrans*, are migratory endoparasites (see Nematodes, page 18); part of the population is in the soil and part in the roots at all times.