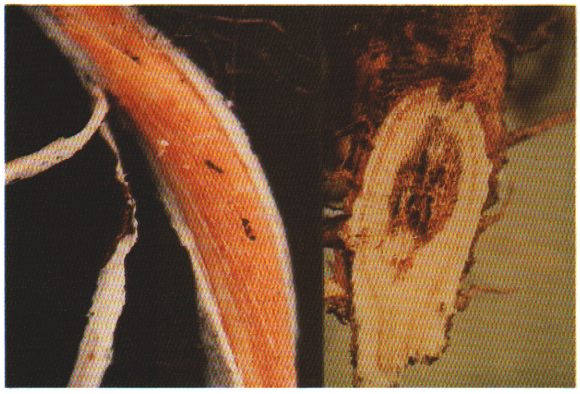
ALFALFA DISEASES II



1. Bacterial wilt

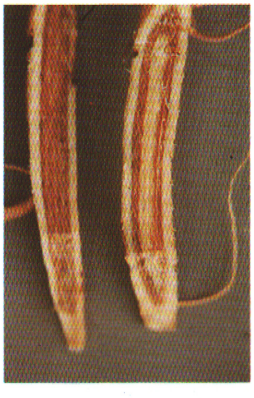
2. Phytophthora root rot. L, dead and dying plants; R, typical root symptoms

3. Anthracnose. L, external and R, internal symptoms

4. Fusarium crown rot

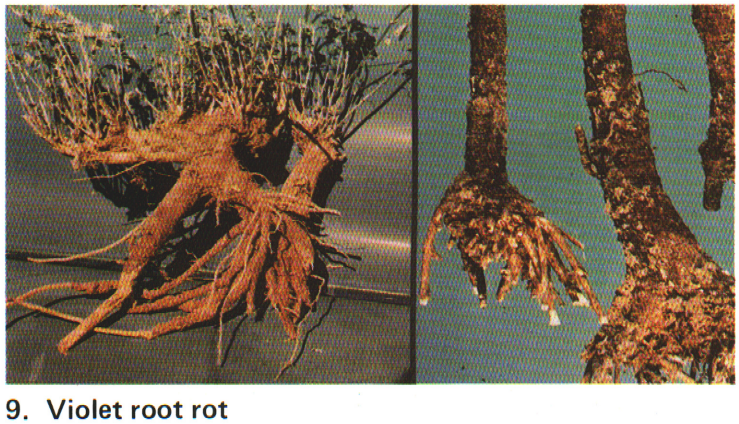
5. Mycoleptodiscus crown rot

6. Sclerotinia crown and stem rot



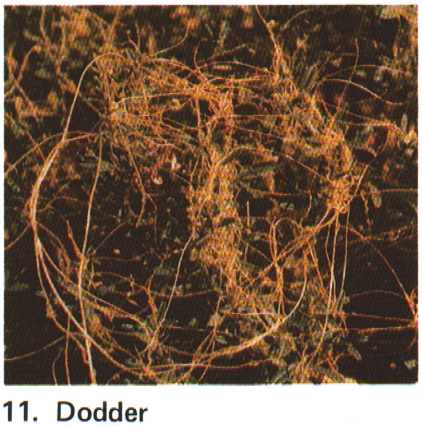
7. Fusarium wilt

8. Rhizoctonia stem canker



9. Violet root rot

10. Crown wart



11. Dodder

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ALFALFA DISEASES II

1. **Bacterial Wilt**, caused by the bacterium *Corynebacterium insidiosum*, is a major disease that occurs worldwide, especially in poorly drained wet areas. The bacterium is easily spread in the field by mowing and tillage equipment, surface water, and animal life in the soil. Symptoms first appear as the dying of scattered plants throughout a field, usually starting in the second or third year after seeding. Severely infected plants are stunted to dwarfed, bunchy, and yellow-green to bleached. Such plants are more susceptible to winter-kill. Under moisture stress, young succulent growth wilts and dies. A cut through a diseased tap root or crown reveals a yellow-to-brown discoloration in the vascular cylinder. The bacterium overseasons in crop debris in the soil and infects plants through a variety of wounds.

2. **Phytophthora Root Rot** is a serious, worldwide, soil-borne disease caused by the fungus *Phytophthora megasperma*. Like Bacterial Wilt (1), it occurs primarily in low-lying, poorly drained soils following periods of excessive rainfall or flood irrigation. Losses are most severe to seedling stands. Infected plants are stunted; the leaves turn yellow or reddish, wilt, and die. Regrowth is often slow and greatly reduced after a cutting. The tap roots and rootlets are rotted with yellow-to-brown lesions that later turn black. There is usually a sharp line between rotted and healthy tissue and the decay may occur at various depths in the soil. The fungus probably overseasons as thick-walled, dormant spores (oospores) or as mycelium in crop debris.

3. **Anthracnose**, caused by the fungus *Colletotrichum trifolii*, occurs in the southern half of the USA during warm, moist or humid weather. Infected shoots wilt and die, turn straw-colored to white, and are scattered through a field. Newly killed shoot tips often have a "shepherd's crook" appearance. Lesions on the lower parts of these shoots are oval to diamond-shaped with a straw-colored center and a brown border. Black fruiting structures (acervuli) form in the centers of older lesions and on crop debris. The fungus may grow downward from infected shoots into the crown tissue which appears bluish-black. Diseased crowns produce weak, less vigorous shoots or entire plants are killed thinning out the stand. The fungus overseasons in living and dead plants, on machinery, and in the soil.

4. **Fusarium Crown Rot** and root rot, like Fusarium Wilt (7), is a widespread, soil-borne disease caused by several species of *Fusarium*. These fungi enter through a variety of wounds caused by machinery, cold temperatures, nematodes, insects and other animals. Infected plants are usually stunted with bleached, yellow leaves that wilt under a moisture stress. Light brown-to-black streaks develop in the vascular tissue of diseased plants. Leaves on these plants often curl slightly and wither. The disease progresses slowly, rarely killing a plant in a single growing season. The stand is gradually thinned from year to year. Seedlings may wilt, wither and die (postemergence damping-off), especially during warm, wet weather. These fungi survive as chlamdospores in soil or plant debris.

5. **Mycoleptodiscus Crown Rot**, caused by the fungus *Mycoleptodiscus terrestris*, is only found in the USA and is most severe in warm, humid weather. The fungus causes damping-off of seedlings, but is more prevalent as a black rot of the lateral roots that later spreads into the tap root and crown. Infected crowns have numerous wilted and dead stems. Small brown leaf spots and reddish-brown stem lesions are occasionally seen. As with Sclerotina Crown and Stem Rot (6), fungal mycelium and numerous, small, round to spindle-shaped black sclerotia may be found in decayed crown tissue. The fungus probably overwinters as sclerotia in crop residue and soil.

6. **Sclerotinia Crown and Stem Rot**, caused by the fungus *Sclerotinia trifoliorum* (synonym *S. sclerotiorum*), is a cool, wet weather disease that infects plants of all ages. Small, more or less circular patches of dying and dead seedling plants are common. On older plants, infected leaves and stems become yellow and finally collapse. A white, cottony mass of fungus mycelium grows over dead plants or the soil surface in wet weather. Dark brown to black sclerotia later form in the fluffy growth. Affected plants may die with the fungus invading the crown area. The crown turns soft and grayish-green, causing the shoots to wilt and turn yellow. the fungus overseasons as dormant, hard, round-to-irregular sclerotia, up to 8 to 20 mm in diameter, in soil and crop debris.

7. **Fusarium Wilt**, normally caused by the soil-borne fungus *Fusarium oxysporum* f. sp. *medicaginis* occurs in irregular areas in a field. Scattered plants within these areas wilt, sometimes starting on one side, with the leaves turning light green-to-yellow. Affected plants are commonly stunted or dwarfed and die slowly over a period of several weeks or months during warm-to-hot weather. Dark or reddish-brown streaks within the vascular cylinder are visible in a tap root that has been split or cut across. The fungus, like those cause Fusarium Crown Rot (4), survives in soil for years as chlamydospores or as mycelium in living or dead plants.

8. **Rhizoctonia Stem Canker** or blight is caused by the cosmopolitan soil fungus *Rhizoctonia solani*. Scattered, round to irregular areas of affected plants are evident in a field. Elliptical to circular, somewhat sunken, tan to reddish- or dark-brown lesions (cankers) form on the lower stems, crown and tap root. If severe, stems and roots are girdled causing the leaves and shoots to turn yellow, wilt and die. Seedlings are killed before or after emergence. In hot, humid weather the leaves and shoots, especially on lush plants in thick stands may appear water-soaked. Affected parts soon wilt, wither and die. The fungus survives for years in the soil as minute, irregular, dark brown-to-black sclerotia or as a saprophyte in plant debris.

9. **Violet Root Rot**, caused by the fungus *Rhizoctonia crocorum* (sexual stage, *Helicobasidium purpureum*), is usually of minor importance. The disease is most prevalent in older stands after midsummer, killing plants in enlarging, circular to irregular patches. The shoots turn yellow, then brown, wither, and die. Infected roots decay, turn brown to dark violet, and are covered with a thick, bright violet-to-cinnamon, feltlike mat of hyphae. The fungus survives as deep violet-brown, velvety sclerotia in soil and as a saprophyte in plant debris.

10. **Crown Wart**, a common disease in excessively wet fields, mostly in the western USA, is caused by the fungus *Physoderma (Urophlyctis) alfalfae*. Irregularly shaped white galls, up to 5 cm in diameter, form on the crown at or slightly below the soil surface. Older galls turn gray-to-brown as they dry and decay. The fungus survives as resting spores in gall tissue and in the soil.

11. **Dodder**, also known as strangleweed, goldthread and lovevine, is caused by several species of *Cuscuta*. Dodder is a slender, twining, orange-to-yellow, annual vine that is parasitic on a wide range of plants. It occurs in tangled, yellowish patches that enlarge up to an acre or more in diameter if left uncontrolled. This "leafless" seed plant entwines alfalfa stems, grows over the tops of plants and mats them down, slowly reducing their vigor. Infected areas are difficult to harvest. Dodder seed can remain dormant in soil up to 20 years.

For chemical control suggestions, a listing of resistant varieties, and other control measures, consult the Extension Plant Pathologist at your land-grant university, or you county extension office.

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