

Foliage Diseases of Alfalfa

By Laura Sweets

There are at least eight leaf and stem diseases that may occur on alfalfa in Missouri. These diseases cause a variety of different types of lesions on leaflets and, in some cases, on petioles and stems as well. The symptoms for some of the foliage diseases are quite similar and might be difficult to distinguish in the field. For accurate diagnosis submitting a sample to the Plant Diagnostic Laboratory would be recommended. Most of these foliage diseases are caused by fungi which survive on infested plant tissue left in the field. And most of these leaf and stem diseases are favored by cool to moderate temperatures and wet or humid conditions. Because most of these diseases are favored by the same environmental conditions, more than one may occur in a field at the same time. When foliage diseases are severe, leaves on infected plants may yellow and drop prematurely. Foliage diseases can reduce plant vigor, reduce yields from stands and reduce the quality of harvested hay.

So far this season the majority of the samples submitted to the University of Missouri, Plant Diagnostic Laboratory have been Lepto leaf spot, although there has been one sample of spring black stem. Since most of the state has been cool and wet for much of the season it is not surprising the foliage diseases are occurring on alfalfa in Missouri.

Lepto leaf spot, caused by the fungus *Leptosphaerulina briosiana*, is usually found on young leaves but may also infect older leaves and petioles. Symptoms of Lepto leaf spot are variable. Under low light intensity spots tend to be small, pinpoint in size and grayish-black in color. Under higher light intensity spots tend to be larger in size and have a light tan center with dark margin and yellow halo. When infection is severe, leaflets will yellow and drop prematurely. Lepto leaf spot is favored by temperatures in the range of 60-80 F and long periods of high humidity.

Spring black stem, caused by the fungus *Phoma medicaginis*, begins as small, dark brown to black spots on the lower leaves, petioles and stems. These

spots become irregular in shape and increase in size. Lesions may run together killing large areas of leaf tissue. Leaflets may yellow, wilt and drop prematurely. Lesions on stems may actually girdle the stem causing shoots to yellow and wilt. Spring black stem is more severe in cooler, wetter seasons.

Summer black stem, caused by the fungus *Cercospora medicaginis*, begins as small, grayish-brown lesions with irregular margins. Tissue around these lesions may turn yellow. Lesions are frequently located on or near leaflet midribs. Infected leaflets may yellow and drop prematurely. Lesions may also occur on stems. Stem lesions are usually reddish-brown to chocolate brown in color and elongate in shape. Summer black stem is favored by high relative humidity (near 100% RH) and temperatures of 80-90 F. This disease is more common after the regrowth is tall enough to shade the lower leaves.

Common leaf spot, caused by the fungus *Pseudopeziza medicaginis*, produces small, nearly circular, dark brown lesions. Common leaf spot lesions are more regular in size and shape than most of the other alfalfa leaf spot lesions. Common leaf spot lesions typically do not have yellow haloes or borders. A distinctive raised disk (fungal fruiting structure) forms in the center of mature lesions. Infected lesions may yellow and drop prematurely. Common leaf spot is favored by cool (60-75 F), wet weather.

Bacterial leaf spot starts as small water soaked spots which rapidly enlarge and merge to form irregularly shaped areas of dead leaf tissue. Lesions appear transparent and may have a narrow darker brown border. Bacterial leaf spot is favored by hot, humid weather. It is caused by the bacterial pathogen, *Xanthomonas alfalfae*.

Downy mildew begins a light grayish-green to yellow green areas on the infected leaflets. Downy mildew tends to develop first on the younger, upper leaves of a plant. Infected leaves may be curled and distorted. The disease may become systemic within plants resulting in stems that are larger in diameter than healthy stems and that are distorted at

the tips. With high humidity patches of grayish-white mold growth of *Peronospora trifoliorum* may develop on the lower leaf surface of infected leaflets. Downy mildew is favored by high relative humidity (close to 100%) and temperatures of 50-65 F so it more likely to be a problem on the first cutting of alfalfa.

Rust on alfalfa begins as small, reddish-brown circular pustules on leaves and stems. These pustules break open to release masses of rusty brown spores of *Uromyces striatus*, the causal fungus. Rust is favored by high relative humidity and temperatures around 70 F. Rust is more likely to become a problem in late summer or early fall.

Anthracnose lesions are more common on alfalfa stems than leaves. Symptoms range from small irregularly shaped blackened areas on more resistant stems to large, sunken oval to diamond shaped lesions on more susceptible stems. If lesions completely girdle stems, the stems will die prematurely. The fungus causing anthracnose, *Colletotrichum trifolii*, can also cause a black to blue-black crown rot of alfalfa.

A management program for foliage diseases of alfalfa should include the following steps:

- ♦ Plant adapted varieties with resistance to diseases likely to occur in your area.
- ♦ Avoid varieties that are known to be susceptible to the foliage diseases known to occur in your area.
- ♦ Maintain good plant vigor by proper fertilization and insect control.
- ♦ Cut hay in late bud to early bloom stage before diseases become severe. (This will reduce losses and prevent infected leaflets from building up in the lower canopy of plants).

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