Downy Mildew On Alfalfa

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DIAGNOSIS AT A GLANCE

Caused by
The fungus, *Peronospora trifoliorum*

Symptoms
- Chlorotic spots on leaflets
- Yellowing of entire leaflet
- Leaflets twisted and curled downward
- Infected stems become thickened and produce a bunchy, rosette-type growth at their tips
- Seedling death

Signs
White to grayish downy growth on the underside of infected leaflets

Disease conditions
- Cool, moist weather in fall or spring
- Sporulation and germination requires free moisture
- Spread by splashing rain or irrigation and wind
- Optimum temperature for disease development is 65˚F

Disease management
- Spring seeding
- Seed treatment with metalaxyl fungicide
- Early first cutting in spring
- Planting tolerant cultivars

Downy mildew of alfalfa is a fungal disease caused by *Peronospora trifoliorum*. In New Mexico this disease can be troublesome on non-dormant alfalfa when environmental conditions favor disease development. Downy mildew usually occurs in spring prior to the first cutting; however, it may also occur in the fall and is particularly troublesome on newly germinating seedlings. Infected seedlings are weakened and become susceptible to winterkill.

The disease begins as chlorotic spots on the leaflets. As the disease progresses, these chlorotic areas may enlarge and eventually cover the entire leaflet. Infected leaflets become twisted and the margins curl down. Infected stems are usually a little larger than non-infected stems and produce bunchy, rosette-like growth at their tips.

The tell-tale sign of downy mildew is the production of a white to grayish downy growth on the underside of infected leaflets. This fungal growth is a mass of spores (sporangiophores and sporangia), which serve as inoculum for secondary spread of the fungus.

Downy mildew occurs during cool, moist periods in the spring or fall. The fungus sporulates at night with high humidity. The resulting spores are short-lived, surviving only a few hours to a few days depending on environmental conditions. Spread of the fungus is usually dependant on wind or splashing rain. The fungus requires water on the leaf surface for germination and infection. Infection can occur at temperatures between 40 and 85˚F, with peak fungal activity occurring at 65˚F.

Only young, succulent tissue is susceptible to the fungus. Infection occurs either by direct penetration of the leaflet surface or by entry through stomata. Under favorable conditions, secondary infection cycles occur every five days.

Spring seeding is recommended for areas where fall infections are common. Metalaxyl, a systemic fungicide, is registered as a seed treatment for alfalfa. In addition to protecting seedlings from downy mildew, this fungicide will help protect seedlings from damping off caused by *Pythium* and from early season losses due to *Phytophthora* (two fungi related to *P. trifoliorum*).

Because downy mildew requires cool, moist conditions, it is usually only a problem on the first cutting of alfalfa. After the first cutting, environmental conditions limit the activity of this fungus, greatly reducing damage caused by the disease. Therefore, one of the best management tactics for downy mildew is to harvest the first cutting early. This will help minimize the yield loss due to disease. Early harvest coupled with the selection of mildew-tolerant cultivars usually provides adequate control for this disease.

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