

## MANAGING ALFALFA DISEASES

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### INTRODUCTION

Diseases of alfalfa can limit productivity of this valuable forage crop. Alfalfa diseases can reduce forage yield, reduce forage quality, and decrease stand persistence. The effects of diseases can be dramatic, such as sudden stand loss due to *Sclerotinia* crown and stem rot. Often, the effects of alfalfa diseases are more subtle but are no less important. For example, alfalfa plants with *Phytophthora* root rot sometimes regrow slowly after cutting, resulting in a stunted stand showing no other obvious symptoms of disease.

Like most crop diseases, alfalfa diseases are most effectively managed by integrating as many control measures as practical. This report will provide an overview of several timely topics relative to alfalfa disease management.

### VARIETY SELECTION

Alfalfa seed companies have made tremendous progress in recent years in breeding varieties with multiple pest resistance--simultaneous resistance to numerous diseases and pests. Unfortunately, resistance is not available in current varieties to all the diseases of importance in Kentucky. However, useful levels of resistance are available to a number of important diseases.

When selecting an alfalfa variety, disease resistance should be considered after identifying those varieties that consistently perform well in the UK Alfalfa Variety Trials. Below is a discussion of the significance to Kentucky alfalfa producers of disease resistance in alfalfa.

**Bacterial Wilt:** Nearly all commercial varieties have adequate resistance to this disease. A rating of MR (moderate resistance) or higher is considered adequate for Kentucky. Check older varieties before purchase, however, since a few (Arc, Williamsburg, and others) have LR (low resistance) ratings.

**Phytophthora Root Rot:** I recommend only planting varieties with an MR rating or higher to *Phytophthora* in all fields, and even higher levels of resistance on farms where the disease has been diagnosed (R=resistance, or HR=high resistance). In a recent survey of Kentucky alfalfa fields, we found that 10% fields surveyed were infested with *Phytophthora*. Surprisingly, most of the alfalfa fields surveyed did not have detectable levels of the fungus. These data suggest that the majority of Kentucky farmers do not need resistance to *Phytophthora* root rot for maximum yields. However, the question a farmer needs to ask is,

is the field to be planted one of those without *Phytophthora*? Odds are it is, but maybe not. This disease can be so insidious that planting a susceptible variety seems risky, especially when so many good resistant varieties are available.

**Anthracnose:** I recommend using only varieties with at least an MR rating for anthracnose. Higher levels are recommended on farms where the disease has been diagnosed. This disease has been uncommon in recent years. However, recent studies in Iowa confirm what I have suspected: the anthracnose fungus is present in alfalfa fields at very low levels. It may take a couple of seasons of hot, wet weather in August before it rears its ugly head, but I suspect we will see destructive epidemics of anthracnose again.

**Fusarium Wilt:** A rare disease in Kentucky, but we have diagnosed a few cases. Most varieties have acceptable resistance to this disease (MR or better).

**Aphanomyces Root Rot:** At this point, farmers should not concern themselves with the reaction of an alfalfa variety to this disease. The *Aphanomyces* fungus is very common in Kentucky soils. However, seedling stand loss from this disease is very rare in Kentucky. It does occur, but very rarely. There is no harm in selecting an *Aphanomyces*-resistant variety, assuming it is a good performer in UK Alfalfa Yield Trials. However, our ongoing studies so far indicate that *Aphanomyces* resistance is not necessary for good performance in Kentucky.

**Other Diseases:** Although *Verticillium* wilt has been diagnosed in states along Kentucky's northern border, we have not yet positively diagnosed the disease in Kentucky. I strongly suspect infected seedlots occasionally have been planted in Kentucky. Our climate may simply be too warm for disease development. Likewise, stem nematode has not been observed in Kentucky nor in surrounding states, to my knowledge. Farmers can ignore resistance ratings to these diseases.

## OTHER PRACTICES

Use of good agronomic practices is a foundation for disease management in alfalfa. Proper site selection, good soil fertility, and other practices help to maintain vigorous plants which are often more resistant to infectious diseases. Although most agronomic practices can affect disease development in alfalfa, several key topics are highlighted below.

**Crop Rotation.** Most producers understand that crop rotation is an important disease control practice in all crops, not just alfalfa. Most alfalfa *pathogens* (infectious microorganisms) do not survive well in the absence of a host plant. As infested alfalfa residues decompose, pathogen cells become exposed to the soil, where they die out.

How long should a producer rotate away from alfalfa for disease control? As a practical matter, at least a year away from alfalfa is recommended, although two years is preferable. Several pathogens decline to low levels within that period of time, such as most leaf-infecting microorganisms. As many as five years away from alfalfa is

probably ideal, since several alfalfa pathogens are long-lived in the soil, such as *Phytophthora* and *Fusarium*. However, a two-year period without alfalfa is probably enough for most fields if other disease management practices are being used. Sometimes producers are successful reseeding alfalfa without any rotation at all. However, I have also seen unexpectedly severe disease outbreaks where alfalfa follows alfalfa, so I do not recommend it.

Which are good rotational crops for managing alfalfa diseases? Corn, small grains, soybeans, tobacco, or forage grasses are good rotational crops for reducing populations of alfalfa pathogens. These crops are not hosts to the microorganisms that infect alfalfa. Note that growing alfalfa may maintain high levels of certain tobacco pathogens in the soil, such as black root rot and black shank. Red clover is also acceptable for reducing some alfalfa diseases. However, some alfalfa pathogens do infect red clover, as well, so consider red clover a "half rotation" away from alfalfa. Fungi that infect both alfalfa and red clover include those that cause Sclerotinia Crown & Stem Rot, Anthracnose, Spring Black Stem, and Lepto Leaf Spot.

**Timely Cutting & Baling.** Timely cutting and baling are important production practices which are also important as disease management practices. The standing alfalfa crop provides a humid environment favorable for fungal activity. Cutting and harvesting the alfalfa dramatically improves air circulation and sunlight penetration. This can arrest many diseases, including diseases of leaves, stems, and crowns.

Postponing cutting much past the late-bud/early-flower stage gives foliar diseases time to build up and cause leaf loss. Timely cutting, before significant leaf loss occurs, helps to avoid losses in yield and quality caused by foliar diseases. Timely cutting also helps protect future harvests by reducing the accumulation of pathogen-infested leaves on the soil surface.

A curing hay swath creates a dark, humid environment around the crowns of the plants below. If conditions remain humid for long periods of time, damaging crown infections may occur from a variety of fungi. In circumstances where hay has not cured completely but warm, wet weather is expected, it may be best to treat with a hay preservative and bale earlier.

**Grazing.** Grazing alfalfa has a promising place in forage utilization in Kentucky. Some alfalfa scientists in other parts of the country have expressed concern that grazing alfalfa could lead to higher pressure from foliar diseases. This concern is based on the observation that foliar diseases are often severe under grazing systems in certain countries.

In Kentucky, we have not observed significantly greater problems with foliar diseases where alfalfa has been grazed. I wouldn't rule it out entirely. If a particular grazing regime led to high amounts of stems and leaves on the ground, then inoculum levels for foliar diseases could be high enough to result in problems. However, we have not seen this occur in our own experience.

### **OTHER SOURCES OF INFORMATION**

**Managing Diseases of Alfalfa.** UK Extension Publ. ID-104. Vincelli, Lacefield, and Henning, 1991.

**Kentucky Disease Management Guide for Forage Legumes.** UK Extension Publ. PPA-10d. Vincelli, 1993.

**Alfalfa Varieties, 1994 Edition.** Certified Alfalfa Seed Council. Available at Extension Offices.