

MANAGING LEAF SPOT DISEASES OF ALFALFA

W. C. Nesmith

Department of Plant Pathology, University of Kentucky

Approximately 25-30 diseases attack and reduce the yield, quality or stand longevity of alfalfa in Kentucky. The largest number of these diseases are leaf spot. Generally, the leaf spots diseases are more important in reducing quality due to leaf loss than direct killing of plants. Some of the leaf spots are severe enough to warrant specific controls aimed directly at them while others are managed through more general practices.

Three factors operate simultaneously for leaf spots to develop: environment favorable for disease, a susceptible alfalfa plant and a virulent pathogen capable of developing under these conditions. Control of leaf spot diseases is aimed at disruption of the combination of these factors necessary for disease development.

Before trying to disrupt this triangle, let us learn more about the specifics associated with it. By the nature of the very systems used to grow abundant alfalfa in Kentucky, a leaf spot favorable environment will exist at certain times due to abundant lush growth. The disease favorable environment becomes very critical when this abundant growth occurs simultaneously with weather conditions that allow the leaf surface to remain wet much of the day and night. Some of the leaf spots are also severe on the lower leaves as the leaf runs out of food or is weakened by stress.

Which leaf spot develops and how severe the disease becomes depends on what specific factors are present in the field, i.e.: what pathogen, what environment and what type plant. There will generally be a leaf spot disease for every situation of the alfalfa stand. For example: Common leaf spot, spring black stem and downy mildew prefer cool, wet conditions. Lepto leaf spot, Stagonospora leaf spot and bacterial leaf spot are worse during moderate weather. Stemphylium leaf spot and summer black stem like hot, humid "dog days" type weather. Bacterial leaf spot is able to occur in wet weather or dry weather, especially if wounding occurs. Alfalfa rust usually occurs in late summer or fall and is somewhat worse during wet periods.

A specific leaf spot disease may be controlled by a single practice, i.e. using a resistant variety. Single control strategies should be part of the disease control package. However, since there is a leaf spot disease for nearly every situation that exists in an alfalfa stand, steps must be taken to integrate several strategies. Such steps are designed to work over the

'long haul' and will require several control measures used in harmony. Generally, these steps involve: (1) Growing adapted varieties with resistance to several diseases. Currently, there is no variety with resistance to all. (2) Plant good quality disease free seed, grown in arid climates where less disease develops naturally. (3) Plant in land out of legumes for several years, preferably three years or longer, however, any rotation beats no rotation. (4) Time harvest to maximize yields of high quality forage, yet minimize the length of time the environment remains highly favorable for disease. The calendar and number of days between harvest are excellent guides but use common sense and be aware of changing weather patterns, amount of growth, etc. (5) Maintain proper soil pH and fertility. (6) Weed control is important in leaf spot control. Weeds keep the foliage wet longer. (7) Cut only when forage is dry. Cutting wet forage is an excellent way to spread foliar pathogens. These controls must be matched to each farm and farmer. There is no single cookbook method of control.

Following are some tables which may help you in designing your control program for leaf spot diseases.

PRIORITY FOR CONTROLLING LEAF SPOT DISEASES IN ALFALFA IN KENTUCKY

	<u>Plant Resistant Varieties</u>	<u>Using Arid Grown Seed</u>	<u>Proper Fertility</u>	<u>Proper Crop Rotation</u>	<u>Timely Harvest</u>	<u>Avoiding Unusually Rank Growth and High Stubble</u>	<u>Good Weed and Insect Control</u>
Spring Black Stem	1*	2	3	1	1	2	2
Summer Black Stem	-	2	3	1	1	2	2
Common Leaf Spot (<u>Pseudopeziza</u>)	1	2	3	1	1	2	2
Stemphylium Leaf Spot	3	2	3	1	1	2	2
Lepto Leaf Spot (Pepper spot)	2	3	3	1	1	2	2
Yellow Leaf Blotch	-	3	3	1	1	2	2
Stagonospora Leaf Spot	-	3	2	2	2	2	2
Bacterial Leaf Spot	-	2	3	2	2	2	3
Downy Mildew	1	-	1	3	1	2	3
Rust	1	-	1	3	1	2	3

*Priority levels where control should be aimed to reduce these diseases, (1) = high priority should be given to this treatment because it is effective, (2) = medium priority given because this treatment gives significant direct effect, (3) = low priority (but still worthwhile because it has some effect, (-) = not considered to be an option available to control the disease at present.

DISEASE RESISTANCE AND WINTER HARDINESS OF ALFALFA

Variety	Bac- terial Wilt	Common Leaf Spot	Lepto Leaf Spot	Spring Black Stem	Anthrac- nose	Phyto- phthora Root Rot	Downy Mildew	Fusa- rium Wilt	Winter Hardi- ness
Agate	VR	R	MS	MS	MS	R	MR	MR	H
Apollo*	R	MR	MS	MS	MS	R	MS	MS	MH
Arc*	MS	MS	MS	S	R	S	MS	MS	MH
Buffalo	R							M	H
Cimarron	MR	MR			R	R			MH
Classic*	R				MR	MS		S	MH
Cody	R								MH
Gladiator*	VR	MR	MS		MS	S	R	MS	MH
Hi-Phy	VR				MS	MR		MR	MH
Honeoye*	MR	MS	MS	MS	S	S		S	H
Iroquois*	VR	MR	S	MS		S			H
Narragansett*	S	MS	MS	MS		S			MH
Olympic*	R	MS			MR	S		MR	MH
Phytor	R	MR				R		MS	MH
Ramsey	R	VR	MR	MR	MR	MS	R		VH
Ranger	MS	S	S	S	S	S			H
Riley	VR			MR	R		R	MR	H
Saranac*	MR	MR	MS	MS	S	S		S	H
Saranac AR*	MR	MR	MS	MS	R	MS		MS	H
Team	MS	MR			R				
Tempo*	MR	MR	MS	MS	MS	S			MH
Thor	VR	R				S			MH
Titan	VR	MS	MS	R	MR	S			H
Vancor	R				R	MR		MR	MH

Variety	Bac- terial Wilt	Common Leaf Spot	Lepto Leaf Spot	Spring Black Stem	Anthrac- nose	Phyto- phthora Root Rot	Downy Mildew	Fusa- rium Wilt	Winter Hardi- ness
Vanguard/Victor*	MR	MS	MS	S	MR	S	MR	MR	MH
Vernal*	R	MS	MS	MS	S	S			H
Weevlchek*	VR	MR	MS	MS	S	S			H
Williamsburg									MH
Pioneer 520	R	MS	MS	MS	MS	S	S		H
Pioneer 530	R	R	MS	MS	MS	S	R		MH
Waterman & Loomis 220	R	R	MS	MS	MS	MS			MH
311	R	MS	MS	MS	MR	MS	MS	MR	MH
318	MR	MS	MS	MS	MR	MR	MR	MR	MH

*Performing well in Kentucky tests.

1. Relative Disease Ratings in decreasing order of resistance: VR = very resistant; R = resistant; MR = moderately resistant; MS = moderately susceptible; S = susceptible; Blank = not known, assume susceptible; Hardiness ratings in decreasing order of hardiness: VH = very hardy; H = hardy; MH = moderately hardy.
2. The information in this table was obtained from relative disease ratings based on national, regional and state tests provided by University and private researchers.