

Guide for Selecting Alfalfa Varieties with Disease Resistance for Wyoming

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Alfalfa diseases in Wyoming

Several diseases can cause yield loss and stand decline of irrigated alfalfa in Wyoming. The most important of these are the **alfalfa stem nematode**, caused by *Ditylenchus dipsaci*; **Phytophthora root rot**, caused by the fungus *Phytophthora megasperma* f. sp. *medicaginis*; **Verticillium wilt**, caused by the fungus *Verticillium albo-atrum*; and **bacterial wilt**, caused by *Clavibacter michiganense* subsp. *insidiosum*. Recently, **brown root rot**, caused by the fungus *Phoma sclerotoides*, was identified in Sweetwater and Sublette counties where it caused extensive winterkill of plants in 3-year or older stands. Other fungal diseases of lesser importance are **Fusarium wilt**, caused by *Fusarium oxysporum* f. sp. *medicaginis*; **common leaf spot**, caused by *Pseudopeziza medicaginis*; **spring black stem**, caused by *Phoma medicaginis* var. *medicaginis*; **downy mildew**, caused by *Peronospora trifoliorum*; and **anthracnose** caused by *Colletotricum trifolii*. Other diseases include **bacterial stem blight**, caused by *Pseudomonas syringae* pv. *syringae*, and the **northern root-knot nematode**, caused by *Meloidogyne hapla*.

These diseases can decrease both yield and quality of alfalfa. Perhaps more importantly, the **stem nematode**, **Phytophthora root rot**, **Verticillium wilt**, **bacterial wilt**, and **brown root rot** all cause stand decline, reducing the yield potential and useful life of an alfalfa stand by killing individual plants and by predisposing plants to winter-kill.

Relatively few diseases attack alfalfa grown under dryland conditions in Wyoming. The principal disease under these conditions is **yellow leaf blotch** caused by the fungus *Leptotrochila medicaginis*.

Varietal resistance

Because of the significant impact of diseases throughout the United States, plant breeders have developed alfalfa varieties with multiple disease resistance. Since brown root rot has only recently been reported in the United States (Wyoming only), breeding programs have not addressed this disease and the presence of resistance in U.S. bred varieties is unknown. Selection of a disease resistant variety is *the most important and economical means* of controlling alfalfa diseases. However, other practices such as crop rotation, harvesting, and irrigation management will ensure maximum performance of the resistant variety.

Alfalfa disease zones

The presence and severity of alfalfa diseases varies throughout Wyoming. Differing climates, geography, soil types, and agronomic practices create conditions favorable for certain diseases. Field surveys conducted over the past 15 years have determined the distribution and severity of alfalfa diseases in most growing areas around the state. Information from these surveys was used to rank disease importance in each county. Next, based on the occur-

rence and relative importance of diseases, counties were grouped into one of 10 “alfalfa disease zones.” To determine which diseases are generally important in your area, find the disease zone which includes your county (Figure 1). Then, read the information that pertains to your disease zone. Alfalfa diseases are ranked *in order of importance* (1=most important) for each zone.

Selecting a variety

Using this information, select one or more alfalfa varieties from Table 1 with a high level (H or HR rating) of resistance to the principal diseases in your area. Keep in mind that even within a zone, variations in soil type or cultural practices, including irrigation, may change the relative importance of certain diseases. This is especially true for the stem nematode and Phytophthora root rot, which are generally more severe in furrow irrigated fields with soil having a high clay content, and Verticillium wilt, which is worse under sprinkler irrigation regardless of soil type. Few varieties are currently available with reported resistance to the foliar diseases (common leaf spot, spring black stem, bacterial stem blight, and downy mildew) with the exception of anthracnose. The foliar diseases, however, are not apt to cause loss of stand. Remember to place emphasis on varieties with resistance to those diseases that cause stand decline.

Alfalfa disease ratings

Diseases are rated relative to the percent of resistant plants in the population. Ratings are based on standardized tests conducted by USDA or university scientists. Alfalfa varieties, approved by the National Alfalfa Certification Review Board, are rated for disease resistance as follows:

Susceptible (S): 5% or less of the plants are resistant

Low resistance (LR): 6-14% resistant plants

Moderately resistant (MR): 15-30% resistant plants

Resistant (R): 31-50% resistant plants

Highly resistant (HR): 51% or more resistant plants

Because of the alfalfa plant genetics, even highly resistant varieties may have up to 50 percent of plants that are susceptible to disease. Therefore, optimal yields and stand longevity will be obtained by selecting a variety with *as high a level of resistance as possible*.

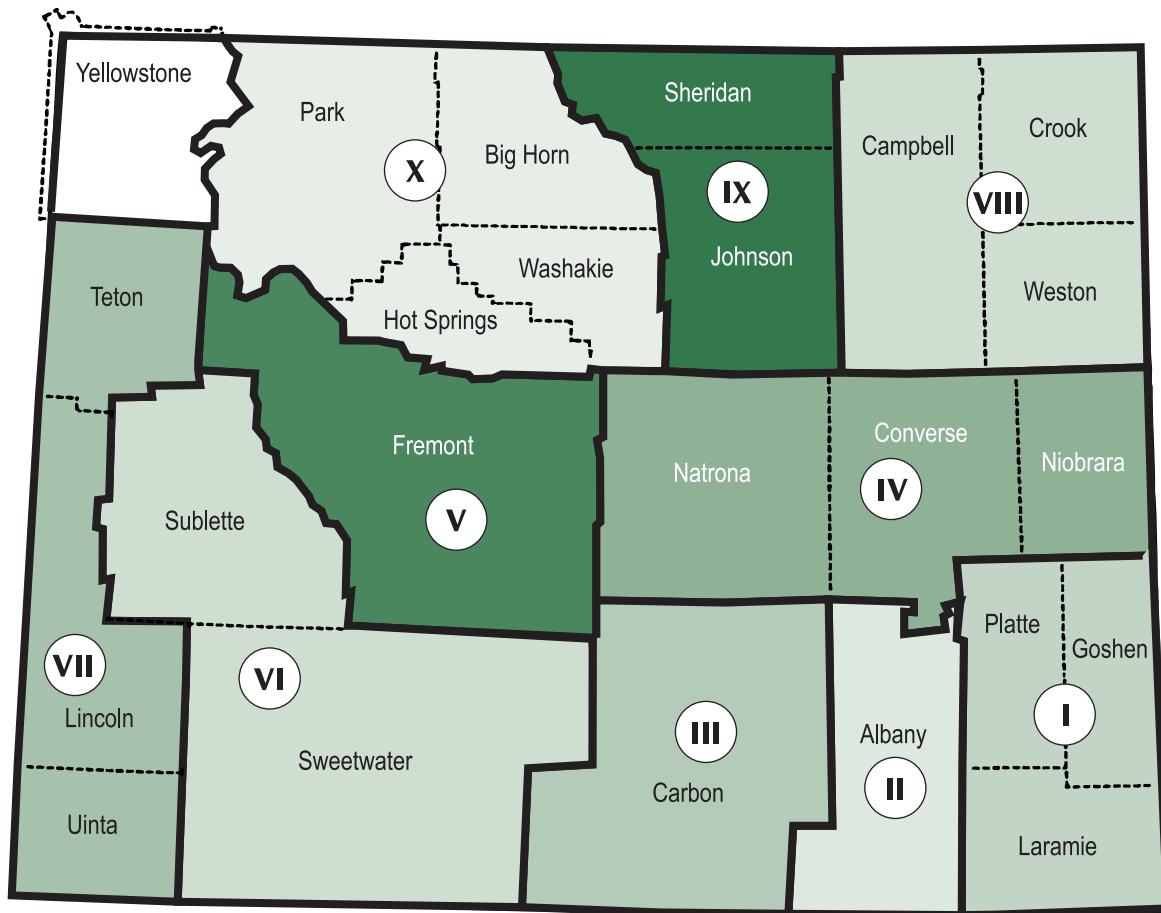
Disease identification

Contact your Cooperative Extension Service extension educator if you observe disease problems in your alfalfa that you wish to be properly diagnosed. He or she will provide you with information on how to collect and prepare a proper sample for submission to the university for diagnosis. Knowing which disease or diseases are present within a field is important in selecting a suitable variety when alfalfa is again planted after two or three years rotation with another crop.

Summary

The purpose of this bulletin is to provide a comprehensive and up-to-date list of certified alfalfa varieties with disease resistance that are sufficiently winterhardy for use in Wyoming. Only varieties with fall dormancies of one to four are included. Information on the performance of some of these multi-disease resistant varieties under Wyoming conditions can be obtained from the “Alfalfa Variety Yield Trials,” published annually by Alan Gray, Extension forage specialist and director of the Powell Research and Extension Center. These reports are available through your local Cooperative Extension Service office and Research and Extension Centers throughout the state. Variety trials are conducted at several locations within the state. Use the information from the location nearest you in making your final variety selection.

Figure 1. Alfalfa disease zones in Wyoming.



Disease Zone I

Counties: Goshen, Laramie, Platte

Principal alfalfa diseases (in order of importance):

1. Verticillium wilt
2. Bacterial wilt
3. Common leaf spot
4. Stem nematode
5. Phytophthora root rot
6. Spring black stem
7. Anthracnose
8. Northern root-knot nematode

Comments: Verticillium wilt is the worst disease in this region. Although common leaf spot is a serious disease in this zone, varietal resistance is unavailable. The alfalfa stem nematode and Phytophthora root rot occasionally can be serious problems in this zone in furrow-irrigated fields with soils having a high clay content.

Disease Zone II

Counties: Albany

Principal alfalfa diseases:

1. Stem nematode
2. Phytophthora root rot
3. Bacterial wilt
4. Spring black stem
5. Downy mildew

Comments: Verticillium wilt has not yet been reported in Zone II.

Disease Zone III

Counties: Carbon

Principal alfalfa diseases:

1. Stem nematode
2. Phytophthora root rot
3. Bacterial wilt

4. Spring black stem
5. Downy mildew

Comments: Verticillium wilt has not yet been reported in Zone III.

Disease Zone IV

Counties: Converse, Natrona, Niobrara

Principal alfalfa diseases:

1. Verticillium wilt
2. Stem nematode
3. Phytophthora root rot
4. Bacterial wilt
5. Common leaf spot
6. Spring black stem

Disease Zone V

Counties: Fremont

Principal alfalfa diseases:

1. Stem nematode
2. Phytophthora root rot
3. Verticillium wilt
4. Bacterial wilt
5. Fusarium wilt
6. Common leaf spot
7. Spring black stem

Disease VI

Counties: Sublette, Sweetwater

Principal alfalfa diseases:

1. Brown root rot
2. Stem nematode
3. Phytophthora root rot
4. Verticillium wilt
5. Bacterial wilt

Comments: Only limited information is available on the incidence of irrigated alfalfa diseases in this zone. To avoid accelerated stand decline, growers should plant varieties that have an R rating or higher to the stand-decline diseases (stem nematode, Phytophthora root rot, Verticillium wilt, and Bacterial wilt). Brown root rot has recently been identified in this zone; however, resistance is not currently available in U.S. varieties.

Disease Zone VII

Counties: Lincoln, Teton, Uinta

Principal alfalfa diseases:

1. Brown root rot
2. Verticillium wilt
3. Spring black stem
4. Bacterial wilt
5. Downy mildew

Comments: Although Verticillium presently is limited to a few fields in this zone, it is expected to spread and become a major disease during the next several years. The stem nematode and Phytophthora root rot have not yet been reported in this zone, but may occur. Brown root rot was found in 1997. However, resistance among currently available U.S. varieties is unknown.

Disease Zone VIII

Counties: Campbell, Crook, Weston

Principal alfalfa diseases:

1. Stem nematode
2. Phytophthora root rot
3. Verticillium wilt
4. Bacterial wilt

Comments: Little information is available on the incidence of irrigated alfalfa diseases in this zone. However, to avoid accelerated stand decline, growers should plant only varieties that have an R rating or higher to the stand decline diseases (stem nematode, Phytophthora root rot, Verticillium wilt, and bacterial wilt).

Disease Zone IX

Counties: Johnson, Sheridan

Principal alfalfa diseases:

1. Verticillium wilt
2. Stem nematode
3. Phytophthora root rot
4. Bacterial wilt
5. Spring black stem
6. Bacterial stem blight

Comments: Verticillium wilt appears to be the most serious disease in this zone, particularly in fields close to the Big Horn Mountains where the weather is cooler and wetter. The disease is expected to be worse in fields that are sprinkler irrigated. In low areas where the clay content of soil is high, stem nematode and Phytophthora root rot may be severe. No resistance is

available for bacterial stem blight. Varieties with a fall dormancy rating of three may have less winter injury than varieties with a four or higher rating.

Disease Zone X

Counties: Big Horn, Hot Springs, Park, Washakie

Principal alfalfa diseases:

1. Stem nematode
2. Phytophthora root rot

3. Verticillium wilt
4. Bacterial wilt
5. Common leaf spot
6. Spring black stem

Comments: Stem nematode and Phytophthora root rot are especially prevalent in fields with furrow irrigation and in high-clay soils.

Table 1. Disease ratings of certified alfalfa varieties with fall dormancy (FD) ratings of 1 to 4.^a

** Variety with an "R" rating or greater for Bw, Vw, PRR, and SN.*

Variety	Marketing Contact	FD ^b	Disease Rating ^c						
			Bw	Vw	PRR	SN	Fw	An	NRKN
Spredor 3	Novartis Seeds	1	HR	MR	MR	MR	HR	R	
620	Garst Seeds	2	HR	R	HR	LR	LR	HR	
5262	Pioneer Hi-Bred	2	HR	LR	R	MR	MR		
2555ML	Garst Seeds	2	HR	R	HR	MR	HR	HR	HR
A-295	PGI/MBS	2	HR	R	HR		HR	R	
ABT 205	AgriBio Tech	2	HR	R	HR		HR	R	
Agate	Public	2	HR		R		HR	MR	
Alfagraze	America's Alfalfa	2	R		LR	R	R	MR	
Alpine	Oasis/Spangler/Bio-Plant Research	2	R	R	R	MR	R	R	
Avalanche+Z	America's Alfalfa	2	HR	HR	HR	MR	HR	HR	
Baker	Public	2	HR				R	LR	
Bounty	PGI/MBS	2	HR	R	HR		HR	HR	
Defiant	AgriPro	2	HR	HR	HR	MR	HR	R	
Dividend	Agway/Allied Seed	2	HR	R	HR		HR	HR	
KD 122	DEKALB	2	HR	R	HR		R	HR	
Empire	Brunner Seed Farm	2	HR	R	HR		HR	HR	
Evolution	Mycogen Seeds	2	HR	R	HR		HR	HR	
Forerunner	Research Seeds/Brown Seed Farms	2	HR	HR	HR		HR	HR	

Variety	Marketing Contact	FD ^b	Disease Rating ^c						NRKN
			Bw	Vw	PRR	SN	Fw	An	
*GH 767	Golden Harvest	2	HR	R	HR	R	HR	HR	
Lactator	Elk Mound Feed & Farm Supply	2	HR	HR	R		HR	HR	
LegenDairy	Croplan Genetics	2	HR	HR	HR		HR	HR	
Mariner	Agway/Allied Seed	2	R	MR	HR		HR		
Pacesetter	Research Seeds/Brown Seed Farms	2	HR	R	HR		R	HR	
Quantum	Renk Seed	2	HR	HR	HR		HR	HR	
Sterling	Cargill	2	HR	R	HR		HR	HR	
Vernal	Public	2	R				MR		MR
Viking 1	Novartis Seeds	2	R	HR	R		HR	R	
WinterStar	Wensman Seed	2	HR	HR	HR	MR	HR	HR	
*WL 252 HQ	W-L Research	2	HR	R	HR	R	HR	HR	
Wrangler	Public	2	R	LR	HR		R	LR	
XGrazer	Cargill	2	HR	HR	HR	MR	HR	HR	
120	DEKALB	3	HR		R		R	LR	
*329	AgribioTech/L & H Seeds	3	HR	HR	HR	R	HR	HR	
645	Garst Seed	3	HR	R	HR	MR	R	HR	
2444	Novartis Seeds	3	HR	R	HR	MR	HR	HR	
*2888	Novartis Seeds	3	HR	HR	HR	R	HR	HR	
5246	Pioneer Hi-Bred	3	HR	R	HR	MR	HR	HR	
5312	Pioneer Hi-Bred	3	HR	HR	HR	LR	HR	HR	
*9326	L.G. Seeds	3	HR	R	HR	R	HR	R	
3452-ML	Garst Seed	3	HR	R	HR	MR	HR	HR	
A-395	PGI/MBS	3	HR	R	HR	MR	HR	HR	
Achieva	Allied Seed	3	R	R	HR	MR	HR	HR	
Arrow	America's Alfalfa	3	HR	R	HR	MR	HR	MR	
*Baralfa 32 IQ	Barenbrug USA	3	HR	R	HR	R	HR	HR	

Variety	Marketing Contact	FD ^b	Disease Rating ^C						NRKN
			Bw	Vw	PRR	SN	Fw	An	
Benchmark	Research Seeds/Ag Venture	3	HR	R	HR		HR	HR	
*Blazer XL	Croplan Genetics	3	R	R	HR	R	HR	HR	
Break-Thru	Custom Farm Seed	3	HR	R	HR	MR	HR	MR	
Class	Union Seed	3	HR	R	HR	MR	R	HR	
Columbo	PGI/MBS	3	R	HR	R	MR	HR	R	MR
Complete	Arrow Seed/Fontanelle Hybrids	3	HR	HR	HR	MR	HR	HR	
Dart	AgriPro	3	HR	R	HR		HR	R	
Demand	AgriPro	3	HR	HR	HR	MR	HR	HR	
*DK 127	DEKALB	3	HR	R	HR	R	R	HR	R
DK 143	DEKALB	3	HR	R	HR	MR	R	HR	R
Encore	Research Seeds/Spangler	3	HR	R	HR		HR	HR	
*Forecast 1000	Dairyland	3	HR	R	HR	R	HR	R	MR
Future	Ray Brothers Seed	3	HR	MR	R	MR	MR	LR	
*GH 766	Golden Harvest	3	HR	R	HR	R	HR	HR	
GH 777	Golden Harvest	3	HR	R	HR	MR	HR	R	
GH 787	Golden Harvest	3	HR	R	HR		R	HR	
GH 797	Golden Harvest	3	HR	HR	HR	MR	HR		
*Guardian	AgVenture	3	HR	HR	HR	R	HR	HR	R
Hyland	Oasis	3	HR	R	HR	MR	HR	R	
Imperial	Top Farm Hybrids/PHT/Cole Growers	3	HR	R	HR	LR	HR	HR	
*Innovator+Z	America's Alfalfa	3	HR	HR	HR	R	HR	HR	
LeafMaster	Union Seed	3	MR	HR	HR	HR	HR	HR	MR
LegenDairy 2.0	Croplan Genetics	3	HR	R	HR	MR	HR	HR	R
*Lightning	Jung Seeds	3	HR	R	HR	R	HR	HR	R
MagnaGraze	Dairyland	3	HR	R	HR	MR	HR	R	LR
Magnum III-Wet	Dairyland	3	R	MR	R	MR	R	MR	MR

Variety	Marketing Contact	FD ^b	Disease Rating ^c						NRKN
			Bw	Vw	PRR	SN	Fw	An	
*Maximum 1	Fred Gutwein & Sons	3	HR	HR	HR	R	HR	HR	
*MP2000	Croplan Genetics	3	HR	R	HR	R	HR	HR	MR
Multi-plier	Mycogen Seeds	3	HR	R	HR		HR	HR	
MultiKing 1	Novartis Seeds	3	HR	R	R	MR	HR	R	
Notice	Midwest Seed Genetics	3	HR	R	HR	MR	HR	HR	R
Oneida VR	Public	3	R	HR	MR		HR	MR	
*Paramount	Wyffels Hybrids/Chemgro Geo. W. Hill of Indiana	3	HR	R	HR	R	HR	HR	LR
Perry	Public	3	R					LR	
Proof	Mycogen Seeds	3	HR	R	HR		HR	HR	
*Rainier	Novartis Seeds	3	HR	R	HR	R	HR	HR	R
Renegade	Geertson Seed	3	R	LR	R		MR		
*RFV-2000	Custom Farm Seed	3	HR	R	HR	R	HR	HR	
*Rhino	Geertson Seed	3	HR	R	R	R	R	R	
Sierra	NC+Hybrids	3	HR	R	HR	MR	HR	R	MR
Spartan	Kinder Seed/Allied Seed	3	HR	R	HR		HR	HR	
Spirit	Fontanelle Hybrids Seed	3	HR	R	HR		HR	R	MR
Stampede	Agway/Allied Seed	3	HR	R	HR		R		
Surpass	Andrews Seed	3	HR	R	R		HR	MR	
Synergy	Crow's Hybrid Corn	3	HR	R	HR	MR	HR	HR	
Total+Z	America's Alfalfa	3	HR	HR	HR	MR	HR	HR	
Treasure	AgriBio Tech	3	HR	R	R	MR	HR	HR	
Trident II	Cargill	3	HR	R	HR	LR	R	R	
*Ultra	Eureka Seeds	3	R	R	R	R	HR	HR	
UltraLeaf 87	La Crosse Seed	3	HR	R	HR		HR	HR	
*Vitro	North-Gro Seed	3	HR	HR	HR	R	HR	HR	
Webfoot	Great Lakes Hybrids	3	R		R		MR		

Variety	Marketing Contact	FD ^b	Disease Rating ^C							NRKN
			Bw	Vw	PRR	SN	Fw	An		
WetLand	Bio-Plant Research	3	R	MR	HR		R	R	MR	
*Wintergreen	Renk Seed	3	HR	HR	HR	R	HR	HR		
Winterking	Wensman Seed	3	HR	HR	HR		HR	HR		
WL 226	W-L Research	3	HR	R	HR	MR	HR	HR		
WL 324 ¹	W-L Research	3	HR	R	HR	MR	HR	HR		
*WL 325 HQ	W-L Research	3	HR	R	HR	R	HR	HR		
330	Union Seeds/North-Gro Seed	4	HR	R	HR		HR	HR		
630	ICI Seeds	4	HR	MR	R	MR	R	MR		
*631	Garst Seed	4	HR	R	HR	R	HR	R		
633	Germain's Seed	4	HR	R	HR	MR	R	HR		
5454	Pioneer Hi-Bred	4	R	MR	HR	MR	HR	HR		
ABT 405	AgriBio Tech	4	HR	HR	HR		HR	R		
Accord	Union Seed/Chemgro	4	HR	R	HR	MR	HR	HR	MR	
*Ace	UAP Seeds	4	HR	R	HR	HR	HR	HR		
*Affinity+Z	America's Alfalfa	4	HR	HR	HR	R	HR	HR		
Aggressor	America's Alfalfa	4	HR	R	HR	MR	HR	HR		
*AlfaLeaf II	Plains Alfalfa	4	R	R	HR	R	HR	HR		
*AlfaStar	Hoffman Seed	4	HR	R	HR	R	HR	HR		
Allegro	Mycogen Seeds	4	HR	R	HR	MR	HR	HR		
ALPHA 2001	Great Lakes Hybrids	4	HR	HR	HR	MR	HR	HR		
*Ameri-Graze 401-Z	America's Alfalfa	4	HR	HR	HR	R	HR	HR		
Apollo Supreme	America's Alfalfa	4	HR	R	R		HR	HR		
*Aspen	Eureka Seeds/Brown Seed	4	HR	R	HR	R	HR	HR	R	
Asset	Allied Seed	4	HR	R	HR		R	R		
*Award	Asgrow Seed	4	HR	HR	HR	R	HR	HR		
*Banquet	Tri-State	4	HR	HR	HR	R	HR	HR		

Variety	Marketing Contact	FD ^b	Disease Rating ^c						NRKN
			Bw	Vw	PRR	SN	Fw	An	
*Big Horn	Cargill	4	HR	R	HR	R	HR	HR	
*Choice	FFR Cooperative	4	HR	HR	HR	R	R	R	
Cimarron	Great Plains	4	HR	LR	MR		HR	HR	
*Cimarron VR	Great Plains	4	HR	R	R	R	HR	HR	
CR6	Super Seeds	4	R	LR	MR	R	R		
Depend+EV	AgriPro	4	HR	HR	HR	MR	HR	HR	
DK 133	DEKALB	4	HR	R	HR	MR	HR	HR	
DK 140	DEKALB	4	HR	R	HR	MR	HR	HR	
DK 141	DEKALB	4	HR	HR	HR	MR	HR	HR	
DK 142	DEKALB	4	HR	R	HR		HR	R	
Dominator	AgriPro	4	HR	R	HR	MR	HR	HR	
*Dual	Great Plains	4	HR	R	R	R	HR	R	
Enhancer	Drussel Seed/Bio-Plant Research	4	HR	R	HR		HR	R	
*Extend	Spangler/Grassland West	4	HR	R	HR	R	R	HR	R
*Forecast 3000	Dairyland	4	HR	R	R	R	HR	R	R
*Fortress	Novartis Seeds	4	R	R	HR	HR	R		
*Gangbusters	Ray Brothers Seed	4	HR	R	R	R	R	MR	
*Gem	FFR Cooperative	4	HR	R	HR	R	HR	HR	
GH 737	Golden Harvest	4	R	R	HR	MR	HR	MR	
*GH 755	Golden Harvest	4	HR	R	HR	R	HR	HR	
GH 794	Golden Harvest	4	HR	R	HR		HR	HR	
Good as Gold	Johnston Seed/Top Farm Hybrids	4	HR	R	HR		HR	R	
HayGrazer	Great Plains	4	HR	R	R		HR	R	
Jade	NC+Hybrids	4	HR	R	HR		R	R	
Jade II	NC+Hybrids	4	HR	R	HR		HR	R	MR
Key	Great Plains	4	HR	HR	HR	MR	HR	HR	

Variety	Marketing Contact	FD ^b	Disease Rating ^C						NRKN
			Bw	Vw	PRR	SN	Fw	An	
Landmark	Geertson Seed	4	R	R	HR	MR	R	R	
Laser	Patriot Seeds/Rainier	4	HR	R	HR		HR	R	MR
Magnum III	Dairyland	4	R	MR	R	MR	R	MR	
*Magnum IV	Dairyland	4	HR	R	HR	R	HR	R	MR
Maxileaf	Ray Brothers Seed	4	HR	LR	MR		MR	R	
MultQueen	Fred Gutwein & Sons	4	HR	R	HR	MR	HR	HR	
Ovation	Callahan Seeds	4	HR	HR	HR	MR	HR	HR	
Persist	Kaltenberg Seed Farms/Doebler's Penna. Hybrids	4	HR	R	HR	MR	HR	R	
Precedent	Doebler's Penna. Hybrids	4	HR	R	HR		R	R	
Premier Plus	Wyffels Hybrids	4	HR	HR	HR	MR	HR	HR	
Pristine	Doebler's Penna. Hybrids	4	HR	R	HR	MR	HR	HR	
Pro Gro 424	PGI/MBS	4	HR	R	HR		HR	R	
Proleaf	Oasis	4	HR	R	HR	MR	HR	HR	LR
*Quest	Renk Seeds	4	HR	R	HR	R	HR	R	MR
Reward	Drussel/Simplot	4	HR	R	HR	MR	HR	R	
Riley	Public	4	HR	LR				MR	
Rushmore	Novartis Seeds	4	HR	R	HR		HR	HR	
Rustler II	Andrews Seed	4	HR	HR	HR	MR	HR	HR	
Sabre	Kinder Seed/Allied Seed	4	HR	HR	R	MR	HR	HR	
Spur	Wheatland Seed	4	HR	R	HR	MR	HR	HR	MR
*Stamina	Allied Seed	4	HR	R	HR	HR	HR	HR	HR
SuperCuts	AgriBio Tech	4	HR	HR	HR	LR	HR	HR	
Target II	Bio-Plant Research	4	HR	R	R		R	R	
TMF Generation	Mycogen Seeds	4	HR	HR	HR		HR	HR	
Venture	Helena Van Dyke/Top Farm	4	HR	R	R	LR	R	HR	
Vernema	Public	4	MR	MR	LR	HR		LR	

Variety	Marketing Contact	FD ^b	Disease Rating ^c						NRKN
			Bw	Vw	PRR	SN	Fw	An	
Voyager II	Bio-Plant Research	4	HR	R	HR	MR	HR	R	
Webfoot MPR	Great Lakes Hybrids	4	HR	HR	HR		HR	HR	
WL 320	W-L Research	4	R	MR	R	MR	R	MR	
WL 322 HQ	W-L Research	4	HR	R	R	LR	HR	MR	LR
*WL 323	W-L Research	4	HR	R	HR	HR	HR	HR	
*W1 332 SR	W-L Research	4	HR	R	HR	R	HR	HR	

^a Information obtained from *Fall Dormancy & Pest Resistant Ratings for Alfalfa Varieties*, 1997/98 edition, available from the Certified Alfalfa Seed Council, P.O. Box 1017, Davis, CA 95617-1017. Addresses and phone numbers of marketers of each variety are provided in the publication.

^b **Fall dormancy (FD) ratings** are made on a scale of 1-9 (1 = most winter dormant, 9 = least winter dormant). Varieties with a rating of 1 to 4 are considered suitable for most Wyoming conditions. Generally, varieties with dormancy ratings of 1 and 2 should be used at high elevations (above 6,000 feet), and those with dormancy ratings of 3 or 4 should be used at lower elevations.

^c **Bw**=Bacterial wilt, **Vw**=Verticillium wilt, **Fw**=Fusarium wilt, **An**=Anthracnose, **PRR**=Phytophthora root rot, **SN**=Stem nematode, **NRKN**= Northern root-knot nematode. Information on reaction to common leaf spot and downy mildew are not provided by the Certified Seed Council but may be available from your seed dealer. Currently there is no variety available with resistance to spring black stem or brown root rot.

HR = High Resistance: 51% or more resistant plants

R = Resistant: 31-50% resistant plants

MR = Moderate Resistance: 15-30% resistant plants

LR = Low Resistance: 6-14% resistant plants

S = Susceptible: 0-5% resistant plants

(blank) = no resistance reported, assumed to be susceptible

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