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Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

Supplement 130

SUMMARY OF THE RECORDED DATA ON THE REACTION OF WILD AND
CULTIVATED GRASSES TO STEM RUST (*PUCCINIA GRAMINIS*),
LEAF RUST (*P. RUBIGOVERA*), STRIPE RUST (*P. GLUMARUM*),
AND CROWN RUST (*P. CORONATA*) IN THE
UNITED STATES AND CANADA

June 15, 1941

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The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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SUMMARY OF THE RECORDED DATA ON THE REACTION OF WILD AND CULTIVATED GRASSES TO STEM RUST (*PUCCINIA GRAMINIS*), LEAF RUST (*P. RUBIGO-VERA*), STRIPE RUST (*P. GLUMARUM*), AND CROWN RUST (*P. CORONATA*) IN THE UNITED STATES AND CANADA^{1/}

George W. Fischer and Moses N. Levine

Plant Disease Reporter
Supplement 130

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During the past several decades many botanists and plant pathologists have published data pertaining to the reaction of wild and cultivated grasses, both native and introduced, to the four most common and important graminicolous rusts in the United States and Canada, namely: stem rust (*Puccinia graminis* Pers.), leaf rust (*P. rubigo-vera* (D.C.) Wint.), stripe rust (*P. glumarum* (Schm.) Erikss. and Henn.), and crown rust (*P. coronata* Cda.). Only a few of the studies involved dealt with the grasses primarily; in most works the grasses have figured more or less incidentally, in recognition of their importance in the spread and overwintering of the same rusts that attack cereals.

In recent years there has been more interest in the grasses themselves, with the objective of improvement through coordinated work in breeding, selection, and disease control studies. In this connection it has seemed desirable to attempt to assemble and tabulate the vast amount of data, much of it unpublished or buried in seemingly endless publications, so as to make this information more easily available to those interested, directly or indirectly, in grass improvement and culture.

The data thus assembled have been summarized in tables 1 and 2, while the source material from which most of the tabulated information was obtained is listed in the attached bibliography. A summary of the records pertaining to known reactions of 350 species of native and introduced grasses in the United States and Canada to the four rusts mentioned in the introductory paragraph is given in table 1. In table 2 are presented the results recorded in literature or otherwise for the six varieties of stem rust commonly found in North America, viz.: *P. graminis agrostidis*, *P. graminis avenae*, *P. graminis phleipratensis*, *P. graminis poae*, *P. graminis secalis*, and *P. graminis tritici*. It is not practicable in this summary to give the literature citation for each record. Instead, as already stated, a bibliography is appended, showing the sources of the published data included in the tables.

^{1/} Joint contribution of the Divisions of Cereal and Forage Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, in cooperation with the State Agricultural Experiment Stations, University of Minnesota and State College of Washington. Grateful acknowledgment is made to Dr. E. C. Stakman, Chief of the Division of Plant Pathology and Botany, University of Minnesota, for many helpful suggestions and constructive criticism. Assistance in the preparation of the typed material was furnished by the personnel of the Work Projects Administration, Official Project No. 165-1-71-124, Sub-project No. 491, sponsored by the University of Minnesota, 1941.

No claim is made that the present summary contains all the pertinent published data in the United States and Canada, although at least a reasonable approach toward completeness has been made. Many unpublished data of the writers have been included, as well as those contributed by others. Unpublished data have been contributed by Dr. Margaret Newton and Dr. Thorvaldur Johnson, Dominion Rust Research Laboratory, Winnipeg, Manitoba; Dr. Roderick Sprague, Division of Cereal Crops and Diseases, Bureau of Plant Industry, Northern Great Plains Field Station, Mandan, North Dakota; Dr. C. L. Lefebvre, Division of Forage Crops and Diseases, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C.; and Mr. Carl Claassen, Washington Agricultural Experiment Station, Pullman, Washington, for which grateful acknowledgment is hereby made.

The symbols used in the tables to denote rust reactions are as follows:

- N = Susceptible, as established by natural rusting under field conditions;
- A = Susceptible, as indicated by artificial inoculation experiments;
- R = Resistant, as demonstrated by inoculation experiments;
- F = Failure to become infected as a result of artificial inoculation experiments. The latter ordinarily indicates immunity, but the possibility must always be considered that the inoculated plants may somehow have escaped infection.

Table 1. - Summary of recorded reactions of wild and cultivated grasses to four species of rusts
(*Puccinia graminis*, *P. rubigo-vera*, *P. glumarum*, and *P. coronata*) in the United States and
Canada.

Affected grass species ^{a/}	Reaction to rust species:			
	<i>P. graminis</i>	<i>P. rubigo-vera</i>	<i>P. glumarum</i>	<i>P. coronata</i>
<i>Aegilops crassa</i> Boiss.	-	-	-	-
<i>A. cylindrica</i> Host	N	-	-	-
<i>A. cvata</i> L.	-	-	-	-
<i>A. squarrosa</i> L.	-	-	-	-
<i>A. triuncialis</i> L.	-	-	-	-
<i>Agropyron albicans</i> Scribn. & Smith:				
<i>A. acutum</i> . (DC.) Roem. & Schult. ...	-	-	-	-
<i>A. caninum</i> (L.) Beauv.	N	-	-	-
<i>A. ciliare</i> (Trin.) Franch	-	-	-	-
<i>A. cristatum</i> (L.) Gaertn.	N	-	-	-
<i>A. dagnae</i> Grossh.	-	-	-	-
<i>A. dasystachyum</i> (Hook.) Scribn.	N	-	-	-
<i>A. desertorum</i> (Fisch.) Schult.	-	-	-	-
<i>A. elmeri</i> Scribn.	-	-	-	-
<i>A. elongatum</i> (Host) Beauv.	-	-	-	-
<i>A. griffithsi</i> Scribn. & Smith	N	-	-	-
<i>A. imbricatum</i> (Stev.) Roem. & Schult.	N	-	-	-
<i>A. inerme</i> (Scribn. & Smith) Rydb. ...	N	-	-	-
<i>A. intermedium</i> (Host) Beauv.	N	-	-	-
<i>A. obtusiosculum</i> Lange	-	-	-	-
<i>A. orientale</i> (L.) Roem. & Schult. ...	-	-	-	-
<i>A. pauciflorum</i> (Schwein.) Hitchc. ...	N	-	-	-
<i>A. pseudorepens</i> Scribn. & Smith ...	N	-	-	-
<i>A. pungens</i> (Pers.) Roem. & Schult. ...	-	-	-	-
<i>A. repens</i> (L.) Beauv.	N	-	-	-
<i>A. riparium</i> Scribn. & Smith	-	-	-	-
<i>A. saxicola</i> (Scribn. & Smith) ...	-	-	-	-
<i>Piper</i>	-	-	-	-

^{a/} Insofar as possible, A. S. Hitchcock's "Manual of the Grasses of the United States" (U. S. Dept. Agr. Misc. Publ. No. 200, 1935) is being followed.

Affected grass species	Reaction to rust species:									
	P. graminis	P. rubigo-vera	P. glumarum	P. coronata						
A. semicostatum (Steud.) Nees	N	-	-	-	:	-	-	-	-	-
A. sibiricum (Willd.) Beauv.	N	-	-	-	:	N	-	-	-	-
A. smithii Rydb.	N	A	R	-	:	N	A	-	-	R
A. spicatum (Pursh) Scribn. & Smith	N	A	-	-	:	N	A	-	-	R
A. striatum (Steud.) Nees ex Hookf.	N	-	-	-	:	N	-	-	-	-
A. strigosum (Bieb.) Boiss.	N	-	-	-	:	-	-	-	-	-
A. subsecundum (Link) Hitchc.	N	A	R	F	:	N	A	R	-	R
Agropyron trichophorum (Link) Richt.	N	-	-	-	:	-	-	-	-	-
A. triticeum Gaertn.	N	-	-	-	:	-	-	-	-	-
A. uganicum Drobov	-	-	-	-	:	N	-	-	-	-
A. villosum (L.) Link	-	-	-	F	:	-	-	-	-	-
Agrostis aequalvis (Trin.) Trin.	-	-	-	-	:	-	-	-	-	-
A. alba L.	N	A	R	F	:	N	-	-	-	F
A. canina L.	N	A	-	-	:	-	-	-	-	F
A. castellana Boiss. & Reut.	-	-	R	-	:	-	-	-	-	-
A. diegoensis Vasey	N	-	-	-	:	-	-	-	-	-
A. exarata Trin.	N	A	-	F	:	-	-	-	-	F
A. gigantea Roth	N	-	-	-	:	-	-	-	-	-
A. hiemalis (Walt.) B. S. P.	N	A	R	F	:	N	-	-	-	-
A. longiligula Hitchc.	-	-	-	-	:	-	-	-	-	-
A. oregonensis Vasey	N	-	-	-	:	-	-	-	-	-
A. palustris Huds.	N	-	R	F	:	-	-	-	-	F
A. perennans (Walt.) Tuckerm.	N	-	-	-	:	N	-	-	-	-
A. retrofracta Willd.	-	-	-	-	:	-	-	-	-	-
A. scabriglumis Boiss. & Reut.	-	-	-	-	:	-	-	-	-	-
A. spica-venti L.	N	A	-	F	:	-	-	-	-	-
A. stolonifera L.	N	A	R	F	:	-	-	-	-	F
A. tenuis Sibth.	N	-	R	F	:	-	-	-	-	-
A. thurberiana Hitchc.	-	-	-	-	:	-	-	-	-	F
A. verticillata Vill.	-	-	-	F	:	-	-	-	-	-
Alopecurus aequalis Sobol.	N	-	-	-	:	-	-	-	-	R
A. geniculatus L.	N	A	-	F	:	-	-	-	-	R

Affected grass species	Reaction to rust species:						
	P. graminis	P. rubigo-vera	P. glumarum	P. coronata			
<i>A. howellii</i> Vasey	N	-	-	-	:	-	-
<i>A. myosuroides</i> Huds.	-	-	-	-	:	-	-
<i>A. pratensis</i> L.	N	-	-	-	:	N	A R F
<i>A. saccatus</i> Vasey	N	-	-	-	:	-	-
<i>Ammophila arenaria</i> (L.) Link	-	-	-	-	:	N	- R F
<i>Andropogon furcatus</i> Muhl.	-	-	-	-	:	-	- F
<i>A. scoparius</i> Michx.	-	-	-	-	:	-	- F
<i>Anthoxanthum aristatum</i> Boiss.	N	-	-	-	:	-	- R F
<i>A. odoratum</i> L.	N	-	-	-	:	-	- A R F
<i>Arctagrostis latifolia</i> (R.Br.) Griseb.	-	-	-	-	:	-	- A -
<i>Arrhenatherum elatius</i> (L.) Mert & Koch	N	-	-	-	:	N	- R F
<i>Arundo donax</i> L.	-	-	-	-	:	N	- -
<i>Avena abyssinica</i> Hochst.	-	-	-	-	:	-	- A -
<i>A. barbata</i> Brot.	N	-	-	-	:	N	A R -
<i>A. brevis</i> Roth	-	-	-	-	:	-	- A R -
<i>A. byzantina</i> K. Koch	N	-	-	-	:	N	- -
<i>A. diffusa</i> (Neibr.) Aschers & Graebn.	-	-	-	-	:	-	- A -
<i>A. fatua</i> L.	N	-	-	-	:	N	A R -
<i>A. hookeri</i> Scribn.	-	-	-	-	:	-	- F F
<i>A. nuda</i> L.	N	-	-	-	:	N	A R F
<i>A. pubescens</i> Huds.	N	-	-	-	:	-	- -
<i>A. sterilis</i> L.	-	-	-	-	:	N	A -
<i>A. strigosa</i> Schreb.	-	-	-	-	:	-	- A -

Affected grass species	Reaction to rust species:									
	P. graminis	P. rubigo-vera	P. glumarum	P. coronata						
Beckmannia erucaeformis (L) Host	N	-	-	-	F	:	N	A	R	F
E. syzigachne (Steud.) Fernald	N	-	-	-	-	:	-	-	-	-
Bouteloua curtipendula (Michx.) Torr.	:	:	:	:	:	:	:	-	-	F
B. gracilis (H. B. K.) Lag.	N	-	-	-	-	:	-	-	-	F
Brachypodium distachyum L.	-	-	-	-	-	:	-	-	-	F
Briza maxima L.	N	-	-	-	-	:	-	-	R	-
B. media L.	N	-	-	-	F	:	-	-	-	-
B. minor L.	N	-	-	-	-	:	-	-	-	-
Brizopyrum siculum Link	-	-	-	-	-	:	-	-	-	-
Bromus adoënsis Höchst.	-	-	-	-	-	:	-	A	-	-
B. anomalus Rupr.	N	-	-	-	F	:	N	-	A	R
B. arvensis L.	-	-	-	-	F	:	-	-	-	F
B. brachystachys Hornung	-	-	-	-	-	:	-	-	-	-
B. breviaristatus Buckl.	-	-	-	-	-	:	-	-	-	-
B. brevis Steud.	-	-	-	-	-	:	-	-	-	-
B. brizaeformis Fisch. & Mey.	-	-	-	-	F	:	-	-	-	F
B. carinatus Hook. & Arn.	N	-	-	-	R	:	N	A	R	F
B. catharticus Vahl.	-	-	-	-	F	:	N	-	-	F
B. ciliatus L.	N	-	-	-	F	:	N	A	R	F
B. commutatus Schrad.	-	-	-	-	F	:	N	-	-	-
B. erectus Huds.	-	-	-	-	-	:	-	A	-	-
B. frondosus (Shear) W & S.	-	-	-	-	-	:	-	A	-	-
B. grandis (Shear) Hitchc.	-	-	-	-	-	:	-	-	-	-
B. hordeaceus L.	-	-	-	-	-	:	-	-	-	-
B. inermis Leyss.	-	-	-	-	F	:	-	-	-	-
B. japonicus Thunb.	N	-	-	-	R	:	-	A	R	F
B. kalmii A. Gray	-	-	-	-	F	:	-	-	-	F
B. lanuginosus Poir.	-	-	-	-	-	:	-	A	-	-

Affected grass species	Reaction to rust species:									
	P. graminis	P. rubigo-vera	P. glumarum	P. coronata						
<i>Bromus latiglumis</i> (Shear) Hitchc. :	-	F	:	N	A	R	-	:	-	A
<i>B. macrostachys</i> Desf. :	-	R	:	-	-	A	-	:	-	-
<i>B. madritensis</i> L. :	-	R	:	N	-	-	-	:	-	-
<i>B. mollis</i> L. :	N	R	:	N	A	R	-	:	-	F
<i>B. orcuttianus</i> Vasey :	N	-	:	-	-	-	-	:	-	-
<i>B. pacificus</i> Shear :	-	-	:	N	-	-	-	:	-	-
<i>B. pumpellianus</i> Scribn. :	N	R	:	N	A	-	-	:	N	A
<i>B. purgans</i> L. :	N	R	:	N	A	R	F	:	N	R
<i>B. racemosus</i> L. :	-	-	:	N	-	-	-	:	-	-
<i>B. rigidus</i> Roth. :	N	R	:	N	-	A	R	:	N	R
<i>B. rubens</i> L. :	-	A	:	N	-	-	-	:	-	-
<i>B. scoparius</i> L. :	-	-	:	N	-	-	-	:	-	-
<i>B. secalinus</i> L. :	N	-	:	N	A	-	F	:	-	F
<i>B. sitchensis</i> Trin. :	N	-	:	N	A	-	-	:	-	-
<i>B. squarrosus</i> L. :	-	R	:	-	-	-	-	:	-	-
<i>B. sterilis</i> L. :	N	A	:	N	A	R	F	:	-	-
<i>B. suksdorfii</i> Vasey :	N	-	:	N	-	-	-	:	-	-
<i>B. tectorum</i> L. :	N	A	:	N	A	R	-	:	-	R
<i>B. tomentellus</i> Boiss. :	-	-	:	-	-	-	-	:	-	-
<i>B. vulgaris</i> (Hook.) Shear :	-	-	:	N	-	-	F	:	-	-
<i>Buchloë dactyloides</i> (Nutt.) Engelm. :	N	-	:	-	-	-	-	:	-	-
<i>Calamagrostis canadensis</i> (Michx.) :			:					:		
Beauv. :	N	A	:	-	-	-	-	:	N	A
<i>C. inexpansa</i> A. Gray :	N	-	:	-	-	-	-	:	N	A
<i>C. koelerioides</i> Vasey :	-	-	:	-	-	-	-	:	N	-
<i>C. montanensis</i> Scribn. :	-	-	:	-	-	-	-	:	N	-
<i>C. nutkaensis</i> (Presl) Steud. :	-	-	:	-	-	-	-	:	N	-
<i>C. neglecta</i> (Ehrn.) Gaertn. :	-	-	:	-	-	-	-	:	N	-
<i>C. purpurascens</i> R. Br. :	-	-	:	-	-	-	-	:	N	A
<i>C. rubescens</i> Buckl. :	-	-	:	-	-	-	-	:	N	-
<i>C. scopulorum</i> Jones :	-	-	:	-	-	-	-	:	N	-

Affected grass species	Reaction to rust species:									
	P. graminis	P. rubigo-vera	P. glumarum	P. coronata						
<i>Calamovilfa longifolia</i> (Hook.) Scribn.	N - - -	- - -	- - -	- - -	:	:	:	- A -	F	
<i>Catabrosa aquatica</i> (L.) Beauv.	N - - -	- - -	- - -	- - -	:	:	:	- - -	-	
<i>Chloris gayana</i> Kunth	- - -	- - -	- - -	- - -	:	:	:	- - -	F	
<i>C. verticillata</i> Nutt.	- - -	- - -	- - -	N - -	:	:	:	- - -	-	
<i>Cinna arundinacea</i> L.	N - - -	N - -	- - -	- - -	:	:	:	N - -	-	
<i>C. latifolia</i> (Trevir.) Griseb.	N - - -	N - -	- - -	- - -	:	:	:	N A -	F	
<i>Corynephorus canescens</i> (L.) Beauv. :	N - - -	- - -	- - -	- - -	:	:	:	- - -	-	
<i>Cynodon dactylon</i> (L.) Pers.	N - - F	- - -	- - -	- - -	:	:	:	- - -	F	
<i>Cynosurus cristatus</i> L.	- - - F	- - -	- - -	- - -	:	:	:	- - R	F	
<i>Dactylis glomerata</i> L.	N A R F	- - - F	- - -	- - -	:	:	:	- A R	F	
<i>Dactyloctenium aegyptium</i> (L.) Richt.	- - - F	- - -	- - -	- - -	:	:	:	- - -	F	
<i>Danthonia intermedia</i> Vasey	- - -	- - -	- - -	- - -	:	:	:	- - -	F	
<i>D. pilosa</i> R. Br.	- - - F	- - -	- - -	- - -	:	:	:	- - -	-	
<i>D. semiannularis</i> (Labill.) R. Br. :	- - - F	- - -	- - -	- - -	:	:	:	- - -	-	
<i>D. spicata</i> (L.) Beauv.	- - - F	- - -	- - -	- - -	:	:	:	- - -	F	
<i>D. unispicata</i> Munro	- - - F	- - -	- - -	- - -	:	:	:	- - -	-	
<i>Deschampsia atropurpurea</i> (Wahl) :	N - - -	- - -	- - -	- - -	:	:	:	- - -	-	
Scheele	N A - F	- - -	- - -	- - -	:	:	:	N - -	F	
<i>D. caespitosa</i> (L.) Beauv.	N - - -	- - -	- - -	- - -	:	:	:	- - -	-	
<i>D. danthonioides</i> (Trin.) Munro.	N A - F	- - -	- - -	- - -	:	:	:	- - -	-	
<i>D. elongata</i> (Hook.) Munro	N - - -	- - -	- - -	- - -	:	:	:	- - -	-	
<i>D. flexuosa</i> (L.) Trin.	N - - F	- - - F	- - -	- - -	:	:	:	- - -	F	

Affected grass species	Reaction to rust species:									
	P. graminis	P. rubigo-vera	P. glumarum	P. coronata						
<i>Deschampsia holciformis</i> Presl	N	-	-	-	-	-	-	-	-	-
<i>Digitaria sanguinalis</i> (L.) Scop. :	-	-	-	-	-	-	-	-	-	F
<i>Distichlis spicata</i> (L.) Greene :	N	-	-	-	-	-	-	-	-	F
<i>Echinochloa crusgalli</i> (L.) Beauv. :	N	-	F	-	-	-	-	-	-	F
<i>Elymus ambiguus</i> Vasey & Scribn.	N	-	-	-	N	-	-	-	-	-
<i>E. arenarius</i> L.	N	-	-	-	N	-	-	-	-	-
<i>E. arenicola</i> Scribn. & Smith	N	-	-	-	N	-	-	-	-	-
<i>E. aristatus</i> Merr.	-	-	-	-	N	-	-	-	-	-
<i>E. canadensis</i> L.	N	A	R	F	N	A	R	-	N	A
<i>E. caput-medusae</i> L.	-	-	-	-	N	-	-	-	-	-
<i>E. condensatus</i> Presl.	N	-	-	-	N	A	-	-	-	-
<i>E. dahuricus</i> Turcz.	N	-	R	F	-	-	-	-	-	-
<i>E. flavescens</i> Scribn. & Smith	N	-	-	-	-	-	-	-	-	-
<i>E. giganteus</i> Vahl	-	-	-	-	-	-	-	-	-	-
<i>E. glaucus</i> Buckl.	N	A	R	F	N	A	-	F	-	-
<i>E. innovatus</i> Beal	-	A	R	-	-	-	-	R	-	F
<i>E. interruptus</i> Buckl.	-	-	-	-	N	A	-	-	-	F
<i>E. junceus</i> Fisch.	N	-	-	-	N	-	-	-	-	F
<i>E. macounii</i> Vasey	N	-	-	-	N	-	-	-	-	R
<i>E. mollis</i> Trin.	-	-	-	-	N	-	-	-	-	-
<i>E. pseudoagropyrum</i> (Griseb.) Trin. :	N	-	-	-	N	-	-	-	-	-
<i>E. sabulosus</i> Bieb.	-	-	-	-	N	-	-	-	-	-
<i>E. salina</i> Jones	-	-	-	-	N	-	-	-	-	-
<i>E. sibiricus</i> L.	N	-	R	F	-	-	-	-	-	-
<i>E. triticoides</i> Buckl.	N	A	R	F	N	-	-	-	N	-
<i>E. vancouverensis</i> Vasey	-	-	-	-	N	-	-	-	-	-
<i>E. villosus</i> Muhl.	-	-	F	-	-	-	-	-	-	-
<i>E. virescens</i> Piper	N	-	-	-	N	-	-	-	-	-
<i>E. virginicus</i> L.	N	A	R	F	N	A	R	F	N	-

Affected grass species	Reaction to rust species:						
	P. graminis	P. rubigo-vera	P. glumarum	P. coronata			
<i>Glyceria borealis</i> (Nash) Batch ...	-	-	-	-	:	-	-
<i>G. elata</i> (Nash) Hitchc.	-	-	-	-	:	N	-
<i>G. fluitans</i> (L.) R. Br.	-	-	-	-	:	-	F
<i>G. grandis</i> S. Wats.	N A	F	-	-	:	N	R F
<i>G. pauciflora</i> Presl	N A	F	-	-	:	N	-
<i>G. striata</i> (Lam.) Hitchc.	- A	-	-	-	:	N	R F
<i>Hierochloë occidentalis</i> Buckl. :	N	-	-	-	:	-	-
<i>H. odorata</i> (L.) Beauv.	N	- F	-	-	:	N	A R F
<i>Holcus lanatus</i> L.	N A	R F	-	-	:	N	A R F
<i>H. mollis</i> L.	- A	- F	-	-	:	-	- F
<i>Hordeum brevisubulatum</i> (Trin.) :					:		
Link	N	R F	-	-	:	N	-
<i>H. bulbosum</i> L.	N	-	-	-	:	N	-
<i>H. gussonianum</i> Parl.	N	- R F	-	-	:	-	-
<i>H. jubatum</i> L.	N A	R F	-	-	:	-	R F
<i>H. marinum</i> Huds.	-	-	-	-	:	N	-
<i>H. montanense</i> Scribn.	-	-	-	-	:	-	- F
<i>H. murinum</i> L.	N A	R F	-	-	:	-	-
<i>H. nodosum</i> L.	N	- F	-	-	:	N	-
<i>H. pusillum</i> Nutt.	N A	R	-	-	:	N	-
<i>H. spontaneum</i> C. Koch	- A	R F	-	-	:	-	-
<i>Hystrix californica</i> Kuntze	-	-	-	-	:	N	-
<i>H. patula</i> Moench	N A	R	-	-	:	N	A R F
<i>Koeleria cristata</i> (L.) Pers.	N A	- F	-	-	:	-	R F
<i>Lagurus ovatus</i> L.	N	-	-	-	:	N	-
<i>Lamarckia aurea</i> (L.) Moench	N	-	-	-	:	N	A R F

affected grass species	Reaction to rust species:					
	: P. graminis	: P. rubigo-vera	: P. glumarum	: P. coronata		
<i>Leptoloma cognatum</i> (Schult.) Chase	-	-	-	-	-	F
<i>Limnodea arkansana</i> (Nutt.) L. H. Dewey	N	-	-	-	N	-
<i>Lolium multiflorum</i> Lam.	N	A	R	F	N	A
<i>L. perenne</i> L.	N	A	R	F	N	A
<i>L. subulatum</i> Vis.	N	-	-	-	-	-
<i>L. temulentum</i> L.	N	-	R	F	-	A
<i>Melica altissima</i> L.	-	-	-	-	-	-
<i>M. bulbosa</i> Geyer	N	-	-	-	-	-
<i>M. geyeri</i> Munro	-	-	-	-	-	-
<i>M. mutica</i> Walt.	-	-	-	-	-	R
<i>M. nutans</i> L.	-	-	-	-	-	F
<i>Milium effusum</i> L.	N	-	-	-	-	-
<i>Molinia caerulea</i> (L.) Moench.	N	-	-	-	-	A
<i>Muhlenbergia cuspidata</i> (Torr.) Rydb.	N	-	-	-	-	-
<i>M. mexicana</i> (L.) Trin.	N	-	-	-	-	-
<i>M. racemosa</i> (Michx.) B.S.P.	N	-	-	-	-	-
<i>Panicum virgatum</i> L.	N	-	-	-	-	-
<i>Paspalum setaceum</i> Michx.	-	-	-	-	N	-
<i>Phalaris angusta</i> Nees	N	-	-	-	-	-
<i>P. arundinacea</i> L.	N	A	R	F	-	A
<i>P. canariensis</i> L.	N	A	-	-	-	R
<i>P. caroliniana</i> Walt.	N	-	-	-	-	-
<i>P. paradoxa</i> L.	-	-	-	-	N	-
<i>P. tuberosa</i> L.	-	-	-	-	-	-

Affected grass species	Reaction to rust species:									
	P. graminis	P. rubigo-vera	P. giunaru	P. coronata						
<i>Phleum boeheimeri</i> Wibel.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. paniculatum</i> Huds.	N A - -	- - - -	- - - -	- - - -	:	:	:	:	- A - -	-
<i>P. phleoides</i> (L.) Karst.	N - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. pratense</i> L.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- A R F	-
<i>Phragmites communis</i> Trin.	N - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	F
<i>Poa alpina</i> L.	N - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. ampla</i> Merr.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. annua</i> L.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- R F F	-
<i>P. arachnifera</i> Torr.	- - - -	- - - -	- - - -	- - - -	:	:	:	:	- N - -	F
<i>P. arctica</i> R. Br.	N - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. arida</i> Vasey	N A - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. attenuata</i> Trin.	- A - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. bulbosa</i> L.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. canbyi</i> (Scribn.) Piper	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. chapmaniana</i> Scribn.	N - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. compressa</i> L.	N A - -	- - - -	- - - -	- - - -	:	:	:	:	- N - R	F
<i>P. curta</i> Rydb.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. cusickii</i> Vasey	- - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. epilis</i> Scribn.	N A - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. fendleriana</i> (Steud.) Vasey	- - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. fertilis</i> Hegetschw.	- A - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. glauca</i> Vahl.	- - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. glaucifolia</i> Scribn. & Will. ..	- A - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. gracillima</i> Vasey	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. howelli</i> Vasey & Scribn.	N - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. interior</i> Rydb.	- R F F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. juncifolia</i> Scribn.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. macrantha</i> Rydb.	N - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. nemoralis</i> L.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	F
<i>P. nervosa</i> (Hook.) Vasey	- - - -	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. nevadensis</i> Vasey	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	-
<i>P. palustris</i> L.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	F
<i>P. pratensis</i> L.	N A R F	- - - -	- - - -	- - - -	:	:	:	:	- - - -	F

Affected grass species	Reaction to rust species:									
	P. graminis	P. rubigo-vera	P. glumarum	P. coronata						
<i>Poa scabrella</i> (Thurb.) Benth.	N	A	R	F	:	N	-	-	-	-
<i>P. secunda</i> Presl.	N	A	R	F	:	N	-	-	-	-
<i>P. sphondylodes</i> Trin.	N	-	R	F	:	-	-	-	-	-
<i>P. stenantha</i> Trin.	-	-	-	-	:	-	-	-	-	-
<i>P. sterilis</i> Bieb.	-	-	-	-	:	-	-	-	-	-
<i>P. sylvestris</i> A. Gray	-	-	-	-	:	-	-	-	-	-
<i>P. tibetica</i> Munro	N	-	-	-	:	-	-	-	-	-
<i>P. trivialis</i> L.	N	-	-	-	:	-	-	-	-	F
<i>Polygogon monspeliensis</i> (L.) Desf. ...	N	A	-	-	:	-	-	-	-	F
<i>Puccinellia distans</i> (L.) Parl.	N	-	-	-	:	N	-	-	-	-
<i>P. maritima</i> (Huds.) Parl.	-	-	-	-	:	N	-	-	-	-
<i>P. nutkaensis</i> (Presl.) Fern. & Weath. :	N	-	-	-	:	N	-	-	-	-
<i>P. nuttalliana</i> (Schult.) Hitchc.	N	-	-	-	:	N	A	-	-	R F
<i>P. pumila</i> (Vasey) Hitchc.	-	-	-	-	:	N	-	-	-	-
<i>P. tenuiflora</i> (Griseb.) Scribn. & Merr.	-	-	-	-	:	N	-	-	-	-
<i>Schedonnardus paniculatus</i> (Nutt.) Trel.	-	-	-	F	:	-	-	-	-	F
<i>Schizachne purpurascens</i> (Torr.) Swallen	-	-	-	-	:	-	-	-	-	F
<i>Secale montanum</i> Guss.	-	-	-	-	:	N	A	-	F	-
<i>Setaria lutescens</i> (Weigel) F. T. Hubb. :	-	-	-	F	:	-	-	-	-	F
<i>Sitanion hansenii</i> (Scribn.) J. G. Smith	-	-	-	-	:	-	-	-	-	-
<i>S. hystrix</i> (Nutt.) J. G. Smith	N	A	-	F	:	N	A	-	-	-
<i>S. jubatum</i> J. G. Smith	N	A	-	F	:	N	A	-	-	-

Affected grass species	Reaction to rust species:						
	:	P. graminis	:	P. rubigo-vera	:	P. glumarum	:
Sorghastrum nutans (L.) Nash	N	-	:	-	-	-	-
S. halepense (L.) Pers.	-	-	F	-	-	-	-
Spartina cynosuroides (L.) Roth :	-	-	:	-	-	-	-
S. gracilis Trin.	-	-	:	-	-	-	R
Sphenopholis nitida (Spreng.) :	-	-	:	-	-	-	-
Scribn.	-	-	F	-	-	-	-
S. obtusata (Michx.) Scribn.	N	A	-	-	-	-	R
S. pallens (Spreng.) Scribn.	-	-	-	-	-	-	-
Sporobolus asper (Michx.) Kunth. :	N	-	F	-	-	-	-
Sporobolus cryptandrus (Torr.) :	-	-	-	-	-	-	-
A. Gray	N	R	F	-	-	-	R
S. heterolepis (A. Gray) A. Gray :	-	-	-	-	-	-	-
Stipa comata Trin. and Rupr.	N	-	-	-	-	-	-
S. coronata Thurb.	N	-	-	-	-	-	-
S. pulchra Hitchc.	N	-	-	-	-	-	-
S. spartea Trin.	-	-	-	-	-	-	-
S. viridula Trin.	-	-	-	-	-	-	R
Triodia flava (L.) Smyth	N	-	F	-	-	-	-
Trisetum canescens Buckl.	N	-	-	-	-	-	-
T. cernuum Trin.	-	-	-	-	N	-	-
T. flavescens (S.) Beauv.	-	A	R	F	-	-	-
T. montanum Vasey	-	-	-	-	-	-	-
T. sesquiflorum Trin.	N	-	-	-	-	-	-
T. spicatum (L.) Richt.	-	A	-	F	-	-	R

Table 2. Summary of recorded reactions of wild and cultivated grasses to six varieties of *Puccinia graminis* in the United States and Canada.

Affected grass species ^{a/}	Reaction to stem rust varieties: <i>Puccinia graminis</i> :					
	: agrostidis :	: avenae :	: phleiprat. :	: poae :	: secalis :	: tritici :
<i>Agropyron caninum</i> (L.) Beauv.	-	-	-	-	-	-
<i>A. ciliare</i> (Trin.) Franch.	-	-	-	-	-	-
<i>A. cristatum</i> (L.) Gaertn.	-	R F	-	-	N A R F	N A R F
<i>A. dasystachyum</i> (Hook.) Scribn.	-	R F	-	-	- A	N A R
<i>A. desertorum</i> (Fisch.) Schult.	-	-	-	-	- F	- R F
<i>A. elmeri</i> Scribn.	-	R	-	-	-	-
<i>A. elongatum</i> (Host) Beauv.	-	-	-	-	- A	-
<i>A. imbricatum</i> (Stev.) Roem. & Schult.	-	-	-	-	-	- A
<i>A. inerme</i> (Scribn. & Smith) Rydb.	-	-	-	-	N - R F	- F
<i>A. intermedium</i> (Host) Beauv.	-	-	-	-	-	- N
<i>A. pauciflorum</i> (Schwein.) Hitchc.	-	-	-	-	- R	- R F
<i>A. repens</i> (L.) Beauv.	-	R F	-	-	N A	N A R F
<i>A. saxicola</i> (Scribn. & Smith) Piper	-	-	-	-	N A	N - R F
<i>A. semicostatum</i> (Steud.) Nees	-	-	-	-	-	-
<i>A. sibiricum</i> (Willd.) Beauv.	-	-	-	-	- R	- F
<i>A. smithii</i> Rydb.	-	-	-	-	N A	N A R
<i>A. spicatum</i> (Pursh) Scribn. & Smith	-	-	-	-	-	- F
<i>A. subsecundum</i> (Link) Hitchc.	-	R F	-	-	N A	N A
<i>A. trichophorum</i> (Link) Richt.	-	-	-	-	-	-
<i>A. triticeum</i> Gaertn.	-	-	-	-	-	N
<i>A. villosus</i> (L.) Link.	-	-	-	-	-	- F
<i>Agrostis alba</i> L.	N A	-	-	-	-	- R F
<i>A. canina</i> L.	- A	-	-	-	-	- N
<i>A. castellana</i> Boiss. & Reut.	-	-	-	-	-	-
<i>A. exarata</i> Trin.	-	N	-	-	-	-
<i>A. hiemalis</i> (Walt.) B.S.P.	N	-	-	-	-	-

^{a/} Insofar as possible, A. S. Hitchcock's "Manual of the Grasses of the United States" (U. S. Dept. Agr. Misc. Publ. No. 200, 1935) is being followed.

Affected grass species	Reaction to stem rust varieties: Puccinia graminis:									
	: agrostidis:	avenae	: phleiprat.:	poae	: secalis	: tritici				
<i>A. oregonensis</i> Vasey	N - - -	- - -	:	- - -	:	- - -	:	- - -	:	- - -
<i>A. palustris</i> Huds.	N - - -	- - R -	:	- - -	:	- - -	:	- - -	:	- - -
<i>A. retrofracta</i> Willd.	- - - -	- - F -	:	- - -	:	- - -	:	- - -	:	- - -
<i>A. spica-venti</i> L.	- - - -	- - F -	:	- - -	:	- - -	:	- - -	:	- - -
<i>A. stolonifera</i> L.	N A - -	- R F F	:	- - -	:	- - F -	:	- - -	:	- - F
<i>A. tenuis</i> Sibth.	- - - -	- - F -	:	- - -	:	- - -	:	- - -	:	- - -
<i>A. verticillata</i> Vill.	- - - -	- - F -	:	- - -	:	- - -	:	- - -	:	- - -
	:	:	:	:	:	:	:	:	:	:
<i>Alopecurus geniculatus</i> L.	- A - -	- A - -	:	- A - -	:	- - F -	:	- - -	:	- - F
<i>A. myosuroides</i> Huds.	- - - -	- A - -	:	- - -	:	- - -	:	- - -	:	- - -
<i>A. pratensis</i> L.	N A - -	- N A R -	:	- A - F	:	- - - F	:	- - -	:	- - R F
<i>Ammophila arenaria</i> (L.) Link	- - - -	- A - -	:	- - -	:	- - -	:	- - -	:	- - -
<i>Andropogon scoparius</i> Michx.	- - - -	- - F -	:	- - -	:	- - -	:	- - -	:	- - -
<i>Anthoxanthum aristatum</i> Boiss.	- - - -	- N - -	:	- - -	:	- - -	:	- - -	:	- - -
<i>A. odoratum</i> L.	- - F -	- N - - F	:	- - -	:	- - F -	:	- - -	:	- - F
<i>Arrhenatherum elatius</i> (L.) Mert. & Koch	- - - -	- N A R -	:	- A R -	:	- - - F	:	- - -	:	- - F
<i>Avena fatua</i> L.	- - - -	- N - -	:	- A - -	:	- - -	:	- - -	:	- - -
<i>Beckmannia erucaeformis</i> (L.) Host	- - - -	- - R F	:	- - F -	:	- - - F	:	- - -	:	- - F
<i>Bouteloua curtipendula</i> (Michx.) Torr.	- - - -	- - F -	:	- - -	:	- - F -	:	- - -	:	- - F
<i>Brachypodium distachyum</i> L.	- - - -	- - F -	:	- - -	:	- - -	:	- - -	:	- - -
<i>Brizopyrum siculum</i> Link	- - - -	- - F -	:	- - -	:	- - -	:	- - -	:	- - -

Affected grass species	Reaction to stem rust varieties: <i>Puccinia graminis</i> :									
	agrestidis	avenae	phleiprat.	poae	secalis	tritici				
<i>Bromus brachystachys</i> Horn	-	-	-	-	-	-	:	:	:	-
<i>B. brevis</i> Steud.	-	-	-	-	-	-	:	:	:	-
<i>B. brizaeformis</i> Fisch. & Mey ..	-	-	-	-	-	-	:	:	:	-
<i>B. carinatus</i> Hook & Arn.	-	-	-	-	-	-	:	:	:	R
<i>B. catharticus</i> Vahl.	-	-	-	-	-	-	:	:	:	R
<i>B. ciliatus</i> L.	-	A	-	-	-	-	:	:	:	-
<i>B. commutatus</i> Schrad.	-	-	-	-	-	-	:	:	:	-
<i>B. erectus</i> Huds.	-	-	-	-	-	-	:	:	:	F
<i>B. hordeaceus</i> L.	-	-	-	-	-	-	:	:	:	-
<i>B. inermis</i> Leyss.	-	-	R	-	-	-	:	:	:	R
<i>B. japonicus</i> Thunb.	-	-	-	-	-	-	:	:	:	-
<i>B. kalmii</i> A. Gray	-	-	-	-	-	-	:	:	:	-
<i>B. lanuginosus</i> Poir.	-	-	-	-	-	-	:	:	:	-
<i>B. latiglumis</i> Hitchc.	-	-	-	F	-	-	:	:	:	F
<i>B. macrostachys</i> Desf.	-	-	-	-	-	-	:	:	:	-
<i>B. madritensis</i> L.	-	-	-	-	-	-	:	:	:	-
<i>B. mollis</i> L.	-	N	-	F	-	-	:	:	:	R
<i>B. pacificus</i> Shear	-	-	-	-	-	-	:	:	:	-
<i>B. pumpellianus</i> Scribn.	-	-	-	-	-	-	:	:	:	-
<i>B. purgans</i> L.	-	-	-	-	-	-	:	:	:	F
<i>B. rigidus</i> Roth	-	N	-	-	-	-	:	:	:	-
<i>B. rubens</i> L.	-	-	-	-	-	-	:	:	:	-
<i>B. secalinus</i> L.	-	N	-	-	-	-	:	:	:	-
<i>B. sitchensis</i> Trin.	-	-	-	-	-	-	:	:	:	N
<i>B. squarrosus</i> L.	-	-	-	-	-	-	:	:	:	-
<i>B. sterilis</i> L.	-	N	-	-	-	-	:	:	:	A
<i>B. suksdorfii</i> Vasey	-	N	-	-	-	-	:	:	:	-
<i>B. tectorum</i> L.	A	-	-	-	-	-	:	:	:	N
<i>B. tomentellus</i> Boiss.	-	-	-	-	-	-	:	:	:	A
<i>Calamagrostis canadensis</i> (Michx.) Beauv.	-	-	-	-	-	-	:	:	:	-
<i>Cynodon dactylon</i> (L.) Pers.	-	-	-	-	-	-	:	:	:	-

Affected		Reaction to stem rust varieties: Puccinia graminis:						
grass species		agrostidis	avenae	phleiprat.	poae	secalis	tritici	
<i>Cynosurus cristatus</i> L.	.....	- - - -	- - - F	- - - -	- - - -	- - - -	- - - -	F
<i>Dactylis glomerata</i> L.	.....	- A - -	N A - -	N A R -	- - - F	- - - -	N A R F	
<i>Dactyloctenium aegyptium</i> (L.) Richt.	.....	- - - -	- - - F	- - - -	- - - -	- - - -	- - - -	-
<i>Danthonia pilosa</i>		- - - -	- - - F	- - - -	- - - -	- - - -	- - - -	-
<i>D. spicata</i> (L.) Beauv.	.....	- - - -	- - - F	- - - -	- - - -	- - - -	- - - -	-
<i>Deschampsia caespitosa</i> (L.) Beauv.	.....	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	N - - -
<i>D. elongata</i> (Hook.) Munro	.....	- - - -	- A - -	- - - -	- - - -	- - - -	- - - -	-
<i>D. flexuosa</i> (L.) Trin.	.....	- - - -	- - - F	- - - -	- - - -	- - - -	- - - -	-
<i>Echinochloa crusgalli</i> (L.) Beauv.	.....	- - - -	- - - F	- - - -	- - - -	- - - -	- - - -	-
<i>Elymus ambiguus</i> Vasey & Scribn.	.....	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	N - - -
<i>E. canadensis</i> L.	.....	- - - -	- R F -	- - - -	- - - -	N A - -	- - - -	N A - -
<i>E. condensatus</i> Presl.	.....	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	N - - -
<i>E. dahuricus</i> Turcz.	.....	- - - -	- R - -	- - - -	- - - -	- R - -	- - - -	N - - F
<i>E. flavescens</i> Scribn. & Smith	.....	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	N - - -
<i>E. glaucus</i> Buckl.	.....	- - - -	- R F -	- A R -	- - - -	N A - -	- - - -	N A - -
<i>E. innovatus</i> Beal	.....	- - - -	- A - -	- R - -	- - - -	- A - -	- - - -	- A - -
<i>E. junceus</i> Fisch.	.....	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	N - - -
<i>E. macounii</i> Vasey	.....	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	N - - -
<i>E. sibiricus</i> L.	.....	- - - -	- - - F	- - - -	- - - -	- - - -	- - - -	N - - -
<i>E. triticoides</i> Buckl.	.....	- - - -	- - - F	- - - -	- - - -	- A - -	- - - -	N A - -
<i>E. villosus</i> Muhl.	.....	- - - -	- - - F	- - - -	- - - -	- - - -	- - - -	- - - -
<i>E. virescens</i> Piper	.....	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	N - - -
<i>E. virginicus</i> L.	.....	- - - -	- R F -	- R F -	- - - -	N A R -	- - - -	N A R F
<i>Eragrostis abyssinica</i> (Jacq.) Link	.....	- - - -	- - - F	- - - -	- - - -	- - - -	- - - -	- - - F

affected grass species	Reaction to stem rust varieties: <i>Puccinia graminis</i> :									
	: agrostidis	: avenae	: phleiprat.	: poae	: secalis	: tritici				
<i>Eragrostis pectinacea</i> (Michx.)										
Nees	- - -	- - - F	- - -	- - -	- - -	- - -				
<i>Festuca dertonensis</i> (All.)										
Aschers. & Graebn.	- - -	- - -	- - -	- - -	- - -	- - -				
F. elatior L.	- - -	- A R F	- - -	- - -	- - - F	- - -				
F. gigantea (L.) Vill.	- - -	- - - F	- - -	- - -	- - -	- A -				
F. idahoensis Elmer	- - -	- - - F	- - -	- - -	- - -	- - -				
F. myuros L.	- - -	- N A -	- - -	- - -	- - - R	- - - F				
F. obtusa Spreng.	- - -	- - - F	- - -	- - -	- - -	- - -				
F. occidentalis Hook.	- - -	- - - F	- - -	- - -	- - -	- - -				
F. octoflora Walt.	- - -	- A -	- - -	- - -	- - -	- - -				
F. ovina L.	- - -	- R F	- - -	- - -	- - -	- - - F				
F. pacifica Piper	- - -	- A R -	- - -	- - -	- - - F	- - - F				
F. rubra L.	- - -	- - - F	- - -	- - -	- - -	- - - F				
F. scabrella Torr.	- - -	- - - F	- - -	- - -	- - -	- - -				
F. thurberi Vasey	- - -	- A -	- - -	- - -	- - -	- - -				
F. viridula Vasey	- - -	- A -	- - -	- - -	- - -	- - -				
<i>Glyceria canadensis</i> (Michx.)										
Trin.	- - -	- - - F	- - -	- - -	- - -	- - -				
G. pauciflora Presl	- - -	- - - F	- - -	- - -	- - -	- - -				
<i>Hierochloa odorata</i> (L.) Beauv. .										
.....	- - -	- - -	- - -	- - -	- - -	- - -				
<i>Holcus lanatus</i> L.	- A -	- - -	- A - F	- - -	- - - F	- - -				
H. mollis L.	- - -	- - -	- - -	- - -	- - -	- - -				
<i>Hordeum brevisubulatum</i> (Trin.)										
Link.	- - -	- - - F	- - -	- - -	- - -	- - -				
H. bulbosum L.	- - -	- - - F	- - -	- - -	- - -	- - -				
H. gussonianum Parl.	- - -	- - - R F	- - -	- - -	- - -	- - -				
H. jubatum L.	- - - F	- - -	- - - R	- - -	- - - A	- - -				
H. murinum L.	- - -	- - -	- - -	- - -	- - -	- - -				
H. nodosum L.	- - -	- - - F	- - -	- - -	- - -	- - -				

Affected grass species	Reaction to stem rust varieties: <i>Puccinia graminis</i> :					
	: agrostidis :	avenae :	phleiprat.: poae :	secalis :	tritici :	
<i>H. pusillum</i> Nutt.	- - -	- - R -	- - - -	: N A - -	: N A - -	- -
<i>H. spontaneum</i> C. Koch	- - -	- - R F	- - - -	: - - - -	: - - - -	- A - -
<i>Hystrix patula</i> Moench	- - -	- - R -	- - - -	: N A - -	: N A - -	- -
<i>Koeleria cristata</i> (L.) Pers.	- A - -	: N A - F	- - - -	: - - - F	: - A - F	- -
<i>Limnodea arkansana</i> (Nutt.) L. H. Dewey	- - -	: N - - -	- - - -	: - - - -	: - - - -	- -
<i>Lolium multiflorum</i> Lam.	- - -	: - - R -	- - - -	: - - - -	: - - - -	- F
<i>L. perenne</i> L.	- - -	: - - R F	- - - -	: - - - F	: - - - F	- F
<i>L. temulentum</i> L.	- - -	: - - R -	- - - -	: - - - -	: - - - -	- F
<i>Melica altissima</i> L.	- - -	: - - - -	- - - -	: - - - -	: - - - -	- F
<i>Milium effusum</i> L.	- - -	: N - - -	- - - -	: - - - -	: - - - -	- -
<i>Muhlenbergia racemosa</i> (Michx.) B.S.P.	- - -	: - - - F	- - - -	: - - - F	: - - - F	- -
<i>Panicum virgatum</i> L.	- - -	: - - - -	- - - -	: - - - -	: N - - -	- -
<i>Phalaris arundinacea</i> L.	- - -	: - A - F	- - - -	: - - - -	: - - - -	- -
<i>P. canariensis</i> L.	- - - F	: N A - -	- - - -	: - - - -	: - - - F	- F
<i>Phleum boehmeri</i> Wibel.	- - -	: - - R -	- - - -	: - - - -	: - - - -	- -
<i>P. paniculatum</i> Huds.	- - -	: - A - -	- - - -	: - - - -	: - - - -	- -
<i>P. pratense</i> L.	- - -	: N A R F	- - - -	: - - - F	: - - - F	- F
<i>Poa annua</i> Merr.	- - -	: - A R F	- - - -	: - - - -	: - - - -	- -
<i>P. annua</i> L.	- - -	: - - F	- - - -	: - A - F	: - - - -	- -
<i>P. arida</i> Vasey	- - -	: - - F	- - - -	: - - - -	: - - - -	- -
<i>P. attenuata</i> Trin.	- - -	: - - F	- - - -	: - - - -	: - - - -	- -
<i>P. bulbosa</i> L.	- - -	: - A - -	- - - -	: - - - -	: - - - -	- -

affected grass species	Reaction to stem rust varieties: <i>Puccinia graminis</i> :					
	:agrostidis:	avenae	:phleibrat.:	poae	:secalis	:tritici
<i>Sphenopholis nitida</i> (Spreng.)						
Scribn.	:	- - F	:	- - -	:	- - -
<i>S. obtusata</i> (Michx.) Scribn.	:	N A -	:	- - -	:	- - -
<i>Sporobolus asper</i> (Michx.) Kunth.:	- - -	- - F	- - -	- - -	- - -	- - F
<i>S. cryptandrus</i> (Torr.) A. Gray :	- - -	- - F	- - -	- - -	N - -	- - R
<i>Stipa pulchra</i> Hitchc.	- - -	- - -	- - -	- - -	- - -	- - -
<i>S. viridula</i> Trin.	- - -	- R F	- - -	- - F	- - F	- - F
<i>Triodia flava</i> (L.) Smith	- - -	- - F	- - -	- - -	- - -	- - -
<i>Trisetum flavescens</i> (L.) Beauv. :	- - -	- A -	- - -	- - -	- - -	- - -
<i>T. spicatum</i> (L.) Richt.	- - -	- A -	- - -	- - -	- - -	- - -

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