DISEASES OF ELYMUS AND OTHER GRASSES IN ALBERTA, 1972

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Abstract

The intensity of powdery mildew, spot blotch, and leaf rust on various lines and species of Elymus was assayed in the field and resistance determined. Previously unreported diseases of Elymus and other forage grasses in Alberta or Canada are listed along with diseases occurring commonly in 1972.

Introduction

Grasses under test in the forage crops program at Lacombe were examined for the presence of diseases as part of the 1972 disease survey in Central Alberta. The severity of powdery mildew, spot blotch, and rust were assessed in a test of Elymus species and lines.

Some of the species included in this study are not grown commercially but were established in nurseries ox tests to evaluate their potential as forage crops. Roegneria fibrosa (Schrenk) Nevski is a Russian introduction. Hordeum brevisubulatum (Trin.)Lk. has been reported as dominant in pasture associations in Siberia (3). Of the Elymus species, only E. junceus Fisch. is extensively used at present. E. piperi Bowden and E. sibiricus L. are native to Canada (1), while E. angustus Trin. and E. junceus are introductions from Russia.

Materials and methods

Observations on diseases of grasses were carried out on various experimental plantings and single nursery rows. Diseases were identified by symptoms or by examination of the fungi on leaf material directly or after incubation in moist chambers; in some cases isolations were made on agar media.

A test of Elymus species (Table 1) was seeded in May 1972. Arranged in a randomized block design, the plots were 20 ft (6.1 m) long with four rows spaced 1 ft (30.5 cm) apart. Disease intensity was estimated on four replications by a 0 to 5 visual rating (0 = disease-free, 5 = severe) in September 1972.

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Results and discussion

Higher than normal moisture levels in the fall of 1972 probably increased the severity of the diseases, since they were not observed to this extent previously. Some of the diseases have not been reported previously in Alberta or Canada (1). These are included with new and common diseases on other species in 1972 as follows:

Agropyron cristatum (L). Gaertn., crested wheat grass
- Bipolaris sorokiniana Sacc. in Sorok.) Shoem., [stat. perf. Cochliobolus sativus (Ito & Kurib Drechs. ex Dast.], spot blotch
- Claviceps nurpurea (Fr) Tul., ergot

Agropyron trichonhorum (Lk) Richt., pubescent wheat grass
- Septoria sp. (a)

Bromus inermis Leyss., brome grass
- Drechslera bromi (Died.) Shoem. [stat perf. Pyrenophora bromi. Died.], leaf blotch, brown leaf ——: common
- Selenonhoma bromiqena (Saac.) Spraque & Johnson, leaf spot

Dactylis glomerata (L.), orchard grass
- Claviceps purpurea, erqot (b)

Elvmus angustus Trin., Altai wild rye
- Bipolaris sorokiniana, snot blotch (a)
- Erysiphe graminis DC. ex Merat, powdery mildew (a)

Elymus junceus Fisch., Russian wild rye
- Ascochyta sp. (a)
- Bipolaris sorokiniana, spot blotch (a)
- Erysiphe graminis, powdery mildew
- Puccinia recondita Rob. ex Desm., leaf rust
- Undetermined causal agent, whitehead (a)

Elymus piperi Bowden
- Bipolaris sorokiniana, spot blotch (a)
- Erysiphe graminis, nowdery mildew
- Puccinia recondita, leaf rust

Table 1. Reactions of lines of Elymus to three diseases

Species and lines	Description or source	Avg disease intensity* (0 - 5 scale) Powdery mildew	Spot blotch	Leaf rust
Elymus *junceus* (Russian wild rye)				
Mayak		2.12 e	1.25 a	0.50 c
Sawki		2.00 e	2.00 b	0 a
Vinall		2.00 e	1.37 a	0 a
NRG 711	Mile 1019	2.00 e	1.50 a	0.25 b
4N 721	Tetraploid	2.00 e	1.25 a	0.25 b
4N 722	Tetraploid	2.12 e	1.62 a	0 a
SC 3711		1.50 d	1.62 a	0.25 b
SC 3712		2.37 e	1.62 a	0 a
SC 17040	USSR	1.37 cd	1.37 a	0.25 b
LRS 6757	Shatter resistant	1.45 cd	1.25 a	0.25 b
SC 17125	Idaho 100	2.25 e	1.25 a	0.25 b
Elymus *angustus* (Altai wild rye)				
SC 3716	Blue	1.00 bc	2.62 b	0 a
SC 3717	Blue-green	0.75 b	2.50 b	0 a
Elymus sibiricus (Siberian wild rye)				
SC 17039	USSR	0.75 b	1.00 a	2.25 e
SC 1701	Alaska	0 a	1.25 a	0 a
*E*lymus piperi				
SC 17171	Kamloops	0.75 b	1.75 a	0.75 d

* Disease intensity values followed by different letters indicate significant differences by Duncan's Multiple Range Test. Disease intensity varied from 0, no disease symptoms, to 5, maximum disease.

Elymus sibiricus (L.), Siberian wild rye
- Bipolaris sorokiniana, spot blotch (a)
- Claviceps purpurea, ergot (b)
- Erysiphe graminis, powdery mildew (a)
- Pseudoplea sp. (a)
- Puccinia recondita, leaf rust (a)
- Septoria sp. (a)

Festuca rubra L., red fescue
- Didymella festucae (Weg.) Holm. (Phleospora idahoensis Sprague), stem eyespot
- Passalora graminis (Fckl.) Hohn. (Scolecotrichum graminis Fckl.), brown stripe

Hordeum brevisubulatum (Trin.) Lk.
- Bipolaris sorokiniana, spot blotch (a)
- Puccinia graminis Pers., stem rust (b)
- Puccinia recondita, leaf rust (a)
- Septoria sp. (a)

Phalaris arundinacea (L.), reed canary grass
- Claviceps purpurea, ergot

Phleum pratense (L.), timothy
- Drechslera phlei (Graham) Shoem., leaf streak; common
- Heterosporium phlei Gregory, purple spot; common

Poa pratensis L., Kentucky blue grass
- Undetermined causal agent, whitehead (silvertop) (b) [often associated with Fusarium poae (Pk.) Wr.]

Roegneria fibrosa (Schrenk) Nevski
- Claviceps purpurea, ergot (a)

The reactions of lines of Elymus species to powdery mildew [Erysiphe graminis DC. *ex* Merat], snot blotch [Bipolaris sorokiniana (Sacc. in Sorok.) Shoem], and leaf rust (Puccinia recondita Rob. ex Desm.), are shown in Table 1. Disease reaction varied both between and within species. One line was found to be free of powdery mildew. Leaf rust was less severe than powdery mildew and several lines were found to be rust-free. All lines were infected with snot blotch, with some variation in resistence which may be considered a general feature of "non-obligate" diseases. Hordeum brevisubulatum was also examined in this test and found to be more severely affected with rust than the Elymus lines (avg. disease intensity 2.50); it was free of powdery mildew and was rated 1.0 for spot blotch.

(a) unreported in Canada (2)

(b) unreported in Alberta (2)

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