FOLIAGE DISEASES OF ALFALFA IN NORTHERN SASKATCHEWAN; A NOTE ON THE 1972 SURVEY AND THE DIFFERENTIAL REACTIONS OF NINE VARIETIES[1]

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Abstract

Disease surveys in 1972 showed yellow leaf blotch [Leptotrochila medicaginis] to be causing serious losses in 15 of 44 alfalfa (Medicago sativa) fields. Black stem [Phoma medicaginis] and common leaf spot [Pseudopeziza trifolii f. sp. medicaginis-sativae] each caused losses in four of the fields. In experimental plots, nine varieties of alfalfa were scored for their reaction to natural infection by these three diseases and by downy mildew. The varieties Ferax, Ranger, and Vernal seemed the most susceptible to yellow leaf blotch. Rambler and Rhizoma seemed the least susceptible to this disease but Rhizoma was extremely susceptible to common leaf spot.

Introduction

previous surveys (1,2) have shown wide ranges in the incidence of the three primary foliage diseases of alfalfa (Medicago sativa L.), yellow leaf blotch [Leptotrochila medicaginis (Fuckl.) Schuepp], black stem [Phoma medicaginis Malbr. & Roum.], and common leaf [Pseudo eziza trifolii f. sp. medicaginis-sativae s a f eckrecht]. These differences do not appear to be related to geographic location, indicating that management practices differ widely or that there are varietal differences in reaction to each of these diseases. As in prior years, a disease survey was conducted in 1972. However, as it is usually not possible to determine on field surveys the varieties being grown, a variety trial was set up at Saskatoon to determine whether varietal differences in reaction to foliage diseases could be detected.

Materials and methods

The 1972 alfalfa disease survey was conducted in mid-July. A total of 44 fields in northern Saskatchewan were visited. The area covered was approximately the same as described previously (2) with many of the fields being located close to alfalfa dehydration plants. Sampling was started about 50 m from the edge of the field and 6-10 samples were taken at about 10-m intervals. Samples were brought back to the laboratory for examination. Disease severity was rated as trace, slight, moderate, or severe.

The variety trial was conducted on the CDA plots at the Research Station Farm, Saskatoon. Seed of nine varieties (Table 2) was obtained from Dr. D. H. Heinrichs, CDA Research Station, Swift Current. Individual plants were grown in plastic "split-tube" containers and were transplanted to the field in June 1971. Four replicated plots of each variety were used. Each plot comprised 126 plants planted in six rows 45.7 cm apart with 21 plants per 610 cm row. Paths 152 cm wide surrounded each plot. The plants were first cut, to a height of 30 cm, in late May 1972. This allowed a build-up of crop debris and presumably a build-up of natural inoculum. Plots were rated for yellow leaf blotch, common leaf spot, black stem, and downy mildew [Peronospora trifoliorum de Bary] in late July 1972. Rating of severity was done as previously described (1) on a scale of 1-10.

Results

The results from the 1972 disease survey are shown in Table 1. Yellow leaf blotch caused serious loss in 15 of the 44 fields while common leaf spot and black stem were serious problems in four fields each. There appeared to be little difference in the severity of each disease with different geographic location. Downy mildew again seemed to be causing real losses in the Shell Lake-Parkside area.

In the experimental plots at Saskatoon, yellow leaf blotch was recorded as early as July 1971. No other foliage diseases were evident in that season. However, sufficient natural inoculum was apparently present, as by mid-July 1972 all four foliage diseases were conspicuous. July was one of the coolest and wettest on record and this

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Table 1. Alfalfa disease survey, 1972

Disease	Disease category and number of fields in each category			
	Trace	Slight	Moderate	Severe
Yellow leaf blotch	21	8	10	5
Common leaf spot	35	5	4	0
Black stem	25	15	4	0

doubtlessly encouraged the build-up of inoculum. The disease ratings for yellow leaf blotch, common leaf spot, and black stem are shown in Table 2. The varieties Ferax, Ranger, and Vernal appeared to be the most susceptible to yellow leaf blotch, while Rambler and Rhizoma seemed to be the least susceptible. However, Rhizoma was very heavily infected with common leaf spot: Beaver, Ferax, Grimm, and Ranger also appeared to be quite susceptible to this disease. Black stem was less evident, although Ferax and Grimm were more heavily infected than the other varieties. The reaction to downy mildew was more difficult to assess as the disease was not distributed evenly within the plots. Generally, however, Ladak appeared to be the most susceptible and Grimm and Rhizoma the least susceptible.

Table 2. Reaction of nine alfalfa varieties to natural infection with three foliage diseases, Saskatoon, 1972

Variety	Disease and disease rating* (avg of four replicates)		
	Yellow leaf blotch	Common leaf spot	Black stem
Beaver	4	6	2
Ferax	8	6	5
Grimm	5	6	4
Iroquois	5	3	2
Ladak	4	4	3
Rambler	2	2	2
Ranger	8	6	3
Rhizoma	2	8	2
Vernal	6	4	2

* 0 = no disease, 10 = severe disease

Discussion

Apparently some of the differences in field survey results can be attributed to varietal differences. It seems obvious that more detailed information on the varieties grown would be of great value. Yellow leaf blotch still appears to be the most serious foliage disease of alfalfa in northern Saskatchewan. This may be due partly to an apparent increase in the acreage of Vernal which seems rather susceptible to the disease. A variety such as Rhizoma apparently has some resistance to the disease but its susceptiblility to common leaf spot would necessitate selections being made very carefully if attempts were made to use this variety in breeding programs. However, it seems probable that an examination of a wider range of genotypes should provide useful resistance to each of the major foliage diseases of alfalfa.

Acknowledgment

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Literature cited

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