DISEASES OF BROMEGRASS IN SASKATCHEWAN IN *1966*[1]

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Introduction

Surveys for the two major leaf spots of Bromus inermis Leyss. caused by Selenophoma bromigena (Sacc.) Sprague and Johnson and Pyrenophora bromi (Died.) Drechsler were made in 233 pastures, seed and hay crops and road verges in the provinces between 19 May and 24 September.

The distribution of the two diseases was similar to that reported by Smith (1). Selenophoma leaf spot was more widespread than pyrenophora leaf blotch but the latter was more common and more severe on the black parkland and black and grey/black parkland/forest soil zones than on the brown prairie soils. With some very localized exceptions, notably in the bottoms of roadside ditches and on irrigated areas, severe pyrenophora leaf blotch was not seen on bromegrass in the brown or dark-brown prairie soil zones. Neither leaf spot was severe on short, grazed pasture.

Both leaf spots appeared earlier than in 1965. In the Unity seed-growing area, selenophoma leaf spot was first seen on young leaves on 19 May. In the Nipawin/Melfort seed-production districts, lesions of pyrenophora leaf blotch on new leaves were recorded on 26 May. Peakeeverity for selenophoma leaf epot wae in mid-July at Saekatoon and Indian Head. Pyrenophora leaf blotch was most severe at Nipawin/Melfort in mid-Auguet and at Big River and Leask at the end of August. There were indication8 by mid-June of an imminent epiphytotic of pyrenophora leaf blotch on seed crops of regirtered varieties of bromegrass in the Nipawin/Melfort area and the below-average yields of eeed there may be a reflection of the high incidence of this and other diseasee. However, wet weather at the time of reed set may alro have contributed to poorer seed yields. Seed yields of bromegrass in the Unity district, where common brome predominatee, was only elightly below normal and leaf spots were only slightly more severe than in 1965.

Ecology of S. bromigena and P. bromi in road allowances

The material for road making is often taken from the road allowances or ditches. Often the roil is thin at the lowest position and thicker alohg the road edge and field side bank of the allowance. On the moister soils in Saskatchewan, road allowrncer are often sown with common brome which is susceptible to both diseases. Most commonly, growth, ir more dense on the shoulders of the allowance where

Table 1. Severity of two major bromegrass leaf spots throughout the season (233 localities).

Survey Periods	Leaf spot	Severity* rating 4	3	2	1	0
19 May to 31 May	Selenophoma	0	0	0	10	13
	Pyrenophora	0	1	a	6	a
2 June to 23 June	Selenophoma	0	10	22	65	**47**
	Pyrenophora	0	20	39	28	**57**
13 July to 22 July	Selenophoma	2	4	5	3	2
	Pyrenophora	0	**5**	**4**	0	**7**
10 August to 31 August	Selenophoma	1	**2**	**7**	**5**	21
	Pyrenophora	7	8	10	**7**	**4**
1 September to 24 September	Selenophoma	0	0	0	**5**	9
	Pyrenophora	0	1	**7**	6	0
Total						
19 May to 24 September	Selenophoma	3	16	34	**88**	92
	Pyrenophora	7	35	68	**47**	**76**

*Where **4** is severe disease and 0 no symptoms seen.

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there is greater top soil depth or higher soil fertility than at its base. In spring, following snow melt, and in wet weather, water often stands in the allowance base.

In the dark brown and brown prairie soil zones the lowest portion of the road allowance is usually the place where P. bromi may be found, sometimes with S. bromigena. On the darker soils of the parkland and parkland forest belt it is often necessary to search the road allowance shoulder in the longer grass to find S. bromigena. Rarely is P. bromi absent from bromegrass in the road allowance bottom on darker soils during the summer. Verge trimming operations expose almost the whole profile of bromegrass stands and it is noticeable that where patches of lush growthoccur there selenophoma leaf spot is usually more severe than where growth is sparse and open.

Results of infection studies with S. bromigena show that following inoculation with conidial suspensions, a 4- to 5-day moist chamber incubation is required to establish infection. Heavy watering of inoculated plants reduces the amount of infection as the inoculum is largely washed off. On the other hand, infection with P. bromi may be apparent 48 hours after inoculation. One of the factors affecting distribution of the two diseases on bromegrass in road allowances may be differences in density of stand, The denser growth at the edges favours the maintenance of high humidity around the lower leaves for the longer infection period required by S. bromigena. At the allowance base, although there may be more moisture, with sparser growth there is less protection from spore "wash off" during prolonged rainy periods.

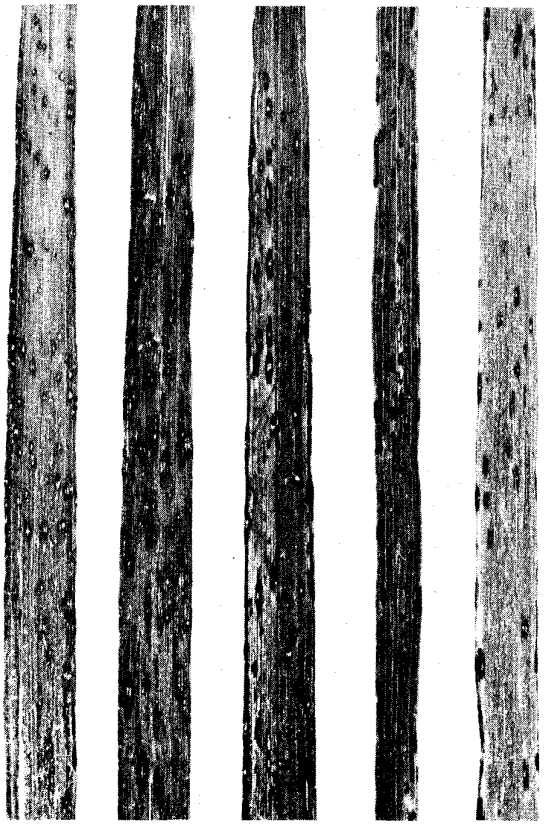

Figure 1. Sporotrichium leaf spot on bramus inermis.

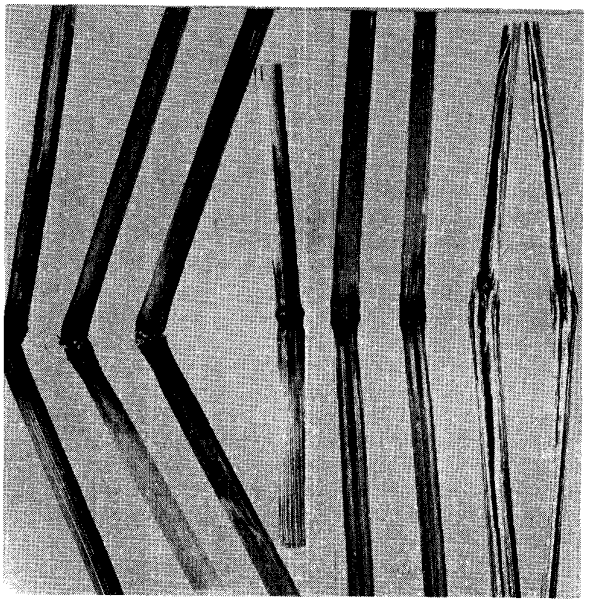

Figure 2. Black node on brome gross culms
Left – Stein fracture
Centre – External appearance
Right – Internol blackening

Effect of burning on P. bromi

The severity of leaf spots was found to have been reduced by burning plant debris. At Leslie, a strip of an 80-acre field of commercial brome grown for seed failed to catch fire in the fall of 1965. In July 1966, 100 plants taken at random from the unburnt strip had an average rating of 2.06 for pyrenophora leaf spot, on the 0-4 scale, and 100 plants from the burnt area had an average rating of 0.20. At Nipawin, 100 plants from an area in a seed crop of 'Carlton' which did not burn in the spring of 1966 had an average rating of 1.82 for pyrenophora leaf spot and 100 from the surrounding burnt area had an average rating of 0.43.

Other diseases

Scald (Rhynchosporium secalis (Oud.) J. J. Davis) was first noted at the end of May and become severe in several locations by mid-August. The disease was as common and severe on brome on light prairie soils as on the black soils of the parkland.

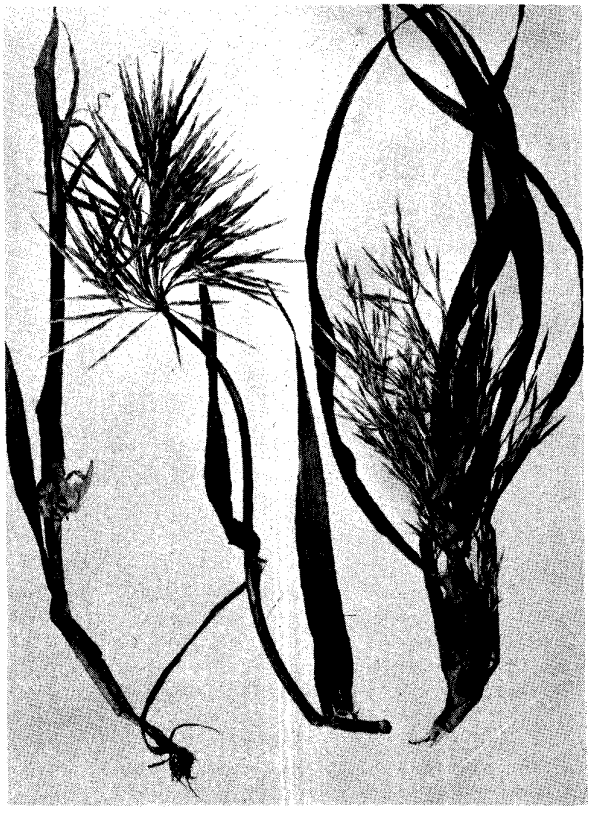

Figure 3. Selective herbicide damage on brome grass.

The Sporotrichium isolated in 1965 in Saskatoon was associated with leaf spot symptoms (Fig. 1) in 13 locations widely scattered over the province from mid-August 1966. The spotting was severe on a seed crop of the variety 'Saratoga' at Melfort on 18 August and moderately severe on a seed crop of the variety 'Carlton' at Leask on 31 August.

A condition referred to as "black node" became apparent in July at Saskatoon (Fig. 2). It was associated with abnormally thick and brittle culms in some varieties, The disease appeared in seed crops in the Melfort area in August. Isolates from blackened nodes yielded principally Septoria and Fusarium spp. The condition had no significant effect on stem or seed weight in the varieties 'Red Patch' and 'S-6733', but increased lodging. Although it was not possible to relate the condition to cultural or climatic factors in commercial crops, at Saskatoon thick tillers and abnormally brittle stems were associated in experimental plantings with selective herbicide damage. The herbicide concerned was a low volatility 2, 4-DB. This was severe (Fig. 3) in all 5 varieties in replicated field experiment.

literature cited

1. Smith, J. Drew. 1965. Diseases of bromegrass in Saskatchewan in 1965. Can. Plant Dis. Surv. 45: 118-119.