Barley leaf spots in Prince Edward Island, 1978[1]

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In Prince Edward Island net blotch (Pyrenophora teres) was found in 100% of the fields of barley surveyed in 1978. Spot blotch (Bipolaris sorokiniana) was found in 71% of the fields. Net blotch was more severe than spot blotch in most fields. Scald (*Rhyncosporium* secalis) and a Selenophoma leaf spot were also recorded. Non-parasitic brown spot was found in 13% of the fields.

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A l'Île du Prince Edouard, la rayure reticulee (Pyrenophora teres) a ete trouvee dans 100% des champs d'orge, échantillonnées en 1978. La tache helminthosporienne (Bipolaris sorokiniana) a été trouvee dans 71% des champs. La rayure reticulee était plus grave que la tache helminthosporienne dans la plupart des champs. La tache pâle (*Rhyncosporium secalis*) et la tache ocellée (Selenophoma *donacis* var. stomaticola) ont aussi ete enregistree. La moucheture brune a ete trouvee dans 13% des champs.

Two principal parasitic fungi are associated with leaf spot symtoms of barley in Prince Edward Island. They are ***Pyrenophora teres*** (Died.) Drechs. causing net blotch (2) and ***Bipolaris sorokiniana*** Sacc. in Sorok. (Shoem) causing spot blotch (4). The severity of infection by these fungi varies from year to year. There is evidence that disease severity is related to factors such as seed source and treatment (5, 8), seeding date (8). crop management practices, and weather (1, 3), but no clear picture of their relative importance was evident from these studies. Casual observations in 1976 and 1977 suggested that net blotch was more prevalent and more severe than spot blotch. Therefore in 1978 this survey was carried out to establish the frequency and severity of these two diseases in Prince Edward Island barley fields. Observations on the presence or absence of other foliar symptoms in barley were also made.

Methods

Forty-five barley fields were selected in Prince Edward Island (Fig. 3). The following information was obtained: a) cultivar, date, and rate of seeding; b) fertilizer and herbicide application; c) crops in field for up to 5 years preceding 1978.

The fields were surveyed in late July when plants were between growth stages 70 and 76 (10). First and second leaves were examined on plants along a diagonal traverse starting 10 m from the edge of the field. Disease severity ratings were made according to the criteria shown in Table 1. Since the symptoms of spot and net blotch are sometimes difficult to separate, leaves from each of the fields were collected for subsequent reference and symptom confirmation.

To confirm the causal agent of leaf spots, leaves were incubated in moisture chambers at 16°C and 24°C. Sporulation of ***P. teres*** is favoured at the lower temperature while ***B. sorokiniana*** sporulates at higher temperatures. Results of these tests were used to confirm field observations.

Table 1. Number of fields in each disease severity category for spot blotch and net blotch in 1978

Category	Explanation	Spot blotch	Net blotch
Absent	no disease	13	0
Trace	when number of lesions averages less than one per leaf	11	2
Slight	lesions cover up to 5% of leaf area	16	14
Moderate	lesions cover up to 10% of leaf area	5	23
Severe	lesions cover more than 10% leaf area	0	6

Results and discussion

The symptoms of spot blotch and net blotch are shown in Figures 1 and 2. Although typical symptoms of both diseases appear quite distinct there are often similarities (7, 9) which may confuse the assessor. In this survey, laboratory tests indicated that all net blotch symptoms sporulated to produce conidia typical of the imperfect stage of ***P. teres.*** Most of the spot blotch symptoms produced conidia of ***B. sorokiniana.*** However few spot blotch symptoms produced only P. ***teres*** conidia. Field assessments were modified according to these results. None of the 45 fields surveyed were free from leaf spot symptoms. Net blotch symptoms were present in all fields (Table 1, Fig. 3). Twenty-three fields (51%) had moderate symptoms and 6 fields (13%) were severely infected. There were no fields in the severe category for spot blotch and only 5 fields (11%) in the moderate category. The remaining 40 fields had few or no spot blotch symptoms (Table 1).

Net blotch was therefore more frequent in occurrence and more severe than spot blotch in 1978. This confirms casual observations made in 1976 and 1977. Aerial Spore populations of ***P.*** teres were 10 to 20 times greater than those of ***B. sorokiniana*** in 1977 and 1978.

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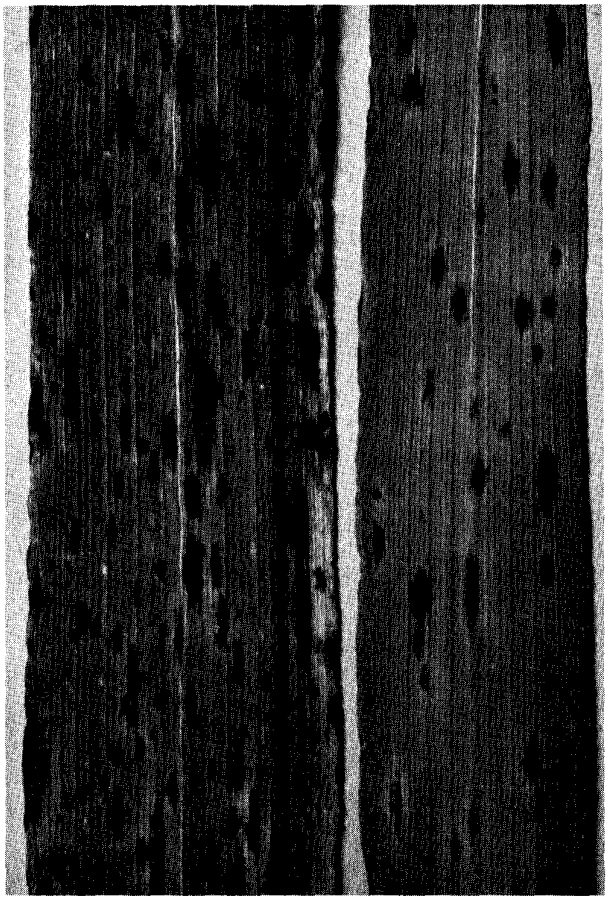

Fig. 1. Symptoms of spot blotch (*Bipolaris sorokiniana*) on Loyola barley.

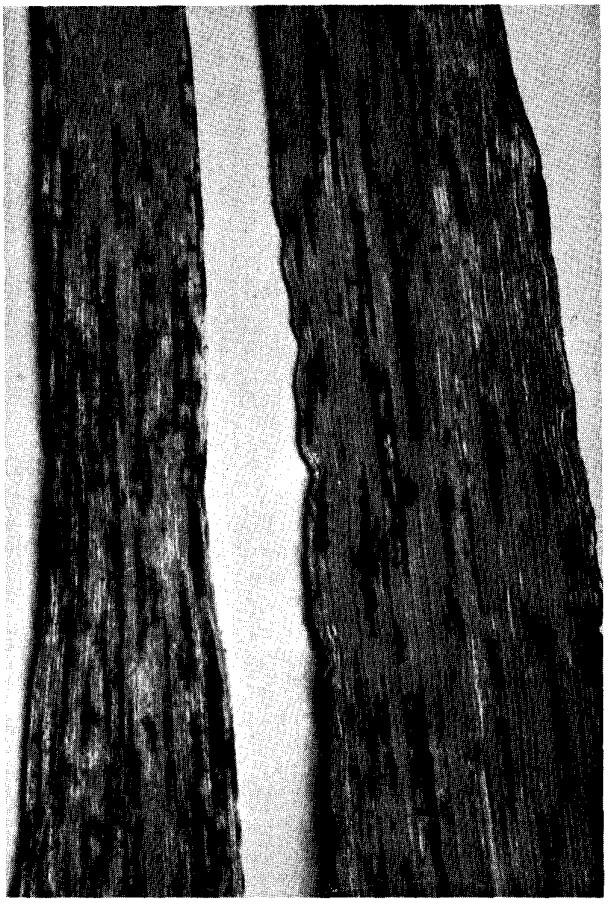

Fig. 2. Symptoms of net blotch (*Pyrenophora teres*) on Loyola barley.

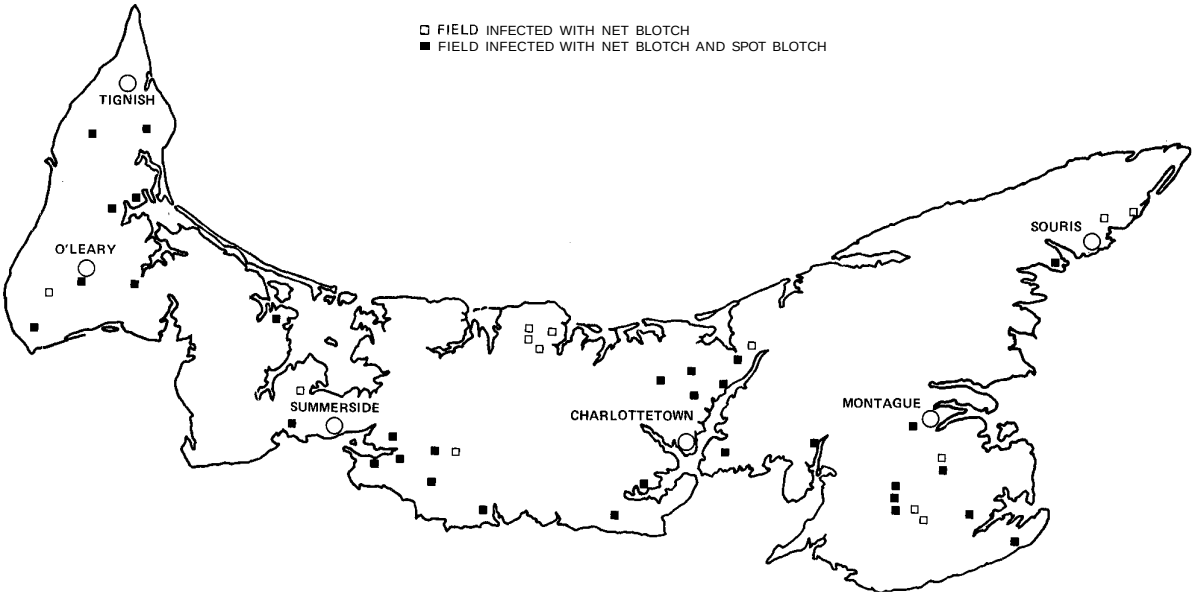

Fig. 3. Map of Prince Edward Island showing fields surveyed and diseases present.

There was no clear relationship between disease and cultivar or disease and management practices. Nine of the fields surveyed had been in barley for two years. Disease was not greater in these fields than in fields which were in potatoes, forage, or another cereal the previous year.

Other diseases noted were scald caused by ***Rhynocosporium secalis*** (Oudem) J. J. Davis in 32 (71%) fields, ***Selenophoma donacis,*** var. ***stomaticola*** (Bauml.) Sprague, A. G. Johnson (6) in 3 (7%) fields and non-parasitic brown spot in 5 (13%) fields.

These results indicated that a variety of leaf spotting fungi are responsible for symptom production and in Prince Edward Island barley fields. Net blotch appears to be the most significant disease, however, more surveys are needed to confirm this.

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