Cereals/Céréales

CROP: Barley and Wheat

LOCATION: Central Alberta

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TITLE: CEREAL DISEASE SURVEY IN CENTRAL ALBERTA, 1995

METHODS: Cereal fields were randomly selected approximately every 10 km in Alberta Census District 8 (north central Alberta) and sampled for disease incidence and/or severity. This area encompassed Sylvan Lake and Rimbey on the west, Bashaw on the east and was bordered north and south by Ponoka and Lacombe, respectively. Fields were traversed in an inverted V, with analysis of 5 plants taking place at 3 locations. Leaf disease was scored on a 0-9 scale where 9 = more than 50 percent area diseased (PLAD) on each of the upper, middle and lower leaf canopies. Common root rot (CRR) was assessed on a 0-4 scale where 1 = trace and 4 = severe. Other diseases were rated as a percent of the field infected.

RESULTS AND COMMENTS: The results are presented in Table 1. July was cool and wet, resulting in crops with high yield and quality. Fifty-six fields of barley were examined, 22, 2-row and 34, 6-row. Scald (*Rhynchosporium secalis*) and net blotch (*Pyrenophora teres*) were more severe (scored higher) in the 2-row compared to 6-row fields. This was due to the prevalent planting in CD 8 of the 2-row cvs., Harrington (susceptible to scald and net blotch) and Manley (susceptible to scald and intermediate to net blotch). Loose smut incidence (*Ustilago nuda*) appeared to be on the rise, mainly in 6-row barley, with one field rating 2% infection. Barley yellow dwarf (BYD) was present in 19 fields and spot blotch (*C. sativus*) was noted in the southern half of CD 8 between Innisfail and Elnora. One field with barley leaf stripe (*P. graminea*) was noted. Sixteen wheat fields were examined, all showing symptoms of septoria leaf spot (*Septoria* spp.). Tan spot (*P. tritici-repentis*) was more common in the southern part of CD 8 with low levels in 4 fields. Take-all (*Gaeumannomyces graminis*) incidence was down this year, with only 3 fields noted with the disease. Of interest were 5 fields in the north that exhibited abnormal head kinking. This appeared to be physiological and was more common in certain cultivars such as AC Michael.

TABLE 1. Severity and incidence of diseases in barley and wheat fields in north central Alberta in 1995.

CROP	AVERAGE DISEASE RATING/NUMBER OF FIELDS AFFECTED*							
	Scald 0-9	Net Blotch 0-9	CRR 0-4	Loose Smut %	Bacterial Blight %	BYD %	SPOT Blotch 0-9	Physiol Spot 0-9
Barley								
2-row	4.7/21	4.2/18	.8/20	0.5/2	tr/1	tr/5	5.0/2	5.0/1
6-row	2.9/26	3.0/28	.5/24	1.0/10	tr/5	tr/14	3.7/9	6.0/2
	Septoria 0-9	Tan Spot 0-9	CRR 0-4	Loose Smut %	Take-all %	BYD %	Powdery Mildew %	Kernel Blast %
Wheat	3.9/16	3.5/4	.4/8	tr/1	.5/3	tr/5	tr/1	5/2

* tr = trace amounts (< 1%).

CROP: Barley, Oat and Wheat

LOCATION: Manitoba and eastern Saskatchewan

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TITLE: STEM RUSTS OF CEREALS IN WESTERN CANADA IN 1995

METHODS: Surveys of fields and nurseries of barley, oat and wheat for incidence and severity of stem rust (*Puccinia graminis* Pers. f.sp. *tritici* Eriks. & E. Henn. and *P. graminis* f.sp. *avenae* Eriks. and E. Henn.) were conducted in Manitoba in July and August, 1995. Samples for race identification were obtained from fields and trap nurseries in Manitoba, Saskatchewan, and Alberta.

RESULTS AND COMMENTS: Conditions in Manitoba generally were very warm and dry in 1995. The temperatures were suitable for stem rust development, but moisture was very inconsistent. The incidence of stem rust thus was variable in 1995. All oat and wheat cultivars recommended for the rust area are resistant to stem rust, and no losses were expected. Infections of susceptible lines in nurseries also were lower than normal, with maximum levels of 20% for wheat stem rust and 50% for oat stem rust, depending on location. Infections of wild oat generally were light. The main variability in the occurrence of stem rust was in commercial barley fields. In most earlier planted fields, and where there was limited rainfall, infection levels ranged from 2 - 5%, which is insufficient to cause significant losses. More serious infections, however, developed in later-sown fields and where local rain showers occurred, resulting in infection levels of up to 60 - 70%. These levels will cause significant economic losses. Stem rust became common on wild barley later in fall.

For *P. graminis* f. sp. *tritici*, the predominant race was QCCJD, followed by lower incidence of RCRSH, TMRKR, and QFCSH. The race QCCJD is particularly virulent to barley cultivars with gene *RPg1* for resistance. For *P. graminis* f. sp. *avenae*, the most common races were NA27 and NA29.

CROP: Barley, Oat and Wheat

LOCATION: Manitoba and Saskatchewan

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TITLE: CEREAL SMUT SURVEY, 1995

METHODS: In July 1995, cereal crops were surveyed for *Ustilago hordei*, *U. nigra*, *U. nuda*, *U. tritici*, *U. avenae* and *U. kolleri* in Manitoba and Saskatchewan. The area was covered by routes from Winnipeg - Estevan - Moose Jaw - Saskatoon - Prince Albert - Canora - Roblin - Russel - Winnipeg, as well as one day trips north and south of Winnipeg. Fields were selected at random at approximately 15 km intervals, depending on the frequency of the crops in the area. An estimate of the percentage of infected plants (i.e. plants with sori) was made while walking an ovoid path of approximately 100 m in each field. Levels of smut greater than trace were estimated by counting plants in a 1 m^2 area at a minimum two sites on the path. *Ustilago nuda* and *U. nigra* were differentiated by observing germinating teliospores with a microscope.

RESULTS AND COMMENTS: Loose smut (*U. tritici*) of bread wheats was found in 36% of the 155 fields surveyed. In most fields only trace levels occurred; the highest level found was 0.5%. In durum wheats, loose smut was more common and found in 66% of the 38 fields surveyed. Again, most fields had trace levels, with 0.2% being the highest found. As has been the case for several years, very few oat fields (15% of 20 fields surveyed) had smut. The levels in the three positive fields surveyed were trace, 0.5 and 3.0%. The highest incidence of smut was found in barley with 73% of the 105 fields surveyed being affected. Incidence was higher in 6-rowed barley (83% of fields) with most fields having levels of 0.1 to 0.2% smut, but 1 to 5% smutted plants was not uncommon. In 2-rowed barley, 48% of fields were affected with about half of these having trace levels; the remainder had levels of 0.1 to 0.5%. False loose smut (*U. nigra*) and covered smut (*U. hordei*) were found in fields of 6-row barley only. Plants in three fields were infected with false loose smut (0.4, 0.3 and 0.1% infected plants) and plants in 6 fields were infected with covered smut (2.0, 0.2, 0.1, 0.1, 0.1 and 0.1% infected plants). False loose smut infected plants were always associated with loose smut infected plants, and in all but the two most heavily infected fields, covered smut infected plants were associated with loose smut infected plants.

CROP: Barley, *Hordeum vulgare* L.

LOCATION: Manitoba

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TITLE: LEAF SPOTS AND FUSARIUM HEAD BLIGHT OF BARLEY IN MANITOBA IN 1995

METHODS: Eighty-two barley fields in southern Manitoba were surveyed for foliar and head diseases between July 27 and August 4, 1995. The 77 six-rowed and 5 two-rowed fields were selected at random along the survey routes depending on crop frequency and availability, in a similar region as sampled in 1994 and 1993. Leaf spot disease incidence and severity were assessed on 10 or more plants along a diamond-shaped transect about 50 m long begun a few paces from the field edge. Disease levels were estimated in both the upper (flag and penultimate leaves) and lower crop canopies using a five category scale: 0 (no visible symptoms), trace (<5% leaf area affected), slight (5-15%), moderate (16-40%) and severe (41-100%). When symptoms of fusarium head blight (FHB) were present, counts of four sub-samples of 50-100 heads were made to determine severity. Samples of infected leaves and heads were collected as appropriate for subsequent pathogen isolation and identification.

RESULTS AND COMMENTS: Conditions in Manitoba were generally dry and hot during the 1995 growing season reducing severity of foliar and head diseases in barley compared to the previous 2 years. Disease levels on upper leaves were moderate to severe in only 1.2% of fields. *Pyrenophora teres* (causal agent of net blotch) and *Cochliobolus sativus* (spot blotch) were isolated from 92 and 76% of fields, respectively, and as is normal were the most common pathogens/diseases found. However, *Septoria passerinii* (speckled leaf blotch) was much more prevalent than usual and was found in 50% of fields. Scald was not detected in 1995 in the fields surveyed. Based on leaf spot severity on upper leaves (mainly trace or slight) and lower leaves (mainly slight or moderate), leaf spots generally caused minor damage in 1995, likely less than 5% of potential yield.

Fusarium head blight was detected in 39 of the 82 fields surveyed (48%). Average infection levels in positive fields were 11.3% (range 0.1-68% of heads with FHB), with individual heads having 2-10% of florets blighted. The more severely affected fields were in the Red River Valley south of Winnipeg. *Fusarium graminearum* and *F. poae* were the species most commonly isolated (37 and 28% of all fields, respectively), but 4 other species, *F. avenaceum, F. culmorum, F. equiseti,* and *F. sporotorichioides* each made up 4-5% of isolations.

CROP: Barley, Oat and Wheat

LOCATION: Manitoba

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TITLE: CEREAL VIRUS DISEASE SITUATION IN MANITOBA IN 1995

METHODS: Research plots and farm fields in southern Manitoba were surveyed for the presence of virus diseases in the summer of 1995.

RESULTS AND COMMENTS: Barley Yellow Dwarf (BYD) - Prolonged, strong southerly winds in early season (mid-June) 1995 were expected to increase the likelihood of severe BYD outbreaks in Manitoba and eastern Saskatchewan. However, no extensive losses due to BYD were subsequently observed in cereal crops planted before June 1. As in recent years, most virus isolates that were obtained from small grains were of the PAV strain (non-specifically transmitted by the oat bird-cherry aphid). Although no large-scale losses due to BYD were observed, fields planted very late would have sustained losses of up to approximately 10%, slightly lower than in 1994. Recent Winnipeg oat cultivars performed very well under conditions of severe BYDV infection brought about by artificial inoculation at early seedling stages. In co-operative nurseries, the effects of the renewed use of highly susceptible oat germplasm in breeding programs that do not screen for BYDV tolerance was again evident, and confirmed similar observations first made in 1993.

Flame Chlorosis (FC) - Barley continues to be the cereal crop most seriously affected by this novel, soil-transmitted, virus-like disease. In 1995, losses in barley or wheat due to FC were generally not extensive. However, there were localized outbreaks in the Red River Valley that were more severe than those observed in 1994.

Wheat Streak Mosaic (WSM) - Localized outbreaks of WSM in spring wheat crops in Manitoba in 1995 occurred in the vicinity of infected winter wheat, but overall losses were very small. Field trials, using artificial virus inoculum, confirmed that substantial differences in tolerance to WSM exist among established wheat cultivars and advanced breeding lines.

CROP: Barley, Oat and Wheat

LOCATION: Maritime Provinces

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TITLE: Diseases of cereals in the Maritime Provinces in 1995

METHOD: Research sites in New Brunswick, Nova Scotia and Prince Edward Island were visited during June and July of 1995. In addition, commercial growers fields were examined in each of these areas at the same time. Principle foliar and head disease symptom severity was assessed with pathogens isolated in the laboratory when required for disease confirmation.

RESULTS AND COMMENTS: Weather conditions during the winter of 1994/95 were conducive to winter wheat survival in the regions of the Maritime Provinces where this crop is produced commercially. During 1995 spring planting conditions were timely in May with little weather delayed plantings observed. Rainfall during July and August were less abundant than normal resulting in few significant fungal disease problems.

Wheat - Winter-kill was not observed in fields except in isolated areas unsuited to the crop due to drainage or other problems and the crop gained in popularity during the past year. While weather conditions were conducive to good winter survival, increased plantings were attributed to market price. An increase in production of the more winter hardy feed wheats rather than the less hardy milling cultivars occurred. To this change in type was also ascribed a decrease in occurrence and severity of powdery mildew (*Erysiphe graminis* f. sp. *tritici*) as the feed wheats, principally cv Borden, are more resistant to this disease than milling cultivars. Less nitrogen fertilizer was generally applied to the feed wheat crops than required for milling cultivars and this also contributed to this disease being less noticeable in 1995 than in previous years. Symptoms of powdery mildew were also less severe on spring wheat crops. This has been attributed to newer cultivars being more resistant and possibly also due to lower nitrogen fertility requirements compared to earlier cultivars. The Septoria diseases (*Stagonospora nodorum*) on both leaves and heads were widespread but due to the dry weather, remained at reduced severity and primarily on lower leaves. Fusarium head blight (*Fusarium graminearum* and other species) developed in research plots to a level where differences between cultivars was obvious. No harvests of commercial crops have been reported to-date as being rejected for contamination by mycotoxins. Take-all, rusts, and barley yellow dwarf symptoms were recorded infrequently. Crops were not examined for severity of common root rots.

Barley - Fungal disease noted in 1995 were similar to previous years, with no change in predominance and little change in severity. In general overall disease severity in the Maritime region was limited to a low or moderate level due to dry weather. Powdery mildew (*Erysiphe graminis* f.sp. *hordei*) was a limited problem in some 6-row barley cultivars in New Brunswick, however severity was low as infection occurred late in the season. Powdery mildew was not a problem in PEI outside of a number of very susceptible lines in cultivar development trials. Net blotch (*Pyrenophora teres*) was of moderate severity on PEI, although some areas exhibited severe disease symptoms which probably had a significant impact on yield. In New Brunswick, net blotch severity was low, particularly in the northeastern area of the Province were the dry weather was not conducive to disease development. Scald (*Rhynchosporium secalis*) occurred at low to moderate levels throughout the region, being most severe in PEI. In isolated instances severe disease symptoms were noted on both 2 and 6 row cultivars.

Fusarium head blight (*Fusarium graminearum*) did occur, however the severity of symptom expression was extremely low and only a limited number of heads demonstrated symptoms. No reports of severely infected fields were recorded in 1995. A small number of barley plants infected with barley leaf stripe were found in breeding trials, however no plants were found or reported in commercial seed lots. Loose smut (*Ustilago nuda*) was widespread in the region but at very low levels (less than 0.1%). Covered smut (*Ustilago hordei*) was noted in one barley field, a hulless cultivar.

Oats - This crop has declined in production in Nova Scotia and Prince Edward Island in recent years and fewer fields or research plots were examined in 1995 than in previous years. The principle disease observed was speckled leaf blotch (*Stagonospora avenae*) but severity in all areas was reduce due to dry weather during the later part of the summer.

CROP: Oat

LOCATION: Manitoba and eastern Saskatchewan

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TITLE: CROWN RUST OF OAT IN WESTERN CANADA IN 1995

METHODS: Surveys of oat crown rust (caused by *Puccinia coronata* Cda. F. sp. *avenae* Eriks.) incidence and severity were conducted in southern Manitoba from late June to Mid-August, and in eastern Saskatchewan in June and mid-August. Crown rust collections were obtained from wild oat (*Avena faua* L.) and commercially grown oat in farm fields, and from susceptible and resistant oat lines grown in uniform rust nurseries. Rust nurseries were composed of susceptible lines, single-gene lines with resistance gene *Pc48* or *Pc68*, lines with resistance genes *Pc38*, *Pc39*, and *Pc68* combined, and common cultivars Dumont and Robert (both have resistance genes *Pc38* and *Pc39*). The nurseries were located near Brandon, Emerson, and Morden, Manitoba, and Indian Head, Saskatchewan. Rust collections were increased on the susceptible cv. Makuru in the greenhouse. One single-pustule isolate, established from each collection, was evaluated for virulence phenotype (race), using 18 backcross lines, each carrying a different gene (*Pc35, Pc38, Pc39, Pc40, Pc45, Pc46, Pc48, Pc50, Pc54, Pc56, Pc58, Pc59, Pc60, Pc61, Pc62, Pc63, Pc64*, or *Pc68*) for resistance to crown rust as differential hosts.

RESULTS AND COMMENTS: Oat crown rust was less severe than in the two previous years. Traces of crown rust were first detected at Carman, MB, in the last week of June, but subsequent hot, dry weather slowed development and kept infections light. By mid-August infections remained light in oat fields in the Red River Valley. In Carman and Portage where local showers occurred, infections were somewhat heavier, ranging up to 20% in farm fields and 60% on wild oat. Aecial infections were found on buckthorn, the alternate host, in Regina and Saskatoon in June 1995, however, very little crown rust was found on wild oat or the oat crop in eastern Saskatchewan in mid-August.

To date, 189 single-pustule isolates have been isolated and 100 virulent phenotypes have been identified. One hundred and twenty-two isolates, comprising 47 virulent phenotypes, were virulent on lines having both genes *Pc38* and *Pc39*. Several of these isolates were virulent on lines having *Pc38, Pc39* and *Pc48* combined, but non of the isolates was virulent on lines with *Pc38, Pc39, Pc48*, and *Pc68* combined. Cultivars with this gene combination are being developed at the Cereal Research Centre, Winnipeg. As in previous years, the newly-derived gene, *Pc94*, from *A. strigosa* was highly resistant to all isolates from Canada in 1995, and should prove to be valuable in breeding programs.

CROP: Oat, *Avena sativa* L.

LOCATION: Quebec

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TITLE: DISEASE PICTURE OF OATS IN QUÉBEC IN 1995

METHODS: Most experimental sites of cereals and a number of farmers' fields in Quebec were visited at least once in the period from mid-July to mid-August. At each visited site, diseases were identified and their severity assessed in all oat lines and cultivars grown there. Selected plant samples were also collected from field crops at various locations and were examined in the laboratory. Plant growth stage at the time of assessment or sampling ranged from medium milk to medium dough.

RESULTS AND COMMENTS: After a wet spring the 1995 growing season was one much drier than normal and resulted in a somewhat modified disease pattern.

Lower levels of speckled leaf blotch (*Stagonospora avenae*) were observed and its occurrence was not as widespread as usual. The overall average was low to moderate. Very late and limited symptoms developed in south western, St. Hyacinthe and Lake Saint-Jean regions.

Crown rust (*Puccinia coronata*) development was more limited than usual, and it was detected in a more narrow number of sites. In addition the highest severity did not occur as usual in the south-west part of the province, where it has been consistently a disease of importance. In fact, at Ste. Anne de Bellevue it was found at trace levels in naked oat cultivars and at low levels in covered oat cultivars. In the lower St. Lawrence region, disease was up to moderate levels, especially in covered oat cultivars. Susceptibility of naked oat cultivar AC Baton approached those of covered oat cultivars at La Pocatiere. Elsewhere in the province disease did not develop beyond trace levels except at Deschambault. The lower susceptibility of naked oat cultivars was consistent at all sites.

Stem rust (*Puccinia graminis*) presence was not noticed at any site visited this year, as is usually the case.

Foliage symptoms of yellow dwarf (**Barley Yellow Dwarf Virus**) were moderate in average and they were found at most visited sites. Infections appeared to have come late in many instances and caused limited damage. Presence of the PAV type was confirmed in ELISA tests of plant samples from most sites. None of the plants collected at Normandin (Lake Saint-Jean region) tested positive for PAV type.

Oat blast (white empty florets) was not especially noticeable this year. The disease was more conspicuous at St. Hyacinthe than elsewhere.

The smut diseases (*Ustilago* spp.) were showing in some farmers' fields as resistance is not present in all cultivars and as seed lots are not consistently treated with fungicide. The occurrence of noticeable levels of smutted panicles in some fields grown from treated seeds might be related to a limited efficacy of seed treatments currently performed in the industry.

Finally, scab or head blight (*Fusarium* spp.) was found in small amounts at some visited sites. It was uncommonly noticeable at Pintendre (south shore of Québec City region) where an average of 0.03% diseased spikelets was estimated at the late milk growth stage. Isolations on agar media confirmed the presence of *Fusarium avenaceum* as the primary causal agent.

CROP: Oat, *Avena sativa* L.

LOCATION: Quebec

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TITLE: INCIDENCE OF SCAB IN OAT CULTIVARS IN QUEBEC IN 1995

METHODS: An unusually high incidence of scab (*Fusarium* spp.) was observed in oat plots grown at Pintendre, Quebec, in the summer of 1995. In the Quebec oat registration/recommendation test plots grown there, the number of diseased spikelets were counted in each plot on 28 July. The average growth stage on that day was late milk. The test was planted in three replicates and each plot consisted of 4 rows that were 3 m in length. Actual count data were transformed to log(x+1) before performing analysis of variance. Means were compared using Fisher's Protected LSD test at $P \leq 0.05$. Contrasts of groups of means were also calculated to compare cultivar types. Cultures of *Fusarium* were isolated from a number of grains on agar media in Petri dishes. They were examined to determine the primary species involved.

RESULTS: It was determined that a range of *Fusarium* species, primarily *avenaceum*, were involved as causal agents. It should be noted that *F. graminearum*, the main causal agent of scab in wheat, was not detected in the set of plots tested. Actual counts of infected spikelets in plots ranged from 0 to 67. Transformation of data to log(x+1) resulted in an even distribution of residuals versus Y in a scattergram. Results of statistical analyses are presented in Table 1. Means reported in the table are detransformed values of means of log (x + 1) data. Analysis of variance yielded a F value of 11.189 for cultivars significant at $P = 0.0062$. Means were classified under five categories with the Fisher's Protected LSD test ($P \leq 0.05$). Among the 17 genotypes tested, QO 617.32 and OA 949-2 differed from most others in being less susceptible. Comparisons of means using contrasts did not prove significant for cultivar types, namely naked and covered oats ($F = 0.245$, $P = 0.624$).

COMMENTS: As far as oats is concerned, scab is rarely a problem. But the present results indicate that scab levels may be significant under some circumstances in oats and that differences between cultivars do occur in nature, as was the case at Pintendre in the summer of 1995. It is estimated that the proportion of spikelets infected was 0,03% overall and reached a maximum of 0,24% in one plot. Although more severe disease levels would be required to assess susceptibility or resistance of cultivars more precisely, this is evidence that there are occasions to seize whenever and wherever they appear, to obtain useful and significant information on genotypes in test plots. Such information ought to be used and considered in making registration and recommendation decisions.

TABLE 1. Severity of scab in oat genotypes grown at Pintendre, Quebec, in 1995.

Cultivar/line	Type	Infected spikelets/plot	Fisher's Protected LSD (P≤0.05)
QO 617.132	covered	1.2	a
OA 949-2	covered	1.3	a
AC Lotta	naked	2.4	ab
NO 857-28	naked	2.5	abc
QO 617.130	covered	3.0	abcd
SO 91079	covered	4.9	bcde
Sylva	covered	5.2	bcde
CFA 93208	covered	5.6	bcde
CFA 90202	covered	6.1	bcde
NO 61-1	naked	6.8	bcde
AC Baton	naked	6.8	bcde
PA 95275	covered	7.4	bcde
QO 621.15	covered	7.6	cde
NO 66-4	naked	7.7	de
Nova	covered	9.1	e
AC Rigodon	covered	10.7	e
Ultima	covered	11.7	e

CROP: Wheat, *Triticum aestivum* L.

LOCATION: Southwestern Saskatchewan

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TITLE: LEAF SPOTTING DISEASES OF WHEAT IN SOUTHWESTERN SASKATCHEWAN IN 1995

METHODS: Twenty-two commercial fields of durum and hard red spring wheat in southwestern Saskatchewan were surveyed for severity of leaf spotting diseases. A random sample of 25 - 30 upper leaves was collected from plants at the milk stage of growth in fields that were under different tillage regimes and/or crop rotation systems. Percent leaf area covered with leaf spots was estimated for each sample. Diseased leaf tissue was surface disinfected and plated on water agar to determine the relative proportion of the leaf spotting fungi.

RESULTS AND COMMENTS: The average percent flag leaf area covered with leaf spots was 11%. The lowest severity (<5%) was found in several of the fields under continuous wheat or under a rotation with a noncereal crop, whereas the highest (25 - 50%) levels were found in wheat after chemical fallow. The most common pathogen isolated from diseased leaf samples was *Pyrenophora tritici-repentis* (tan spot). It was present in all 22 fields, covering an average of 82% of flag leaf area. *Septoria nodorum* (septoria nodorum blotch) was found in 86% of fields at an average of 18%. *S. avenae* f.sp. *triticea* (septoria avenae blotch) and *Cochliobolus sativus* (spot blotch) were the least common fungi, found in 32% of fields at an average of 3%, and in 23% of fields at 6%, respectively. *C. sativus* was found only in the Maple Creek and Shaunavon area.

CROP: Wheat

LOCATION: Manitoba and eastern Saskatchewan

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TITLE: WHEAT LEAF RUST IN WESTERN CANADA - 1995

METHODS: Surveys of fields, research plots and nurseries for incidence and severity of wheat leaf rust were done in Manitoba and eastern Saskatchewan in June, July and August 1995.

RESULTS AND COMMENTS: Wheat leaf rust, caused by *Puccinia recondita* f. sp. *tritici*, was first observed in winter wheat plots at Carman Manitoba on June 16. Rust infections were found on spring wheat at Glenlea Manitoba on June 25. Leaf rust infections were widespread in fields of spring wheat in the Red River Valley of Manitoba by the first week of July. Warm temperatures with frequent dew periods at night provided favourable conditions for the rapid increase and spread of leaf rust in Manitoba during the summer of 1995. In the first week of August nearly all spring wheat fields in Manitoba that were surveyed were infected with leaf rust to varying degrees, depending on the cultivar being grown. Heavy leaf rust infections were observed at plots in Carman, Rosebank, Portage, and Brandon. Plots of susceptible wheat at Indian Head and Regina had light levels of leaf rust infection. Leaf rust infections were also lighter in farm fields in Saskatchewan compared to Manitoba.

In Manitoba, the cultivar Katepwa was severely affected by rust, with infection levels 50% - 90%. The resistance in Katepwa is no longer effective in years that are conducive to rust epidemics. It should be considered for removal from the recommended varieties for Manitoba. Cultivars AC Barrie, CDC Teal, and Roblin and moderate levels of infection between 10% - 40%. More recent cultivars released by the Cereal Research Centre, Winnipeg: Pasqua, AC Minto, AC Cora, and AC Domain were highly resistant, with infection levels less than 5%. The CPS cultivar AC Foremost had high levels of infection, between 50% - 90%, while the cultivars AC Taber and AC Karma had moderate infection levels between 10% - 50%.

CROP: Wheat

LOCATION: Manitoba

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TITLE: SURVEY OF FOLIAR PATHOGENS OF SPRING WHEAT IN MANITOBA IN 1995

METHODS: One hundred and sixty-two fields of wheat (142 common, 15 semi-dwarf, and 5 durum) in southern Manitoba were surveyed between heading and soft dough stages of development for foliar pathogens between 27 July and 3 August 1995. Severity of disease on upper and lower leaves was categorized as 0, trace, 1, 2, 3 or 4, with 4 describing dead leaves and 1 lightly affected. Samples of diseased leaf tissue were collected from each site, and were subsequently surface sterilized and placed in moisture chambers for 5-7 days to promote pathogen sporulation and facilitate disease identification.

RESULTS AND COMMENTS: In general, leaf spot diseases in southern Manitoba were less severe in 1995 than in 1994. The exception was incidence and severity of *Septoria tritici* which increased in common bread wheat to 88% (70%; 1994 values in brackets), and accounted for 53% (29%) of all fungal isolations (Table 1). Concomitantly, incidence of *S. nodorum* was lower at 51% (78%) of fields and 15% (32%) of fungal isolations. Incidence and severity of tan spot (*Pyrenophora tritici-repentis)* and *S. avenae* f. sp. *triticea* were similar to those of 1994. Incidence of spot blotch (*Cochliobolus sativus)* was twice that of 1994, but severity remained low.

TABLE 1. Frequency of leaf spot diseases identified in 162 wheat fields in Manitoba in 1995.

Wheat type	Disease				
	Septoria leaf blotch			Spot blotch	Tan spot
	S. nodorum	*S. tritici*	*S. avenae*		
Common	52.0	89.2	47.1	37.3	52.0
Semi-dwarf	80.0	80.0	40.0	20.0	46.7
Durum	20.0	20.0	20.0	40.0	40.0
Total Fields	73	125	55	90	75
Fields (%)	51.4	88.0	38.7	63.4	52.8
Isolations (%)	14.9	53.1	8.6	10.4	13.0

CROP: Wheat

LOCATION: Manitoba

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TITLE: 1995 SURVEY OF FUSARIUM HEAD BLIGHT IN MANITOBA

METHODS: A survey for fusarium head blight (FHB) in spring wheat fields was conducted in southern Manitoba between 27 July and 3 August 1995. Heads were examined in 175 fields (155 common, 5 durum, 15 semi-dwarf) between watery-ripe and medium dough stages of development. The percentage of heads affected with FHB was estimated in each field. Kernels from sampled heads were surface sterilized and incubated on potato dextrose agar under continuous cool white light for 4-5 days to confirm and identify the *Fusarium* species present.

RESULTS AND COMMENTS: FHB was less severe in southern Manitoba in the warm dry summer of 1995 than in the previous two years. However, local shower activity caused favourable conditions for disease development in some fields. FHB levels ranged from zero to 70% of heads affected with up to 80% of the spikelets blighted in individual heads. *Fusarium graminearum* was the principal causal species accounting for more than 80% of isolations from common and semi-dwarf cultivars. Data for durum wheats are sparse as few fields were encountered. A greater diversity of *Fusarium* species were found in 1995 compared to previous years, but species other than *F. graminearum* accounted for less than 1% of the isolations. Saprophytic fungi, including *Alternaria, Cladosporium,* and *Penicillium* species, accounted for the remainder of isolations.

TABLE 1. Frequency of *Fusarium* species isolated from FHB-positive spring wheat fields in southern Manitoba in 1995.

	Wheat Type		
Fusarium spp.	Common (155)	Semi-Dwarf (15)	Durum (1)
graminearum	81.35	83.52	0.0
avenaceum	0.32	0.37	2.9
sporotrichioides	0.15	0.18	0.0
equiseti	0.08	0.0	0.0
culmorum	0.37	0.0	0.0
poae	0.15	0.0	0.0

CROP: Wheat

LOCATION: Québec

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TITLE: DISEASES OF WHEAT IN QUÉBEC IN 1995

METHODS: The incidence of the most common diseases of spring bread and forrage wheat was recorded on the different lines and cultivars of the regional and cooperative test plot trials grown in ten localities covering the wheat growing regions of Quebec. Winter wheat was surveyed at Sainte-Anne de Bellevue, Saint-Hyacinthe and Sainte-Foy. Disease severity assessments was made once during the late milk to soft dough stages.

RESULTS AND COMMENTS: Powdery mildew (*Erysiphe graminis*) was severe on the very susceptible spring bread lines at Lennoxville and moderate to low infections occurred at Saint-Césaire and Sainte-Anne de Bellevue. On forrage wheat, low infections were observed only at Lennoxville on cv. Messier. On winter wheat, moderate infections was observed at the three localities surveyed on the susceptible lines Norstar and PRCR9201.

Leaf spots (*Pyrenophora tritici-repentis*) mixed with *(Phaeospharia nodorum*) was present, in the later part of the season as usual, on spring and winter wheats of S.W. Québec, but only at very low intensities, due to the very dry climatic conditions that prevailled during the season. However, it was severe in the region of Lennoxville and in moderate quantity at those of Sainte-Foy and La Pocatière.

Glume blotch (*Phaeospharia nodorum*) was observed on the susceptible spring wheat lines at moderate intensities only at Lennoxville.

Leaf rust (*Puccinia recondita*) was widespread this year, except at La Pocatière and at Normandin. It was observed only late in the season but was quite severe on the very susceptible lines of both spring and winter wheat.

Fusarium head blight (*Fusarium graminearum*), due to the very dry spell that occurred during the flowering stages of both spring and bread wheat in S.W. Québec, was not found in that region. However, it affected many of the spring wheat lines in only low quantities at Lennoxville, Sainte-Foy and La Pocatière.

Chlorotic fleck (physiological leaf spot) was observed at moderate levels only on the winter wheat line UL21015.8 at Saint-Hyacinthe.

Barley yellow dwarf virus (Yellow dwarf) was quite visible in the winter wheat plots at Saint-Hyacinthe. The most susceptible cultivar was Frankenmuth where about 50% of the plots showed yellowing and dwarfing of the plants.

Other diseases observed at very low intensities were loose smut (*Ustilago tritici*) on some lines in all regions. Take all (*gaeumannomyces graminis*) and ergot (*Claviceps purpurea*) were observed only in the more northern regions.