Special crops

CROP: Canola, cv. Tobin (Brassica campestris L.)

LOCATION: Alberta

NAME AND AGENCY:
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TITLE: INCIDENCE OF THE BLACKSPOT OF CANOLA CAUSED BY ALTERNARIA BRASSICAE (BERK.) SACC. DURING 1987.

METHODS: Twenty-five randomly selected fields were surveyed in central Alberta during August, 1987. Additional information and materials were obtained through Mr. C. Loessin and Mr. L. Turner, both of Alberta Agriculture, Innisfail, and Mr. L.J. Lee of Saskatchewan Agriculture, Nipawin. The disease was confirmed by isolation of the pathogen on V8 juice agar supplemented with rose bengal.

RESULTS: All the fields surveyed revealed the presence of blackspot. Each silique (fruit) had up to numerous blackspot lesions. Alternaria brassicae was isolated from most of the diseased plant. samples collected or received from the various provincial government agriculture personnel. In the severely affected fields, many siliques were undeveloped (or underdeveloped) indicating initiation of infection during the green silique stage. The fungus, in many cases, had penetrated the fruit wall and colonized the developing seed. In 5 fields in the Nipawin, SK, area, the estimated yield of canola ranged from 17-25 bushels/acre with higher than usual dockage in the heavily infected fields (Mr. L.J. Lee, personal communication). A few of these fields had some variable hail damage as well. In Innisfail, Alberta, a heavily infected field had an estimated yield of 15-20 bushels/acre with about 16% dockage (Mr. L. Turner, personal communication). Several heavily infected fields were located on sandy soils. This association has to be studied further, but could have been due to early maturity of the crop and/or due to some nutritional interactions.

CONCLUSIONS: It appears that the blackspot disease was more severe this year than in the previous few years, and was, perhaps, the most economically important disease of canola across the prairies during 1987. In heavily infected fields, the yield losses are estimated to be about *30%* with significantly higher-than-normal dockage.

CROP: Irrtgated Canola

LOCATION: Southern Alberta

NAME AND AGENCY:
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TITLE: SURVEY FOR SCLEROTINIA STEM ROT OF IRRIGATED CANOLA IN SOUTHERN ALBERTA IN 1984

METHODS: Irrigated canola (Brassica napus and Brassica campestris) fields in southern Alberta were surveyed for Sclerotinia stem rot (Sclerotinia sclerotiorum) August 1–15, 1984. The survey covered all the major areas of production of irrigated canola, including Counties of Vulcan, Lethbridge, and Forty Mile, Municipal District of Taber, and Improvement District No. 1 (Medicine Hat). In each field, five random spots of at least 25 m from the edge of the field were selected. The distance between any two spots was approximately 20 m. At each spot, two 1-m rows were marked off and the plants were examined to determine the numbers of diseased and healthy plants. Average percent infection in each field and range of infection were determined.

RESULTS AND COMMENTS: There were about 25,000 ha of canola grown under irrigation in southern Alberta in 1984 (A. M. Harvey, personal communication). Sclerotinia stem rot was found in 46 out of the 68 fields surveyed (See Table below). Of the 46 fields with the disease, the incidence was trace to light in 24 fields but was severe in six fields which had over 50% of the plants infected. The growth stage of the crop surveyed varied with fields, ranging from mid–bloom to early maturity.

The survey indicates that Sclerotinia stem rot of canola is widespread in most of the irrigated areas in southern Alberta. Due to the severe drought in 1984, Sclerotinia stem rot was not found in dryland canola in central Alberta (I. Evans, personal communication). The high incidence of the disease in the irrigated region suggests that Sclerotinta stem rot will remain a serious problem in irrigated crops even in years when it is not present on dryland crops because of weather conditions.

Table. Survey of irrigated canola for Sclerotinia stem rot in southern Alberta in 1984

Census Division	County or Municipal District	No. fields*		% infected plants	
		Surveyed	Diseased	Range	Average
1	Co. Forty Mile	19	15	0.4 - 65.0	22.9
2	MD Taber	35	24	0.6 - 66.1	15.9
2	Co. Lethbridge	5	1	9.7	9.7
5	Co. Vulcan	7	4	3.4 - 23.7	12.5
Total		66	44	0.4 - 66.1	17.8

*Two canola fields in Improvement District No. 1 (south of Medicine Hat) also had Sclerotinia stem rot but notes on percent tnfected plants were not taken.

CROP: Irrigated Canola

NAME AND AGENCY:
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LOCATION: Southern Alberta

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TITLE: SURVEY FOR SCLEROTINIA STEM ROT OF IRRIGATED CANOLA IN SOUTHERN ALBERTA IN 1985

METHODS: Irrigated canola (Brassica napus and Brassica campestris) fields were surveyed for Sclerotinia stem rot (Sclerotinia sclerotiorum) between August 20 and September 17, 1985. the survey covered the Counties of Forty Mile and Vulcan and the Municipal District of Taber. In each field, five random spots at least 25 m from the edge of the field were selected. The distance between any two spots was approximately 20 m. At each spot, two 1-m rows were marked off and the plants in the marked areas were examined to determine the numbers of diseased and healthy plants. Average percent infection in each field and range of infection were determined.

RESULTS AND COMMENTS: There were about 30,300 ha of irrigated canola in southern Alberta in 1985 (A. M. Harvey, personal communication). Sclerotinia stem rot was observed in 16 out of the 23 irrigated fields surveyed (See Table below). The average percent of plants infected in each field was 8.2 with a range from 0.8 to 29.7, The maturity of the crop surveyed varied with fields, ranging from early seed set to completely ripe.

Due to the severe drought in 1985, Sclerotinia stem rot was not found in the traditional Sclerotinia problem area for dryland canola in central Alberta (I. Evans, personal communication). The survey suggested that despite the drought conditions in central and southern Alberta in 1985, Sclerotinia stem rot was still a devastating disease of canola grown under irrigation.

Table, Survey of irrigated canola for Sclerotinia stem rot in southern Alberta in 1985

Census Division	County or Municipal District	No. fields		% infected plants	
		Surveyed	Diseased	Range	Average
1	Co. Forty Mile	5	4	2.4 - 29.7	15.1
2	MD Taber	14	9	0.8 - 28.7	5.4
5	Co. Vulcan	4	3	6.4 - 9.1	7.7
Total		23	16	0.8 - 29.7	8.2

CROP: Irrigated Canola

LOCATION: Southern Alberta

NAME AND AGENCY:
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TITLE: SURVEY FOR SCLEROTINIA STEM ROT OF IRRIGATED CANOLA IN SOUTHERN ALBERTA IN 1986

METHODS: Twenty-two irigated fields and three non-irrigated fields of either Brassica napus or Brassica campestris were surveyed between August 19 and August 26. The area of souther Alberta surveyed included Counties of Forty Mile, Lethbridge, and Vulcan, and the Municipal District of Taber. Canola plants were examined for symptoms of the Sclerotinia disease by inspecting five sites in each field, with two 1-meter rows at each site, and recording the number of diseased and healthy plants. Average percent infection for each field and average percent infection for each County or Municipal District were determined.

RESULTS AND COMMENTS: There were about 16,000 ha of irrigated canola in southern alberta in 1986 (K. Parker, personal communication). The Sclerotinia disease (Sclerotinia sclerotiorum) was observed in 21 out of the 25 fields surveyed (See Table below). The average percent plants infected in each field varied from 0.3 to 20.4%, averaging 5.3%. The disease occurred on cultivars of both B. napus and B. campestris.

Table. Survey of irrigated canola for Sclerotinia stem rot in southern Alberta in 1986

Census Division	County or Municipal District	No. fields*		% infected plants	
		Surveyed	Diseased	Range	Average
1	Co. Forty Mile	11	10	0.6 - 20.4	5.5
2	Co. Lethbridge	9	7	0.3 - 16.2	5.4
3	MD Taber	4	3	1.2 - 5.4	3.5
5	Co. Vulcan	1	1	7.2	7.2
Total		25	21	0.3 - 20.4	5.3

*Three of the fields surveyed were dryland canola located one in each of the Counties of Lethbridge, Vulcan, and the Municipal District of Taber.

CROP: Irrigated Canola

LOCATION: Southern Alberta

NAME AND AGENCY:
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TITLE: SURVEY FOR SCLEROTINIA STEM ROT OF IRRIGATED CANOLA IN SOUTHERN ALBERTA IN 1987

METHODS: Irrigated canola fields were surveyed for incidence of Sclerotinia stem rot (Sclerotinia sclerotiorum) between August 28 and September 9 in the Counties of Lethbridge, Forty Mile (Bow Island), and Vulcan, and the Municipal District of Taber. Canola plants (Brassica napus) were examined for symptoms on stems, leaves and/or pods by inspecting five sites in each field, with two 1-meter rows at each site, and recording the numbers of diseased and healthy plants. Range and average percent infection were determined for each field.

RESULTS AND COMMENTS: There were about 12,000 ha of irrigated canola in southern Alberta in 1987 (B. Roth, personal communication). Sclerotinia stem rot was found in 18 out of the 19 fields surveyed (See Table below). Of the 18 positive fields, the disease incidence varied from 0.7–35%, averaging 10.8% of infected plants in each field.

The crops in the survey fields varied from early seed set stage to completely ripe. The weather conditions for the survey period were generally cool and rainy. Due to lateness of the survey, half of the canola fields examined were already swathed and the disease was determined by the examination of stubble for characteristic lesions of stem blight.

Table. Survey of irrigated canola for Sclerotinia stem rot in southern Alberta in 1987

Census Division	County or Municipal District	No. fields		% infected plants	
		Surveyed	Diseased	Range	Average
1	Co. Forty Mile	3	3	4.9 - 23	13.6
2	Co. Lethbridge	11	10	0.7 - 35	11.1
3	MD Taber	1	1	10.3	10.3
4	Co. Vulcan	4	4	0.7 - 15	8.0
Total		19	18	0.7 - 35	10.8

CROP: Irrigated Canola

NAME AND AGENCY:
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LOCATION: Southern Alberta

TITLE: DISTRIBUTION OF SCLEROTINIA STEM ROT OF IRRIGATED CANOLA IN SOUTHERN ALBERTA, 1984-87

METHODS: Canola (Brassica napus and Brassica campestris) grown under irrigation in southern Alberta was surveyed for Sclerotinia stem rot from 1984 to 1987. The survey in each year covered the major production areas of irrigated canola, including Counties of Vulcan, Lethbridge and Forty Mile, Municipal District of Taber and Improvement District No. 1.

RESULTS AND COMMENTS: The numbers of fields surveyed in 1984, 1985, 1986, and 1987 were 66, 23, 25, and 19, respectively. Brassica napus was found in more than 87% of the fields surveyed each year. Brassica campestris was found in less that 13% of the fields surveyed.

Sclerotinia stem rot of canola was found in most of the irrigated areas in southern Alberta, including Counties of Vulcan, Lethbridge, and Forty Mile, Municipal District of Taber and Improvement District No. 1 (See Figure 1). The highest concentration of diseased fields was in the M.D. of Taber and County of Forty Mile in the area between Grassy Lake and Bow Island.

Results of the 4-year survey suggest that irrigated conditions are conducive to the development of Sclerotinia stem rot of canola. The prevalence of the disease in the Grassy Lake-Bow Island region suggests that the heavy infestation of S. sclerotiorum is due to the growth of canola and other irrigated host crops such as field beans and sunflower in that area.

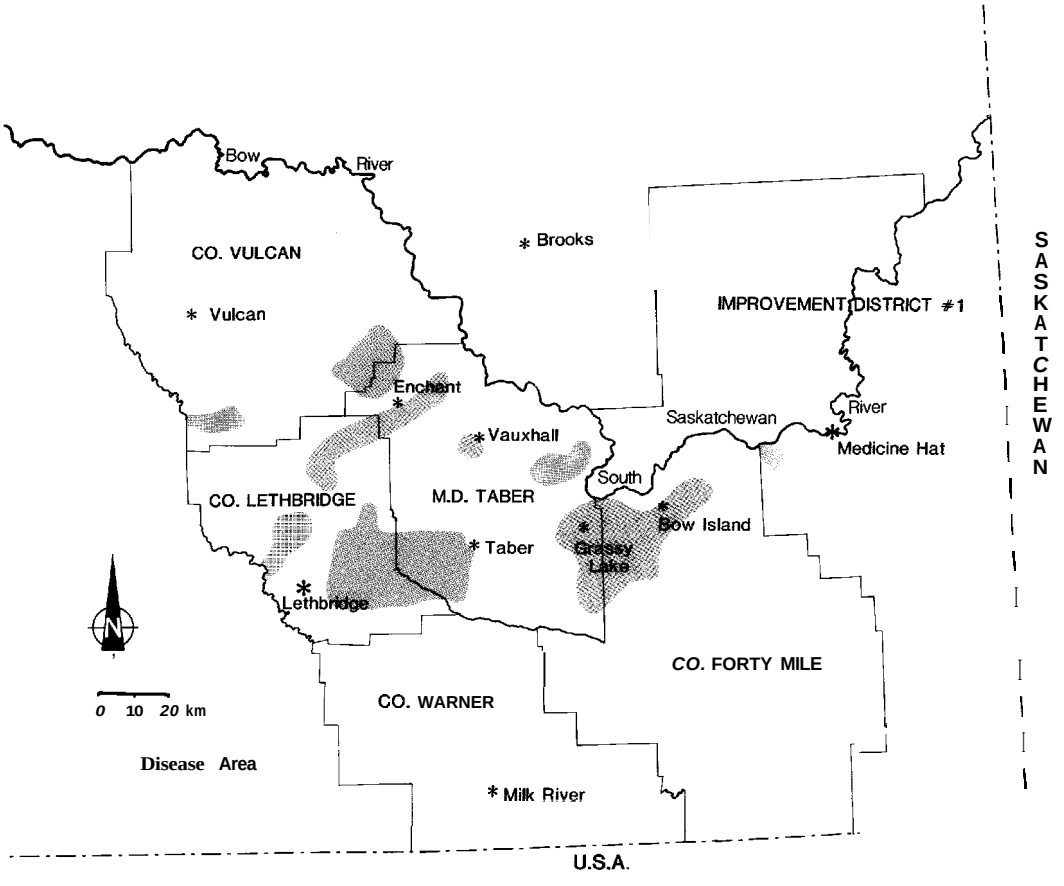

Figure 1. Distribution of Sclerotinia stem rot of irrigated canola in southern Alberta, 1984–87.

CROP: Rapeseed/Canola

LOCATION: Alberta

NAME AND AGENCY:
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TITLE: RAPESEED/CANOLA DISEASE SURVEY IN THE PEACE RIVER REGION IN 1987.

METHODS: A disease survey was conducted in August on 54 rapeseed/canola fields in the Peace River Region of Alberta. The total area of canola in the region in 1987 was about 900,000 acres. Forty-three fields were planted with Tobin (Brassica campestris) and 11 fields with Westar (B. napus).

Fields were sampled by walking into each one in a V pattern and collecting the first plants at a site 30 paces from the edge of the field. Ten plants were selected at random at each of five sites along the V pattern for a total of 50 plants per field. Disease incidence was recorded on every plant, and the incidence of root maggot damage was also noted.

RESULTS: The results are given in Tables 1 and 2.

COMMENTS: The root rot complex was the most prevalent disease affecting 96% of fields observed (Table 1). Disease incidence averaged 48.7% of plants observed in each field.

Incidence of root rot and maggot was compared in Tobin and Westar fields (Table 2). Tobin was more susceptible than Westar. The cultivar Tobin is prevalent in the Peace Region, comprising approximately 85% of the total acreage. Its susceptibility is one of the factors accounting for the high root rot incidence.

Table 1. Prevalence and incidence of diseases of canola in the Peace River Region in 1987.

Disease	% fields infected	% plants infected
Root Rot (Rhizoctonia, Pythium, Fusarium)	96	48.7
Foot Rot (Rhizoctonia, Fusarium)	83	13.9
Staghead (Albugo candida, Peronospora parasitica)	54	5.3
Sclerotinia (Sclerotinia sclerotiorum)	1	0.3
Blackleg (Leptosphaeria maculans)	0	0.0
Aster Yellows (mycoplasma)	0	0.0
Gray Stem (Pseudocercosporella capsellae)	96	31.6
Black Spot (Alternaria spp.)	94	24.6

Table 2. Incidence of root rot and root maggot in Tobin and Westar fields in the Peace River Region in 1987.

Cultivar	No. of fields	% root rot	% root maggot
Tobin	43	57.4	61.0
Westar	11	15.5	2.4

CROP: Canola

LOCATION: Alberta

NAME AND AGENCY: KHARBANDA, P.D., Alberta Environmental Centre, Vegreville,, Alberta,T0B 4L0; EVANS, I.R., Plant Industry Division, Alberta Agriculture, Edmonton, Alberta, T6H 5T6; SLOPEK, S., Regional Crop Laboratory, Alberta Agriculture, Olds, Alberta, T0M 1P0; HOWARD, R.J., Alberta Special Crops and Horticultural Research Center, Brooks, Alberta, T0J 0J0; HARRISON, L., Regional Crop Laboratory, Alberta Agriculture, Fairview, Alberta, T0H 1L0; TEWARI, J.P., Plant Science Department, University of Alberta, Edmonton, Alberta, T6G 2P5; HUANG, H.C., Research Station, Agriculture Canada, Lethbridge, Alberta, T1J 4B1.

TITLE: BLACKLEG OF CANOLA SURVEY IN ALBERTA - 1987

METHODS: Canola fields were surveyed by individual cooperators as indicated in the table below. Approximately one field per 20,000 acres of canola grown in each Crop District was surveyed. Blackleg was identified by visual symptoms in the field, however, the virulent nature of blackleg (Leptosphaeria maculans) was confirmed by laboratory tests (1). Each field was traversed along the path of an inverted V and sampled at 5 spots, about 100 meters apart. In swathed fields, 50 stem stalks and the corresponding adjacent swath were examined for blackleg. In standing crops, 25 plants were checked for the disease. Observations on stem rot (Sclerotinia sclerotiorum), root rot/basal stem rot (Rhizoctonia solani), black spot (Alternaria spp.), and staghead (Albugo candida) were also taken.

Blackleg severity was assessed from low to very severe based upon the depth and size of stem lesions: healthy = no lesion; low = small basal lesion; moderate = lesion up to several cm long; severe = stem girdled but not severed at base; very severe = stem severed, plant lodged.

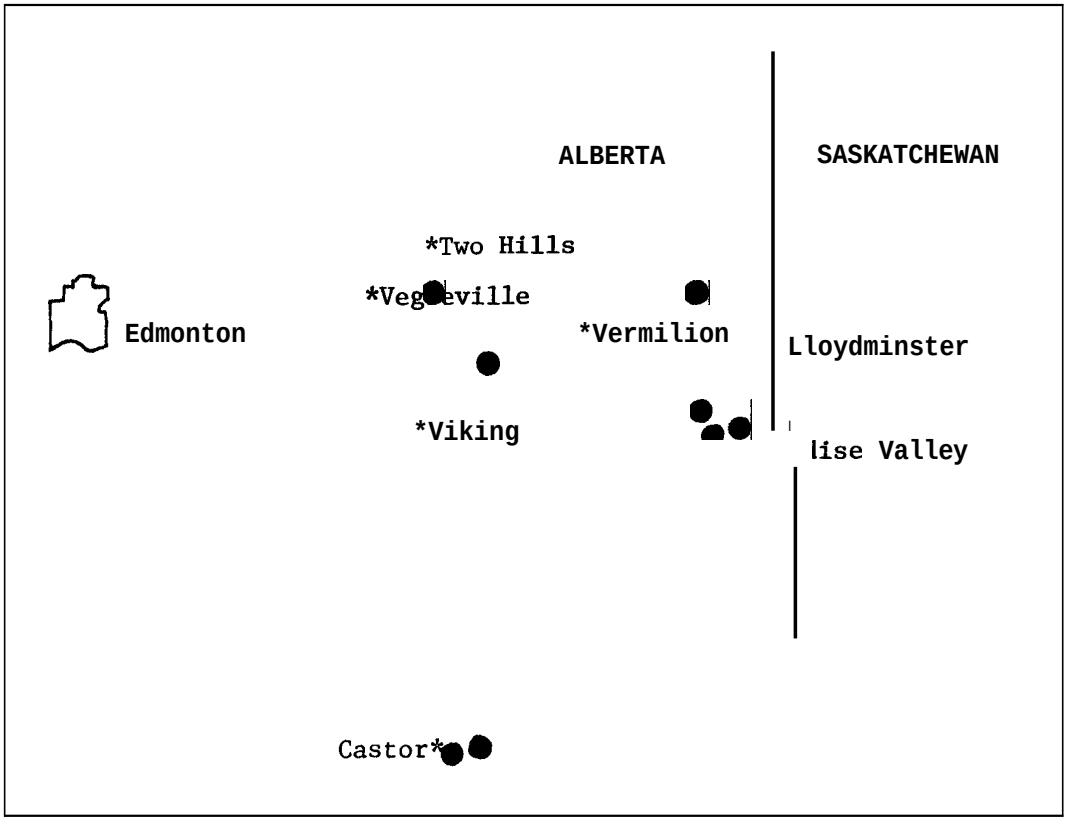
RESULTS AND COMMENTS: See Table below. Blackleg severity was generally low. Highly virulent blackleg was identified in north-central Alberta as indicated on the map below. The incidence and severity of black spot, in general, and staghead in cv. Tobin was higher than in 1986. By contrast, the occurrence of other diseases was considerably lower.

Census Divisions	Acreage (Thousands)	No. of fields surveyed	Surveyors	Fields infested with highly virulent blackleg
1 + 4	35	19	Huang	0
2 + 5	222	12	Howard	0
3 + 6	166	13	Howard	0
7	460	24	Slopek	3
8 + 11	358	26	Evans	0
10	621	36	Kharbanda	9
12 + 13	248	9	Tewari	0
15	837	54	Harrison	0

REFERENCE: 1. McGee, D.C. and G.A. Petrie. 1978. Variability of Leptosphaeria maculans in relation to blackleg of oilseed rape. Phytopathology 68:625-630.

1987 BLACKLEG OF CANOLA SURVEY

INCIDENCE OF THE VIRULENT STRAIN



CROP: Canola

LOCATION: South-Central Alberta

PEST. Blackleg, Leptosphaeria maculans, Stem rot, Sclerotinia sclerotiorum, Grey Stem, Pseudocercosporella capsellae, Powdery mildew, Erysiphe communis, Blackspot, Alternaria spp., Crown borer, unidentified

NAME AND AGENCY:
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TITLE: A SURVEY OF CANOLA DISEASES IN SOUTH CENTRAL ALBERTA, 1987

METHODS: Fifty-one canola fields were surveyed on September 8 and 11 in the counties of Red Deer and Mountainview and the municipal district of Kneehill. Fields were surveyed after swathing but prior to combining. Twenty-five plants were examined at each of ten sites. Each site was 15-30 feet apart, depending upon the width of swath. For blackleg and stem rot, only plants that were girdled were counted as diseased. Diseased sterns were collected and further examined in the laboratory. Isolations were made from the blackleg lesions and virulence was determined using the methods described by McGee and Petrie (1978, Phytopath. 68:625-30). The severity of grey stem and powdery mildew was established by estimating the percentage of infected plants. The following categories (Ellis, 1983, M.P.M. Thesis, SFU) were used, 0 = no plants with lesions, 1 = Trace 5%of plants with lesions, 2 = Slight 6-25%, 3 = Moderate 26-75%, 4 = Severe >75%. Apart from the formal surveys, some observations were made in regards to other field visits and specimens which were received by the Regional Crops Lab, Olds.

RESULTS: The results of the survey are summarized in the figure and tables below. This is the first year in which powdery mildew of canola has been reported in Alberta. Canola plants infected with powdery mildew were received by both the Regional Crops Laboratory in Olds and by R. Howard in Brooks. Apart from the survey two fields in the Innisfail area were found to have very damaging levels of blackspot. It was estimated that yield losses would exceed 50%due to pod damage and seed shrivelling and the inevitable increased losses due to shattering. Blackspot levels appeared to be generally higher than in other years. It was noticed during the survey that an insect of some sort had burrowed into the crown of the plants. Affected plants at the time of the survey were brownish in colour and brittle. Root maggot damage was very common in all fields surveyed. The virulent strain of blackleg was not found.

COMMENTS: The objective of this survey was to provide both quantitative and qualitative estimates of disease severity levels and distributions. Although it is impossible to produce estimates of yield losses from the survey results, they provide an indication of whether disease levels are increasing from one year to the next. Although this is the first report of powdery mildew of canola in Alberta, it appears that the pathogen is widely distributed (42% of fields with infections). Overall stem rot levels were low at 2.3%. The field with 13.2% stem rot had a very bad infestation of hemp-nettle which was also heavily infected with stem rot. Poor weed control has undoubtedly contributed to the stem rot probably in this field. It is felt that the damage caused to

crowns by an as of yet unidentified insect may be causing significant yield losses.

Pest	No. of Fields Rated	% of Fields with Infections	Mean % Incidence per field	Range in % Incidence
Blackleg	51	23.5	0.3	0–4.0
Stem Rot	51	80.0	2.3	0–13.2
Powdery Mildew	40	42.0	-	-
Grey Stem	40	45.0	-	-
Crown borers	15	93.0	8.0	0–21.2

Table 1. Percentage of fields infected with canola diseases and the mean incidence per field.

Pest	Severity Category 0	1	2	3	4
Powdery Mildew	24	11	0	3	2
Grey Stem	23	12	4	0	1

Table 2. Distribution of severity categories for powdery mildew and grey stem.

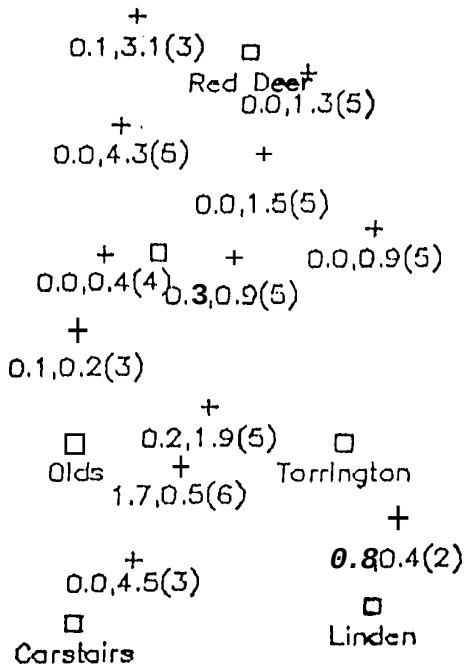

Fig. 1. Disease distribution of blackleg and stem rot. The first number refers to the percentage of blackleg, the second to stem rot and in brackets, the number of fields surveyed.

CROP: Canola

LOCATION: Saskatchewan

NAME AND AGENCY:
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TITLE: DISEASE SURVEY OF CANOLA IN N.E. SASKATCHEWAN

METHODS: Forty four canola fields were surveyed between June 75 and August 12, 1987 in crop districts 5b, 8a, 8b and 9a in N.E. Saskatchewan. Fields surveyed were selected at random throughout each crop district. One plant was selected every ten paces, ten times in each field. Diseases were identified according to the visual symptoms expressed on the plants. Root rot severity was assessed according to the lesions on the roots where 0 = Healthy, 2 = Trace, 5 = Moderate, and 10 = Severe, similar to that of Petrie in 1972 (1). All other diseases were assessed on the basis of percentage of leaf or stem area affected. Results for each disease were totalled and averaged over the total number of samples and fields surveyed to give the Disease Index. Percentage of fields affected was calculated by dividing the number of fields in which the disease was noted by the total number of fields surveyed.

RESULTS AND COMMENTS: The severity and distribution of diseases of canola in the four crop districts surveyed are shown in the table below. The early survey dates probably had an effect on the intensity and percentage of fields affected by the diseases (2, 3).

Blackleg (Leptosphaeria maculans) was found to be the most prevalent disease. The disease was most severe in crop district 8b, as was found in 1084 and 1985 (2). The symptoms were noted mainly on the leaves, but during August surveys it was found on the stems as well. Overall this disease was found in greater than 70 percent of the fields surveyed.

Blackspot (Alternaria spp.) was found in low levels in all crop districts surveyed. It was more prevalent, however, in crop district 8b as it was found in every field surveyed. The low severity levels were probably due to the early survey.

White rust (Albugo candida) was uncommon, occurring in only three out of forty four fields surveyed. Staghead symptoms were only noted in one of these three fields.

Downey mildew (Peronospora parasitical and Root rot (several fungi) were also uncommon, occurring in less than 5 and 16 percent of the fields respectively.

Stem blight (Sclerotinia sclerotiorum) was found only in crop district 8b. Again the survey in July was too early to properly assess this disease (2, 3, 4). It did, however, occur in 25% of the fields in crop district 8b with a disease index of 0.83.

Table. Disease Survey of Canola in N.E. Saskatchewan, 1987

C.D.	Fields Assessed Number of Fields	Disease Index/% Fields Affected					
		Root Rot	Blackleg	Blackspot	White Rust	Downey Mildew	Sclerotinia
5B	8	0/0	1.28/87.5	0.41/37.5	<0.1/12.5	0/0	0/0
8A	8	0/0	1.57/50.0	1.85/62.5	0/0	T/12.5	0/0
8B	12	0.13/16.7	7.34/100.0	1.49/100.0	0/0	0/0	0.83/25.0
9A	16	0.23/31.3	1.08/50.0	0.34/68.8	0.91/12.5	<0.1/6.3	0/0
Total or Avg.	44	0.10/15.9	2.82/70.5	1.02/70.5	0.23/6.8	<0.1/4.5	0.21/6.8

*Disease found in the field, but not in the sampled plants

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Blackleg and other dilseases of canola in Saskatchewan in 1984 and 1985.
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(3) Morrall, R.A.A., J. Dueck, D.L. McKenzie and D.C. McGee. 1976
Some aspects of Sclerotinia sclerotiorum in Saskatchewan, 1970-75
Can. Plant Dis. Surv. 56(2):56-62

(4) Petrie, G.A. 1985
Saskatchewan rapeseed/canola disease survey, 1983
Can. Plant Dis. Surv. 65(2):47-49

CROP: Canola

LOCATION: Manitoba

TITLE: Survey of Plant Diseases of Canola in Manitoba in 1987

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METHODS: Results are based on a survey of 65 fields distributed throughout southern Manitoba during the third week of August 1987. Fifty-nine fields of Brassica napus and six fields of Brassica campestris type canola were included in the survey.

RESULTS: The incidence of disease in Brassica napus type canola is presented in Table 1. Sclerotinia stem rot was found in the highest percentage of fields 64% at an average level of occurrence of 5.77% and an estimated overall severity of 3.72%. However in only a few areas such as in the central region near Elm Creek, Carman and Rosebank, in the northwest region near Benito and Swan River and the eastern region near St. Anne was stem rot a major problem . In the above areas individual fields with up to 30% loss from stem rot were detected. In the majority of the province only low levels of stem rot occurred. Blackleg caused in most cases by the virulent strain of Leptosphaeria maculans was found in 54% of fields surveyed at an average level of incidence of 17.7% and caused an estimated overall loss of 9.6%. The high loss attributed to blackleg is a reflection of the severe problem in the southwest region south of Souris, and the northwest region near Grandview, Gilbert Plains and Roblin. In the eastern area of Manitoba only trace levels of blackleg were detected. Black spot caused by Alternaria sp. was found in 35% of fields but the disease was of very low incidence 0.5% and only caused a trace level of damage 0.17%. Foot rot caused mainly by Rhizoctonia solani was found in 22% of fields at an average level of incidence of 7.15% and it caused an overall loss of 1.6%. The areas affected most severely by foot rot were in the southwest region near Killarney and Neepawa and the northwest region near Swan River. In all of these areas the affected fields had received higher than normal amounts of precipitation during July and early August. Other diseases detected were aster yellows in 10% of fields and ringspot or white leaf spot caused by Pseudocercosporella capsellae in 1% of fields. Both of these diseases caused losses less than .2%.

The level of disease in Brassica campestris type canola was similar to that caused by B. napus and is presented in Table 2. The majority of B. campestris fields included in the survey were in the northwest region. Blackleg and foot rot were the most prevalent disease problems and were detected in 83% of fields surveyed, causing overall losses of 10.8 and 9.83% respectively. Sclerotinia stem rot and ringspot were both found in 66% of fields surveyed. Sclerotinia rot caused an estimated loss of 2.5%. Ringspot although rated at an overall level of severity of 9.25% did not in most cases cause severe yield loss

as the disease occurs very late in the growing season. Aster yellows and white rust were not found in any fields surveyed.

Table 1. Results of Disease Survey in B. napus Fields in Manitoba (Total number of fields = 59)

DISEASE	FIELD %	MEAN %[1] INCIDENCE	MEAN %[2] SEVERITY
Sclerotinia	64	5.77	3.72
Blackleg	54	17.70	9.60
Black spot	35	.50	0.17
Foot rot	22	7.15	1.60
Aster Yellows	10	2.33	0.23
Ringspot	1	10.00	0.16
White rust - staghead	0	0	0

Table 2. Results of Disease Survey in B. campestris Fields in Manitoba (Total number of fields = 6)

DISEASE	FIELD %	MEAN %[1] INCIDENCE	MEAN %[2] SEVERITY
Blackleg	83	12.10	10.08
Foot rot	83	11.80	9.83
Ringspot	66	13.87	9.25
Sclerotinia	66	3.75	2.50
Black spot	50	.55	0.27
Aster Yellows	0	0	0
White rust - staghead	0	0	0

[1] based on disease level within infected fields only

[2] average level of infected plants based on all fields surveyed

CROP: Fababeans

LOCATION: Manitoba

TITLE: Incidence of Plant Diseases in Fababeans in Manitoba in 1987

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METHODS: Results are based on 14 samples of fababeans submitted to the Plant Pathology Laboratory and field examinations.

RESULTS: The most commonly encountered disease problem was chocolate spot caused by Botrytis fabae. Sclerotinia was detected from plants submitted from Swan River. Root rot caused by Fusarium sp. was recorded from Altona. Five seed samples were analysed all showed Rotrytis sp. at an average level of occurrence of 6%. Fusarium was detected on 80% of seed samples at an average level of 5%. Ascochyta was not detected on any fababean plants or seed samples submitted in 1987.

CROP: Flax

LOCATION: N.E. Saskatchewan

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METHODS: Nineteen flax fields were surveyed between June 29, 1987 and August 21, 1987 for disease in Crop districts 5b, 8a, 8b and 9a of N.E. Saskatchewan. One plant was selected every ten paces, ten times in each field. Diseases were assessed according to the visual symptoms expressed on the plants. Root rot was assessed based on a scale where 0 = Healthy, 2 = Trace, 5 = Moderate, and 10 = Severe, according to lesions found on the roots. All other diseases were assessed for percentage of leaf or stem area affected (1). Results were recorded for each plant on a standard format sheet, 1 sheet per field. Disease index was calculated by totalling results for each disease and then averaging it over the number of samples and total number of fields surveyed. Percentage of fields affected was calculated by dividing the number of fields in which the disease occurred by the number of fields surveyed.

RESULTS AND COMMENTS: The table below shows that there were very low levels of disease found in N.E. Saskatchewan this year. Pasmo (Septoria lincola) was by far the most prevalent disease, occurring in the majority of the fields. Low levels of root rot (several fungi) and traces of Aster yellows (Mycoplasmalike organism) were found in less than 6 and 20 percent of the fields respectively. No evidence of Rust (Melampsora lini) was found in any of the fields surveyed. On the whole most of the fields surveyed showed low levels of disease, with the exception of the late August samples which ranged up to 30% leaf and stem areas affected with Pasmo.

Table. Percentage of Fields Affected and Severity of Diseases

Disease	Disease Index	% Fields Affected
Pasmo	4.94	84.2
Root Rot	<.1	5.2
Aster Yellows	*T	15.8

*T Disease found in the field, but not among the sampled plants

REFERENCES:

(1) James, C. 1971
A Manual of Assessment Keys for Plant Diseases
Canada Department of Agriculture #1458

CROP: Flax

LOCATION: Manitoba

TITLE: Incidence of Plant Diseases in Flax in Manitoba in 1987

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METHODS: Results are based on 21 samples of flax submitted to the Plant Pathology Laboratory and field examinations.

RESULTS: Early in the season heat canker and damping off were quite common particularly from fields in the Central and Eastern regions. Pasmo appeared on flax late in July and August but did not cause significant loss. A sample of flax from the Swan River area in the Northwest region was found to have a flower and stem blight caused by Alternaria sp. but it did not cause appreciable loss.

CROP: Lentils

LOCATION: Manitoba

TITLE: Incidence of Plant Diseases in Lentils in Manitoba in 1987

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METHODS: Results are based on 42 samples of lentils submitted to the Plant Pathology Laboratory and field examinations.

RESULTS: There were 28 samples of seed, 17 from 1986 crop and 11 from 1987. Ascochyta sp. was present on 82% of 1986 seed samples at an average level of 3.5%. Botrytis sp. was found on 65% at the 1.6% level. The incidence of Ascochyta found on 1987 harvested seed was 82% at a level of 1.5%. Botrytis sp. was found on 73% of samples at a level of .8%. Colletotrichum sp. was detected on plant samples submitted from St. Jean in southern Manitoba adjacent to the Red River. It has not yet been determined if the Colletotrichum sp. is causing an actual plant disease problem. An isolation of Colletotrichum from lentil stems in 1983 was identified by the Commonwealth Mycological Laboratory as Colletotrichum detructivum.

CROP: Peas

LOCATION: N.E. Saskatchewan

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TITLE: DISEASE SURVEY OF PEA FIELDS IN N.E. SASKATCHEWAN

METHODS: Sixteen fields of peas were surveyed from June 29, 1987 to August 21, 1987 for diseases in four crop districts of N.E. Saskatchewan, (5b, 8a, 8b, and 9a). Diseases were identified according to visual symptoms on the plant and then recorded on a standard format sheet. One plant was selected at ten pace intervals ten times in each field. Any symptoms that were not recognized on the plants were returned to the lab and incubated until identification of the pathogen was possible.

Root rot severity was assessed according to amount of discoloration on the roots based on a scale where 0 = Healthy, 2 = Trace, 5 = Moderate, and 10 = Severe. All other diseases were assessed on the basis of percentage of leaf area covered, to estimate the disease index over all fields.

RESULTS AND COMMENTS: Blight (Mycosphaerella pinodes) was the most widespread followed by Root rot (several fungi) and foot rot (Ascochyta sp.). Ascochyta leaf spot (Ascochyta pisi), and Powdery mildew (Erysiphe polygoni) were found in less than half the fields while Downy mildew (Peronospora viciae) and Septoria leaf blotch (Septoria pisi) were found in a few fields, but in very small amounts.

Table. Percentage of Fields Affected and Severity of Diseases.

Disease	Disease Index	% Fields Affected
Mycosphaerella Blight	19.56	81.3
Root Rot	0.66	62.5
Foot Rot	0.76	56.3
Ascochyta Leaf Spot	0.94	37.5
Powdery Mildew	3.21	25.0
Downy Mildew	<.1	12.5
Septoria Leaf Blotch	<.1	6.3

CROP: Field Peas

LOCATION: Manitoba

TITLE: Incidence of Plant Diseases in Field Peas in Manitoba in 1987

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METHODS: Results are based on 31 samples of field peas submitted to the Plant Pathology Laboratory and field examinations.

RESULTS: Ten of the samples submitted were of seed. The seed showed an average of 3.3% Mycosphaerella sp. Botrytis was generally trace in most samples but was present at a *21%* level in one sample. Heat canker was evident in samples submitted in June following a week of 30°C average temperature. Mycosphaerella pinodes leaf and stem blight was present in most pea fields prior to harvest in September but it appears to have developed late in the season and did not cause major loss. Sclerotinia stem rot was observed in a field near Winnipeg causing about *5%* level of damage. Root rot attributed to Fusarium sp. was diagnosed from 6 samples.

CROP: Soybeans

LOCATION: Eastern Ontario

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TITLE: SOYBEAN DISEASE INCIDENCE IN GROWERS' FIELDS, 1987

INTRODUCTION: Since the 1979 soybean disease survey (1), the soybean acreage in Eastern Ontario has expanded. Hence, this survey was conducted to obtain current information on soybean diseases (3).

METHODS: With guidance from the Agriculture Representatives (Ontario Ministry of Agriculture and Food) to locate soybean growers, 75 fields in 9 counties (see Table) in Eastern Ontario were visited during the month of August. In each field, within an area of 0.04 ha., disease incidence was recorded and, based on a 1-5 visual rating scale (2), disease severity was estimated. The approximate field size was determined using a range finder.

RESULTS AND COMMENTS: Three foliage diseases, brown spot (*Septoria glycines*), bacterial blight (*Pseudomonas syringae* pv. *glycinea*), and downy mildew (*Peronospora trifoliorum*) were distributed in the 75 fields (see Table) with a total area of 710 ha. Disease severity was usually low (visual rating of 2-3) except in two fields where brown spot rating was more than 3.

REFERENCES:

1. Basu, P.K. 1980. Occurrence of soybean foliage diseases in Eastern Ontario, 1979. Can. Plant Dis. Surv. 60: 23-24.

2. Basu, P.K. and G. Butler. 1986. An evaluation of soybean bacterial blight assessment methods. Can. J. Plant Pathol. *8:* 459-463.

3. Sinclair, J.B. and M.C. Shurtleff. (ed). 1975. Compendium of soybean diseases. American Phytopathol. Soc., St. Paul, Minn., U.S.A. 69 pp.

TABLE. Number of fields affected by brown spot (BS), bacterial blight (BB), and downy mildew (DM).

County	Fields	BS	BB	DM
Lanark	5	5	3	3
Leeds	5	5	0	1
Grenville	8	7	4	1
Ottawa-Carleton	15	13	5	10
Dundas	11	9	8	3
Russell	15	13	7	8
Stormont	7	5	5	3
Prescott	4	4	1	1
Glengarry	5	2	4	5
TOTAL	75	63	37	35

CROP: Sunflower

LOCATION: Southern Alberta

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TITLE: SURVEY OF SCLEROTINIA WILT AND HEAD ROT OF SUNFLOWER IN SOUTHERN ALBERTA, 1983

METHODS: Six sunflower (Helianthus annuus L.) fields in the County of Forty Mile near Bow Island were surveyed for Sclerotinia wilt and head rot (Sclerotinia sclerotiorum) on September 1, 1983. This was done by randomly selecting four rows in the field, with about 20 paces between the rows surveyed. One hundred plants in each row were examined for symptoms of Sclerotinia wilt by the presence of bleached lesions on basal stem of wilted plants and symptoms of Sclerotinia head rot by the presence of sclerotia on rotted head. The severity of Sclerotinia wilt and head rot was determined by the average percent infection in each field.

RESULTS AND COMMENTS: Sunflower was a new crop grown under contract with the Alberta Sunflower Company Ltd. There were about 730 ha of sunflowers in southern Alberta in 1983 (B. Roth, personal communication). Almost all the varieties were confectionary type.

All the six fields surveyed were confectionary type of sunflower. Sclerotinia wilt was found in all the fields, and the disease incidence was trace or less than 1% of wilt in three fields, light or less than 5% of wilt in two fields, and moderate or 20% of wilt in one field. Sclerotinia head rot was found in three fields, two with trace infection, and one with 10% of head rot.

Three of the six fields had hail damage. Insect infestation was found in two fields, one with aphids and the other with aphids and grasshoppers.

CROP: Sunflower

LOCATION: Southern Alberta

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TITLE: SURVEY OF SCLEROTINIA WILT AND HEAD ROT OF SUNFLOWER IN SOUTHERN ALBERTA, 1986

METHODS: Fourteen fields of sunflower (Helianthus annuus L.) in the County of Forty Mile and the Municipal District of Taber were surveyed from September 18-23, 1986. In each field six rows of 25 plants per row were rated for incidence of Sclerotinia wilt and head rot.

RESULTS AND COMMENTS: Sclerotinia wilt was found in six of the seven fields surveyed in the County of Forty Mile near Bow Island area and in one of the seven fields surveyed in the Municipal District of Taber (Table 1). The disease ranged from light, or 1.3% of wilt, to severe, or 42-78% of wilt.

Sclerotinia head rot was found in three of the seven fields surveyed in the County of Forty Mile and two of the seven fields surveyed in the Municipal District of Taber. The disease incidence was generally light, ranging from 1-4.8% of infection (Table 1).

Table 1. Survey of Sclerotinia wilt and head rot of sunflower in southern Alberta, 1986.

County or Municipality	Field Number	Sclerotinia disease (%) Wilt	Head rot
Co. Forty Mile	1	0	2.7
	2	2.4	4.8
	3	1.3	2.0
	4	78.0	0
	5	45.3	0
	6	53.0	0
	7	42.0	0
M.D. Taber	8	14.5	0
	9	0	0
	10	0	1.0
	11	0	0
	12	0	0
	13	0	1.3
	14	0	0

CROP: Sunflower

LOCATION: Southern Alberta

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TITLE: SURVEY OF SCLEROTINIA WILT AND HEAD ROT OF SUNFLOWER IN SOUTHERN ALBERTA, 1987

METHODS: Twenty-nine sunflower fields in the County of Forty Mile and the Municipal District of Taber were surveyed from October 14-19, 1987. In each field, six rows of 25 plants per row were rated for incidence of Sclerotinia wilt and head rot.

RESULTS AND COMMENTS: There were 1420 ha of sunflowers in southern Alberta in 1987 (B. Roth, personal communication). Of the 29 fields surveyed, 5 were oilseed type and 24 were confectionary type of sunflower. The Sclerotinia wilt was found in 18 fields and the Sclerotinia head rot was found in 16 fields (Table 1). The severity for Sclerotinia wilt varied with fields, ranging from trace, or less than 1% of infected plants, to moderate, or 31.3% of infected plants. The severity for head rot ranged from trace to light infection. Both wilt and head often occurred in the same field in the County of Forty Mile and the Municipal District of Taber (Figure 1).

Table 1. Survey of Sclerotinia wilt and head rot of sunflower in southern Alberta, 1987.

Disease severity and incidence	No. fields Sclerotinia wilt	Sclerotinia head rot
None	11	13
Trace (< 1%)	4	12
Light (1-10%)	10	4
Moderate (11-40%)	4	0
Severe (41-80%)	0	0
Very Severe (> 80%)	0	0
Total	29	29

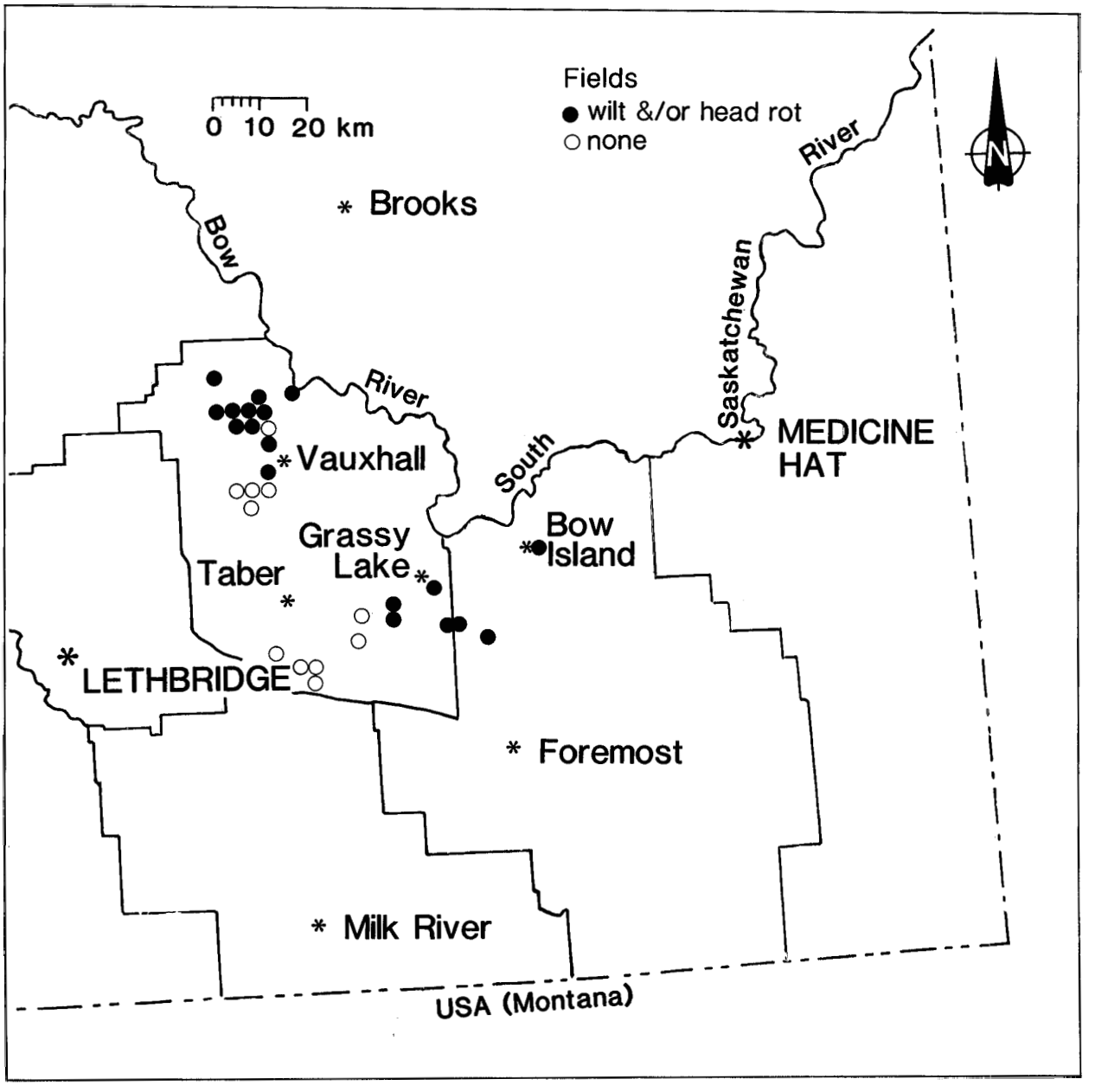

Figure 1 Distribution of fields with Sclerotlnia wilt and head rot in southern Alberta, 1987.

CROP: Sunflower

LOCATION: Manitoba

TITLE: Incidence of Plant Diseases in Sunflowers in Manitoba in 1987

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METHODS: Results are based on samples of sunflowers submitted to the Plant Pathology Laboratory and field examinations.

RESULTS: Sunflowers, with a few exceptions, were not severely affected by diseases in 1987. Five replicated variety trials were examined in the Eastern, Central and Southwest regions. Sclerotinia head rot was most severe in the Eastern region ranging from trace to 70%. Phoma was common on most varieties of sunflowers when examined on September 2 and when the same plot was re-examined on September 24 there was evidence of premature ripening on most varieties. Botrytis head rot was present at a low level in 2 commercial fields examined in the Eastern region. In the Central region the variety trial at Altona showed less disease damage than the Eastern region trial. The level of head rot varied from trace to 20%. Phoma was present but at a low level. The trial at Morden showed low levels of sclerotinia stem or head rot from trace to 10%. Phoma was present but at low levels on most varieties. Sclerotinia head rot was severe at the Holland site in the central region ranging from trace to 50% loss. In the southwest region disease incidence was generally lower than in the central and eastern region fields. Rust was very evident in the trial at Waskada in the extreme southwest. Damage due to rust was in all cases low as most varieties have at least moderate resistance to rust. Rust was very heavy on wild sunflowers, Helianthus annuus which were very common along the margins of the field at Waskada.