Diagnostic laboratories/ Laboratoires diagnostiques

CROP: Diagnostic Laboratory Report - Alfalfa

LOCATION: Manitoba

NAME AND AGENCY:
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TITLE: DISEASES DIAGNOSED ON ALFALFA CROPS BY THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1993

METHODS: The Manitoba Agriculture Crop Diagnostic Centre provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted by Manitoba agriculture extension staff, farmers, agri-business and the general public. Diagnosis is based on visual examination for symptoms and culturing onto artificial media.

RESULTS AND COMMENTS: The results of alfalfa submissions are shown in Table 1. The most common problem affecting alfalfa was root and crown rot caused by *Fusarium* spp. Leaf diseases including common leaf spot, downy mildew, Leptosphaerulina leaf spot and yellow leaf blotch were also diagnosed. Wet weather favoured development of black stem. A blossom blight disease in seed alfalfa fields was diagnosed as being caused by *Botrytis* sp. This disease caused a severe loss of blossoms to several fields in the Interlake region and Eastern Manitoba.

Table 1. Diseases diagnosed on alfalfa samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1993.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Root and crown rot	*Fusarium* spp.	5
Black stem	*Phoma medicaginis*	4
Blossom blight	*Botrytis* spp.	3
Common leaf spot	*Pseudopeziza medicaginis*	3
Downy mildew	*Peronospora trifoliorum*	1
Leptosphaerulina leaf spot	*Leptosphaerulina* spp.	1
Root rot	*Cylindrocarpon* spp.	1
Yellow leaf blotch	*Leptotrochila medicaginis*	1
Physiological stress	Winter injury, white spot	4
Nutrient deficiency		2
Herbicide injury		1

CROP: Diagnostic Laboratory Report - Cereal Crops

LOCATION: Manitoba

NAME AND AGENCY:
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TITLE: DISEASES DIAGNOSED ON CEREAL CROPS BY THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1993

METHODS: The Manitoba Agriculture Crop Diagnostic Centre provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted by Manitoba agriculture extension staff, farmers, agri-business and the general public. Diagnosis is based on visual examination for symptoms and culturing onto artificial media.

RESULTS AND COMMENTS: Results of cereal submissions are presented in Tables 1, 2 & 3. The most commonly encountered problems in wheat in 1993 were leaf diseases caused by *Septoria* spp. and *Pyrenophora tritici-repentis*. Fusarium head blight was severe in the southern Red River Valley area resulting in extensive crop loss and downgrading of wheat to feed and sample. In four municipalities in southern Manitoba in the Red River Valley area over 90% of the wheat graded feed or sample on account of tombstone (ie) Fusarium infected kernels being over 5% by weight.

The results of barley submissions are shown in Table 2. Barley yellow dwarf was detected in 4 samples from western Manitoba. Flame chlorosis was associated with several barley fields, one from near Shoal Lake in western Manitoba and two from near Niverville in southeastern Manitoba. Fusarium head blight was also found in barley and although there were only 2 samples submitted to the Crop Diagnostic Centre it was quite widespread in the southern Red River Valley area.

The results of oat submissions are presented in Table 3. The most serious disease problems affecting oats was crown rust.

Table 1a. Diseases diagnosed on cereal crops submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1993. WHEAT — 254 SAMPLES SUBMITTED.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Septoria leaf blotch	*Septoria* spp.	72
Head blight	*Fusarium graminearum*	25
Glume blotch	*Septoria* spp.	24
Tan spot	*Pyrenophora tritici-repentis*	16
Common root rot	*Fusarium* spp.	
	Cochliobolus sativus	10
Flame chlorosis	Flame chlorosis virus like-agent	6
Seedling blight	*Fusarium* spp.	
	Cochliobolus sativus	6
Barley yellow dwarf	Barley yellow dwarf virus	2
Leaf rust	*Puccinia recondita*	2
Take all root rot	*Gaeumannomycesgraminis* var *tritici*	2
Ergot	*Claviceps purpurea*	1
Loose smut	*Ustilago tritici*	1
Herbicide injury		42
Environmental stress		25
Other		20

Table **1b.** Diseases diagnosed on cereal crops submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1993. BARLEY — 17 SAMPLES SUBMITTED.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Barley yellow dwarf	Barley yellow dwarf virus	4
Flame chlorosis	Flame chlorosis virus like-agent	2
Fusarium head blight	*Fusarium graminearum*	2
Septoria	*Septoria* spp.	2
Common root rot	*Fusarium* spp.	
	Cochliobolus sativus	1
Net blotch	*Pyrenophora teres*	1
Spot blotch	*Cochliobolus sativus*	1
Environmental stress	Frost, deep seeding, nutirent deficiency, excess water	4

Table 1c. Diseases diagnosed on cereal crops submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1993. OAT — 12 SAMPLES SUBMITTED.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Barley yellow dwarf	Barley yellow dwarf virus	2
Crown rust	***Puccinia coronata***	2
Fusarium head blight	***Fusarium graminearum***	2
Bacterial blight	***Pseudomonas syringae***	1
Septoria leaf blotch	***Septoria*** spp.	1
Environmental stress		4

CROP: Diagnostic Laboratory Report - Cereal Crops

LOCATION: Alberta

NAME AND AGENCY:

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[1] Regional Crop Laboratory, Alberta Special Crops and Horticultural Research Centre, Brooks, T1R 1E6

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TITLE: DISEASES DIAGNOSED ON CEREAL CROP SAMPLES SUBMITTED TO THE SOUTHERN ALBERTA REGIONAL CROP LABORATORY AND BROOKS DIAGNOSTICS LIMITED IN 1993

METHODS: The Regional Crop Laboratory (RCL) at the Alberta Special Crops and Horticultural Research Center (ASCHRC) diagnosed diseases on samples of cereal crops submitted by district agriculturalists, extension specialists and farmers from January 1 to June 30, 1993. Brooks Diagnostics Limited (BDL), a private diagnostic clinic, moved into the RCL's facilities and assumed responsibility for identifying plant diseases in southern Alberta on July 1, 1993. Each diagnosis listed in the table below was made by carefully examining symptoms expressed on host plants or by isolating primary pathogens from diseased tissues.

RESULTS: All of the disease identifications made by the RCL and BDL on cereals in 1993 have been pooled and are summarized in Table 1.

Table **1.** Summary of diseases diagnosed on cereal crop samples submitted to the southern Alberta Regional Crop Laboratory and Brooks Diagnostics Limited in **1993.**

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Barley	Blackpoint	*Alternaria* spp.
		Cochliobolus spp.
		Fusarium spp.
	Browning root rot	*Pythium* spp.
	Chlorosis	Physiological stress
	Crown/root rot	*Fusarium* spp.
	Net blotch	*Pyrenophora teres*
	Scald	*Rhynchosporium secalis*
	Spot blotch	*Cochliobolus sativus*
	Stem eyespot	*Pseudocercosporella herpotrichoides*
	Stunting	Physiological stress
Oats	Leaf spot	Nutritional deficiency
Wheat	Blackpoint	*Alternaria* spp.
		Cochliobolus spp.
		Fusarium spp.
	Chlorosis	Physiological stress
		Spray drift injury
	Crown/root rot	*Cochliobolus sativus*
		Fusarium spp.
	Dieback	Spray drift injury
	Leaf blotch	*Septoria* spp.
	Leaf shatter	Hail
	Leaf tip dieback	Physiological stress
	Prematurity blight	*Fusarium* spp.
	Sooty mold	*Alternaria* spp.
		Cladosporium spp.
	Spot blotch	*Cochliobolus sativus*
	Stem eyespot	*Pseudocercosporella herpotrichoides*
	Take-all	*Gaeumannomyces tritici* subsp. *tritici*
	Tanspot	*Pyrenophora tritici-repentis*

CROP: Diagnostic Laboratory Report - Commercial Crops

LOCATION: Prince Edward Island

NAME AND AGENCY:
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TITLE: DISEASES DIAGNOSED ON COMMERCIAL CROPS IN PRINCE EDWARD ISLAND, 1993

METHODS: The P.E.I. Department of Agriculture, Fisheries and Forestry's Plant Health Services group provides diagnosis of, and control recommendations primarily for, disease problems of commercial crops produced on P.E.I. The following data lists samples submitted to the laboratory by agricultural extension staff, producers, agribusiness and the general public. Diagnoses are based on visual examination of symptoms, microscopic observation and culturing on artificial media. Assisting with the diagnoses were K.I.Al-Mughrabi, M.M. Clark, and J.F. Diamond.

RESULTS AND COMMENTS: A total of 396 samples were processed during the period November 1992 - November 1993. Results are summarized in Table 1. Problems associated with insect-related damage and nutrient imbalance are listed under the heading 'Other'.

Table 1. Diseases diagnosed on commercial crops in Prince Edward Island, 1993.

CROP	DISEASE	CAUSAL AGENT/ PLANT PATHOGEN	NO. OF TIMES AGENTS WERE IDENTIFIED
CEREALS:			
Oats	Powdery Mildew	*Erysiphe graminis*	1
Wheat	Head Blight	*Fusarium* spp.	2
	Bacterial Blight	*Pseudomonas* spp.	1
	Powdery Mildew	*Erysiphe graminis*	1
SMALL FRUITS:			
Raspberry	Root Rot	*Armillaria melle*	1
Strawberry	Fruit Rot	*Rhizoctonia* spp.	3
	Wilt	*Verticillium* sp.	1
	Red Stele	*Phytophthora fragariae*	1
	Leaf Spot	*Mycosphaerella fragariae*	4
		Botrytis spp.	2
	Other		2

(cont'd)

CROP	DISEASE	CAUSAL AGENT/ PLANT PATHOGEN	NO. OF TIMES AGENTS WERE IDENTIFIED
SPECIALITY CROPS:			
Ginseng	Leaf Spot	*Alternaria* sp.	1
		Alternaria alternata	1
		Helminthosporium sp.	1
	Root Rot	*Alternaria* sp.	1
Tobacco	White Mold	*Sclerotinia sclerotiorum*	1
VEGETABLES:			
Cabbage	Damping Off	*Rhizoctonia solani*	1
		Rhizopus sp.	1
Carrot	Dry Rot	*Fusarium* spp.	3
	Crown Rot	*Rhizoctonia* spp.	1
	Botrytis Rot	*Botrytis* spp.	1
	Leaf Spot	*Cercospora* spp.	1
	Scab	*Streptomyces scabies*	1
Cauliflower	Wilt	*Fusarium roseum*	1
	Root and Stem Rot	*Erwinia* spp.	1
		Pseudomonas spp.	1
Garlic	Mold-Rot	*Helminthosporium* sp.	1
Green Pepper	Wilt	*Fusarium* sp.	1
Lettuce	Wilt	*Botrytis* sp.	1
	Head Rot	*Rhizopus* sp.	1
Parsnip	Leaf Spot	*Septoria* sp.	1
Potato	Leaf Spot	*Botrytis cinerea*	38
		Stemphylium spp.	3
		Fusarium spp.	4
		Alternaria spp.	47
		Phytophthora infestans	31
	Dry Rot	*Fusarium* spp.	42
		Phoma spp.	3
	Soft Rot	*Clostridium* spp.	2
		Pseudomonas spp.	4
		Erwinia spp.	14
		Rhizopus spp.	3
	Pink Rot	*Phytophthora erythroseptica*	3
	Skin Spot	*Polyscytalum pustulans*	2
	Black Dot	*Colletotrichum coccoides*	12
	White Mold	*Sclerotinia sclerotiorum*	5
	Seed Piece Decay	*Fusarium* spp.	3
		Erwinia spp.	4
		Rhizoctonia spp.	1

(cont'd)

CROP	DISEASE	CAUSAL AGENT/ PLANT PATHOGEN	NO. OF TIMES AGENTS WERE IDENTIFIED
	Black Scurf	*Rhizoctonia solani*	19
	Stem Canker	*Rhizoctonia solani*	12
	Silver Scurf	*Helminthosporium solani*	17
	Tuber Rot	*Botrytis* spp.	4
	Scab	*Streptomyces scabies*	12
		Spongospora subterranea	17
	Pinkeye	*Pseudomonas* spp.	2
	Blackleg	*Erwinia* spp.	6
	Virus	Mosaic	22
		Leafroll	4
	Physiological	Skinning	3
	Disorders	Blackheart	1
		Internal Brown Spot	1
		Low Temperature Injury	10
		Hollow Heart	1
		Chemical Damage	35
		Mechanical Damage	33
		Bruising and Cracking	9
		Stem End Browning	1
		Other	14
Rutabaga	Soft Rot	*Erwinia* spp.	1
		Pseudomonas spp.	1
		Sclerotinia spp.	3
		Botrytis spp.	1
	Damping Off	*Rhizoctonia* sp.	2
	Downy Mildew	*Peronospora parasitica*	1
Tomato	Powdery Mildew	*Erysiphe polygoni*	1
	Wilt	*Fusarium* sp.	1
	Other		1
Zucchini	Other		1
WOODY ORNAMENTALS AND FLOWERING SHRUBS:			
Evening	Damping Off	*Botrytis cinerea*	1
Primrose	Wilt	*Phytophthora* spp.	1
		Pythium spp.	1
	Mildew	*Peronospora* sp.	1
Flowering	Dieback	Other	1
Almond			
Rose	Mechanical Damage		1
Phlox	Leaf Spot	*Erysiphe* sp.	1
Hybrid salix	Other		1
Silver Maple	Powdery Mildew	*Erysiphe* sp.	1
	Other		2
Horse Chesnut	Dieback	*Fusarium* sp.	1
Poplar	Leaf Spot	*Cladosporium* sp.	1
		Other	1
Pear	Fire Blight	*Erwinia amylovora*	1
			TOTAL = 513

CROP: Diagnostic Laboratory Report – Commercial Crops

LOCATION: Quebec

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TITLE: DISEASES DIAGNOSED ON COMMERCIAL CROPS SUBMITTED TO THE MAPAQ DIAGNOSTIC LABORATORY IN 1993

METHODS: The objective of the MAPAQ diagnostic laboratory is to provide diagnosis and control recommendations for disease problems of commercial crops. The following data reflects diagnosis of samples submitted to the laboratory by the extension staff of MAPAQ, by the "Régie des assurances agricoles du Quebec", by the "Institut quebecois pour le développement de l'horticulture ornementale" and by the agricultural industry. Diagnosis is based on visual examination for symptoms and on the use of various laboratory tests to detect and to identify pathogens. The following tests are used in the laboratory; for nematodes, isolation with the Baermann funnel and microscope examination: for fungi, isolation on artificial media, microscope examination and pathogenicity testing; for bacteria, isolation on artificial media, classical biochemical tests including API-20E and Biolog and ELISA; and for virus, Elisa and double stranded RNA analysis.

RESULTS AND COMMENTS: The MAPAQ diagnostic lab received 1549 samples between April 1 and October 31, 1993. The crop distribution of these samples was: vegetable crops 47.2%, small fruits 18.6%, ornamentals 18.1%, fruit trees 4.9%, field crops 3.7% and shrubs and trees 2.2%. Tables 1-5 show a summary of parasitic diseases diagnosed by the lab for the most representative vegetable crops, small fruits, ornamentals, greenhouse vegetables and for apple trees. Non parasitic and unidentified problems appear under the category "other".

ACKNOWLEDGEMENT: The authors gratefully thank Lucie Laverdiere, Marlene Roger, Mario Tésolin and Lise Vezina for technical assistance.

Table 1. Summary of vegetable crop diseases diagnosed by the MAPAQ diagnostic laboratory in 1993.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Bean	*Pseudomonas syringae* (leaf spot)	5
	Pythium crown and root rot	2
	Rhizoctonia crown and root rot	1
	Sclerotinia sclerotiorum	1
	Other	20
Beet	*Streptomyces scabies*	1
	Other	11
Broccoli	*Peronospora parasitica*	2
	Other	11
Carrot	*Cercospora carotae*	1
	Meloidogyne hapla	3
	Pythium (cavity spot)	1
	Other	14

(cont'd)

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Cabbage	*Alternaria brassicicola*	2
	Fusarium oxysporum	2
	Pseudomonas marginalis (soft rot)	2
	Potyvirus	1
	Xanthomonas campestris pv. *campestris*	7
	Other	15
Cauliflower	*Alternaria brassicae*	1
	Alternaria brassicicola	2
	Pseudomonas fluorescens IVb + *P. marginalis* (soft rot)	2
	Xanthomonas campestris pv. *campestris*	7
	Other	15
Chinese cabbage	*Alternaria brassicae*	1
	Erwinia carotovora subsp. *carotovora*	1
	Pseudomonas marginalis (soft rot)	1
	Pseudocercosporella (leaf spot)	1
	Other	1
Corn	Fusarium stalk rot	6
	Other	6
Cucumber	*Alternaria alternata* (leaf spot)	6
	Cladosporium cucumerinum	1
	Ulocladium (leaf spot)	1
	Other	18
Eggplant	*Alternaria* (fruit rot)	1
	Botrytis cinerea	2
	Rhizoctonia damping off	1
	Sclerotinia sclerotiorum	1
	Verticillium sp.	3
	Other	6
Leek	*Erwinia carotovora* subsp. *carotovora*	2
	Other	11
Lettuce	*Botrytis cinerea*	3
	Bremia lactucae	1
	CMV	1
	Erwinia carotovora subsp. *carotovora*	1
	Pseudomonas florescens IVb + *P. marginalis* + *P. viridiflava* (soft rot)	7
	Potyvirus	1
	Pythium stunt	1
	Rhizoctonia bottom rot	1
	Sclerotinia sclerotiorum	5
	Xanthomonas campestris pv. *vitians*	8
	Other	14
Melon	CMV	1
	Verticillium sp.	1
	Other	9

(cont'd)

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Onion	*Alternaria porri*	1
	Botrytis neck rot	4
	Colletotrichumcircinans	1
	Fusarium oxysporum (basal rot)	1
	Peronospora destructor	1
	Other	17
Pepper	*Alternaria porri* (leaf spot)	2
	Botrytis cinerea	1
	CMV	8
	Fusarium (fruit rot)	3
	PVY	2
	Rhizoctonia damping off	2
	TMV	2
	TSWV-L	2
	Xanthomonas campestris pv. *vesicatoria*	10
	Other	52
Potato	*Alternaria solani* (leaf spot)	1
	Clavibacter michiganensis subsp. *sepedonicum*	16
	Erwinia carotovora subsp. *atroseptica*	4
	Erwinia carotovora subsp. *carotovora*	28
	Fusarium spp. (tuber rot)	14
	Helminthosporium solani	1
	Phytophthora erythroseptica	7
	Phytophthora infestans (tuber)	16
	Pseudomonas fluorescens IVb + *P. marginalis* (soft rot)	11
	PLRV	2
	Potyvirus	1
	Pythium (leak)	1
	Rhizoctonia solani	7
	Streptomyces sp. (common scab)	6
	Spongospora subterranea	3
	Verticillium sp.	8
	Other	90
Rutabaga	*Botrytis cinerea*	2
	Erwinia carotovora subsp. *carotovora*	1
	Pseudomonas fluorescens IVb + *P. marginalis* (soft rot)	3
	Peronospora parasitica	1
	Rhizoctonia crater rot	2
	Other	9
Tomato	*Alternaria solani*	4
	Colletotrichumcoccodes	1
	Clavibacter michiganensis subsp. *michiganensis*	3
	Phytophthora infestans	2
	Pseudomonas syringae pv. *tomato*	5
	Septoria lycopersici	1
	Xanthomonas campestris pv. *vesicatoria*	2
	Other	6

Table 2. Summary of small fruit diseases diagnosed by the MAPAQ diagnostic laboratory in 1993.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Strawberry	*Diplocarpon earliana*	6
	Mycosphaerella fragariae	5
	Meloidogyne sp.	2
	Phytophthora fragariae	40
	Sphaerotheca macularis	1
	Verticillium sp.	7
	Black root	14
	Winter injury	35
	Other	77
Raspberry	*Agrobacferium tumefaciens*	1
	Armillaria mellea	2
	Didymella applanata	5
	Erwinia amylovora	1
	Elsinoe veneta	1
	Pucciniastrum americanum	1
	Phytophthora root rot	27
	Winter injury	28
	Other	46

Table 3. Summary of ornamental diseases diagnosed by the MAPAQ diagnostic laboratory in 1993.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Begonia spp.	TSWV-I	1
	Xanfhomonas campestris pv. *begoniae*	2
	Other	5
Callendula officinalis	Mycoplasma like organism	1
Calluna sp.	Rhizoctonia root and stem rot	1
Celosia sp.	Botrytis stem rot	1
	Pythium root rot	3
	Rhizoctonia root and stem rot	1
	Other	4
Cereus sp.	*Bipolaris cactivora*	2
	Fusarium root and stem rot	1
	Pythium root rot	1
Cyclamen sp.	Botrytis stem rot	1
	Rhizoctonia root and stem rot	1
	Other	2

(cont'd)

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Dianthus sp.	Fusarium root and stem rot	1
	Pythium root rot	1
	Other	2
Dracaena sp.	Fusarium leaf spot	1
	Other	4
Euphorbia	Botrytis stem rot	1
pulcherrima	Phytophthora root rot	1
	Other	6
Sinningia	Botrytis stem rot	1
speciosa		
Impatiens spp.	TSWV-I	14
	Rhizoctonia root and stem rot	1
	Other	11
Mammilaria sp.	*Bipolaris cactivora*	1
	Fusarium root and stem rot	1
	Pythium root rot	1
	Rhizoctonia root and stem rot	1
Opuntia sp.	Fusarium root and stem rot	1
Pelargonium x	*Botrytis cinerea*	6
Hortorum	*Puccinia pelargonii zonalis*	1
	Pythium root rot	3
	Verticillium sp.	1
	Other	25
Petunia x	*Botrytis cinerea* (flower)	1
Hybrida	Rhizoctonia root and stem rot	1
	Other	3
hododendron	Pestalotia stem rot	1
	Pestalotia leaf spot	1
	Other	1
Saintpaulia	*Botrytis cinerea*	2
ionantha	Other	1
Schlumbergera sp.		
	Pythium root rot	1
Tagetes sp.	Phytophthora root rot	1
Zinnia sp.	*Bottytis cinerea*	1

Table 4. Summary of apple tree diseases diagnosed by the MAPAQ diagnostic laboratory in 1993.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Apple	Alternaria leaf spot	5
	Cytospora canker	3
	Nectria cinnabarina	2
	Nectria galligena	2
	Venturia inaequalis	8
	Other	44

Table 5. Summary of greenhouse vegetable diseases diagnosed by the MAPAQ diagnostic laboratory in 1993.

CROP	CAUSAL AGENT/PLANT PATHOGENS	NO. OF SAMPLES
Cucumber	CMV	**1**
	Erwinia carotovora subsp. *carotovora*	1
	Pythium crown and root rot	1
	Sclerotinia sclerotiorum	2
	Verticillium sp.	3
	Other	8
Tomato	*Botrytis cinerea*	3
	Colletotrichum sp. (root)	**2**
	Erysiphe sp.	3
	Fulva fulvum	1
	Fusarium oxysporum f. sp. *radicis lycopersici*	8
	Meloidogyne hapla	3
	Phytophthora cinnamomi (root)	1
	Pyrenochaeta lycopersici	18
	PVX	1
	Pythium root rot	6
	Rhizoctonia root and crown rot	**1**
	Septoria lycopersici	1
	Sclerotinia sclerotiorum	1
	Other	63

CROP: Diagnostic Laboratory Report - Commercial Crops

LOCATION: British Columbia

NAME AND AGENCY:
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TITLE: DISEASES DIAGNOSED ON COMMERCIAL CROPS SUBMITTED TO THE BRITISH COLUMBIA PLANT DIAGNOSTIC LABORATORY IN 1993

METHODS: The B.C.M.A.F.F. Plant Diagnostic Laboratory provides the diagnosis of, and control recommendations for, diseases of commercial crops. The following data reflects samples submitted to the lab by ministry extension staff, growers, agribusiness, parks departments and Master Gardeners. Diagnoses were accomplished by microscope examination, culturing onto artificial media and ELISA. Assisting with the diagnoses were Leslie MacDonald and David J. Ormrod, Plant Pathologists at the B.C.M.A.F.F.

RESULTS AND COMMENTS: Summaries of diseases diagnosed on crops of each commodity are presented in Tables 1-8. The total number of submissions for each crop category is listed at the bottom of each table. Only diseases of significance are listed in the attached summaries. Problems not listed include: nutritional stress; pH imbalance; water stress; poor sample; physiological responses to growing conditions; chemical damage; insect related damage; and damage where no conclusive disease-causing organism was identified. These submissions are grouped under the heading 'OTHER' at the bottom of each table. Sample numbers are based on submissions received from October 1992 through to November 1993.

Table 1. Summary of diseases diagnosed on greenhouse vegetable crops submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1993.

CROP	DISEASE	NO. OF SAMPLES
Cucumber	Botrytis stem rot	1
	Didymella bryoniae	continuing problem
	Crown and root rot	
	Pythium spp. / *P. aphanidermatum*	3
	Stem rot - *Sclerotinia sclerotiorum*	1
Lettuce	Bottom rot - *Sclerotinia sclerotiorum*	1
Pepper	*Botrytis cinerea*	2
	Impatiens necrotic spot virus - (INSV)*	4
	Pythium root rot	1
	Pseudomonas stem rot	1
	Xanthomonas leaf spot	2
Tomato	Fusarium crown and root rot	2
	INSV	1
	Phytophthora infestans	1
	Pythium root rot	3
	Erwinia carotovora	1
OTHER		57
TOTAL		81

* Impatiens necrotic spot virus was previously called Tomato spotted wilt virus strain I (TSWV - I).

Table 2. Summary of diseases diagnosed on floriculture crops submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1993.

CROP	DISEASE	NO. OF SAMPLES
Ageratum spp.	Pythium root rot	1
Antirrhinum spp.	*Peronospora antirrhini*	3
Begonia spp.	INSV	1
	Xanthomonas campestris pv. *begoniae*	1
Centauria cineraria	*Albuga trabopogonis*	1

(cont'd)

CROP	DISEASE	NO. OF SAMPLES
Cleome spp.	Leaf rust - *Puccinia* spp.	1
Chrysanthemum x morifolium	*Erwinia chrysanthemii*	1
	*Puccinia horiana***	1
Cyclamen persicum	INSV	2
Dianthus caryophyllus	*Cladosporuim echinulatum*	1
Euphorbia pulcherrima	Pythium root rot	5
Fuchsia x hybrida	Root rot - Phycomycete	2
	Leaf rust - *Pucciniastrum* spp.	1
Gerbera spp.	*Erysiphe cichoracearum*	1
Hedera spp.	Xanthomonas leaf spot	1
Impatiens wallerana	*Erwinia carotovora*	1
	INSV	3
Lavatera spp.	Root rot - Phycomycete	1
Liatris spicata	*Botrytis cinerea*	1
Lilium spp.	*Botrytis elliptica*	2
Narcissus pseudonarcissus	*Botrytis* spp. -smoulder	1
Mizuna spp.	*Plasmodiophora brassicae*	1
Pelargonium x hortorum	*Puccinia pelargonii* pv. *zonalis***	1
	Xanthomonas campestris pv. *pelargonii*	10
P. peltaum	Oedema	3
Phalaenopsis spp.	Root rot -Phycomycete	2
	Rhizoctonia root rot	1
Primula spp.	INSV	1
P. obconica	INSV	1
Ranunculus spp.	INSV	1
Senecia cruentus	INSV	1
Sinningia speciosa	INSV	1
Saintpaulia spp.	*Podosphaera clandestina*	1
Tulipa spp.	*Bottytis tulipae*	2
	Fusarium basal rot	1
Viola spp.	*Bottytis cinerea*	1
	Peronospora viola	1
	Ramularia leaf spot	1
	Thielaviopsis basicola	1
OTHER		62
TOTAL		125

** These samples were submitted by homeowners and a garden club. White rust of chrysanthemum and geranium rust are not present in commercial operations in British Columbia.

Table 3. Summary of diseases diagnosed on small fruit crops submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in **1993.**

CROP	DISEASE	NO. OF SAMPLES
Blueberry	Botrytis blossom blight	1
	Stem canker - *Coryneum* spp.	1
	Godronia cassandrae	17
	Monilinia vaccinii-corymbosi	1
	Pseudomonas syringae	8
	Winter damage	3
Cranberry	Botrytis leaf blight	1
	Phomopsis vaccinii	1
	Pseudomonas syringae	1
Raspberry	*Didymella applanata*	4
	Phragmidium leaf rust	1
	Phytophthora root rot	2
	Pseudomonas syringae	1
Strawberry	*Verticillium albo-atrum*	1
	Cold damage	2
OTHER		38
TOTAL		83

Table **4.** Summary of diseases diagnosed on specialty crops submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in **1993.**

CROP	DISEASE	NO. OF SAMPLES
Chives	Botrytis leaf blight	1
	Pythium root rot	1
Dill	Root rot -Phycomycete	1
Garlic	*Botrytis cinerea*	1
	Sclerotium cepivorum	1
	Onion yellow dwarf virus	1
Ginseng	*Alternaria panax*	10
	Root and crown rot - *Rhizoctonia* spp.	4
	Root rot - *Phytophthora* spp./ *P. cactorum*	8
Oregano	Root rot - Phycomycete	1
Parsley	Root rot - Phycomycete	1
Polygonum	Root rot - Phycomycete	1
Rosemary	Root rot - Phycomycete	1
Sage	Root rot - Phycomycete	1
OTHER		2
TOTAL		35

Table 5. Summary of diseases diagnosed on tree fruit samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1993.

CROP	DISEASE	NO. OF SAMPLES
Apple	Nectria canker - *Nectria* spp./	
	Nectria galligena	5
	Neofabraea perennans	1
	Pezicula malicottis	7
	Phytophthora crown rot	7
	Venturia inaqualis	2
	Erwinia amylovora	1
Apricot	*Pseudomonas syringae*	1
Cherry	*Pseudomonas syringae*	2
Filbert	*Xanthomonas campestris* pv *corylina*	3
Walnut	Downy leaf spot - *Microstroma juglandis*	1
OTHER		37
TOTAL		67

Table 6. Summary of diseases diagnosed on vegetable crops submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1993.

CROP	DISEASE	NO. OF SAMPLES
Brussels sprouts	Watery soft rot-	
	Sclerotinia sclerotiorum	1
	Pseudomonas leaf spot	1
	Xanthomonas campestris pv *campestris*	1
Bok Choy	Rhizoctonia crown rot	1
Cabbage	*Peronospora parasitica*	1
	Sclerotinia sclerotiorum	1
	Xanthomonas campestris pv. *campestris*	1
Carrot	Alternaria foliar blight	1
	Cercospora carotae	1
Cauliflower	Bacterial soft rot - *Erwinia* spp.	1
Celery	Bacterial blight - *Pseudomonas syringae*	4
Cucumber	Bacterial blight - *Pseudomonas syringae*	1
Gai Lan	*Peronospora parasitica*	1
	Plasmodiophora brassicae	1
Lettuce	Downy mildew - *Bremia lactucae*	1
	Anthracnose - *Marssoninia panattoniana*	2
	Rhizoctonia solani	1
Onion	Botrytis blast	3
	Peronospora destructor	2
	Sclerotium cepivorum	2

(cont'd)

CROP	DISEASE	NO. OF SAMPLES
Pea	Pythium root rot	1
Potato	*Helminthosporium solani*	1
	Pink rot - *Phytophthora erythroseptica*	1
	Phytophthora infestans	5
	Pythium storage rot	1
	Rhizoctonia solani	5
	Powdery scab - *Spongospora subterranea*	1
	Streptomyces scabies	2
	Erwinia carotovora	1
	Pink eye - *Pseudomonas fluorescens*	1
	Potato leafroll virus	3
Rutabaga	*Plasmodiphora brassicae*	1
	Streptomyces scabies	1
Spinach	Fusarium wilt	1
	Rhizoctonia root rot	1
Squash	Pythium stem rot	1
Tomato	*Alternaria solani*	1
	Phytophthora infestans	1
	Pseudomonas syringae	1
	Erwinia carotovora	1
OTHER		38
TOTAL		97

Table 7. Summary of diseases diagnosed on herbaceous woody ornamental and herbaceous perennial crops submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1993.

CROP	DISEASE	NO. OF SAMPLES
Abies procera	*Rhizosphaera kalkhoffii*	1
A. grandis	Phyllosticta needle blight	1
	Black mildew - *Epipolaeum abietis*	1
Acer spp.	Botryosphaeria dieback	1
	Leaf blister - *Taphrina* spp.	1
	Nectria canker	3
A. palmatum	*Kabatiella apoctypta*	2
	Winter damage	3
Arctostaphylos spp.	Thielaviopsis root rot	1
Artemisia Schmidtiana	Root rot - Phycomycete	1
Chamaecyparis spp.	*Pestalotiopsis funerea*	1
Clematis spp.	Ascochyta stem blight	1
Cotoneaster spp.	Phytophthora root rot	1
Crataegus spp.	*Diplocarpon mespili*	2
Delphinium spp.	Pythium root and crown rot	1

(cont'd)

CROP	DISEASE	NO. OF SAMPLES
Forsythia spp.	Crown gall - *Agrobacterium* spp.	1
Fragaria x 'Pink Panda'	*Cercospora vexans*	1
Goniolimon tataricum	*Botrytis cinerea*	1
	Colletotrichum gloeosporioides	1
Hibiscus spp.	Pythium root rot	1
Hypericum calycinum	Uromyces leaf rust	1
Iberis sempervirens	Crown rot - *Sclerotinia sclerotiorum*	1
Iris spp.	*Mycosphaerella macrospora*	1
I. setosa	Crown rot - Phycomycete	1
Jasminum spp.	Root rot - Phycomycete	1
Juniperus spp.	*Gymnosporangium nelsonii*	1
	Lophodermium juniperi	3
Kalmia latifolia	Pythium root rot	1
Lamium amplexicaule	Downy mildew - *Peronospora* spp.	1
Lavandula angustifolia	Phytophthora root rot	1
Leonurus cardiaca	*Thielaviopsis basicola*	1
Lonicera spp.	*Microsphaera alni*	1
Lunaria annua	*Alternaria brassicae*	1
Malus floribunda	*Phytophthora cactorum*	1
Magnolia **spp.**	*Pseudomonas syringae*	1
Paeonia lactiflora	Rhizoctonia crown rot	2
Penstemon fructicosus	Verticillium wilt and dieback	1
Picea pungens	Root rot - Phycomycete	2
Pinus spp.	Needle cast - *Elytroderma deformans*	1
	Endocronartium harknessii	1
P. contorta	Lophodermium needle cast	1
P. strobus	*Cronartium ribicola*	1
P. sylvestris	Botrytis tip dieback	1
Platanus **spp.**	Anthracnose - *Apiognomonia* spp.	1
Populus alba	Melamspora leaf rust	1
Primula vialii	*Thielaviopsis basicola*	1
Prunus serrulata	Monilinia brown rot	1
Pseudostuga menziesii	Black mildew - *Epipolaeum tsugae*	1
	Needle blight - *Hormonema merioides*	1
	Rhizosphaera kalkhoffii	2
Rhododendron spp.	Phytophthora root rot	3
	Pestalotiopsis leaf blight	1
Rosa spp.	Crown gall - *Agrobacterium* spp.	1
	Peronospora sparsa	1
Thuja spp.	*Kabatina thujae*	1
	Pestalotiopsis twig blight	1
T. occidentalis	*Kabatina thujae*	1
	Seiridium cardinale	3
	Cedar flagging	6

(cont'd)

CROP	DISEASE	NO. OF SAMPLES
Fragaria x *T. plicata*	*Didymascella thujina*	6
	Seiridium cardinale	1
Trifolium repens	Uromyces leaf rust	1
Trillium spp.	Verticillium crown rot	1
Viburnum spp.	Powdery mildew - *Microsphaera* spp.	1
Yucca spp.	Coniothyrium leaf spot	1
OTHER		161
TOTAL		251

Table 8. Summary of diseases diagnosed on turfgrass samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1993.

DISEASE	GOLF COURSE GREENS	SOD FARM	LAWN	PARKS & RECREATION
Root rot - *Pythium* spp. and *P. graminicola*	10†+19*	2+4*	2	2*
Gaeumannomyces graminis var *avenae*	5*	4*	2	
Ascochyta leaf blight	1*		3	
Microdochium nivale	3†	1+1*		1*
Colletotrichum graminicola		2		
Limonomyces roseipellis and *Laetisaria fuciformis*	1†+1*	2		1*
Curvularia spp. and *Drechslera* spp.			2	
Typhula ishikariensis	1†			
Coprinus spp.		1*		
Puccinia spp.		1		
Phyllosticta spp.	2*			
Algae	1*			
OTHER	44†	4	3	4
TOTAL	57	20	14	8

* Indicates the number of bentgrass samples.

† Refers to bentgrass and/or *Poa annua* or an undetermined mix. Unstarred numbers refer to mixes of fescues, ryegrass, Kentucky bluegrass and *Poa annua*.

CROP: Diagnostic Laboratory Report - Forage Crops

LOCATION: Alberta

NAME AND AGENCY:
J.D. Holley[1] and J.C. Calpas[2]
[1] Regional Crop Laboratory, Alberta Special Crops and Horticultural Research Centre, Brooks, Alberta T1R 1E6
[2] Brooks Diagnostics Limited, Alberta Special Crops and Horticultural Research Centre, Brooks, Alberta T1R 1E6

TITLE: DISEASES DIAGNOSED ON FORAGE CROP SAMPLES SUBMITTED TO THE SOUTHERN ALBERTA REGIONAL CROP LABORATORY AND BROOKS DIAGNOSTICS LIMITED IN 1993

METHODS: The Regional Crop Laboratory (RCL) at the Alberta Special Crops and Horticultural Research Center (ASCHRC) diagnosed diseases on samples of forage crops submitted by district agriculturalists, chemical and fertilizer company representatives and from farmers from January 1 to June 30, 1993. Brooks Diagnostics Limited (BDL), a private diagnostic clinic, moved into the RCL's facilities and assumed responsibility for identifying plant diseases in southern Alberta on July 1, 1993. Each diagnosis listed in the table below was made by carefully examining symptoms expressed on host plants or by isolating primary pathogens from diseased tissues.

RESULTS: All of the disease identifications made by the RCL and BDL on samples of forage crops in 1993 have been pooled and are summarized in Table 1.

Table 1. Summary of diseases diagnosed on forage crop samples submitted to the southern Alberta Regional Crop Laboratory and Brooks Diagnostics Limited in 1993.

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Alfalfa	Crown/root rot	*Fusarium* spp.
		Pythium spp.
	Chlorosis	Frost/cold injury
	Leaf discoloration	Nutritional deficiency
	Leaf spot	*Phoma medicaginis*
		Pseudopeziza medicaginis
	Stem spot	*Phoma medicaginis*
	Wilt	*Verticillium albo-atrum*
Orchard grass	Leaf spot	Physiological stress
	Root rot	*Fusarium* spp.
Red clover	Northern anthracnose	*Kabatiella caulivora*
Timothy	Leaf shatter	Wind damage
grass	Purple leaf spot	*Cladosporium phlei*

CROP: Diagnostic Laboratory Report - Fruit Crops

LOCATION: Alberta

NAME AND AGENCY:

J.D. Holley[1] and J.C. Calpas[2]

[1] Regional Crop Laboratory, Alberta Special Crops and Horticultural Research Centre, Brooks, Alberta T1R 1E6

[2] Brooks Diagnostics Limited, Alberta Special Crops and Horticultural Research Centre, Brooks, Alberta T1R 1E6

TITLE: DISEASES DIAGNOSED ON FRUIT CROPS SUBMITTED TO THE SOUTHERN ALBERTA REGIONAL CROP LABORATORY AND BROOKS DIAGNOSTICS LIMITED IN 1993

METHODS: The Regional Crop Laboratory (RCL) at the Alberta Special Crops and Horticultural Research Center (ASCHRC) diagnosed diseases on fruit crop samples submitted by district agriculturalists, farmers, market gardeners and greenhouse growers from January 1 to June 30, 1993. Brooks Diagnostics Limited (BDL), a private diagnostic clinic, moved into the RCL's facilities and assumed responsibility for identifying plant diseases in southern Alberta on July 1, 1993. Each diagnosis listed in the table below was made by carefully examining symptoms expressed on host plants or by isolating primary pathogens from diseased tissues.

RESULTS: All of the disease identifications made by the RCL and BDL on fruit crops in 1993 have been pooled and are summarized in Table 1.

Table 1. Summary of diseases diagnosed on fruit crop samples submitted to the southern Alberta Regional Crop Laboratory and Brooks Diagnostics Limited in 1993.

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Apple	Canker	*Cytospora* spp.
		Erwinia amylovora
		Mechanical damage
	Chlorosis	Iron deficiency
		Nitrogen deficiency
		Physiological stress
	Crown rot	Cold temperature injury
	Dieback	Winter drought injury
	Fireblight	*Erwinia amylovora*
	Leaf blackening	Frost
	Leaf burn	Physiological stress
		Spray drift injury
	Leaf distortion	Frost
		Phenoxy herbicide injury
	Shot-hole	*Coccomyces hiemalis*
	Stem blackening	Frost
	Stem distortion	Frost
Blueberry	Storage rot	*Apergillus* spp.
		Penicillium spp.

(cont'd)

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Crabapple	Bacterial blight	*Pseudomonas syringae*
	Fireblight	*Erwinia amylovora*
	Leaf distortion	Physiological stress
		Spray drift injury
Currant	Coral spot	*Nectria cinnabarina*
Kiwi	Leaf spot	Low light
Pear	Fireblight	*Erwinia amylovora*
	Leaf blackening	Frost
Raspberry	Bacterial blight	*Pseudomonas syringae*
	Chlorosis	Iron deficiency
		Pseudomonas syringae
	Leaf distortion	Phenoxy herbicides
	Spur blight	*Didymella applanata*
Rhubarb	Crown rot	*Erwinia rhapentici*
Saskatoon	Bacterial blight	*Pseudomonas syringae*
	Blackleaf	*Apiosporina collinsii*
	Canker	*Cytospora* spp.
	Crown rot	Cold temperature injury
	Fireblight	*Erwinia amylovora*
	Fruit abortion	*Pseudomonas syringae*
	Leaf distortion	Spray drift injury
	Rust	*Gymnosporangium nelsonni*
	Storage rot	*Penicillium* spp.
Strawberry	Crown/root rot	*Fusarium* spp.
	Fruit rot	*Botrytis cinerea*
	Leaf spot	*Botrytis cinerea*
		Mycosphaerella fragariae
Tangerine	Brown spot	*Alternaria citri*

CROP: Diagnostic Laboratory Report - Greenhouse Crops

LOCATION: Alberta

NAME AND AGENCY:

J.D. Holley[1] and J.C. Calpas'

[1] Regional Crop Laboratory, Alberta Special Crops and Horticultural Research Centre, Brooks, Alberta T1R 1E6

[2] Brooks Diagnostics Limited, Alberta Special Crops and Horticultural Research Centre, Brooks, Alberta T1R 1E6

TITLE: DISEASES DIAGNOSED ON GREENHOUSE CROPS SUBMITTED TO THE SOUTHERN ALBERTA REGIONAL CROP LABORATORY AND BROOKS DIAGNOSTICS LIMITED IN 1993

METHODS: The Regional Crop Laboratory (RCL) at the Alberta Special Crops and Horticultural Research Center (ASCHRC) diagnosed diseases on greenhouse grown ornamental and vegetable crops submitted by district agriculturalists, extension specialists, florists, or greenhouse growers from January *1* to June 30, 1993. Brooks Diagnostics Limited (BDL), a private diagnostic clinic, moved into the RCL's facilities and assumed responsibility for identifying plant diseases in southern Alberta on July 1, 1993. Each diagnosis listed in the table below was made by carefully examining symptoms expressed on host plants or by isolating primary pathogens from diseased tissues.

RESULTS: All of the disease identifications made by the RCL and BDL on greenhouse crops in 1993 have been pooled and are summarized in Table 1.

Table 1. Summary of diseases diagnosed on greenhouse crop samples submitted to the southern Alberta Regional Crop Laboratory and Brooks Diagnostics Limited in 1993.

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Alyssum	Chlorosis	Nutritional deficiency
	Leaf spot	Spray drift injury
Begonia	Marginal leaf burn	High soil salinity
Chrysanthemum	Crown/root rot	*Pythium* spp.
		Fusarium spp.
	Leaf spot	Spray drift injury
	Oedema	Overwatering/high humidity

(cont'd)

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Cucumber	Chlorosis	Overwatering
		Nutritional deficiency
	Crown/root rot	*Fusarium* spp.
		Pythium spp.
	Leaf spot	*Bottytis cinerea*
		Cladosporium cucumerinum
		Nutritional deficiency
		Manganese toxicity
		Physiological stress
		Spray drift injury
	Marginal leaf burn	High soil salinity
		Manganese toxicity
	Soft rot	*Erwinia carotovora*
		subsp. *carotovora*
	Storage rot	*Fusarium* spp.
		Penicillium spp.
	Wilt	*Verticillium* spp.
Coleus	Stunting	Poor soil aeration
Cyclamen	Leaf spot	Spray drift injury
Dracena	Leaf spot	*Botrytis cinerea*
Fababean	Leaf spot	TSWV
Geranium	Bacterial blight/	*Xanthomonas campestris*
	Bacterial canker	subsp. *pelargonii*
	Blackleg	*Pythium* spp.
	Chlorosis	Physiological stress
	Crown/root rot	*Fusarium* spp.
		Pythium spp.
	Flower distortion	Genetic anomaly
	Leaf burn	High soil salinity
		Spray drift injury
	Leaf discoloration	Phosphorous deficiency
	Leaf distortion	Physiological stress
	Oedema	Overwatering/high humidity
	Stunting	Poor soil aeration
Gloxinia	Leaf distortion	INSV (TSWV-I)*
	Leaf spot	INSV (TSWV-I)
Godetia	Canker	*Fusarium* spp.
		Physiological stress
		Pythium spp.
Gypsophila	Leaf spot	Physiological stress
Lavaterra	Leaf spot	INSV (TSWV-I)
Lily	Crown/root rot	*Fusarium* spp.
	Leaf spot	*Botrytis cinerea*
	Marginal leaf burn	High soil salinity
	Stunting	Low light/low temperature
		Nutritional deficiency

(cont'd)

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Marigold	Leaf distortion	Spray drift injury
	Leaf mottling	Chilling injury
Pansy	Stunting	High soil salinity
Pepper	Crown gall	*Agrobacterium* spp.
	Storage rot	*Penicillium* spp.
Petunia	Stunting	Low light/low temperature
Podocarpus	Leaf burn	Low light
Poinsettia	Crown/root rot	*Rhizoctonia solani*
Rose	Leaf spot	*Botrytis cinerea*
		Physiological stress
	Marginal leaf burn	High soil salinity
	Oedema	High humidity
	Powdery mildew	*Sphaerotheca pannosa*
	Wilt (Cut flowers)	Bacteria in holding water
	Wilt	*Verticillium albo-atrum*
Statice	Leaf discoloration	Phosphorous deficiency
Tomato	Canker	*Erwinia carotovora*
		Sclerotinia sclerotiorum
	Chlorosis	Nutritional deficiency
		Physiological stress
	Chimaera	Genetic anomaly
	Crown/root rot	*Fusarium oxysporum*
		Pythium spp.
	Ghost spot	*Botrytis cinerea*
	Leaf discoloration	Phosphorous deficiency
	Leaf distortion	Physiological stress
		Spray drift injury
	Leaf spot	*Botrytis cinerea*
		Chemical in soil mixture
		Nutritional deficiency
		Physiological stress
		Spray drift injury
	Stem mottling	Nutritional deficiency
	Stunting	Chemical in potting mixture
		Poor soil aeration
	Wilt	*Fusarium oxysporum*
		Physiological stress

* Strains of TSWV listed above were identified with strain specific antisera using the ELISA technique.

CROP: Diagnostic Laboratory Report - Herbaceous and Woody Ornamentals

LOCATION: Alberta

NAME AND AGENCY:

J.D. Holley[1] and J.C. Calpas[2]

[1] Regional Crop Laboratory, Alberta Special Crops and Horticultural Research Centre, Brooks, Alberta T1R 1E6

[2] Brooks Diagnostics Limited, Alberta Special Crops and Horticultural Research Centre, Brooks, Alberta T1R 1E6

TITLE: DISEASES DIAGNOSED ON HERBACEOUS AND WOODY ORNAMENTALS SUBMITTED TO THE SOUTHERN ALBERTA REGIONAL CROP LABORATORIES AND BROOKS DIAGNOSTICS LIMITED IN 1993

METHODS: The Regional Crop Laboratory (RCL) at the Alberta Special Crops and Horticultural Research Center (ASCHRC) diagnosed diseases on samples of herbaceous and woody ornamental plants submitted by district agriculturalists, extension specialists, florists, landscaping companies, municipal parks and recreation staff and the general public from January 1 to June 30, 1993. Brooks Diagnostics Limited (BDL), a private diagnostic clinic, moved into the RCL's facilities and assumed responsibility for identifying plant diseases in southern Alberta on July 1, 1993. Each diagnosis listed in the table below was made by carefully examining symptoms expressed on host plants or by isolating primary pathogens from diseased tissues.

RESULTS: All of the disease identifications made by the RCL and BDL on herbaceous and woody ornamental plants in 1993 have been pooled and are summarized in Table 1.

Table 1. Summary of diseases diagnosed on herbaceous and woody ornamental plants submitted to the southern Alberta Regional Crop Laboratory and Brooks Diagnostics Limited in 1993.

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Ash	Anthracnose	*Gloeosporium aridum*
	Canker	*Cytospora* spp.
	Chlorosis	Iron deficiency
	Leaf distortion	Phenoxy herbicide injury
	Slime flux	Various bacteria
Aspen	Dieback	Winter drought injury
	Leaf burn	Physiological stress
Blue spruce	Needle browning	Winter drought injury
	Needle cast	Physiological stress
	Needle distortion	Frost
		Spray drift injury
Birch	Canker	*Cytospora* spp.
		Mechanical damage
	Dieback	Winter drought injury
	Leaf burn	Dimethoate injury
		High soil salinity
		Spray drift injury
	Wilt	Moisture stress

(cont'd)

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Caragana	Leaf burn	Spray drift injury
	Marginal leaf burn	High soil salinity
Cedar	Needle browning	Winter drought injury
Coriander	Blight	*Alternaria* spp.
Cotoneaster	Coral spot	*Nectria cinnabarina*
	Fireblight	*Erwinia amylovora*
	Leaf distortion	Phenoxy herbicide injury
Crabapple	Bacterial blight	*Pseudomonas syringae*
	Fireblight	*Erwinia amylovora*
	Leaf distortion	Frost
		Spray drift injury
Dogwood	Bacterial blight	*Pseudomonas syringae*
	Leaf spot	*Septoria canadensis*
English Ivy	Crown/root rot	*Fusarium* spp.
		Pythium spp.
Flowering Cherry	Powdery Mildew	*Podosphaera clandestina*
Gladiolus	Basal bulb rot	*Erwinia carotovora* subsp. *carotovora*
Hibiscus	Leaf spot	Low light
Hollyhock	Crown/root rot	*Pythium* spp.
		Rhizoctonia solani
Iris	Crown/root rot	*Erwinia carotovora* subsp. *carotovora*
		Fusarium oxysporum
Lilac	Bacterial blight	*Pseudomonas syringae*
	Fasciation	Genetic anomaly
	Leaf distortion	Phenoxy herbicide injury
	Marginal leaf burn	High soil salinity
	Stunting	Nutritional deficiency
Linden	Canker	*Nectria galligena*
	Leaf spot	Physiological stress
Maple	Canker	*Cytospora* spp.
	Marginal leaf burn	High soil salinity
		Moisture stress
	Leaf distortion	Phenoxy herbicide injury
	Tar spot	*Rhytisma acerinum*
Marigold	Leaf distortion	Spray drift injury
Mayday	Bacterial blight	*Pseudomonas syringae*
	Black knot	*Dibotryon morbosum*
	Canker	*Cytospora* spp.
	Leaf blackening	Frost
	Leaf distortion	Frost
	Marginal leaf burn	High soil salinity
	Shot-hole	*Coccomyces hiemalis*
Mountain ash	Bacterial blight	*Pseudomonas syringae*
	Fireblight	*Erwinia amylovora*

(cont'd)

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Peony	Measles	*Cladosporium paeoniae*
	Stunting	Nutritional deficiency
	Wilt	*Verticilliumalbo-atrum*
Pine	Bud distortion	Frost
	Needle blight	*Scirrhia aecicola*
	Needle browning	Winter drought injury
Poplar	Canker	*Cytospora* spp.
		Frost/sunscald
		Mechanical damage
	Dieback	Winter drought injury
	Leaf distortion	Frost
		Phenoxy herbicide injury
	Leaf shatter	Wind injury
	Leaf spot	*Marssonina populi*
		Physiological stress
	Slime flux	Various bacteria
	Twig blight	*Venturia macularis*
POPPY	Leaf discoloration	Phosphorous deficiency
Rose	Fireblight	*Erwinia amylovora*
	Rust	*Phragmidium* spp.
Russian olive	Wilt	*Verticilliumalbo-atrum*
Willow	Canker	Frost/sunscald
	Dieback	Cold temperature injury
		Winter drought injury
	Leaf blackening	Frost
	Leaf burn	Moisture stress
		Spray drift injury
	Witches broom	*Venturia saliciperda*

CROP: Diagnostic Laboratory Report - Lentils

LOCATION: Manitoba

NAME AND AGENCY:
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TITLE: DISEASES DIAGNOSED ON LENTIL CROPS BY THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1993

METHODS: The Manitoba Agriculture Crop Diagnostic Centre provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted by Manitoba agriculture extension staff, farmers, agri-business and the general public. Diagnosis is based on visual examination for symptoms and culturing onto artificial media.

RESULTS AND COMMENTS: Results are based on 42 samples of lentils submitted to the Crop Diagnostic Centre. A summary of disease diagnoses is presented in Table 1. The most commonly encountered diseases were ascochyta, anthracnose and Sclerotinia white mold. Root rot was detected in five samples. Environmental stress, particularly excess moisture, caused extensive crop loss in the Red River Valley.

Table 1. Diseases diagnosed on lentil submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1993.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Ascochyta blight	*Ascochyta fabae* pv. *lentis*	11
Anthracnose	*Colletotrichum truncatum*	10
Sclerotinia stem rot	*Sclerotinia sclerotiorum*	8
Root rot	*Fusarium* spp.	5
Environmental stress	Deep seeding excess moisture	4
Nutrient Deficiency		4

Sclerotinia was the most serious problem affecting lentils in Manitoba in 1993. Areas of high incidence and severe damage occurred near Portage and McGregor in central Manitoba and in the southern Red River Valley. The cool weather delayed the onset of anthracnose but some fields showed heavy development in August. Cool wet weather promoted the development of a dense plant stand. Maturity was also delayed several weeks by the weather. Anthracnose was common in many fields in the southern Red River Valley area but it was difficult to separate loss due to anthracnose and loss attributed to excess **soil,** water and root rot.

CROP: Diagnostic Laboratory Report - Oilseed and Special Field Crops

LOCATION: Alberta

NAME AND AGENCY:

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TITLE: DISEASES DIAGNOSED ON OILSEED AND SPECIAL FIELD CROPS SUBMITTED TO THE SOUTHERN ALBERTA REGIONAL CROP LABORATORY AND BROOKS DIAGNOSTICS LIMITED IN 1993

METHODS: The Regional Crop Laboratory (RCL) at the Alberta Special Crops and Horticultural Research Center (ASCHRC) diagnosed diseases on oilseed and special field crop samples submitted by district agriculturalists, extension specialists and farmers from January 1 to June 30, 1993. Brooks Diagnostics Limited (BDL), a private diagnostic clinic, moved into the RCL's facilities and assumed responsibility for identifying plant diseases in southern Alberta on July 1, 1993. Each diagnosis listed in the table below was made by carefully examining symptoms expressed on host plants or by isolating primary pathogens from diseased tissues.

RESULTS: All of the disease identifications made by the RCL and BDL on oilseed and special field crops in 1993 have been pooled and are summarized in Table 1.

Table 1. Summary of diseases diagnosed on oilseed and special field crop samples submitted to the southern Alberta Regional Crop Laboratory and Brooks Diagnostics Limited in 1993.

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Canola	Chlorosis	Frost
	Prematurity blight	*Fusarium* spp.
	Staghead	*Albugo candida*
Ginseng	Crown/root rot	*Rhizoctonia solani*
	Damping-off	*Pythium* spp.
	Leaf spot	Physiological stress
Lentil	Crown/root rot	*Fusarium* spp.
	Leaf spot	*Botrytis cinerea*
Spearmint	Crown/root rot	Cold temperature injury
		Fusarium spp.
	Storage rot	*Alternaria* spp.
		Penicillium spp.
		Rhizopus stolonifera

CROP: Diagnostic Laboratory Report - Potato

LOCATION: Manitoba

NAME AND AGENCY:
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TITLE: DISEASES DIAGNOSED ON POTATO CROPS BY THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1993

METHODS: The Manitoba Agriculture Crop Diagnostic Centre provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted by Manitoba agriculture extension staff, farmers, agri-business and the general public. Diagnosis is based on visual examination for symptoms and culturing onto artificial media. Forty samples of potato plants and 81 tuber samples from potatoes harvested in 1992 were analysed for disease.

RESULTS AND COMMENTS: Results of potato submissions are shown in Table 1. Unseasonably cool weather favoured the development of late blight in Carman, Portage and Steinbach. Growers averted serious damage by using a spray program of mancozeb and metalaxyl. Wet weather in August resulted in severe drownout of potatoes in the Winkler area, in the Eastern region near Selkirk and some fields in the Central region west of Portage. Early blight was not as prominent as late blight in 1993. Very little of the early dying complex involving Verticillium, Fusarium and Colletotrichum was observed. Loss in storage from late blight occurred particularly in potatoes from fields that had not been sprayed. Fusarium dry rot was the most common cause of storage decay (Table 2).

Table 1. Disease diagnosed on potatoes submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1993.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Early blight	*Alternaria solani*	6
Fusarium root rot	*Fusarium* sp.	5
Late blight	*Phytophthora infestans*	5
Blackleg	*Erwinia carotovora* var. *atroseptica*	1
Verticillium wilt	*Verticillium dahliae*	1
Environmental stress	Excess water, black heart	22

Table 2. Tuber survey results (1992 harvested potatoes).

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Fusarium dry rot	*Fusarium* spp.	40
Black dot	*Colletotrichum* spp.	29
Soft rot	*Erwinia caratovora* var. *carotovora*	5
Late blight	*Phytophthora infestans*	3
Black scurf	*Rhizoctonia solani*	2
Verticillium wilt	*Verticillium dahliae*	2

CROP: Diagnostic Laboratory Report - Turf

LOCATION: Alberta

NAME AND AGENCY:
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TITLE: DISEASES DIAGNOSED ON TURF SUBMITTED TO THE SOUTHERN ALBERTA REGIONAL CROP LABORATORY AND BROOKS DIAGNOSTICS LIMITED IN 1993

METHODS: The Regional Crop Laboratory (RCL) at the Alberta Special Crops and Horticultural Research Center (ASCHRC) diagnosed diseases on samples of turf submitted by golf course supervisors and by the general public from January 1 to June 30, 1993. Brooks Diagnostics Limited (BDL), a private diagnostic clinic, moved into the RCL's facilities and assumed responsibility for identifying plant diseases in southern Alberta on July 1, 1993. Each diagnosis listed in the table below was made by carefully examining symptoms expressed on host plants or by isolating primary pathogens from diseased tissues.

RESULTS: All of the disease identifications made by the RCL and BDL on turf samples in 1993 have been pooled and are summarized in Table 1.

Table 1. Summary of diseases diagnosed on samples of turf submitted to the southern Alberta Regional Crop Laboratory and Brooks Diagnostics Limited in 1993.

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Turf	Brown patch	*Rhizoctonia solani*
	Crown/root rot	*Fusarium* spp.
		Pythium spp.
	Damping-off	*Pythium* spp.
	Gerlachia patch	*Gerlachia nivalis*
	Leaf spot	*Drechslera poae*
	Melting out	*Drechslera poae*

CROP: Diagnostic Laboratory Report - Turf

LOCATION: Manitoba

NAME AND AGENCY:
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TITLE: DISEASES DIAGNOSED ON TURFGRASS SUBMITTED TO THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1993

METHODS: The Manitoba Agriculture Crop Diagnostic Centre provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted by Manitoba agriculture extension staff, farmers, agri-business and the general public. Diagnosis is based on visual examination for symptoms and culturing onto artificial media.

RESULTS AND COMMENTS: The results of lawn and amenity turf submissions are shown in Table. 1. Leaf diseases, notably Septoria, Anthracnose and melting out were the most common problems encountered. Cool, wet weather conditions prevented the normal appearance of the summer decline disease complex. However the wet weather was very favourable for fairy ring and in a few instances red thread.

Table 1. Diseases diagnosed on lawn and turf samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1993.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Septoria leaf spot	*Septoria* spp.	8
Anthracnose	*Colletotrichumgraminicola*	5
Melting out	*Drechslera* spp.	5
Rhizoctonia	*Rhizoctonia solani*	5
Fusarium patch	*Fusarium* spp.	3
Slime mould	Unidentified	3
Ascochyta leaf blight	*Ascochyta* spp.	1
Fairy ring	*Marasmius* sp.	2
Pink snow mould	*Fusarium nivale*	1
Red Thread	*Laetisaria fuciformis*	2
Root rot	*Pythium* sp.	1
Environmental stress		2
Herbicide injury		1

Cool moist weather prevented the normal appearance of the summer decline disease complex. Conditions were very favourable for fairy ring and a few cases of red thread were detected. Leaf diseases were not a major problem in 1993.

CROP: Diagnostic Laboratory Report - Vegetable Crops

LOCATION: Alberta

NAME AND AGENCY:

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TITLE: DISEASES DIAGNOSED ON VEGETABLE CROPS SUBMITTED TO THE SOUTHERN ALBERTA REGIONAL CROP LABORATORY AND BROOKS DIAGNOSTICS LIMITED IN 1993

METHODS: The Regional Crop Laboratory (RCL) at the Alberta Special Crops and Horticultural Research Center (ASCHRC) diagnosed diseases on samples of field grown vegetable crops submitted by district agriculturalists, extension specialists, market gardeners, farmers and the general public from January 1 to June 30, 1993. Brooks Diagnostics Limited (BDL), a private diagnostic clinic, moved into the RCL's facilities and assumed responsibility for identifying plant diseases in southern Alberta on July 1, 1993. Each diagnosis listed in the table below was made by carefully examining symptoms expressed on host plants or by isolating primary pathogens from diseased tissues.

RESULTS: All of the disease identifications made by the RCL and BDL on field grown vegetable crops in 1993 have been pooled and are summarized in Table 1.

Table 1. Summary of diseases diagnosed on field grown vegetable crops submitted to the southern Alberta Regional Crop Laboratory and Brooks Diagnostics Limited in 1993.

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Bean	Bacterial brown spot	***Pseudomonas syringae*** subsp. ***syringae***
	Halo blight	***Pseudomonas syringae*** subsp. ***phaseolicola***
Beet	Leaf shatter	Wind injury
Cabbage	Leaf speckle	***Cladosporium*** spp.
Carrot	Cavity spot	***Pythium*** spp.
	Storage rot	***Botrytis cinerea*** ***Sclerotinia sclerotiorum***
	Root rot	***Rhizoctonia solani***
Corn	Leaf distortion	Physiological stress
	Stalk rot	***Erwinia carotovora*** subsp. ***carotovora***
		Excessive irrigation
Garlic	Storage rot	***Penicillium*** spp.
Onion	Bulb spot	Physiological stress

(cont'd)

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Pea	Blight	*Mycosphaerella pinodes*
	Chlorosis	Nitrogen deficiency
	Crown/root rot	*Fusarium* spp.
		Ascochyta pinodella
	Leaf distortion	Phenoxy herbicide injury
	Oedema	Physiological stress
Pepper	Fruit speckle	*Alternaria* spp.
	Stem rot	*Sclerotinia sclerotiorum*
Potato	Bacterial ring rot	*Clavibacter michiganensis* subsp. *sepedonicum*
	Black dot	*Colletotrichum atramentarium*
	Black heart	Low oxygen in storage
	Blackleg	*Erwinia carotovora* subsp. *atroseptica*
	Black scurf	*Rhizoctonia solani*
	Canker	*Rhizoctonia solani*
	Chlorosis	Mosaic viruses
		Nitrogen deficiency
	Damping-off	*Rhizoctonia solani*
	Dry rot	*Fusarium* spp.
	Early blight	*Alternaria solani*
	Fiddlehead	Tordon residue in the soil
	Hollow heart	Physiological stress
	Late blight	*Phytophthora infestans*
	Leaf blackening	Frost
	Leaf burn	Spray drift injury
	Leak	*Pythium debaryanum*
	Mahogany browning	Chilling injury
	Net necrosis	Chilling injury
		PLRV
	Oedema	Physiological stress
	Pink rot	*Phytophthora erythroseptica*
	Seed piece decay	*Erwinia carotovora* subsp. *carotovora*
		Fusarium spp.
	Silver scurf	*Helminthosporium solani*
	Sunscald	Exposure to light
	Stunting/stem cracking	Dragging soil off hills late in the season
	Vein chlorosis	metribuzin injury
	Wilt	*Fusarium oxysporum*
		Moisture stress
	Wilt	*Verticilliumdahliae*
		Verticilliumalbo-atrum

(cont'd)

CROP	SYMPTOM/DISEASE	CAUSAL AGENT/PLANT PATHOGEN
Tomato	Bacterial speck	*Pseudomonas tomato*
	Chlorosis	Nutritional deficiency
		Physiological stress
	Early blight	*Alternaria solani*
	Ghost spot	*Botrytis cinerea*
	Late blight	*Phytophthora infestans*
	Leaf distortion	Phenoxy herbicide injury