Diagnostic Laboratories / Laboratoires diagnastiques

CROP: Commercial Crops - Diagnostic Laboratory Report

LOCATION: British Columbia

NAME AND AGENCY:
J.F. Elmhirst and V. Joshi
British Columbia Ministry of Agriculture, Fisheries and Food
17720 - 57th Avenue, Surrey, British Columbia V3S 4P9

TITLE: DISEASES DIAGNOSED ON COMMERCIAL CROPS SUBMITTED TO THE BRITISH COLUMBIA PLANT DIAGNOSTIC LABORATORY IN 1994

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 laboratory by ministry extension staff, growers, agri-business, 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 the diseases and/or causal agents diagnosed on commercial crops are presented in Tables 1 to 8 by crop category. 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 December 1, 1993 to Novembier 30,1994.

TABLE 1. Summary of diseases diagnosed on greenhouse vegetable samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1994.

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Cucumber	***Penicillium oxalicum*** stem rot*	1
	Didymella bryoniae	1
	Pythium root rot	2
	Fruit Rot - ***Penicillium*** sp.	1
	- ***Didymella bryoniae***	1
Pepper	***Botrytis cinerea***	1
	Fusarium solani	5
	Fusarium sp.	2'
	Verticillium fruit rot	1
	Erwinia soft rot	1
	Pythium root rot	3
Tomato	Botrytis ***cinerea***	1
	Pythium root rot	61
	Corky root - ***Humicola*** sp.	61
Other		301
TOTAL		62

* First report *of* virulent strain in British Columbia (J. Menzies, Agriculture and Agri-Food Canada, Agassiz, British Columbia, pers. com.).

TABLE 2. Summary of diseases diagnosed on floriculture samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1994.

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Anthurium sp.	Pythium root rot	1
Antirrhinum spp.	*Peronospora antirrhini*	1
	Root rot - Phycomycete	1
	INSV	1
Alyssum spp.	*Peronospora myosotidis*	1
	Pythium root rot	1
Begonia sp.	*Bottytis cinerea*	1
Brachycome sp.	INSV	1
Browalia sp.	INSV	**2**
Chrysanthemum x *morifolium*	*Sclerotinia sclerotiorum*	1
	TSWV	**2**
Cyclamen persicum	Cylindrocarpon crown rot	1
Dahlia sp.	INSV	1
Dendrobium sp.	Pythium root rot	1
Dianthus caryophyllus	Crown and root rot - Phycomycete	1
	Pythium damping off	1
Euphorbia pulcherrima	*Xanthomonas campestris*	1
	Crown and root rot - Phycomycete	**2**
	Thielaviopsis basicola	1
Exacum sp.	INSV	1
Fuchsia x *hybrida*	Root rot - Phycomycete	1
	Pucciniastrum epilobii	1
	Thielaviopsis basicola	**2**
	Botrytis cinerea	**2**
Gerbera sp.	*Sclerotinia sclerotiorum*	1
Hydrangea sp.	Anthracnose - *Colletotrichum* sp.	1
Impatiens wallerana	*Botrytis cinerea*	1
	INSV	**3**
	Pythium root rot	1
	Slime mold - Myxomycete	1
Lilium sp.	Pythium root rot	1
Lisianthus sp.	*Botrytis cinerea*	**2**
Matthiola sp.	Pythium root rot	1
Narcissus spp.	*Fusarium oxysporum* f. *sp. narcissi*	1
	Bulb and stem nematode	**2**
Pelargonium x *hortorum*	*Xanthomonas campestris* pv. *pelargonii*	**5**
	Bottytis cinerea	**3**
	Pythium root rot	**5**
	Rhizoctonia root rot	1
	Puccinia pelargonii-zonalis	1*
Pelargonium peltatum	Oedema	1
Petunia sp.	INSV	1

(cont'd.)

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Primula sp.	Root rot - Phycomycete	2
	Thielavopsis basicola	2
	Fusarium crown rot	1
	Erwinia carotovora	1
	Pseudomonas leaf spot	1
Ranunculus sp.	INSV	1
Saintpaulia sp.	Crown and root rot - Phycomycete	1
Senecio cruentus	INSV	1
Schizostylus sp.	Anthracnose - *Colletotrichum* sp.	1
Tagetes spp.	Pythium root rot	1
	Botrytis cinerea	1
	INSV	1
Tulipa sp.	Fire - *Botrytis* sp.	1
Verbena sp.	INSV	1
	Root rot - Phycomycete	1
Viola spp.	*Thielaviopsisbasicola*	3
	Peronospora violae	1
	Alternaria violae	1
	Pythium root rot	1
Cactus sp.	*Fusarium oxysporum*	1
Other		58
TOTAL		143

• Sample from a home garden. Disease is not present in commercial operations in British Columbia.

TABLE 3. Summary of diseases diagnosed on small fruit samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1994.

CROP	DISEASE/CAUSAL AGENT	NIO. OF SAMPLES
Blueberry	*Botrytis* spp.	4
	Coryneum stem canker	2
	Godronia cassandrae	7
	Monilinia vaccinii-corymbosi	1
	Pseudomonas syringae	10
	Phomopsis vaccinii	1
	Phytophthora root rot	2
Blackberry	Coryneum cane canker	1
	Phytophthora root rot	2
Cranberry	Phytophthora root rot	3
	Rhizoctonia sp.	1
Currant	*Drepanopeziza ribis*	1
	Cronartium ribicola	1

(cont'd.)

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Raspberry	***Didymella applanata***	1
	Phragmidium rubi-idaei	1
	Phytophthora root rot	4
	Anthracnose	2
	Botrytis cane wilt	1
	Verticillium wilt	4
	Leptosphaeria coniothyrium	1
Saskatoon	***Botrytis cinerea***	1
	Gymnosporangium rust	2
Strawberry	***Verticillium dahliae***	1
	Rhizoctonia root rot	7
	Parasitic root nematodes	2
Other		**9**
TOTAL		72

TABLE 4. Summary of diseases diagnosed on specialty crop samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in **1994.**

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Agaricus bisporus	***Trichoderma*** sp.	2
Basil	Damping off - Phycomycete	1
	Crown and root rot - Phycomycete	1
Dill	Alternaria leaf blight	1
Garlic	Botrytis bulb rot	1
	Sclerotium cepivorum	5
	Fusarium basal rot	2
	Thielaviopsis basicola root rot	1
	Rhizoctonia sp.	1
Ginseng	***Alternaria panax***	14
	Rusty root - ***Cylindrocarpon destructans***	1
	Root and crown rot - ***Rhizoctonia*** sp.	5
	Root rot - ***Phyfophthora*** sp.	a
	Damping off - ***Rhizoctonia*** sp.	2
	- ***Pythium*** sp.	1
	Leaf spot - ***Botrytis*** sp.	**3**
	Seed decay - ***Fusarium*** spp.	2
	- ***Botrytis*** sp.	1
	- ***Alternaria*** sp.	1
	- ***Cylindrocarpon*** sp.	1
Oyster mushroom	***Penicillium*** sp.	2
	Trichoderma sp.	**1**
Rosemary	***Thielaviopsis basicola***	1
Tobacco	Damping off - Phycomycete	**1**
Other		**19**
TOTAL		***70***

Table 5. Summary of diseases diagnosed on tree fruit samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in **1994.**

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Apple	***Venturia inaequalis***	1
	Nectria galligena	**2**
	Diaporthe perniciosa	1
	Cytospora canker	**2**
	Alternaria sp.	1
	Phytophthora crown rot	**2**
	Erwinia amylovora	**1**
	Crown gall - ***Agrobacterium*** sp.	**2**
	Cork spot - Calcium deficiency	1
Cherry	***Pseudomonas syringae***	1
Filbert	***Xanthomonas campestris*** pv. ***corylina***	1
Pear	***Venturia pirina***	1
Other		**3**
TOTAL		**19**

TABLE 6. Summary of diseases diagnosed on field vegetable samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in **1994.**

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Asparagus	***Stemphyllium vesicarium***	1
Bean	Pythiurn crown and root rot	1
Broccoli/Cauliflower	Root rot - Phycomycete	**2**
Brussels sprout	***Pseudomonas*** sp. pepper spot	**2**
	Fusarium sp. - superficial	1
	Alternaria sp. - superficial	1
Carrot	***Fusarium roseum***	1
	Pythium cavity spot	1
Celery	***Pseudomonas syringae*** - bacterial blight	1
	Bacterial soft rot	1
	Fusarium root rot	1
	Thanatephoris cucumeris	1
	Cercospora apii	1
	Septoria apiicola	1
	Ustilago maydis	1
Corn	Pythium crown and root rot	**4**
Cucumber	***Pseudomonas lacrymans***	1
	Bremia lactucae	1
Lettuce		(cont'd.)

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Melon	Fusarium wilt and root rot	1
Onion	Botrytis blast	1
	Peronospora destructor	1
	Aspergillus niger	1
Pea	Pythium/Rhizoctonia root rot	1
	Thielaviopsis basicola	1
Pepper	***Botrytis cinerea*** stem blight	1
	Root rot - Phycomycete	1
	Damping off - ***Fusarium*** sp.	1
Potato	***Phytophthora erythroseptica***	1
	Phytophthora infestans	1
	Pythium cottony leak	1
	Scab - ***Streptomyces*** sp.	1
	Erwinia carotovora	5
	Dry rot - ***Fusarium solani***	2
	Fusarium spp.	2
	Clavibacter michiganensis subsp. ***sepedonicus***	1*
	Botrytis sp.	1
	Mosaic virus	1
Spinach	Pythium root rot	1
Tomato	Root rot - Phycomycete	3
Turnip	***Plasmodiophora brassicae***	1
Watermelon	Pythium damping off	1
Zucchini	***Cladosporium cucumerinum***	1
Other		38
TOTAL		93

• Ongoing problem in one area, no new outbreaks.

TABLE 7. Summary of diseases diagnosed on woody ornamental and perennial samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1994.

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Abies sp.	*Rhizosphaera kalkhoffii*	1
Acer palmatum	Nectria canker	2
	Pseudomonas syringae	1
	Verticillium dahliae	2
	Kabatiella apocrypta	2
Acer sp.	Nectria canker	1
Adiantum sp.	Rhizoctonia aerial blight	1
Alcea rosea	Pythium root rot	1
Alnus sp.	*Pseudomonas syringae*	1
Aster sp.	Cercospora leaf spot	2
Araucaria araucana	Phytophthora root rot	1
Azalea spp.	Phytophthora crown and root rot	2
	Exobasidium vaccinii	2
	Microsphaeria sp. - powdery mildew	1
Campanula sp.	Pythium root rot	1
Catalpa sp.	*Verticillium dahliae*	1
Cedrus atlantica	*Rhizosphaera kalkhoffii*	1
Chamaecyparis sp.	Phytophthora root rot	1
Clematis spp.	*Ascochyta aquilegiae*	1
	Fusarium crown rot	1
Delphinium grandiflorum	Root rot - Phycomycete	1
Edgeworthia sp.	*Botrytis cinerea*	1
Forsythia sp.	*Pseudomonas syringae*	1
Gaillardia sp.	Root rot - Phycomycete	1
Hemerocallis sp.	Root rot - Phycomycete	1
Heuchera sanguinea	*Thielaviopsis basicola*	1
Hibiscus spp.	Sooty mold - Ascomycete	2
Humulus lupulus	*Pseudoperonospora humuli*	1
Hypericum calycinum	Phytophthora root rot	1
Ilex sp.	Phytophthora blight	1
Iris sp.	Crown rot - Phycomycete	1
Juniperus chinensis	Phytophthora root rot	1
Juniperus spp.	Twig dieback - *Cercospora* sp.	1
	Phytophthora root rot	6
	Kabatina sp.	1
Kalmia latifolia	Root rot - Phycomycete	1
Larix sp.	Phytophthora root rot	1
Liatris sp.	Stem rot - *Botrytis cinerea*	1
	Sclerotinia sp.	1
Limonium vulgare	*Colletotrichum gloeosporoides*	2
Lobelia sp.	Pythium root rot	1
Lunaria annua	*Alternaria brassicae*	1
Lupinus spp.	*Peronospora trifoliorum*	1
	Powdery mildew	1

(cont'd.)

CROP	DISEASE/CAUSAL AGENT	NO. OF SAMPLES
Malus floribunda	Phytophthora root rot	1
Malus spp.	Fungal canker	1
	Nectria galligena	1
	Phythophthora crown rot	1
Phlox sp.	Smut - *Entyloma* sp.	1
Pinus contorta	Lophodermium needle cast	1
P. flexilus	Phytophthora root rot	1
P. nigra	*Dothiostroma pini*	1
P. paniculata	Stem canker - *Phoma* sp.	1
P. ponderosa	*Lophodermella morbida*	1
P. thunbergiana	Lophodermella needle cast	1
Populus alba	Cytospora canker	1
Populus spp.	Taphrina leaf blister	1
	Venturia macularis	1
Prunus spp.	Thielaviopsis root rot	1
	Monilinia fructicola	1
	Pseudomonas bacterial blight	1
Pseudotsuga menziesii	Phytophthora root rot	2
	Rhabdocline needle cast	1
Rhododendron spp.	Phytophthora root rot	3
	Pestalotiopsis leaf blight	1
	Necrotic ringspot virus	1
	Microsphaeria sp. - powdery mildew	1
Rosa spp.	*Leptosphaeria coniothyrium*	2
	Root rot - Phycomycete	2
	Pseudomonas syringa	1
	Rose mosaic virus	1
Salix sp.	*Marssonina salicicola*	1
Sequoiadendron gigantium	*Phomopsis juniperova*	1
Syringa spp.	*Pseudomonas syringae*	1
	Pestalotiopsis twig blight	1
Thuja occidentalis	*Seiridium cardinale*	1
	Root rot - Phycomycete	3
	Pestalotiopsis twig blight	2
	Kabatina thujae	1
T. plicata	*Didymascella thujina*	7
	Seiridium cardinale	1
	Kabatina thujae	1
Thuja spp.	*Didymascella thujina*	1
	Seiridium cardinale	1
	Root rot - Phycomycete	2
	Pestalotiopsis twig blight	2
Tradescantia sp.	Root rot - Phycomycete	1
Other		251
TOTAL		367

TABLE 8. Summary of diseases diagnosed on turfgrass samples submitted to the B.C.M.A.F.F. Plant Diagnostic Laboratory in 1994.

DISEASE/CAUSAL AGENT	SOURCE OF SAMPLE*		
	Golf/Bowling Green	Sod Farm	Lawn
Pythium spp. root rot	**63**	**7**	1
Pythium spp. damping off	**6**		
Gaeumannomyces graminis	12	**1**	
Ascochyta agrostis	1		
Ascochyta spp.	4		**6**
Microdochium nivale	**6**		2
Colletotrichumgraminicola	**3**	**1**	4
Rhizoctonia spp.	7	**2**	4
Cladosporium sp.		**1**	
Limonomyces roseipellis			1
Curvularia spp.			**2**
Drechslera spp.		**2**	1
Typhula sp.	1		
Puccinia spp.		**2**	1
Ustilago striiformis			1
Fusarium crown and root rot	1		
Basidiomycete dry spot	5		
Basidiomycete snow mold	1		
Basidiomycete fairy ring	2		1
Physarum sp. slime mold			2
Algae	1	**1**	
Other	34	**0**	**35**
TOTAL	147	17	**61**

* Golf **and bowling greens are primarily creeping bentgrass and/or annual bluegrass. The remaining categories refer** to **mixtures of fescues, ryegrass, Kentucky bluegrass and annual bluegrass.**

CROP: Commercial Crops, and others - Diagnostic Laboratory Report

LOCATION: Alberta

NAME AND AGENCY:
B.J. Penner, President
J. Calpas, Plant Pathologist
A. Henrickson, S. Lawrence, W. Voroney, Technologists
Brooks Diagnostics Limited
Box 1701, Brooks, Alberta T1R 1C5

TITLE: DISEASES DIAGNOSED ON PLANT SAMPLES SUBMITTED TO BROOKS DIAGNOSTICS LIMITED IN 1994

METHODS: Brooks Diagnostics Limited (BDL) diagnosed diseases on samples of commercial crops and other types of plants submitted by district agriculturists, agri-business, golf courses, farmers and the general public from January 1 to December 1, 1994. BDL, a private plant health clinic, assumed responsibility for operating the plant diagnostic laboratory at the Alberta Special Crops and Horticultural Research Centre, Brooks on July 1, 1993. This facility had previously been under the direction of Alberta Agriculture. Each diagnosis listed in the table below was made by carefully examining symptoms expressed on host plants and/or by isolating primary pathogens from diseased tissues.

RESULTS: All of the disease identifications made by BDL on all plant samples from Alberta in 1994 are summarized in Table 1. BDL also received samples from outside Alberta, which are not included in this report.

TABLE 1. Summary of diseases diagnosed on all commercial crops and other types of plants submitted to Brooks Diagnostics Limited in 1994.

SOUTHERN ALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Alfalfa	Chlorosis, wilting	Drought
	Common leaf spot	***Pseudopeziza medicaginis***
	Crown rot	***Fusarium*** sp.
	Fusarium crown rot	***Fusarium*** sp.
	Spring black stem and leaf spot	***Phoma medicaginis***
	Stunting	Cold temperature stress
	Stunting, chlorosis	Cold temperature stress
	Target spot	***Stemphylium sarcinaeforme***
	Verticillium wilt	***Verticillium albo-atrum***
Alyssum	Stunting, chlorosis	High soil salts
Ash	Leaf scorch	Transplant shock
Aspen	Leaf and stem blackening	High soil salts
	Leaf drop	Cold temperature injury

(cont'd.)

SOUTHERN ALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Barley	Barley scald	*Rynchosporium secalis*
	Net blotch	*Pyrenophora teres*
	Root rot	*Fusarium* sp.
		Pythium sp.
	Septoria leaf spot	*Septoria avenae*
Basil	Leaf spotting	Environmental stress
Bean	Leaf spotting, interveinal chlorosis/necrosis	Magnesium deficiency
Beet	Leaf spotting	Diquat spray drift
Begonia	Damping-off	*Fusarium* sp.
	Leaf spotting	Impatiens necrotic spot virus
Birch	Leaf scorch	Cygon injury
		Environmental stress
Cabbage (seedlings)	Damping-off	*Rhizoctonia solani*
Canola	Alternaria blackspot	*Alternaria brassicae*
	Blackleg	*Leptosphaeria maculans*
	Chlorosis/leaf purpling	Cold temperature stress
	Sclerotinia stem rot	*Sclerotinia sclerotiorum*
	Stem purpling	Phosphorous deficiency
	Stunting	Environmental stress
	Stunting, leaf purpling, chlorosis	Sulfonylurea herbicide injury
	White leaf spot and gray stem	*Pseudocercosporella capsellae*
Caragana	Leaf and stem blackening	High soil salts
	Leaf spotting	*Pleospora* sp.
Carrot	Alternaria leaf blight	*Alternaria dauci*
	Common scab	*Streptomyces scabies*
Cauliflower	Soft rot	*Erwinia* sp.
Cereal	Common root rot	*Cochliobolus sativus*
	White ear	*Fusarium* sp.
Chinese Vegetable	Rhizoctonia root rot	*Rhizoctonia solani*
Cherry	Leaf scorch	Winterkill and drought stress
Chokecherry	Leaf spot	*Rhizopus* sp.
Corn	Common smut	*Ustilago maydis*
	Poor cob development	High plant density
Cucumber	Damping-off	*Pythium* sp.
	Gummy stem blight	*Didymella bryoniae*
	Phosphorous deficiency	High soil pH
	Pythium root and stem rot	*Pythium* sp.
	Rapid bleaching and dieback	Response to high light intensity
	Rapid wilting	Fungicide toxicity
Dracena	Leaf spotting	Impatiens necrotic spot virus

(cont'd.)

SOUTHERNALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Elm	Cytospora canker	Cytospora sp.
	Dieback	Drought stress
		Environmental stress
Evergreen	Needle browning/chlorosis	Drought stress
		High soil pH
		High soil salts
		High water table
Fir	Needle chlorosis and drop	Environmental stress
Flax	Pasmo	Septoria *linicola*
Flowering crab	Chlorosis	Iron deficiency
	Fireblight	*Erwinia* amylovora
Geranium	Interveinal chlorosis	Nutrient deficiency
	Interveinal chlorosis, leaf browning	Environmental stress
	Root and crown rot	Pythium sp.
Ginseng	Alternaria leaf blight	*Alternaria panax*
	Root rot	Pythium sp.
		Fusarium sp.
Lentil	Ascochyta	Ascochyta *lentis*
	Botrytis stem rot	Botrytis cinerea
	Seedling blight	Fusarium sp.
		Rhizoctonia *solani*
Lily	Basal rot	Fusarium oxysporum
	Leaf spotting	Potyvirus
Maple	Leaf distortion	Herbicide damage
	Sooty mold on leaves	*Cladosporium* sp.
Marigold	Leaf scorch	High soil salts
Mayday	Dieback	Soil sterilant
Oak	Leaf distortion and curling	Cold temperature injury
		Herbicide damage
Onion	Neck rot	*Botrytis allii*
Pepper	Necrosis, chlorosis	Oedema
	Soft rot	*Erwinia* sp.
	Stunting, leaf distortion	Environmental stress
	Yellow mosaic	Environmental stress
Petunia	Stunting, chlorosis	High soil salts
Pine	Dieback	High soil pH
	Needle browning	Drought stress
		Environmental stress
	Needle chlorosis	Environmental stress
Plum	Dieback	Environmental stress
Poinsettia	Leaf scorch	Environmental stress
	Root and stem rot	Pythium sp.
		Rhizoctonia solani

(cont'd.)

SOUTHERNALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Poplar	Leaf drop, browning	Environmental stress
	Leaf spots, holes	Cold temperature injury
	Leaf twisting and cupping	Cold temperature stress
	Mycosphaerella leaf blight	*Mycosphaerella populorum*
Potato	Bacterial ring rot	*Corynebacterium sepedonicum*
	Bacterial soft rot	*Erwinia carotovora*
	Blackleg	*Erwinia caratovora* pv. *atroseptica*
	Bruising	Handling injury
	Common scab	*Streptomyces scabies*
	Early blight	*Alternaria solani*
	Enlarged lenticels	High soil moisture
	Fusarium dry rot	*Fusarium* sp.
	Internal browning	*Rhizoctonia solani*
	Internal cracking	Hollow heart
	Late blight	*Phytophthora infestans*
	Leaf damage	Wind injury
	Leaf scorch	Herbicide damage
	Leak	*Pythium* sp.
	Pink rot	*Phytophthora erythroseptica*
	Pythium	*Pythium* sp.
	Soft rot	*Erwinia carotovora*
	Surface mold	*Alternaria alternata*
	Vascular discoloration (tuber)	*Verticillium* sp.
	Vascular necrosis (tuber)	Net necrosis
Safflower	Root rot/leaf spot	*Pythium* sp.
		Fusarium sp.
		Rhizoctonia sp.
		Cladosporium sp.
Saskatoon	Black leaf and witches broom	*Apiosporina collinsii*
	Soft rot of fruit	*Rhizopus* sp.
Spruce	Browning	Cold temperature injury
	Dieback	Soil sterilant injury
		Transplanted too deep
		High water table
	Lophodermium needle cast	*Lophodermium picea*
	Needle browning, decline	Winter injury
	Needle chlorosis, tip browning	Drought stress
	Needle loss	Autumn needle shed
	Needle loss	Drought stress
Timothy	Browning of top leaves	Environmental stress
	Purple spot	*Cladosporium phlei*

(cont'd.)

SOUTHERN ALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Tomato	Bacterial speck	***Pseudomonas syringae***
	Blossom end rot	Calcium deficiency
	Botrytis ghost spot	*Botrytis* sp.
	Stem twisting	Ethylene injury
Turf	Chlorosis	Algae
	Dead patches in lawn	Annual bluegrass taking over lawn
	Dieback	Soil sterilant injury
	Fusarium patch	***Fusarium*** sp.
		Fusarium nivale
	Pink snow mold	***Fusarium nivale***
	Pythium blight	***Pythium*** sp.
	Rhizoctonia brown patch	***Rhizoctonia solani***
	Speckled snow mold	***Typhula ishikariensis***
	Take-all patch	***Gaeumannomyces graminis***
Wheat	Common root rot	***Cochliobolus sativus***
		Fusarium sp.
	Chlorosis	Environmental stress
		Nutrient deficiency
		Wind damage
	Leaf scorch	Spray damage
	Root rot	***Rhizoctonia*** sp.
		Fusarium sp.
	Take-all	***Gaeumannomyces graminis***
	Tan spot	***Pyrenophora tritici-repentis***
	Wheat streak mosaic	Wheat streak mosaic virus
	Whitehead	***Fusarium*** sp.
Wheatgrass	Stunting, flag leaf browning	Environmental stress
Willow	Dieback	Environmental stress
	Leaf scorch	Herbicide injury
Zucchini	Fusarium Wilt	***Fusarium*** sp.

SOUTH CENTRAL ALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
African Violet	Crown dieback	Environmental stress
	Leaf lesions	Sunscald
Apple	Apple scab	*Venturia inaequalis*
	Fireblight	*Erwinia amylovora*
	Leaf drop	Environmental stress
Ash	Cracking of trunk	Frost crack
	Fireblight	*Erwinia amylovora*
Aspen	Aspen leaf and twig blight	*Venturia macularis*
	Chlorosis	Iron deficiency
	Hypoxylon canker	*Hypoxylon mammatum*
	Weeping trunk	Sunscald
Barley	Net blotch	Pyrenophora teres
Bluegrass	Silvertop	*Fusarium* sp.
Cactus	Fusarium stem rot	*Fusarium oxysporum*
Canola	Alternaria black spot	*Alternaria brassicae*
	Blackleg	*Leptosphaeria maculans*
Caragana	Rapid decline/girdling	Environmental stress
		High soil salts
Chrysanthemum	Botrytis blight	*Sotrytis cinerea*
	Crown rot	*Rhizoctonia solani*
	Gray mold	*Botrytis cinerea*
	Leaf scorch	Environmental stress
	Leaf spotting, wilt	Chemical damage
	Rhizoctonia root rot	*Rhizoctonia solani*
	Stem dieback	*Botrytis* sp.
Clematis	Stem canker	*Fusarium* sp.
		Rhizoctonia solani
Cucumber	Chlorosis and stunting	Possible virus problem
	Fruit and leaf lesions, wilt	*Cladosporium cucumerinum*
		Verticillium albo-atrum
	Marginal leaf necrosis	Potassium deficiency
	Wilt	Low temperature injury
Dogwood	Cytospora canker	*Cytospora* sp.
	Pseudomonas twig blight	*fseudomonas syringae* pv. *syringae*
Dracena	Leaf scorch	Environmental stress
Elm	Wilt	*Dothiorella ulmi*
Geranium	Flower distortion, leaf dieback	Environmental stress
		Nutrient deficiency
Hops	Root dieback	Environmental stress
	Stem constriction	High soil salts
Impatiens	Leaf spotting	Symptomatic for impatiens necrotic spot virus
Ivy	Vein collapse, oedema	High soil salts

(cont'd.)

SOUTH CENTRAL ALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Lilac	Leaf scorch	***Pseudomonas syringae***
Lily	Stunting and chlorosis at top of plant	Carlavirus
Oats	Gray speck	Manganese deficiency
	Root rot	***Fusarium*** sp.
		Pythium sp.
Palm	Leaf spotting	Environmental stress
Pea	Downy mildew	***Peronospora viciae***
Petunia	Purpling, chlorosis, stunting, necrosis	Cold temperature injury
Poplar	Leaf distortion, petiole bending	Dicamba injury
	Marssonina leaf spot	***Marssonina populi***
	Poplar leaf and twig blight	***Venturia macularis***
Potato	Blackleg	***Erwinia carotovora*** pv. ***atroseptica***
	Early blight	***Alternaria solani***
	Soft rot	***Erwinia carotovora***
Rhubarb	Bacterial soft rot	***Erwinia rhapontici***
Spruce	Chlorosis	Possible chemical damage
	Cytospora canker	***Cytospora kunzei***
	Decline	Overwatering
	Root rot	***Fusarium*** sp.
	Spruce needle rust	***Chrysomyxa ledicola***
Strawberry	Berry rot	*Botrytis* sp.
		Penicillium sp.
Sunflower	Downy mildew	***Plasmopara halstedii***
Timothy	Marginal leaf necrosis	Environmental stress
Tomato	Cladosporium leaf mold	***Cladosporium fulvum***
	Fusarium wilt	***Fusarium oxysporum*** f. sp. ***lycopersi***
	Leaf scorch	High soil salts
	Pith necrosis	***Pseudomonas*** sp.
Turf	Fusarium patch	***Fusarium*** sp.
	Melting out	***Drechslera poae***
	Pythium blight	***Pythium*** sp.
	Rhizoctonia patch	***Rhizoctonia*** sp.
	Spring dieback	Freezing injury
	Summer patch	***Magnaporthe poae***
	Superficial fairy ring	Various basidiomycetes
Wheat	Chlorosis and browning of upper leaves	Environmental stress

NORTH CENTRAL ALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Canola	Twisting, chlorosis, stunting	Cold temperature stress
Chrysanthemum	Root rot	*Fusarium* sp.
		Rhizoctonia solani
		Rhizoctonia sp.
Elm	Leaf scorch	Environmental injury
		Herbicide damage
Freesia	Leaf scorch	Environmental stress
Ginseng	Alternaria leaf blight	*Alternaria panax*
Pea	Foot rot	*Mycosphaerella pinodes*
	Mycosphaerella blight	*Ascochyta pinodella*
	Root rot	*Fusarium solani*
Pine	Lophodermella needle cast	*Lophodermella* sp.
	Needle loss	Autumn needle shed
Poinsettia	Root and stem rot	*Pythium* sp.
		Rhizoctonia sp.
Poplar	Poplar leaf and twig blight	*Venturia macularis*
Potato	Leaf damage	Herbicide damage
	Leaf spot	Magnesium deficiency
Primula	Leaf spot	Impatiens necrotic spot virus
Saskatoon	Saskatoon-juniper rust	*Gymnosporangium* sp.
Spruce	Needle loss	Autumn needle shed
		Drought stress
Tomato	Leaf twisting, distortion, cupping	Chemical injury
	Necrotic leaf spots	Manganese deficiency
Turf	Dieback	Algae
		Fusarium sp.
		Pythuim sp.
		Rhizoctonia sp.
	Fusarium patch	*Fusarium* sp.
	Pythium blight	*Pythium* sp.

NORTH EAST ALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Apple	Fireblight	***Erwinia amylovora***
Begonia	Leaf spotting, wilt	Impatiens necrotic spot virus
	Root rot	Not specified
Canola	Blackleg	***Leptosphaeria maculans***
Maple	Twig blight	***Stigmina negundinis***
Pea	Herbicide damage symptoms	Picloram damage
	Root rot	***Rhizoctonia solani***
Raspberry	Cane blight	***Leptosphaeria coniothyrium***
	Crown and cane gall	***Agrobacterium radiobacter***
	Fireblight	***Erwinia amylovora***
	Gray mold	***Botrytis cinerea***
Saskatoon	Entomosporium leaf spot	***Entomosporium mespili***
Spruce	Needle drop	Environmental stress
		Drought stress
Turf	Fusarium patch	***Fusarium*** sp.
	Pink snow mold	***Microdochium nivale***
	Take-all	***Gaeumannomyces graminis***
Wheat	Chlorosis	Herbicide damage
	Nitrogen deficiency	
Willow	Dieback	Environmental stress

NORTH WEST ALBERTA

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Alfalfa	Downy mildew	***Peronospora trifoliorum***
Aspen (seedlings)	Aspen leaf and shoot blight	***Venturia macularis***
	Cytospora canker	***Cytospora*** sp.
	Marssonina leaf spot	***Marssonina*** sp.
Turf	Pythium blight	***Pythium*** sp.

PEACE RIVER REGION

CROP/PLANT	DISEASE/SYMPTOM	CAUSAL AGENT
Canola	Root rot	***Rhizoctonia solani***
		Fusarium sp.
	Blackleg	***Leptosphaeria maculans***
Pea	Root rot	***Rhizoctonia solani***
		Fusarium sp.
Pine (Ponderosa)	Needles dropping, chlorotic, stunted	Transportation/ transplant stress
Spruce	Twisting, browning	Herbicide injury

CROP: Forage Legumes, Alfalfa - Diagnostic Laboratory Report

LOCATION: Manitoba

NAME AND AGENCY:
R.G. Platford
Manitoba Agriculture, Crop Diagnostic Centre
201 - **545** University Crescent, Winnipeg, Manitoba R3T 5S6

TITLE: DISEASES DIAGNOSED ON ALFALFA SAMPLES SUBMITTED TO THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1994

METHODS: The Manitoba Agriculture Crop Diagnostic Centre (CDC) provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted to the CDC 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: The CDC received a total of 26 alfalfa samples for disease analysis. Results are summarized in Table 1. The most common problem affecting alfalfa was black stem. Wet weather in June and July resulted in a high incidence of leaf spot diseases. The lack of snow cover in the fall of **1993** and **cold** temperatures before permanent snow cover occurred resulted in a higher than normal amount of winter injury in the Eastern and Interlake areas. One sample of alfalfa submitted from southeastern Manitoba was found to be affected by rust which has only once been previously reported on alfalfa in Manitoba, (Platford **1992).**

REFERENCES:
Platford, **R.G. 1992.** Diseases diagnosed on alfalfa samples submitted to the Manitoba Agriculture Plant Pathology Laboratory in **1991.** Can. Plant Dis. Surv. 72:37.

TABLE 1. Summary of diseases diagnosed on alfalfa samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in **1994.**

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Black stem	Phoma *medicaginis*	8
Common leaf spot	*Pseudopeziza medicaginis*	7
Leptosphaerulina leaf spot	*Leptosphaerulina* sp.	2
Rust	Uromyces *striatus*	1
Root rot	*Fusarium* sp.	1
Physiological	winter injury, white spot	4
Nutrient deficiency		3

CROP: Cereals - Diagnostic Laboratory Report

LOCATION: Manitoba

NAME AND AGENCY:
R.G. Platford
Manitoba Agriculture, Crop Diagnostic Centre
201 - 545 University Crescent, Winnipeg, Manitoba R3T 5S6

TITLE: DISEASES DIAGNOSED ON CEREAL CROP SAMPLES SUBMITTED TO THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1994

METHODS: The Manitoba Agriculture Crop Diagnostic Centre (CDC) provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted to the CDC 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: Results of cereal crop submissions are shown in Tables 1 to 3. The major disease problems seen on wheat in 1994 were Septoria blotch which caused crop losses, primarily in the northwest region and Fusarium head blight which was severe in the southern Red River Valley, but did not have as detrimental effect on quality as in 1993. Net blotch was the major disease problem detected in barley. There was a moderate incidence of Fusarium head blight in the southern Red River Valley area. Flame chlorosis was detected in a few fields in the northwest region. The most serious disease problem affecting oats in 1994 was crown rust. Generally oat yields were good in Southern Manitoba, and disease loss (except in late planted fields) was low to moderate.

TABLE 1. Summary of diseases diagnosed on wheat samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Septoria	***Septoria*** spp.	38
Head blight	***Fusarium graminearum***	9
Common root rot	***Fusarium*** spp., ***Cochliobolus sativus***	11
Barley yellow dwarf	Barley yellow dwarf virus	5
Tan spot	***Pyrenophora tritici-repentis***	3
Take all root rot	***Gaeumannomyces graminis*** var. ***tritici***	2
Ergot	***Claviceps purpurea***	1
Glume blotch	***Septoria*** spp.	1
Leaf rust	***Puccinia recondita***	1
Loose smut	***Ustilago tritici***	1
Seedling blight	***Fusarium*** spp., ***Cochliobolus sativus***	1
Environmental stress		19
Herbicide injury		12
TOTAL		114

TABLE 2. Summary of diseases diagnosed on barley samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Barley yellow dwarf	Barley yellow dwarf virus	26
Net botch	***Pyrenophora teres***	14
Common root rot	***Fusarium*** spp., ***Cochliobolus sativus***	**8**
Loose smut	***Ustilago nuda***	**3**
Fusarium head blight	***Fusarium graminearum***	2
Septoria	***Septoria*** spp.	**2**
Spot blotch	***Cochliobolus sativus***	**2**
Flame chlorosis	Flame chlorosis virus like agent	1
Scald	***Rhynchosporium secalis***	1
Environmental stress	Frost, deep seeding, nutrient deficiency, excess water	4
TOTAL		**63**

TABLE 3. Summary **of** diseases diagnosed on oat samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Barley yellow dwarf	Barley yellow dwarf virus	5
Crown rust	***Puccinia coronata***	2
Fusarium head blight	***Fusarium graminearum***	***2***
Bacterial blight	***Pseudomonas syringae***	1
Ergot	***Claviceps purpurea***	1
Septoria leaf blotch	***Septoria*** spp.	1
Environmental stress	Blast	1
TOTAL		13

CROP: Oilseeds and Special Crops, Canola - Diagnostic Laboratory Report

LOCATION: Manitoba

NAME AND AGENCY:
R.G. Platford
Manitoba Agriculture, Crop Diagnostic Centre
201 - 545 University Crescent, Winnipeg, Manitoba R3T 5S6

TITLE: DISEASES DIAGNOSED ON CANOLA SAMPLES SUBMITTED TO THE MANITOBA-AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1994

METHODS: The Manitoba Agriculture Crop Diagnostic Centre (CDC) 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: The CDC received a total of 246 canola samples for disease analysis. Results are summarized in Table 1. Weather conditions were very favourable for Alternaria black spot. Black spot was present at higher than normal levels for both Argentine and Polish type canola throughout southern Manitoba and caused premature pod ripening and shattering. Blackleg was present in most fields in the southwest and northwest regions south of Swan River and in occasional fields throughout the rest of the areas where canola was grown. It initially appeared in early July that sclerotinia would be a major problem but a major epidemic did not develop. A higher than normal amount of spraying of fields with benomyl occurred which prevented high losses in areas of the central and northwest regions. The downy mildew detected on canola was all from leaf samples submitted during June, following a period of wet weather.

TABLE 1. Summary of diseases diagnosed on canola samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Blackspot	*Alternaria* sp.	**53**
Downy mildew	Peronospora parasitica	**20**
Root rot, seedling blight	*Rhizoctonia solani, Fusarium* spp.	11
Sclerotinia	*Sclerotinia* sclerotiorum	**10**
Blackleg	*Leptosphaeria* maculans	**9**
Aster yellows		**4**
Staghead	*Albugo* candida	2
Herbicide injury		88
Nutrient deficiency	Sulphur deficiency	35
Environmental stress	Excess moisture, frost	14

CROP: Oilseeds and Special Crops, Lentil - Diagnostic Laboratory Report

LOCATION: Manitoba

NAME AND AGENCY:
R.G. Platford
Manitoba Agriculture, Crop Diagnostic Centre
201 - 545 University Crescent, Winnipeg, Manitoba R3T 5S6

TITLE: DISEASES DIAGNOSED ON LENTIL SAMPLES SUBMITTED TO THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1994

METHODS: The Manitoba Agriculture Crop Diagnostic Centre (CDC) provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted to the CDC 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: Results are summarized in Table 1. The major diseases detected were anthracnose and ascochyta, which were widepsread and caused losses up to 50% in some fields in the central region.

TABLE 1. Summary of diseases diagnosed on lentil samples submitted to the CDC in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF **SAMPLES**
Root rot, seedling blight	*Fusarium* spp.	23
Ascochyta	*Ascochyta fabae* f.sp. *lentis*	14
Anthracnose	*Colletotrichum truncatum*	9
White mold	*Sclerotinia sclerotiorum*	4
Botrytis blight	*Botrytis cinerea*	2
Herbicide injury		6
Environmental stress	Deep seeding, excess moisture	4
Nutrient deficiency		3

CROP: Vegetables, Potatoes - Diagnostic Laboratory Report

LOCATION: Manitoba

NAME AND AGENCY:
R.G. Platford
Manitoba Agriculture, Crop Diagnostic Centre
201 - **545** University Crescent, Winnipeg, Manitoba R3T **5S6**

TITLE: DISEASES DIAGNOSED ON POTATO CROP SAMPLES SUBMITTED TO THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE

METHODS: The Manitoba Agriculture Crop Diagnostic Centre (CDC) provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted to the CDC 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: The CDC received a total of **56** samples of potatoes for disease analysis. Results are summarized in Table 1. The major disease concern in potatoes in 1994 was late blight. An intensive survey and reporting program was undertaken. Late blight infected fields were detected near Winkler, Carman, and Portage. Late blight field symptoms were less severe in **1994** because of a greater awareness of growers about threat of late blight and earlier and more frequent application of fungicides. Also weather conditions during August were not as favourable for late blight in 1994 compared to 1993. The A_1 strain of late blight was detected in a potato leaf sample collected August 24 from a field south of Winkler and near the Manitoba - North Dakota border. The initial testing was done at the Agriculture and Agri-Food Canada, Central Plant Health Laboratory in Nepean, Ontario, and was confirmed at Agriculture and Agri-Food Canada, Charlottetown. This is the first report of the A_2 strain of late blight from Manitoba. The late blight strain had intermediate sensitivity to Ridomil fungicide. Moist weather in September, and the absence of frost, created conditions favourable for tuber infection. Several cases of severe tuber infestation were observed in the Portage la Prairie, and Winkler areas. Early blight was less severe than normal in **1994.** Several cases of bacterial soft rot were detected in table stock potatoes harvested in August. Bacterial soft rot, fusarium dry rot, and pink rot were found to be associated with late blight in causing storage deterioration in potatoes.

TABLE 1. Summary of diseases diagnosed on potato samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Late blight	*Phytophthora infestans*	22
Early blight	*Alternaria solani*	8
Fusarium root rot	*Fusarium* spp.	4
Blackleg	*Erwinia caratovora* var. *atroseptica*	*2*
Bacterial *soft* rot	*Erwinia caratovora* var. *caratovora*	*2*
Gray mold	*Botrytis cinerea*	2
Pink rot	*Phytophthora erythroseptica*	5
Rhizoctonia canker	*Rhizoctonia solani*	2
Verticillium wilt	*Verticillium dahliae*	1
Herbicide injury		**4**
Environmental stress	Excess water, black heart, frost damage to tubers	4

CROP: Fruit Crops - Diagnostic Laboratory Report

LOCATION: Manitoba

NAME AND AGENCY:
R.G. Platford
Manitoba Agriculture, Crop Diagnostic Centre
201 - 545 University Crescent, Winnipeg, Manitoba R3T 5S6

TITLE: DISEASES DIAGNOSED ON FRUIT CROP SAMPLES SUBMITTED TO THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1994

METHODS: The Manitoba Agriculture Crop Diagnostic Centre (CDC) provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted to the CDC 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: Results of fruit crop submissions are shown in Tables 1 to *5.*
Winter injury was the main problem affecting apples in 1994. There was a higher level of fireblight in 1994 than in 1993. One commercial nursery had a high incidence of nectria canker that appeared to be entering the trees at pruning wound sites. Root rot was the major problem detected in strawberries. High temperatures during the summer were favourable for the development of Fusarium root and crown rot. Dieback of saskatoons caused by Cytospora canker and leaf diseases caused by *Entomosporium mispili* and powdery mildew were the main disease problems diagnosed in saskatoons in Manitoba.

TABLE 1. Summary of diseases diagnosed on apple samples Submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Fireblight	*Erwinia amylovora*	5
Canker	*Cytospora* sp.	3
Canker	*Nectria cinnabarina*	2
Scab	*Venturia inaequalis*	2
Canker and leaf spot	*Botryosphaeria obtusa*	2
Environmental stress	Winter injury	**10**
Herbicide injury		4
Nutrient deficiency	Iron chlorosis	1
TOTAL		29

TABLE 2. Summary of diseases diagnosed on strawberry samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Crown rot, root rot	***Fusarium*** spp.	7
Leaf spot	***Mycosphaerella fragariae***	1
Herbicide injury		2
Nutrient deficiency		1
TOTAL		11

TABLE 3. Summary of diseases diagnosed on raspberry samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Cane blight	***Leptosphaeria coniothyrium***	3
Spur blight	***Didymella applanata***	3
Anthracnose	***Elsinoe veneta***	1
Powdery mildew	***Sphaerotheca macularis***	1
Verticillium wilt	***Verticillium*** sp.	1
Herbicide injury		1
TOTAL		10

TABLE 4. Summary of diseases diagnosed on saskatoon samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Cankers	***Cytospora*** spp.	7
Leaf spot	***Entomosporium mespili***	3
Powdery mildew	***Podosphaera*** spp.	3
Rust	***Gymnosporangium*** sp.	1
Herbicide injury		3
Environmental stress		2
TOTAL		19

Table 5. Summary of diseases diagnosed on crabapple samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Fireblight	*Erwinia amylovora*	3
Canker	*Cytospora* sp.	1
Frogeye leaf spot	*Botryosphaeria obtusa*	1
Environmental stress		6
Nutrient deficiency		1
TOTAL		12

CROP: Ornamentals, Amenity turf - Diagnostic Laboratory Report

LOCATION: Manitoba

NAME AND AGENCY:
R.G. Platford
Manitoba Agriculture, Crop Diagnostic Centre
201 - 545 University Crescent, Winnipeg, Manitoba R3T **5S6**

TITLE: DISEASES DIAGNOSED ON AMENITY TURF SAMPLES SUBMITTED TO THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1994

METHODS: The Manitoba Agriculture Crop Diagnostic Centre (CDC) 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: The CDC received a total of 13 turf samples for disease analysis. Results are summarized in Table 1 Cool, moist weather prevented the normal appearance of the summer decline disease complex. Leaf diseases were not a major problem in 1994.

The number of samples submitted for analysis was down in 1994. Favourable weather conditions resulted in *good* growing conditions for lawns and lack of stress related problems in most areas.

TABLE 1. Summary of diseases diagnosed on amenity turf samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Fusarium	*Fusarium* spp.	4
Red Thread	***Laetisaria fuciformis***	1
Anthracnose	***Colletotrichumgraminicola***	2
Ascochyta	***Ascochyta*** sp.	2
Blister Smut	***Entyloma*** sp.	1
Fairy ring	***Marasmius*** sp.	1
Leaf spot	***Leptosphaerulina trifolii***	1
Melting out	***Drechslera*** spp.	1

CROP: Ornamentals, Shade Trees - Diagnostic Laboratory Report

LOCATION: Manitoba

NAME AND AGENCY:
R.G. Platford
Manitoba Agriculture, Crop Diagnostic Centre
201 - 545 University Crescent, Winnipeg, Manitoba R3T **5S6**

TITLE: DISEASES DIAGNOSED ON SHADE TREE SAMPLES SUBMITTED TO THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1994

METHODS: The Manitoba Agriculture Crop Diagnostic Centre (CDC) provides diagnoses and control recommendations for disease problems of agricultural crops and ornamentals. Samples are submitted to the CDC 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: Results of shade tree submissions are shown in Table 1.

TABLE 1. Summary of diseases diagnosed on shade tree samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Elm (28 samples)		
Dutch elm disease	*Ophiostoma ulmi*	1
Canker	Cytospora spp.	2
Canker	Tubercularia *ulmea*	1
Herbicide Injury		8
Environmental stress		5
Willow (22 samples)		
Willow scab	*Venturia saliciperda*	1
Herbicide injury		18
Environmental stress		2
Poplar (10 samples)		
Canker	Cyfospora sp.	3
Shoot blight	Pollaccia sp.	2
Septoria leaf spot	Septoria sp.	1
Environmental stress	Winter injury	4
Birch (4 samples)		
Birch decline	Environmental stress	1
Herbicide injury		3

(cont'd.)

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Ash (22 samples)		
Herbicide injury		20
Environmental stress		2
Maple (22 samples)		
Canker	*Cytospora* sp.	3
Anthracnose	*Gloeosporium* spp.	2
Environmental stress		8
Herbicide injury		8
Nutrient deficiency		1
Oak (8 samples)		
Anthracnose	*Apiognomonia errabunda*	1
Herbicide injury		7

CROP: Ornamentals, Spruce - Diagnostic Laboratory Report

LOCATION: Manitoba

NAME AND AGENCY:
R.G. Platford
Manitoba Agriculture, Crop Diagnostic Centre
201 - 545 University Crescent, Winnipeg, Manitoba R3T 5S6

TITLE: DISEASES DIAGNOSED ON SPRUCE SAMPLES SUBMITTED TO THE MANITOBA AGRICULTURE CROP DIAGNOSTIC CENTRE IN 1994

METHODS: The Manitoba Agriculture Crop Diagnostic Centre (CDC) 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: The CDC received a total of 57 spruce samples for disease analysis. Results are summarized in Table 1. A major proportion of the spruce submitted showed non specific needle browning which was categorized as being caused by environmental factors such as winter injury, excess or deficiency of soil moisture and competition. Cytospora canker was the main disease problem associated with mature blue spruce.

TABLE 1. Summary of diseases diagnosed on spruce tree samples submitted to the Manitoba Agriculture Crop Diagnostic Centre in 1994.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Cytospora canker	*Cytospora kunzei*	13
Needle cast	*Rhizosphaera kalkoffii*	6
Environmental stress	Winter injury, frost, excess moisture, competition	26
Nutrient deficiency		9
Herbicide injury		3

CROP: Commercial Crops - Diagnostic Laboratory Report

LOCATION: Ontario

NAMES AND AGENCY:
M. Sabourin and M.D. Dykstra
Pest Diagnostic Clinic
Ontario Ministry of Agriculture, Food and Rural Affairs
Agriculture and Food Laboratory Services Centre
P.O. Box 3650, 95 Stone Road West, Zone 2
Guelph, Ontario N1H 8J7

TITLE: DISEASES DIAGNOSED ON CROP SAMPLES SUBMITTED TO THE OMAFRA PEST DIAGNOSTIC CLINIC IN 1994

METHODS: The Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) Pest Diagnostic Clinic provides diagnosis and identification of plant diseases, nematodes, insects, weeds, and other pest problems. The service is offered to OMAFRA crop advisors, to employees of other public agencies, to growers and agriculture businesses and to the general public. Diagnoses were made by visual and microscopic examination of the samples. Isolation on selective media, the Biolog® bacterial identification system and pathogenicity tests were used, where necessary, to assist in the diagnosis of some samples.

RESULTS AND COMMENTS: In 1994, the Pest Diagnostic Clinic received 1129 samples excluding nematodes. OMAFRA crop advisors with other public agencies submitted about one third of the samples. Horticultural businesses including growers also submitted about one third. The remaining samples were submitted by homeowners. About 50% of the samples received were for disease diagnosis. Of these, nearly 70% were ornamentals, including both woody and herbaceous plants, occurring outdoors, in atria and in greenhouses. Remaining submissions were placed in the vegetable, turf, fruit, forage and cereal crop categories. Summaries of the diagnoses are presented in Tables 1 to 6.

TABLE 1. Summary of diseases diagnosed on cereal, field corn and forage crop samples submitted to the OMAFRA Pest Diagnostic Clinic in 1994.

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Alfalfa	***Phoma medicaginis***	1
	Pseudopeziza medicaginis	2
	Verticillium albo-atrum	1
	Boron deficiency	1
	Other physiological disorders	4
Barley	Physiological disorder	1
Canola	***Sclerotinia sclerotiorum***	1
Cereal (mixed)	Physiological disorder	1
Corn	Herbicide injury	2
	Other physiological disorder	1
Hay	***Epichloe typhina***	1
Wheat	***Tilletia controversa***	2
	Septoria tritici	2
	Black head molds	1
	Physiological disorders	3

TABLE 2. Summary of diseases diagnosed on legume samples submitted to the OMAFRA Pest Diagnostic Clinic in 1994.

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Bean	Bean Common Mosaic Virus	1
	Xanthomonas campestris pv. ***phaseoli***	1
	Pseudomonas syringae pv. ***phaseolicola***	1
	Herbicide injury	1
	Other physiological disorder	1
Pea	Fusarium root rot	1
	Aphanomyces euteiches f. sp. ***pisi***	2
Soybean	Herbicide injury	3
	Other physiological disorders	4

TABLE 3. Summary of diseases diagnosed on vegetable samples submitted to the OMAFRA Pest Diagnostic Clinic in 1994.

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Basil	Root rot	1
Broccoli	***Xanthomonas campestris*** pv. ***campestris***	2
	Pseudomonas fluorescens	1
	Altemaria sp.	2
	Peronospora parasitica	1
	Wilt	2
	Black speck	1
Brussels sprouts	***Phoma lingam***	1
	Physiological disorder	1
Cabbage	***Xanthomonas*** sp.	1
	Wilt	2
	Physiological disorders	2
Cauliflower	***Xanthomonas campestris*** pv. ***campestris***	2
	Physiological disorder	1
Crucifers	***Xanthomonas campestris*** pv. ***campestris***	1
	Fusarium sp.	1
Cucumber	Physiological disorder	1
Eggplant	***Altemaria solani***	1
	Verticillium albo-atrum	1
Garlic	Waxy breakdown	1
Lettuce	Physiological disorders	2
Pepper	***Xanthomonas campestris*** pv. ***vesicatoria***	2
	Altemaria solani	1
	Physiological disorders	2

(cont'd.)

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Potato	Bacterial soft rot	**2**
	Streptomyces scabies	**2**
	Phyfophtora infestans	1
	Hollow heart	1
	Other physiological disorders	**3**
Radish	***Streptomyces scabies***	1
	Rhizoctonia solani	1
Radish (Chinese)	Physiological disorder	1
Rhubarb	Physiological disorder	1
Rutabaga	***Leptosphaeria maculans***	1
	Physiological disorder	1
Spinach	***Colletotrichum spinaciae***	1
Spinach (water)	Oedema	1
Sweet corn	***Setosphaeria turcica***	1
Tomato	***Pseudomonas syringae*** pv. ***tomato***	1
	Pseudomonas corrugata	1
	Septoria lycopersici	**6**
	Fusarium oxysporum f. sp. ***radicis-lycopersici***	**2**
	Fusarium sp.	**4**
	Fulvia fulva	1
	Alternaria solani	1
	Erysiphe sp.	1
	Botrytis sp.	1
	Pythium sp.	**4**
	Blossom end rot	1
	Herbicide injury	1
	Other physiological disorders	10

TABLE 4. Summary of diseases diagnosed on fruit samples submitted to the OMAFRA Pest Diagnostic Clinic in **1994.**

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Apple	***Cryptosporiopsis curvispora***	1
	Penicillium sp.	1
	Scald	1
	Hail damage	1
	Winter injury	**2**
	Other physiological disorders	***7***
Apricot	***Cladosporium carpophilum***	1
	Winter injury	1

(cont'd.)

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Cherry	Winter injury	1
	Other physiological disorder	1
Grape	Physiological disorder	1
Peach	Physiological disorder	1
Pear	*Venturia pirina*	1
	Botrytis cinerea	1
	Physiological disorders	4
Raspberry	*Erwinia amylovora*	1
	Elsinoe veneta	2
	Physiological disorder	1
Strawberry	*Phomopsis obscurans*	1
	Physiological disorders	4

TABLE 5. Summary of diseases diagnosed on turf samples submitted to the OMAFRA Pest Diagnostic Clinic in 1994.

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Turf	*Sclerotinia homeocarpa*	1
	Leptosphaeria korrae	6
	Rhizoctonia cerealis	1
	Laetisaria fuciformis	2
	Typhula ishikariensis	1
	Puccinia sp.	1
	Pythium sp.	2
	Drechslera sp.	1
	Fusarium patch	1
	Physiological disorders	28

TABLE 6. Summary of diseases diagnosed on ornamentals submitted to the OMAFRA Pest Diagnostic Clinic in 1994.

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Alternanthera	Stem blight	1
Alyssum	Physiological dieback	1
African violet	Crown and root rot	1
Ash	Anthracnose	7
	Other	1
Azalea	Wilt	1
Beech	Winter injury	1
	Other physiological disorders	2
Begonia	***Xanthomonas campestris*** pv. ***begoniae***	1
	Botrytis sp.	1
	Other	**4**
Birch	Powdery mildew	1
	Physiological disorders	3
Boxwood	Anthracnose	1
	Winter injury	2
	Other physiological disorder	2
Caragana	***Nectria cinnabarina***	1
	Root rot	1
Catalpa	Physiological disorders	2
Celosia	Physiological disorder	1
Cherry	Coccomyces leaf spot	2
	Canker	1
	Other	2
Chrysanthemum	***Erwinia chrysanthemi***	1
	Fusarium sp.	2
	Other	2
Clematis	***Ascochyta clematidina***	1
	Physiological disorders	**3**
Cotoneaster	Rodent damage	1
Crabapple	Anthracnose	1
	Physiological disorders	2
Currant	Physiological disorder	1
Cypress (False)	Winter injury	1
Dahlia	High salts	1
Delphinium	***Erwinia carotovora*** pv. ***atroseptica***	1
	Root rot	1
Digitalis sp.	Physiological disorder	1
Douglas fir	***Phaeocryptopus gaeumanni***	1
Elm (American)	***Ophiostoma ulmi***	1
Elm (Chinese)	Herbicide injury	1
English Ivy	Root rot	**1**
Eucalyptus	Oedema	1

(cont'd.)

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Euonymous	Anthracnose	1
	Physiological disorders	5
Euphorbia	Physiological disorder	1
Ficus sp.	Anthracnose	1
Fir	Pythium root rot	1
Forsythia	Scorch	1
Fuchsia	*Pythium* sp.	1
	Other	1
Geranium	*Xanthomonas campestris* pv. *pelargonii*	23
	Botrytis cinerea	1
	Puccinia pelargonii-zonalis	1
	Pythium sp.	6
	Oederna	4
	Other physiological disorders	15
German statice	Physiological disorder	1
Hawthorn	Physiological disorder	1
Hazel (Corkscrew)	*Nectria cinnabarina*	1
Helleborus niger	*Botrytis cinerea*	1
Hemlock	Physiological disorders	3
Hibiscus	Physiological disorder	1
Honey locust	*Nectria cinnabarina*	1
	Thyronectria austro-americana	1
	Other	4
Horsechestnut	Winter injury	1
	Leaf scorch	1
Ironwood	*Cylindrosporium* sp.	1
Juniper	*Gymnosporangium juniperi-virginiana*	1
	Winter injury	1
	Other	3
Lamium sp.	Physiological disorder	1
Laurel	Anthracnose	1
Lilac	*Pseudomonas syringae*	2
	Herbicide injury	1
	Other	3
Lily	Physiological disorders	2
Lupine	*Thielaviopsis basicola*	1
Magnolia	Winter injury	1
	Other physiological disorders	3
Maple	Anthracnose	8
	Nectria sp.	1
	Verticilliurn wilt	1
	Herbicide injury	2
	Bacterial wetwood	1
	Root decay	1
	Other physiological disorders	24

(cont'd.)

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Maple (Japanese)	Anthracnose	1
	Nectria cinnabarina	1
	Other	1
Maple (Norway)	***Didymosporina aceris***	1
	Other	1
Mock Orange	Physiological disorder	1
Morning glory	Fungal leaf spot	1
Mountain ash	***Venturia inaequalis***	1
	Bacterial canker	1
	Other	1
New Guinea Impatiens	Tomato spotted wilt virus	**3**
	Other	***8***
Oak	***Apiognomonia quercina***	1
	Herbicide injury	**2**
	Other	***6***
Orchid	Physiological disorders	**2**
Palm	Anthracnose	1
Peony	***Botrytis*** sp.	1
Perennial plants	Physiological disorder	1
Philadelphus sp.	Physiological disorder	1
Pine	***Meloderma desmazierii***	1
	Sphaeropsis sapinae	1
	Natural autumn shed	**2**
	Other	10
Pine (Austrian)	***Dothistroma septospora***	1
	Sphaeropsis sapinae	1
	Other	**2**
Pine (Jack)	Crown and root rot	1
	Other	1
Pine (Red)	Physiological disorder	1
Pine (Scots)	***Cronartium quercuum***	1
Pine (White)	***Cronartium ribicola***	**2**
	Other	**3**
Poinsettia	***Botrytis*** sp.	1
Poplar	***Marssonina*** sp.	1
	Other	**2**
Potentilla	Physiological disorder	1
Pothos	Physiological disorder	1
Primula	Physiological disorder	1
Privet	Physiological disorder	1
Red Bud	Physiological disorder	1
Rhododendron	Transplant shock	1
Rose	***Botrytis*** sp.	**2**
	Root rot	1
	Other physiological disorders	**3**
Snapdragon	***Pythium*** sp.	1
Snow-On-The-Mountain	Physiological disorder	1

(cont'd.)

CROP	CAUSAL AGENT/DISEASE	NO. OF SAMPLES
Sorbaria sorbifolia	Physiological disorder	1
Sorrel	Physiological leaf drop	1
Spirea	Physiological disorder	1
Spruce	***Rhizosphaera kalkhoffii***	3
	Root rot	1
	Herbicide injury	**3**
	Winter injury	**4**
	Other	21
Spruce (Blue)	Winter injury	1
	Other physiological disorder	1
Star of Bethlehem	Physiological disorder	1
Stephanotis floribunda	Tomato spotted wilt virus	**1**
Sweet William	Physiological disorder	1
Sycamore	***Apiognomonia veneta***	1
	Microsphaera platani	**1**
Syngonium	***Xanthomonas*** sp.	1
	Physiological disorder	1
Thuja	***Pestalotiopsis funerea***	2
	Other	12
Tilia sp.	***Glomerella cingulata***	2
	Other	3
Tulip	***Penicillium*** sp.	2
Viburnum sp.	Physiological disorder	1
Vinca	***Phoma exigua***	1
Yew	Physiological disorders	**3**
Yucca	Physiological disorder	1

CROP: Commercial Crops - Diagnostic Laboratory Report

LOCATION: Quebec

NAME AND AGENCY:
M. Lacroix, G. Gilbert and D. Hamel
Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Quebec (MAPAQ)
Complexe scientifique, 2700, rue Einstein - D.1.200H
Sainte-Foy, Quebec G1P 3W8

TITLE: DISEASES DIAGNOSED ON COMMERCIAL CROPS SUBMITTED TO THE MAPAQ DIAGNOSTIC LABORATORY IN 1994

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 diagnoses of samples submitted to the laboratory by the extension staff of MAPAQ, by the "Regie des assurances agricoles du Quebec", by the "Institut quebecois du developpement de l'horticulture ornementale" and by the agricultural industry. Diagnoses are based on visual examinations 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, ELISA and PCR tests; and for virus, ELISA and double stranded RNA analysis.

RESULTS AND COMMENTS: The crop distribution of samples was: vegetable crops (field and greenhouse) 51%, small fruits 19%, herbaceous and woody ornamentals 18.5%, fruit trees 4.6%, field crops 3.9% and cereal crops 3.0%. Tables 1 to 7 show a summary of parasitic and non parasitic diseases diagnosed by the laboratory for the most representative field vegetable crops, greenhouse vegetables, small fruits, herbaceous and woody ornamentals, apple trees, cereals and other crops. Unidentified problems and samples for the detection of pathogens of seeds and substrates appear under the category "Other".

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TABLE 1. Summary of field vegetable crop diseases diagnosed by the MAPAQ diagnostic laboratory in 1994.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Bean	***Bipolaris sorokiniana***	1
	Pythium crown and root rot	3
	Rhizoctonia root rot	2
	Sclerotinia sclerotiorum	1
	Thielaviopsis root rot	2
	Chilling injury (russeting)	3
	Ozone injury (bronzing)	1
	Other	3
Beet	Nitrogen deficiency (leaf chlorosis)	1
	Other	3

(cont'd.)

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Broccoli	***Alternaria brassicicola***	1
	Plasmodiophora brassicae	1
	Rhizoctonia crown rot	1
	Xanthomonas campestris pv. ***campestris***	1
	Calcium deficiency (bud tip burn)	2
	Climatic stress (curd distortion)	1
	Oedema	**1**
	Other	3
Cabbage	***Alternaria brassicicola***	**5**
	Fusarium oxysporum	**2**
	Pythium root rot	1
	Rhizoctonia crown rot	1
	Erwinia carotovora subsp. ***carotovora***	1
	Xanthomonas campestris pv. ***campestris***	**12**
	Black midrib	1
	Black speck	2
	Calcium deficiency (leaf tip burn)	2
	Grey speck	1
	Lightning (leaf burn)	1
	Other	17
Cantaloupe	Alternaria leaf spot	1
	Septoria cucurbitacearum	2
Carrot	***Cercospora carotae***	2
	Pythium sp. (cavity spot)	1
	Sclerotinia sclerotiorum	1
	Meloidogyne hapla	2
	Abrasion injury (root injury)	1
	Boron deficiency (five o'clock shadow)	1
	Heat canker	1
	Other	**3**
Cauliflower	***Alternaria brassicicola*** (leaf)	**3**
	Alternaria brassicicola (curd)	**4**
	Pythium stem rot	1
	Xanthomonas campestris pv. ***campestris***	10
	Boron deficiency (brown curd)	3
	Riceyness	3
	Other	12
Celery	***Septoria apiicola***	3
	Erwinia carotovora subsp. ***carotovora***	1
	Pseudomonas syringae pv. ***apii***	1
	CMV	1
	Ozone injury (leaf spot)	1
Chinese cabbage	***Alternaria brassicicola***	1
	Erwinia carotovora subsp. ***carotovora***	2
Chinese cabbage	***Xanthomonas campestris*** pv. ***campestris***	1
	Other	1
Corn	Zinc deficiency (leaf chlorosis)	**1**
	Other	1

(cont'd.)

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Cucumber	Alternaria leaf spot	1
	Phoma leaf spot	1
	Pseudoperonospora cubensis	1
	Pythium fruit rot	1
	Ulocladium leaf spot	1
	Pseudomonas syringae pv. ***lachrymans***	2
	Erwinia carotovora subsp. ***carotovora***	2
	CMV	2
	Poor pollination (fruit distortion)	1
	Other	3
Eggplant	***Sclerotinia sclerotiorum***	1
Leek	***Erwinia carotovora*** subsp. ***carotovora***	3
	Pseudornonas soft rot	2
	Mosaic (Potyvirus)	4
	Acid soil (root distortion)	1
	Nitrogen deficiency (leaf chlorosis)	1
	Other	7
Lettuce	Rhizoctonia crown rot	1
	Xanthomonas campestris pv. ***vitians***	4
	Fertilizer burn (crown necrosis)	1
	Wind injury (leaf necrosis)	2
	Other	5
Onion	***Alternaria porri***	1
	Fusariurn bulb rot	1
	Calcium injury (leaf burn)	3
	Hail injury (leaf spot)	1
	Ozone injury (leaf spot)	1
	Rain injury (leaf spot)	1
	Other	10
Pea	***Ascochyta pisi***	2
Pepper	Alternaria fruit rot	1
	Sotrytis cinerea	1
	Pythiurn sp. (damping-off)	1
	Rhizoctonia solani (darnping-off)	1
	Sclerotinia sclerotiorum	2
	Erwinia carotovora subsp. ***carotovora***	1
	Xanthomonas campestris pv. ***campestris***	15
	CMV	2
	TMV	1
	Atrazine injury (leaf chlorosis)	1
	Boron or calcium deficiency (leaf distortion)	3
	Excess water (root rot)	1
	High soil salinity (marginal leaf burn)	4
	Magnesium deficiency (leaf chlorosis)	1
	Nitrogen deficiency (leaf chlorosis)	1
	Oederna	3
	Ozone injury (leaf spot)	2

(cont'd.)

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Pepper	Paraquat injury (leaf spot)	2
	Potassium deficiency (marginal leaf burn)	3
	Chilling injury (russeting)	2
	Other	9
Potato	***Alternaria solani*** (leaf blight)	2
	Colletotrichum coccodes	8
	Fusarium spp. (tuber rot)	10
	Phytophthora erythroseptica	1
	Phytophthora infestans	34
	Rhizoctonia solani	2
	Sclerotinia sclerotiorum	1
	Spongospora subterranea	1
	Verticillium sp.	3
	Clavibacter michiganensis subsp. ***sepedonicus***	3
	Erwinia carotovora subsp. ***carotovora***	26
	Pseudomonas syringae pv. ***fluorescens*** (pink eye)	1
	Streptomyces spp.	3
	Mosaic (Potyvirus)	1
	PLRV	2
	PVX	3
	Black heart	1
	Calcium deficiency (sprout tip burn)	1
	Dicamba injury (leaf distortion)	4
	2,4-D injury (leaf distortion)	1
	Elephant skin	1
	Excess water (skin necrosis)	4
	Genetic anomaly (pink pith)	1
	Hollow heart	2
	Mechanical injury	1
	Ozone injury (leaf burn)	1
	Wind injury (leaf burn)	2
	Other	30
Pumpkin	***Ascochyta*** sp. (fruit rot)	1
	Colletotrichum sp. (fruit rot)	1
	Phoma sp. (fruit rot)	2
	Pythium sp. (fruit rot)	2
	Septoria cucurbitacearum	2
	Oedema (fruit)	2
	Other	2
Rutabaga	***Plasmodiophora brassicae***	1
	Sclerotium rolfii	1
	Brown heart	1
	Excess water (root distortion)	1
	Mechanical injury	1
	Other	1

(cont'd.)

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Squash	***Sclerotinia sclerotiorum***	1
	Septoria cucurbitacearum	**3**
	Phoma sp. (fruit rot)	**1**
	Pythium sp. (fruit rot)	1
	Erwinia carotovora subsp. ***carotovora***	**1**
	CMV	**2**
Tomato	*Fulvia fulva*	1
	Phytophthora infestans	**2**
	Rhizoctonia solani	1
	Septoria lycopersici	**3**
	Clavibacter michiganensis subsp. ***michiganensis***	**2**
	Pseudomonas syringae pv. ***tomato***	***7***
	Xanthomonas campestris pv. ***vesicatoria***	**2**
	TSWV	**1**
	Virus (leaf roll)	**1**
	Atrazine injury (leaf chlorosis)	**1**
	Oedema	1
	Physiological stress (leaf roll)	1
	Other	**6**

TABLE 2. Summary of greenhouse vegetable diseases diagnosed by the MAPAQ diagnostic laboratory in 1994.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Cucumber	***Didymella bryoniae***	**2**
	Fusarium root rot	**2**
	Pseudoperonospora cubensis	1
	Pythium crown and root rot	**3**
	Ulocladium sp. (leaf spot)	1
	Erwinia carotovora subsp. ***carotovora***	**1**
	Calcium deficiency (leaf distortion)	1
	Chilling injury (russeting)	1
	Phosphorus deficiency (leaf chlorosis)	1
	Physiological stress (leaf spot)	1
	Poor pollination (fruit distortion)	1
	Other	**4**
Lettuce	High salinity	**3**
	Other	**2**
Pepper	TSWV	**2**
	INSV	1

(cont'd.)

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Tomato	***Botrytis cinerea***	**3**
	Erysiphe sp.	**4**
	Fusarium oxysporum f. sp. ***radicis-lycopersici***	**7**
	Humicola root rot	**3**
	Phytophthora infestans	11
	Phytophthora root rot	1
	Pyrenochaeta lycopersici	a
	Pythium root rot	10
	Rhizoctonia root rot	1
	Septoria lycopersici	2
	Verticillium sp.	1
	Clavibacter michiganensis subsp. ***michiganensis***	**4**
	Erwinia carotovora subsp. ***carotovora***	**6**
	Pseudomonas corrugata	2
	Pseudomonas syringae pv. ***tomato***	1
	INSV	1
	PLRV	1
	PVX	1
	PVY	1
	ToMV	***8***
	TSWV	**15**
	Virus (yellow vein)	1
	Calcium deficiency (leaf distortion)	**3**
	Dicamba injury (leaf distortion)	1
	2,4-D injury (leaf distortion)	1
	Ethylene injury (leaf distortion)	1
	Glyphosate injury (leaf chlorosis)	1
	High salinity (marginal leaf burn)	**4**
	Iron deficiency (leaf chlorosis)	1
	Manganese deficiency (leaf chlorosis)	1
	Mechanical injury	**2**
	Oedema	2
	Physiological stress (leaf spot)	**5**
	Russeting	1
	Silver leaf	1
	Other	**47**

TABLE **3.** Summary of small fruit diseases diagnosed by the MAPAQ diagnostic laboratory in **1994.**

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Blueberry	***Aureobasidium*** sp.	**3**
	Botrytis cinerea	**1**
	Cytospora **sp.**	1
	Monilia vaccinii-corymbosi	**1**
	Phomopsis **sp.**	**2**
	Pucciniastrum goeppertianum	**1**
	Septoria sp.	**8**
	Agrobacterium tumefaciens	**1**
	Glyphosate injury (leaf distortion)	**1**
	Hail injury	**1**
	Mechanical injury	1
	Winter injury	**5**
	Other	**22**
Strawberry	***Diplocarpon earliana***	**1**
	Mycosphaerella fragariae (leaf spot)	**13**
	Mycosphaerella fragariae (black seed)	**1**
	Myxomycete (slime mold)	**1**
	Phytophthora fragariae	**25**
	Sphaeropsis macularis	**3**
	Verticillium **s**p.	**7**
	Xanthomonas fragariae	**9**
	Mycoplasma-like organism	**3**
	Black rot	**18**
	Calcium deficiency (leaf distortion)	**1**
	Clopyralid injury (leaf distortion)	**1**
	Hail injury	**1**
	Lightning (leaf burn)	**1**
	Nitrogen deficiency (leaf chlorosis)	**1**
	Winter injury	**a**
	Other	**31**
Raspberry	***Didymella applanata***	**4**
	Elsinoe veneta	**8**
	Phytophthora root rot	**30**
	Agrobacterium tumefaciens	**5**
	Erwinia amylovora	**3**
	Excess water (root rot)	**7**
	iron deficiency (leaf chlorosis)	**1**
	Winter injury	**19**
	Other	**27**

TABLE 4. Summary of herbaceous and woody ornamental diseases diagnosed by the MAPAQ diagnostic laboratory in 1994.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Acer sp.	*Cryptosporiopsis* sp. (canker)	1
	Winter injury (canker)	1
Aegopodium sp.	Rhizoctonia root rot	1
Aglaonema sp.	*Pseudomonas marginalis* (soft rot)	1
	High salinity (leaf burn)	1
Aster sp.	Physiological stress (leaf spot)	1
Begonia sp.	*Erysiphe cichoracearum*	1
	INSV	2
	Physiological stress (leaf spot)	2
Betula sp.	Chilling injury	1
Calluna sp.	*Pseudophacidium* sp.	1
Canna sp.	Pythium bulb rot	1
Carthamus tinctorius	Ozone injury (necrotic speck)	1
Carya sp.	*Microstroma juglandis*	1
Celosia sp.	Pythium crown rot	1
Cereus sp.	*Helminthosporium cactivorum*	1
	Oedema	1
Chamaedora sp.	Phytophthora root rot	1
Clematis sp.	*Phyllosticta* sp.	1
Cotoneaster sp.	Iron deficiency (leaf chlorosis)	1
Cyclamen persicum	Fusarium crown rot	1
	INSV	1
	Physiological stress (leaf spot)	1
Delphinium sp.	Phytophthora root rot	1
	Pythium root rot	1
	Rhizoctonia crown rot	1
Diervilla lonicera	*Septoria diervillae*	1
Euphorbia pulcherrima	Pythium root rot	1
	Thielaviopsis root rot	1
Fuchsia x hybrida	Thielaviopsis root rot	1
Gladiolus sp.	*Stomatinia gladioli*	1
Hedera helix	Phytophthora root rot	1
Hemerocallis sp.	*Colletotrichum* sp.	1
Hibiscus sp.	Oedema	1
Hosta carnosa	INSV	2
Ipomoea aquatica	*Fusarium semitectum*	1
	Pythium root rot	3
Impatiens sp.	*Sphaerotheca* sp.	2
	Rhizoctonia crown rot	1
	Pseudomonas leaf spot	1
	INSV (leaf spot)	1
	TSWV (stem spot)	1
Iris sp.	Nitrogen deficiency (leaf chlorosis)	1

(cont'd.)

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Kalanchoe sp.	INSV	1
Limonium sp.	*Botrytis cinerea*	1
	Glomerella cingulatal	
Lupinus sp.	*Pleichaeta lupini*	1
Pachistema sp.	Phytophthora root rot	1
Paeonia sp.	*Botrytis cinerea*	1
Papaver sp.	*Entyioma fuscum*	1
Pelargonium sp.	Pythium crown rot	4
	Rhizoctonia crown rot	1
	Xanthomonas campestris pv. *pelargonii*	7
	Oedema	4
Petunia x hybrida	*Botrytis cinerea*	2
Picea sp.	*Chrysomyxa* sp.	1
	Phytophthora root rot	3
Pinus sp.	Phytophthora root rot	1
Rosa sp.	*Agrobacterium tumefaciens*	10
	Glyphosate injury (leaf distortion)	1
Santoiina sp.	Rhizoctonia root rot	1
Senecio x hybridus	Phytophthora root rot	1
	Pythium crown rot	1
Sinningia speciosa	INSV	3
Sorbus sp.	*Botryosphaeria* sp.	1
	Erwinia amylovora	1
Spathiphyllum sp.	Rhizoctonia root rot	1
Syringa sp.	*Ascochyta syringae*	1
	Pseudomonas syringae	3
	Winter injury	1
Tagetes sp.	*Alternaria* sp.	1
Thuja sp.	Dicamba injury (leaf distortion)	1
Vinca sp.	Thielaviopsis root rot	1
	Other	133

TABLE 5. Summary of apple diseases diagnosed by the MAPAQ diagnostic laboratory in 1994.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Apple	*Alternaria alternata* (leaf spot)	7
	Alternaria fruit rot	1
	Botryosphaeria obtusa	1
	Chondrostereumpurpureum	1
	Cytospora sp.	10
	Nectria cinnabarina	1
	Phoma sp.	2
	Phomopsis sp.	2
	Phytophthora cactorum	1
	Agrobacterium tumefaciens	13
	Erwinia amylovora	2
	Brown heart	1
	Ozone injury (purple leaf)	1
	Russeting	1
	Winter injury	6
	Other	14

TABLE 6. Summary of cereal crop diseases diagnosed by the MAPAQ diagnostic laboratory in 1994.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Barley	*Bipolaris sorokiniana*	10
	Fusarium graminearum	1
	Excess water (root rot)	2
	Other	1
Oat	*Ustilago avenae*	1
	BYDV	1
	Other	2
Wheat	*Bipolaris sorokiniana* (head blight)	1
	Fusarium graminearum	1
	Puccinia sp.	1
	Chlorotic fleck	1
	Excess water (root rot)	1
	Other	3

TABLE 7. Summary of diseases diagnosed on miscellaneous crops by the MAPAQ diagnostic laboratory in 1994.

CROP	CAUSAL AGENT/PLANT PATHOGEN	NO. OF SAMPLES
Alfalfa	*Fusarium* sp.	1
	Leptosphaerulina briosiana	2
	Phoma medicaginis	1
	Verticillium sp.	1
Ginseng	Rhizoctonia root rot	2
Soybean	*Peronospora manshurica*	1
	Colletotrichum sp.	1
	Metribuzin injury (leaf chlorosis)	1
Tobacco	*Alternaria longipes*	1
	Fusarium oxysporum	1
	Sclerotinia sclerotiorum	2
	Thielaviopsis basicola	1

CROP: Commercial Crops - Diagnostic Laboratory Report

LOCATION: Prince Edward Island

NAME AND AGENCY:
A.V. Sturz and M. Clark
P.E.I. Department of Agriculture, Fisheries and Forestry
Research, Resources and Laboratories
Plant Health Services
P.O. Box 1600, Charlottetown, Prince Edward Island C1A 7N3

TITLE: DISEASES DIAGNOSED ON COMMERCIAL CROPS IN PRINCE EDWARD ISLAND, 1994

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 agriculture extension staff, producers, agri-business and the general public. Diagnoses are based on visual examination of symptoms, microscopic observation and culturing on artificial media.

RESULTS AND COMMENTS: A total of 339 samples were processed during the period November 1993 - November 1994. Results are summarized in Table 1.

TABLE 1. Diseases diagnosed on commercial crop samples submitted to the Plant Health Services group, Prince Edward Island Department of Agriculture Fisheries and Forestry, Prince Edward Island, 1994.

CROP	DISEASE	CAUSAL PLANT AGENT/ PATHOGEN	NO.OF TIMES AGENTS WERE IDENTIFIED
VEGETABLES:			
Beans	Common Blight	***Xanthomonas*** sp.	1
Brussel	White Mold	***Sclerotinia*** sp.	2
Sprouts	Gray Mold	***Botrytis cinerea***	1
	Leaf Spot	***Alternaria*** spp.	1
Carrot	Dry Rot	***Fusarium roseum***	1
Cauliflower	Leaf Spot	***Alternaria*** sp.	1
	Head Rot	***Pseudomonas*** sp.	3
		Alternaria sp.	3
		Botrytis cinerea	3
	Physiological Disorders	Leaf Burn	1
		Boron Deficiency	3
Cucumber	Damping Off	***Fusarium*** sp.	1
		Alrernaria sp.	1
	Target Leaf Spot	***Corynespora cassiicola***	1
Garlic	Pink Rot	***Stemphylium*** **sp.**	1

(cont'd.)

CROP	DISEASE	CAUSAL PLANT AGENT/ PATHOGEN	NO.OF TIMES AGENTS WERE IDENTIFIED
Green Pepper	Bacterial Spot	***Xanthomonas*** sp.	**1**
Lettuce	Head Rot	***Botrytis cinerea***	1
		Pseudomonas sp.	**1**
		Erwinia sp.	**1**
	Physiological Disorder	Calcium Deficiency	1
Onion	Pink Rot	***Pyrenochaeta terrestris***	**1**
	Bulb Rot	***Fusarium* sp.**	1
Potato	Early Blight	***Alternaria alternata***	**31**
		Alternaria solani	**21**
		Stemphylium spp.	**2**
	Gray Mold	***Botrytis cinerea***	**26**
	Late Blight	***Phytophthora infestans***	**1**
	Dry Rot	***Fusarium*** spp.	**7**
		Phoma sp.	**1**
	Pink Rot	***Phytophrhora erythroseptica***	**3**
	Skin Spot	***Polyscytalum pustulans***	**1**
	Black Dot	***Colletotrichum coccodes***	**3**
	White Mold	***Sclerotinia sclerotiorum***	**7**
	Seed Piece Decay	***Fusarium*** spp.	**6**
		Erwinia spp.	**2**
		Rhizoctonia spp.	**9**
		Clostridium sp.	**1**
	Black Scurf	***Rhizoctonia solani***	**6**
	Stem Canker	***Rhizoctonia solani***	**13**
		Alternaria alternata	**3**
	Silver Scurf	***Helminthosporium solani***	**2**
	Scab	***Streptomyces scabies***	**13**
		Spongospora subterranea	**10**
	Pinkeye	***Pseudomonas*** spp.	**1**
	Blackleg	***Erwinia*** spp.	**3**
	Virus	Leaf Roll	**1**
	Physiological Disorders	Low Temperature Injury	1
		Chemical Damage	**3**
		Mechanical Damage	**3**
		Stem End Browning	**3**
		Nutritional Disorders	**3**
		Vascular Discoloration	**1**
		Glyphosate Damage	**1**
		Fertilizer Burning	**7**
		Little Tuber	**5**
		Wind Damage	**4**
		Elephant Hide	**2**
	Wilt	***Fusarium*** spp.	**4**
		Verticillium spp.	**9**

(cont'd.)

CROP	DISEASE	CAUSAL PLANT AGENT/ PATHOGEN	NO. OF TIMES AGENTS WERE IDENTIFIED
Potato	Early Dying Syndrome	***Rhizoctonia solani***	10
		Fusarium spp.	12
		Verticillium spp.	13
		Colletotrichum sp.	9
		Alternaria alternata	8
	Insect Damage		3
Rutabaga	Common Scab	***Streptomyces scabies***	1
	Downy Mildew	***Peronospora*** sp.	1
	Blackleg	***Phoma lingam***	1
	Physiological	Boron Deficiency	2
Tomato	Leaf Spot	***Botrytis cinerea***	1
		Alternaria solani	1
	Black Mold	***Alternaria alternata***	1
	Blossom End Rot	Calcium Deficiency	1
SMALL FRUITS:			
Strawberry	Leaf Spot	***Mycosphaerella fragariae***	1
	Powdery Mildew	***Sphaerotheca macularis***	1
Blueberry	Powdery Mildew	***Microsphaera vaccinii***	1
SPECIALITY CROPS:			
Ginseng	Root Rot	***Phytophthora*** sp.	1
		Alternaria sp.	1
		Rhizoctonia solani	1
Tobacco	Stalk Rot	***Sclerotinia sclerotiorum***	3
		Botrytis cinerea	2
		Pseudomonas sp.	2
	Wilt	***Fusarium oxysporum***	3
	Brown Spot	***Alternaria*** sp.	1
	Leaf Spot	***Botrytis cinerea***	1
WOODY ORNAMENTALS AND FLOWERING SHRUBS:			
Shrub	Powdery Mildew	***Erysiphe*** sp.	1
Pear	Physiological	Leaf Scorch	1
Lilac	Powdery Mildew	***Microsphaera*** sp.	1
	Bacterial Blight	***Pseudomonas*** sp.	1
		Heterosporium sp.	1
Maple		***Alternaria*** sp.	1
Dahliae	Insect Damage		1
TOTAL			339