Diagnostic laboratories / Laboratoires diagnostiques

Crop / Culture: Cultures aux fruits

Location / Emplacement: Québec

Title / Titre: Maladies des petits fruits et du pommier identifiées par le laboratoire de diagnostic en 1990

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METHODES: Le laboratoire de diagnostic a reçu quelque 1 580 échantillons pour l'identification de désordres observés sur diverses plantes cultivées. Les petits fruits et le pommier représentaient 18,9% des cas soumis. Plus spécifique, le fraisier comptait pour 9,7% des échantillons, le framboisier 4,9%, le bleuet 0,9% et le pommier 3,4%.

L'identification des maladies fongiques et bactériennes est réalisée par l'observation microscopique, l'isolement sur des milieux de culture sélectifs et la réalisation de tests biochimiques.

RESULTATS: Fraisier - parmi les principaux problèmes observés, 45 étaient de la stèle rouge (Phytophthora fragariae), 14 de la pourriture noire des racines (Idriella, Pyrenochaeta et/ou Rhizoctonia), 3 du flétrissement verticillien (Verticillium sp.), 6 de la tache commune (Mycosphaerella fragariae), 3 de la tache angulaire (Xanthomonas fragariae), 17 du gel hivernal et 8 des carences minérales diverses.

Framboisier - les principaux problèmes ont regroupé 14 échantillons de pourridié des racines (Phytophthora sp.), 4 de brûlure des dards (Didymella applanata), 2 d'anthracnose (Elsinoe veneta), 1 de brûlure bactérienne (Erwinia amylovora), 4 de maladies virales, et 21 de gel hivernal.

Pommier - les désordres regroupaient 9 cas de brûlure bactérienne (Erwinia amylovora), 4 de dépérissement nectrien (Nectria annalavina), 2 de flétrissement verticillien (Verticillium sp.), 9 de gel hivernal, et 2 de tache amère.

Crop / Culture: Canola

Location / Emplacement: Manitoba

Title / Titre: Diseases diagnosed on canola samples submitted to the Manitoba Agriculture Plant Pathology Laboratory in 1990.

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METHODS: There were 126 samples of canola submitted to the Manitoba Agriculture Plant Pathology Laboratory between January 1 and November 30, 1990. Samples were examined for symptoms of disease and when necessary, isolations were made on Potato Dextrose Agar.

RESULTS: Diseases diagnosed on canola are presented in Table 1. Blackleg (Leptosphaeria maculans) was the most common infectious disease problem and was diagnosed on 40 samples. The majority of these samples were from western Manitoba. Rhizoctonia root rot (Rhizoctonia solani) was found on 8 samples and was particularly severe on 2 samples submitted from Roblin. Downy mildew was found on 6 samples. The infections had occurred on plants during June, at which time the weather was very moist. Stem rot (Sclerotinia sclerotiorum) was found in only 4 samples and generally occurred at low levels throughout Manitoba. There were a large number of samples (45) in which herbicide injury (primarily due to spray drift), was the problem diagnosed.

TABLE 1: Diseases diagnosed on canola samples submitted to the Manitoba Agriculture Plant Pathology Laboratory in 1990.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Blackleg	Leptosphaeria maculans	40
Root rot	Rhizoctonia solani	8
Downy mildew (early infection on leaves)	Peronospora parasitica	6
Stem rot	Sclerotinia sclerotiorum	4
White leaf spot	Pseudocercosporella capsellae	3
Herbicide injury		45
Nutrient deficiency (mainly sulphur)	sulphur deficiency	10
Environmental stress		6
Miscellaneous		4
Total		126

Crop / Culture: Fruit Crops

Location / Emplacement: Manitoba

Title / Titre: Diseases diagnosed on fruit crops submitted to the Manitoba Agriculture Plant Pathology Laboratory in 1990.

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METHODS: There were 284 samples of fruit crops submitted to the Manitoba Agriculture Plant Pathology Laboratory. The majority of the saskatoons, raspberry, and strawberry samples were from commercial growers, while the apple, plum, pear, and currant samples were from home gardens.

RESULTS: Plum - of 41 samples of plum, 14 were affected by plum pocket (Taphrina communis), 3 by cytospora canker (Cytospora spp.), 1 by shot hole (Coccomyces spp.), 4 showed environmental stress and 19 were affected by miscellaneous problems including herbicide injury, insect damage, and nutrient deficiencies.

Currant - of 12 samples submitted, 2 were affected by powdery mildew (Sphaerotheca mors-uvae), 1 by anthracnose (Drepanopeziza spp.), 1 by leaf spot (Mycosphaerella ribis), 1 by canker (Nectria cinnabarina), 6 by physiological/ environmental causes, and 1 by herbicide injury.

Saskatoon - of 14 samples of saskatoon , 2 were found to be affected by leaf spot (Entomosporium maculatum), 1 with rust (Gymnosporangium spp.), 1 canker (Valsa sp.), 7 environmental (winter injury), and 4 miscellaneous including herbicide and insect injury.

Pear - of 12 samples submitted, 2 showed fireblight (Erwinia amylovora), 2 frogeye leaf spot (Botryosphaeria obtusa), 4 showed effects of winter injury, and 4 were affected by nutrient deficiencies and herbicide injury.

Apple - of 126 samples submitted, 46 showed fireblight (Erwinia amylovora), 16 cytospora canker (Cytospora spp.), 10 frogeye leaf spot (Botryosphaeria obtusa), 3 silverleaf (Chondrostereum purpureum), 1 white rot (Botryosphaeria dothidea), 34 environmental damage (winter injury), 12 nutrient deficiency (iron chlorosis), and 4 samples showed herbicide drift injury.

Raspberry - of 45 samples submitted, 12 were found to be affected by anthracnose (Elsinoe veneta), 10 by cane blight (Leptosphaeria coniothyrium), 3 by fireblight (Erwinia amylovora), 1 with powdery mildew (Oidium spp.), 1 with fruit rot (Botrytis spp.). In addition to infectious disease, 2 samples were affected by winter injury causing tip kill and 11 samples showed nutrient deficiency, primarily iron chlorosis, and 5 showed environmental stress.

Strawberry - of 34 samples submitted, 16 were affected by crown and root rot (Fusarium spp.), 7 by fruit rot (Botrytis cinerea), 4 by leaf spot (Mycosphaerella fragariae), 1 by powdery mildew (Sphaerotheca macularis), 1 by suspected virus disease, 5 by physiological disorders as a result of environmental stress, and 14 samples exhibited insect damage.

Crop / Culture: Forage Crops

Location / Emplacement: Manitoba

Title / Titre: Diseases diagnosed on forage samples submitted to the Manitoba Agriculture Plant Pathology Laboratory in 1990.

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METHODS: There were 20 samples of forage crops submitted to the Manitoba Agriculture Plant Pathology Laboratory.

RESULTS: Results of forage submissions are presented in Table 1. Winter kill was severe in some fields because of poor snow cover and cold temperatures in early December Spring black stem and its associated leaf spot was the most common problem identified on alfalfa. Crown rot continues to be a major problem in stands over 4 years old. Observations suggest a relationship between winter injury, snow mould and invasion of damaged alfalfa crowns by Fusarium spp.

TABLE 1: Diseases diagnosed on forage samples submitted to the Manitoba Agriculture Plant Pathology Laboratory in 1990.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Spring black stem	Phoma medicaginis	8
Physiological	Winter injury, white spot	5
Crown rot	Fusarium spp.	4
Herbicide injury		4
Common leaf spot	Pseudopeziza medicaginis	3
Downy mildew	Peronospora trifoliorum	1
Yellow leaf blotch	Leptotrochila medicaginis	1
Stemphylium leaf spot	Stemphylium botyosum	1
Total		27

Crop / Culture: Shade Tree

Location / Emplacement: Manitoba

Title / Titre: Diseases diagnosed on samples of shade trees submitted to the Manitoba Agriculture Plant Pathology Laboratory in 1990.

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METHODS: Over 500 samples of trees and shrubs were submitted to the laboratory in 1990, not including 1,811 samples of elms submitted for Dutch Elm Disease analysis. Samples were examined for symptoms of diseases and when necessary, isolations were made onto Potato Dextrose Agar. Following are diseases and disorders most commonly diagnosed.

RESULTS: Poplar (Populus spp.) - In 40 samples of poplar, 4 showed cytospora canker (Cytospora chrysosperma), 4 septoria canker and leaf spot (Septoria musiva), 7 leaf rust (Melampsora medusae), 2 shoot blight (Pollacia spp.), and 7 samples showed effects of environmental stress. In addition to disease, 15 samples were submitted with insect injury.

Oak (Quercus macrocarpa) - In 32 samples of oak, 2 showed anthracnose (Gnomonia veneta), 4 leaf blister (Taphrina caerulescens), 1 phomopsis twig canker (Phomopsis spp.), 5 showed oak decline due to the environmental stress of drought and site disturbance, and 1 canker (Fusarium solani and F. oxysporum). In addition to diseases, 19 samples showed insect injury.

Spruce (Picea spp.) - In 95 samples of spruce, 17 showed cytospora canker (Cytospora kunzei), 2 showed needle cast (Rhizosphaerea kalkhoffii, Lirula spp.), 39 showed environmental stress due to drought stress, 1 showed seedling blight (Fusarium spp. and Botrytis cinerea), 4 showed herbicide injury. In addition to disease, 30 samples showed insect damage.

Scots Pine (Pinus sylvestris) - In 14 samples of pine, 1 showed western gall rust (Endocronartium harknessii), 1 showed needle cast (Cyclaneusma niveum), 2 showed canker (Cytospora spp.), 7 showed environmental stress, 1 showed mechanical damage, 1 herbicide injury and 1 insect damage.

Birch (Betula spp.) - In 40 samples of birch, 17 showed birch dieback (complex of environmental stress, nutrient deficiency and bronze birch borer damage), 3 showed cytospora canker (Cytospora spp.), and 2 showed herbicide injury. In addition to diseases, 18 samples showed insect damage.

Ash (Fraxinus spp.) - In 48 samples of ash, 3 showed anthracnose (Gloeosporium spp.), 2 showed canker (unidentified cause), 8 showed effects of the environmental stress of winter injury and drought. In addition to infectious disease, 21 samples showed symptoms of herbicide injury, and 14 samples exhibited insect damage.

Manitoba Maple (Acer negundo) - In 68 samples of maple, 11 showed cytospora canker (Cytospora spp.), 4 showed anthracnose (Gloeosporium spp.), 1 showed steganosporium canker (Steganosporium spp.), 15 showed environmental stress primarily leaf scorch due to drought conditions, 23 samples showed leaf distortion due to herbicide drift, 8 showed nutrient deficiency, and 5 showed insect damage.

Crop / Culture: Turfgrass

Location / Emplacement: Manitoba

Title / Titre: Diseases diagnosed on turfgrass samples submitted to the Manitoba Agriculture Plant Pathology Laboratory in 1990

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METHODS: There were 95 submissions of turfgrass sent to the Manitoba Agriculture Plant Pathology Laboratory in 1990. Samples were examined for disease symptoms and where necessary, isolations were made onto Potato Dextrose Agar.

RESULTS: Diseases diagnosed on turf submissions are presented in Table 1. Leaf diseases caused by Colletotrichum graminicola, Ascochyta spp, and Drechslera spp. were more prominent in Manitoba in 1990 than in 1989 primarily as a result of moist weather in June. Snow mold was not a major problem in 1990. Decline of lawns, attributed to Fusarium patch and late season drought conditions, was a frequent problem in 1990 diagnosed on lawn samples submitted from Winnipeg.

TABLE 1: Diseases diagnosed on turfgrass submitted to the Manitoba Agriculture Plant Pathology Laboratory in 1990.

DISEASE	SCIENTIFIC NAME	NUMBER OF SAMPLES
Anthracnose	Colletotrichum graminicola	25
Ascochyta	Ascochyta spp.	8
Melting out	Drechslera spp.	27
Fusarium patch	Fusarium spp.	11
Septoria	Septoria spp.	3
Pink snow mold	Gerlachia nivalis	2
Slime mould	Physarum spp.	2
Environmental stress	drought	6
Herbicide injury		4
Miscellaneous		7
Total		95

Crop / Culture: Diagnostic Laboratory Report

Location / Emplacement: British Columbia

Name and Agency / Nom et Organisation: MacDonald, Leslie S.
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Title / Titre: Diseases Diagnosed on Floriculture Crops in B.C., 1990.

METHODS: The B.C.M.A.F. Plant Diagnostic Lab provides the diagnosis of, and control recommendations for disease problems of commercial crops. The following data reflects samples submitted to the lab by Ministry extension staff, growers and agribusiness. Diagnosis was accomplished by microscope examination, culturing onto artificial media, ELISA and the Biolog bacterial identification system. Viruses were identified by Dr. R. Stace-Smith and Dr. D. MacKenzie, Agriculture Canada Research Station, Vancouver, through sap inoculation onto indicator plants and ELISA.

RESULTS AND COMMENTS: There were 153 submissions consisting of 60 floriculture plant species. Highlights of disease submissions on floriculture crops are presented in table 1. Root rots caused by *Pythium* or *Phytophthora* were the most common infectious disease, accounting for 22 submissions. Tomato spotted wilt virus was detected in 13 samples on cineraria, cyclamen, impatiens, marigold, petunia and primula. Bacterial blight was detected on 10 geranium samples. Physiological diseases were diagnosed on 30 submissions.

Table 1 Highlights of Floriculture Disease Submissions in 1990

Crop	Disease	No. of Samples
Alstroemeria	Crown and root rot (*Phytophthora* sp)	1
Anemone	Collar rot (*Botrytis cinerea*)	1
Anthurium	*Xanthomonas campestris pv. dieffenbachiae*	1
Cineraria	Tomato spotted wilt virus	3
Cyclamen	*Fusarium oxysporum f. sp. cyclaminis*	1
	Crown rot (*Erwinia carotovora*)	1
	Tomato spotted wilt virus	1
Carnation	*Fusarium oxysporum*	1
Freesia	*Stromatinia* dry rot	1
Geranium	Root rot (*Pythium* sp.)	7
	Xanthomonas campestris pv. pelargonii	8
Geranium, ivy	Root rot (*Pythium* sp.)	1
	Xanthomonas campestris pv. pelargonii	2
Impatiens	Tomato spotted wilt virus	1
Impatiens New Guinea	Leaf spot (*Pseudomonas* sp.)	1
	Tomato spotted wilt virus	5
Iris, bulbous	*Sclerotium rolfsii*	1
Kalanchoe	Root rot (*Thielaviopsis basicola*)	1
Marguerite	Tomato aspermy virus	1

Marigold	Tomato spotted wilt virus	1
Petunia	Root rot (*Thielaviopsis basicola*)	1
	Tomato spotted wilt virus	1
Poinsettia	Root rot (*Pythium* sp.)	5
	Stem rot (*Rhizoctonia* sp.)	1
	Branch wilt	4
Primula	Wilt (*Pseudomonas* sp.)	1
	Tomato spotted wilt virus	1
Ranunculus	Tomato spotted wilt virus	1
Syngonium podophyllium	*Xanthomonas campestris pv. syngonii*	1
Total		36

Crop / Culture: Diagnostic Laboratory Report

Location / Emplacement: British Columbia

Name and Agency / Nom et Organisation: MacDonald, Leslie S.
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Title / Titre: Diseases Diagnosed on Greenhouse Vegetable Crops in B.C., 1989 and 1990.

METHODS: The B.C.M.A.F. Plant Diagnostic Lab provides the diagnosis of, and control recommendations for disease problems of commercial crops. The following data reflects samples submitted to the lab by Ministry extension staff, growers and agribusiness. Diagnosis was accomplished by microscope examination, culturing onto artificial media and bioassays. Viruses were identified by Dr. R. Stace-Smith, Agriculture Canada Research Station, Vancouver, through sap inoculation onto indicator plants and ELISA.

RESULTS AND COMMENTS: Disease submissions on greenhouse vegetable crops are presented in table 1. *Pythium* root rot was the most common disease diagnosed on cucumber. Zucchini yellow mosaic virus was introduced for a second time into a B.C. greenhouse; the first incident was in 1988. Pepper mild mottle virus caused an estimated $1.2 million loss this year. Most of the loss occurred at three greenhouses where it was introduced early in the growing season and spread through crop handling before its presence was indicated by symptom development on the fruit. The tomato spotted wilt virus report for 1990 was from tomato transplants grown for the bedding plant market. Physiological diseases were the most common diagnosis on tomato crops with most related to imbalanced nutrient levels. The miscellaneous category refers to insect injury, undetermined cause and no disease as the diagnosis.

Table 1 Summary of Greenhouse Vegetable Crop Diseases Submitted in 1989 and 1990.

Crop	Disease	No. of Samples 1989	1990
Cucumber	Stem & fruit rot (*Botrytis cinerea*)	-	2
	Root rot (*Pythium* sp.)	6	6
	Damping off (*Rhizoctonia* sp.)	-	1
	Stem rot (*Sclerotinia sclerotiorum*)	-	1
	Zucchini yellow mosaic virus	-	1
	Pale fruit viroid	1	1?
	Miscellaneous	2	-
Pepper	Root rot (*Pythium* sp.)	1	-
	Damping off (*Rhizoctonia* sp.)	-	1
	Pepper mild mottle virus	-	4
	Physiological	1	5
	Undetermined	-	2
Tomato	*Alternaria solani*	-	1
	Stem rot (*Botrytis cinerea*)	2	1
	Leaf mould (*Fulvia fulvum*)	5	2
	Fusarium oxysporum f.sp. racidis-lycop.	2	1
	Root rot (*Pythium* sp.)	3	3
	Rhizoctonia sp.	-	1
	Sclerotinia sclerotiorum	-	1
	Pith decay	3	-
	Tomato spotted wilt virus	1	1
	Cucumber mosaic virus	1	1
	Physiological	2	12
	Miscellaneous	6	5
	Total	36	53

Crop / Culture: Diagnostic Laboratory Report

Location / Emplacement: British Columbia

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Title / Titre: Diseases Diagnosed on Small Fruit and Grape Crops in B.C., 1990.

METHODS: The B.C.M.A.F. Plant Diagnostic Lab provides the diagnosis of, and control recommendations for disease problems of commercial crops. The following data reflects samples submitted to the lab by Ministry extension staff, growers and agribusiness. Diagnosis was accomplished by microscope examination, and culturing onto artificial media.

RESULTS AND COMMENTS: Disease submissions on small fruit and grape crops are presented in table 1. The fall of 1989 had an early freeze which caused damage to some growth that was still succulent. Spring 1990 had some late frosts that damaged blossoms of early flowering varieties. May and June were very wet which promoted foliar diseases and caused root damage due to saturated soils for prolonged periods. There were 74 submissions in these categories.

Table 1 Summary of Small Fruit and Grape Crop Diseases Submitted in 1990

Crop	Disease	No. of Samples
Blueberry	Twig dieback (*Botrytis cinerea*)	2
	Godronia canker (*Fusicoccum putrefaciens*)	5
	Powdery mildew (*Microsphaera* sp.)	1
	Mummyberry (*Monilinia vaccinii-corymbosi*)	1
	Bacterial blight (*Pseudomonas syringae*)	6
	Crown gall	3
	Frost injury	10
	Improper management	9
	Insect or mouse damage	5
Cranberry	Upright dieback (*Phomopsis vaccinii*)	1
Currant	White pine blister rust (*Cronartium ribicola*)	1
	Insect/No disease	2
Gooseberry	Canker (*Ascochyta* sp.)	1
Raspberry	Spur blight (*Didymella applanata*)	2
	Cold damage	1
	Sun scorch	2
	Saturated soil	8
	Insect damage	1
Strawberry	Black root rot complex	1
	Red stele (*Phytophthora fragariae*)	8
	Verticillium sp.	2
	Physiological	2
	Insect damage	1
Grape	Brown rot of cluster (*Monilinia* sp.)	1
Total		74