CROP: Clover

LOCATION: Saskatchewan

NAME AND AGENCY:
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TITLE: DISEASES OF CLOVER IN NORTHEASTERN SASKATCHEWAN

A limited number of clover fields were examined and the following diseases found : Black Stem (Phoma trifolii), Stagonospora Leaf Spot (Leptosphaeria pratensis), Powdery Mildew (Erysiphe polygoni), and Northern Anthracnose (Kabatiella caulivora) on red clover; Sooty Blotch (Cymadothea trifolii), Stagonospora Leaf Spot and Powdery Mildew on alsike clover; Stagonospora Leaf Spot and Plenodomus Root Rot on sweet clover.

Forest trees

CROP: Ash

LOCATION: Manitoba

TITLE: Incidence of Plant Diseases on Ash in Manitoba in 1987

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

RESULTS: Dieback of green and black ash was widespread in Winnipeg area in the spring. No pathological cause could be determined. Unusual winter conditions may have resulted in dieback. The sudden and early onset of winter conditions following November 8th 1986 snowfall may have been a factor in increased amount of winterkill.

CROP: Birch

LOCATION: Manitoba

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

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

RESULTS: There were fewer samples of birch dieback reported in 1987 in Manitoba. The lower incidence of dieback could be related to a diminishing population of mature weeping birch in Winnipeg and a greater awareness of the need to water birch trees during periods of dry weather.

CROP: Conifer Plantations

LOCATION: Southern Interior British Columbia

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TITLE: ROOT DISEASE SURVEY IN BACKLOG AREAS AND PLANTATIONS IN SOUTHERN INTERIOR BRITISH COLUMBIA

METHODS: In 1986 - 87, 18 areas either planted or naturally stocked with conifers or scheduled for rehabilitation treatment under the backlog reforestation program of the Forest Resources Development Agreement (FRDA) were examined for root diseases by M. Curran and J. Schulting, Pathocon Consulting. The work was conducted under contract (FRDA Backlog Research project 3.8) jointly funded by the Province of British Columbia and the Government of Canada. Trees, vegetation, stumps, and adjacent mature forest stands were examined using systematically placed transects approximately 100m apart. Identification of root disease fungi was based on field characteristics, and occasionally by collecting specimens and isolating cultures.

RESULTS AND COMMENTS: Root diseases were present in 17 of the 18 areas. From 2 to 18% of the planted or most common trees per site were infected. Trees infected - both planted and naturally established - included Douglas-fir, lodgepole pine, western white pine, interior spruce, western hemlock and western red cedar. With one exception, all young trees were infected by Armillaria root disease (pathogen: Armillaria obscura). Laminated root rot (pathogen: Phellinus weirii) was found only on one young tree but often in stumps or in adjacent stands at five areas.

On the unstocked backlog sites, root diseases were found attacking young conifers in four areas. Root diseases were found in all of the nearby, mature stands, and on stumps in two areas. On four areas, armillaria root disease was found on hardwood trees and brush species.

On the 12 stocked areas, armillaria root disease was found on young trees that had been planted as recently as 1984, with only one site completely free of any signs of Armillaria or Phellinus. The fungi were also found in the adjacent stands (6 areas), on stumps (3) and hardwoods (6).

The occurrence of root disease in most of the backlog areas and plantations was a major concern. In backlog unstocked areas, root disease could be the major reason for the chronic, unsatisfactory stocking. In several of the stocked plantations, tree mortality due to root disease was so severe that these areas might soon become poorly stocked. Mature stands scheduled for harvest and backlog, non-satisfactorily restocked areas should be examined for root diseases, and an appropriate root disease treatment applied in most instances.

Plantings of tree species less susceptible to armillaria root disease, or mechanical removal of infected stumps and roots, could re-establish or even enhance productive forests on infested sites.

CROP: Oak

LOCATION: Manitoba

TITLE: Incidence of Plant Diseases on Oak in Manitoba in 1987

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

RESULTS: Dieback of bur oak was reported from Winnipeg, Morden, Stonewall and other areas. Site examination of several cases indicated the problem was likely cultural rather than pathological. Removal of underbrush from native oak stands, change in soil grade and soil compaction are major contributing factors to oak decline. In a few cases Armillaria root rot was also observed but this is usually only a problem in trees weakened by environmental conditions.

CROP: Poplar

LOCATION: Manitoba

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

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

RESULTS: Septoria canker is a common problem in shelterbelts of hybrid poplars. Septoria leaf spot caused premature leaf fall of poplar in August in Winnipeg. Efforts to retain native poplar in home landscapes in new land developments in Winnipeg invariably result in eventual death of the trees by hypoxylon canker.

CROP: Elm

LOCATION: Manitoba

TITLE: Incidence of Dutch Elm Disease in Manitoba in *1987*

NAME AND AGENCY:
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METHODS: Results are based on *3,002* samples of American elm, Ulmus americana submitted to the Plant Pathology Laboratory from a survey conducted by the Manitoba Department of Natural Resources. Trees were selected for sampling and submission to the laboratory on the basis of presence of wilted brown leaves and internal brown staining of the cambium. All samples submitted were cultured on potato dextrose agar medium and incubated for *7* days at *20°*C. Fungal identifications were done after *7* days.

RESULTS: There were *3,002* elm trees sampled in Manitoba in *1987* of which *2,778 (92.5%)* were found to be affected by Dutch Elm Disease (DED), caused by Ophiostoma ulmi (Ceratocystis ulmi). The Dothiorella wilt. caused by Dothiorella ulmi and Verticillium wilt caused by Verticillium spp.

The results of the *1987* DED survey for Manitoba are presented in Table *1.* The results of the Winnipeg survey are divided into 6 regions. The highest number of DED infected trees occurred in the Assiniboine Park, Fort Garry area, *608* trees or *93.3%* of trees sampled. The majority of infected trees were found in the southern part of this area along the Red and La Salle Rivers. There was also a high number of infected trees in the St. Boniface, St. Vital regions, mainly in trees adjacent to the Red and Seine Rivers. The number of infected trees in the other regions of Winnipeg is presented in Table *1.* A measure of the full extent of DED severity within Winnipeg can be obtained by examining tree removal records of the Manitoba Department of Natural Resources and the City of Winnipeg. There were *4,362* trees tagged for removal in the City of Winnipeg area (Figure 1). The areas of highest DED incidence were the southern portions of St. Boniface-St.Vital *(1,234)* and St. Norbert-Fort Garry *(1,296).* Most of the infected trees were in native stands along the Red, Seine and La Salle rivers. There were also numerous trees identified for removal in North Winnipeg. Infected trees were found in the Kildonan Park area and other areas adjacent to the Red River along the west side of the river and Henderson Highway on the east side of the river *(1,273).* There were *4,367* trees designated for removal in the Ritchot municipality, which were within the Winnipeg buffer zone. This also applied to the large number of trees desig-

nated for removal in the RM of Cartier (828) and RM of St. Francois Xavier (604) which border on the west side of Winnipeg along the Assiniboine River. There were 177 infected trees detected in Brandon but high concentrations of dead trees, most of which on the basis of sampling likely died from DED, were evident in the Brandon area north of the city adjacent to the Assiniboine river (3,169) Figure 2. Within the City of Brandon, only 203 trees were marked for removal. The incidence of DED is particularly severe in Eastern Manitoba where 707 infected trees were detected or 97% of all elm trees sampled in this area. There were fewer infected trees detected in Western Manitoba, 36 or 80% of elm trees sampled. In the entire province of Manitoba 17,266 trees have been identified for removal because of being infected by DED or having sufficient dead wood to be a risk as a potential brood tree for elm bark beetles.

The survey did not accurately reflect the large numbers of trees that have been killed by DED in the Eastern and Interlake regions, because sampling and tree removal primarily takes place within the boundaries and buffer zones of cities, towns and villages and not in rural areas.

There was no major expansion in the geographic limits of DED, westward along the Assiniboine adjacent to the Saskatchewan border in 1987. Infected trees were again observed in 1987 near St. Lazare on the Assiniboine River but no dead or diseased trees were observed along the Saskatchewan border. The Souris river had DED infected elms from its junction with the Assiniboine east of Brandon until the river enters the United States in the Southwest corner of Manitoba, south of Melita.

Table 1. Dutch Elm Disease Survey for Manitoba

AREA	TREES SAMPLED	TREES DISEASED~	PERCENT DISEASED
Wpg. Centre/ Fort Rouge	136	117	86.0
Wpg. St. James/ Assiniboia	35	32	91.4
Wpg. Lord Selk./ West Kildonan	138	122	88.4
Wpg. East Kildonan/ Transcona	321	295	91.9
Wpg. St. Boniface/ St. Vital	512	469	91.6
Wpg. Assiniboine Pk./ Fort Garry	652	608	93.3
Brandon	74	67	90.5
Interlake[1]	147	139	94.5
Central[2]	212	186	87.7
Eastern[3]	730	707	96.8
Western[4]	45	36	80.0

a Based on confirmation of presence of Ophiostoma ulmi (Ceratocystis ulmi) in laboratory cultures.

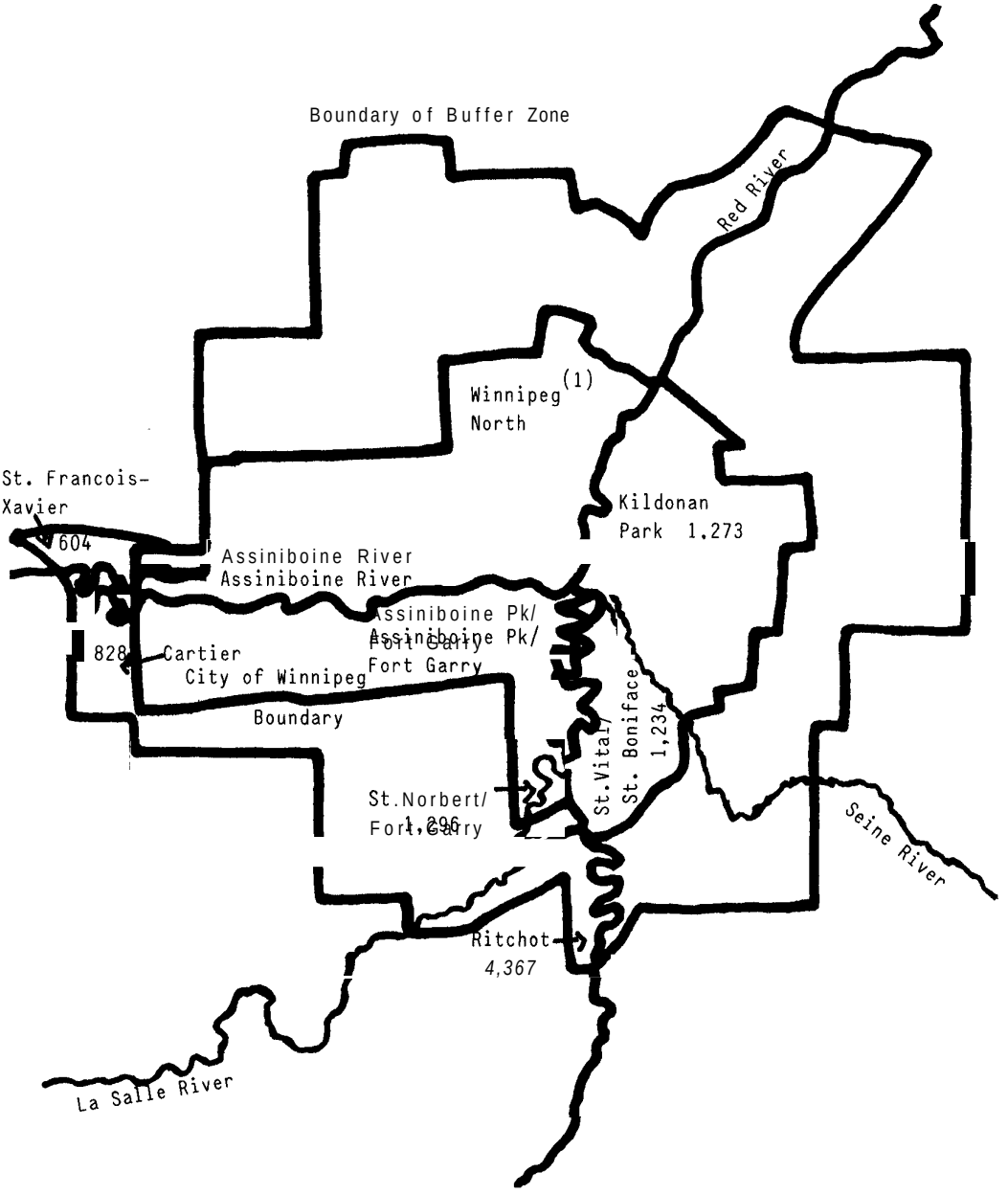
1 Interlake region includes the City of Selkirk and all area north of Winnipeg between Lake Manitoba and Lake Winnipeg

2 Central region includes the town of Portage la Prairie and the area south to the United States border and east to the Red River

3 Eastern region includes all area east of the Red River to the Ontario border

4 Western region includes area west of Portage la Prairie to the Saskatchewan border excluding the City of Brandon

FIGURE 1: Distribution of Dutch Elm Disease Within City of Winnipeg and Buffer Zone.



(1) **Trees marked for removal-diseased and hazard, over 50% dead**

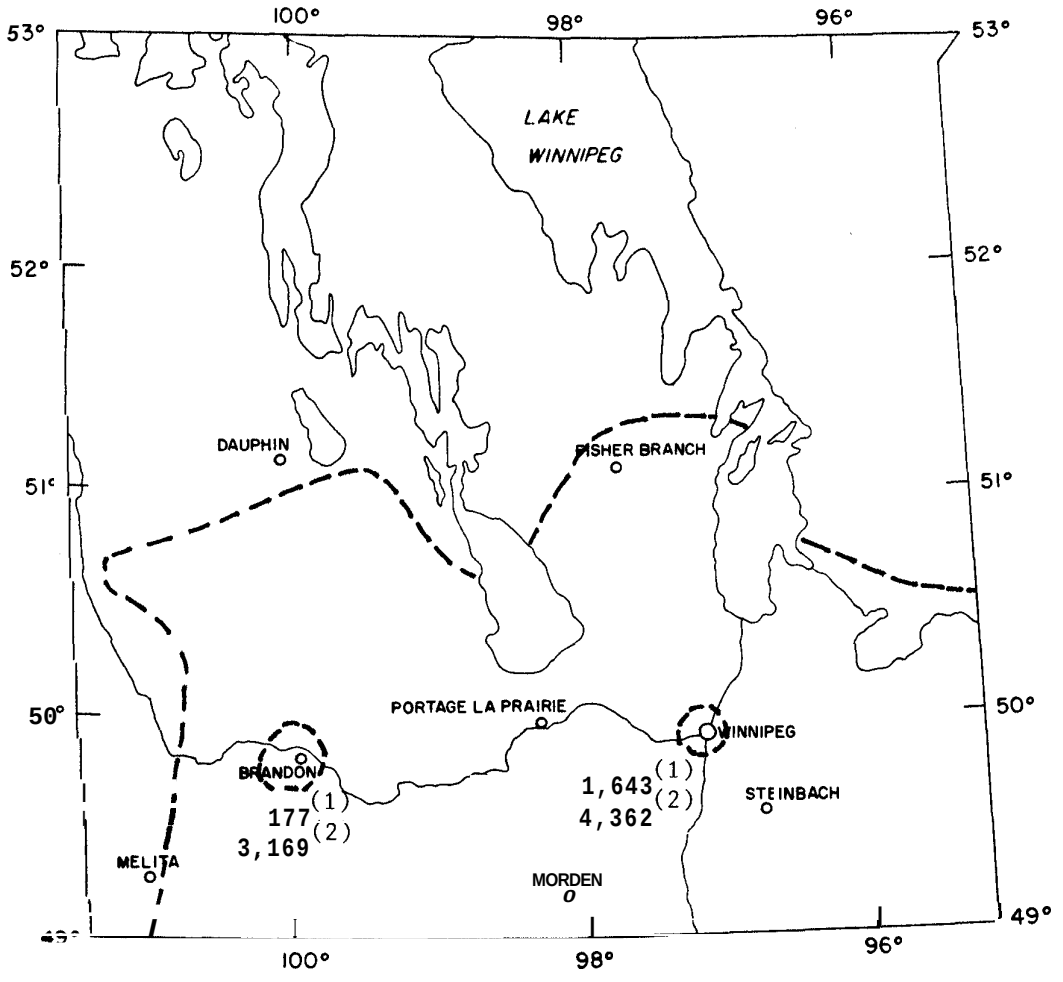


Figure 2: Distribution of Dutch Elm Disease in Manitoba in 1987

--- geographical limit of Dutch Elm Disease in Manitoba as of 1987

(1) Elm trees confirmed to have Dutch Elm Disease

(2) Elm trees marked for removal – diseased and hazard, over 50% dead

CROP: Spruce

LOCATION: Manitoba

TITLE: Incidence of Plant Diseases on Spruce in Manitoba in 1987

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METHCDS Results are based on spruce samples submitted to the Plant Pathology Laboratory and field examinations.

RESULTS: Cytospora canker was found as a common problem on mature blue spruce.

Needle casts caused by Lirula sp. were detected from samples submitted from Eastern Manitoba. Rhizosphaera needle cast is commonly observed on spruce particularly from western Manitoba. This disease has caused considerable damage to spruce in International Peace Garden plantings.

Ornamentals

CROP: Ornamentals

LOCATION: Nanitoba

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

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METHODS: Results based on 1,033 samples of ornamentals submitted to the Plant Pathology Laboratory and field examinations.

RESULTS: Common disease problems were: fireblight of cotoneaster; corm rot of gladioli caused by Penicillium spp; leaf spot anthracnose) of dogwood; silver leaf and fireblight of mountain ash; black spot, powdery mildew and rust of roses, Gymnosporangium sp. gall of junipers.

Cytospora sp. canker was a common problem on ornamental crabapples especially in the early spring. It is closely associated with winter damage. There were only a few samples of fireblight on crabapples received. Many of the samples showed evidence of environmental and nutritional disorders such as winter sunscald of crabapples, leaf scorch of dogwood related to spring drought conditions and iron chlorosis of spirea and roses.