PROCEEDINGS OF THE 1st ANNUAL WESTERN INTERNATIONAL FOREST DISEASE WORK CONFERENCE

Victoria, British Columbia
November 1953

Proceedings of the 1st Annual Western International Forest Disease Work Conference

Victoria, British Columbia
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Report on the First International Western Forest Disease Work Conference
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TABLE OF CONTENTS

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REPORT ON

FIRST INTERNATIONAL

WESTERN FOREST DISEASE WORK CONFERENCE

VICTORIA, B.C. NOVEMBER 1953.

Forest Biology (Pathology) Laboratory,
409, Federal Building,
Victoria, B.C.

January, 1954.

FIRST INTERNATIONAL

WESTERN FOREST DISEASE WORK CONFERENCE

VICTORIA, B.C., NOVEMBER, 1953.

An international meeting of western forest pathologists was held at the Forest Biology (Pathology) Laboratory in Victoria, B.C. November 19-21, 1953. Although the meeting was sponsored by the Canadian Division of Forest Biology and the United States Division of Forest Pathology, attendance was solicited from all persons known to be actively engaged in the study of forest disease in western North America.

Thirty-three delegates (Appendix I) responded to the invitation. Representation was gained from Washington, Oregon, California, New Mexico, Utah, Colorado, Idaho, Montana, Alberta, and British Columbia. Also in attendance were Dr. L.M. Hutchins, Head Pathologist in Charge, U.S. Division of Forest Pathology, Beltsville, Maryland, Dr. M.L. Prebble, Chief, Cdn. Division of Forest Biology and Head, Unit of Forest Zoology, and Dr. J.E. Bier, Associate Chief, Cdn. Division of Forest Biology and Head, Unit of Forest Pathology, Ottawa, Ontario.

The meeting was designed to provide an opportunity to review briefly all activities in forest pathology in western North America and was held in recognition of the many and varied problems in forest disease and of the values to be derived through evaluation of problems of mutual interest

and concern.

Fifty-nine active projects were reviewed during the course of the meeting (Appendix II). It was evident from the review that parallel and related investigations were in progress and that much was to be gained from the formal review and the informal discussions relating to policies, techniques, and methods which had been developed to contribute to their solution.

On the evening of November 19th members attended a special meeting of the Vancouver Island Section of the Canadian Institute of Forestry at which Drs. L.M. Hutchins and J.E. Bier were guest speakers.

A business meeting was held on November 20 and the following officers elected to the Conference executive for 1954:

Chairman: Dr. W.W. Wagener, U.S. Division of Forest Pathology, San Francisco, Calif.

Secretary: Dr. P.C. Lightle, U.S. Division of Forest Pathology, San Francisco, Calif.

Berkeley, California was chosen as the location of the 1954 Conference. It was agreed that the meeting should be held immediately preceding the annual meeting of the Western Forestry and Conservation Association and that steps should be taken to determine the possibility of holding a portion of the meeting in joint session with the Western Forest Insect Work Conference.

An informal social evening was spent at the Cowichan Lake field station of the Victoria Laboratory on November 20th. Members were welcomed to the Forest Experiment Station by Mr. F.S. McKinnon, Assistant Chief Forester of the Province of British Columbia. On the following day project reviews were completed and work in progress at Lake Cowichan examined in the field. Mr. R. H. Spilsbury, Chief of the Forest Research Division, B.C. Forest Service reviewed the work of his Division. Members returned to Victoria later in the day.

R.E. Foster,
Chairman (1953)

Forest Biology (Pathology) Laboratory,
409 Federal Bldg.,
Victoria, B.C.

January 29, 1954.

APPENDIX I

LIST OF MEMBERS*

** Andrews, Dr. S.R.	Albuquerque, N.M.
Ames, Dr. R.W.	Logan, Utah.
Bedwell, Dr. J.L.	Portland, Ore.
** Bier, Dr. J.E.	Ottawa, Ont.
Bingham, Mr. R.T.	Spokane, Wash.
Bourchier, Mr. R.J.	Calgary, Alta.
** Browne, Mr. J.E.	Victoria, B.C.
Buckland, Dr. D.C.	Vancouver, B.C.
** Childs, Dr. T.W.	Portland, Ore.
Clark, Mr. J.W.	Portland, Ore.
** Davidson, Mr. R.W.	Fort Collins, Colo.
Dickson, Dr. F.P.	Vancouver, B.C.
Eades, Mr. H.W.	Vancouver, B.C.
** Engelhardt, Mr. N.T.	Victoria, B.C.
** Etheridge, Mr. D.E.	Calgary, Alta.
** Foster, Dr. R.E.	Victoria, B.C.
** Fowler, Dr. M.F.	Beltsville, Md.
** Gill, Dr. L.S.	Albuquerque, N.M.
** Graham, Mr. D.P.	Spokane, Wash.
** Hawksworth, Mr. F.G.	Albuquerque, N.M.
Hansen, Dr. H.N.	Berkeley, Calif.
** Hubert, Dr. E.E.	Moscow, Idaho.
** Hutchins, Dr. L.M.	Beltsville, Md.
** Kimmey, Dr. J.W.	San Francisco, Calif.
** Leaphart, Mr. C.D.	Missoula, Mont.
** Lightle, Dr. P.C.	San Francisco, Calif.
** McMinn, Mr. R.G.	Victoria, B.C.
** Mielke, Dr. J.L.	Logan, Utah.
Miller, Dr. P.A.	Los Angeles, Calif.
** Molnar, Mr. A.C.	Victoria, B.C.

* Provisional mailing list established in June, 1953 and subsequently revised, November, 1953.

** In attendance, 1953 Conference, Victoria, B.C.

** Nordin, Dr. V. J.	Calgary, Alta.
** Parker, Mr. A.K.	Victoria, B.C.
** Porter, Mr. W.A.	Victoria, B.C.
** Prebble, Dr. M.L.	Ottawa, Ont.
Roff, Mr. J.	Vancouver, B.C.
** Roth, Dr. L.F.	Corvallis, Ore.
** Salisbury, Mr. P.J.	Victoria, B.C.
Seliskar, Dr. C.F.	Fort Collins, Colo.
** Shaw, Dr. C.G.	Pullman, Wash.
** Slipp, Dr. A.W.	Moscow, Idaho.
** Thomas, Mr. G.P.	Victoria, B.C.
Thomas, Dr. W.D.	Fort Collins, Colo.
** Wagener, Dr. W.W.	San Francisco, Calif.
** Wallis, Mr. G.W.	Victoria, B.C.
** Waters, Dr. C.W.	Missoula, Mont.
Wright, Dr. E.	Portland, Ore.
Zentmyer, Dr. G.A.	Riverside, Calif.
** Ziller, Mr. W.G.	Victoria, B.C.

APPENDIX II.

REVIEW OF PROJECT ACTIVITIES*

FOREST DISEASE SURVEYS

1. Forest disease surveys in Alberta, the Rocky Mountain National Parks, and North West Territories.

R.J. Bourchier (Cdn. Forest Biology (Pathology) Laboratory, Calgary, Alta.).

Objectives: To record the occurrence, distribution and relative importance of the native forest pathogens of the area. To search for new or recently introduced diseases with a view to affecting their immediate control and determining their range, hosts, and economic importance. To keep an annual check on the spread and degree of infection of the various pathogens reported.

Publications:

Bourchier, R.J. Forest disease surveys in Alberta and Rocky Mountain National Parks. In, Annual Report of the Forest Insect and Disease Survey, Div. Forest Biol. 1952.

_____. Dwarf mistletoe of spruce in Alberta. Can. Dept. Agr. Div. Forest. Biol., Bi monthly Progress Rept. 9 (2): 4. 1953.

Nordin, V.J. A leaf-spot disease of aspen. Can. Dept. Agr. Div. Forest Biol., Bi-monthly Progress Rept. 9 (2): 4. 1953.

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* The following reviews have been summarized from material submitted by project leaders in attendance at the 1953 Work Conference. It is recognized, therefore, that reference is not made to all activities in Forest Pathology in Western North America.

2. Survey of western white pine pole blight.

D.P. Graham (U.S. Division of Forest Pathology, Spokane, Wash.).

Objectives: To obtain the distribution, range, extent, and acreage of pole blight in the western United States.

Publications:

Fowler, M.E. Airplane scouting for pole blight of western white pine. Jour. For., Vol. 48, No. 1, Jan., 1950.

Wright, E. and D.P. Graham. Surveying for pole blight. Jour. For., Vol. 50, No. 9, Sept., 1952.

3. Forest disease survey in Alaska.

J.W. Kimmey (U.S. Division of Forest Pathology, San Francisco, Calif.

Objectives: To determine the principal tree diseases and other pathological problems of the various forest types and tree species in Alaska, and to establish and develop a pathological herbarium at the Forest Research Centre in Juneau, and add to the National herbarium in Beltsville, Md.

Publications:

Cash, E.K. A check list of Alaskan fungi. The Plant Disease Reporter. Supplement 219. 70 pp. Feb. 15, 1953.

4. Disease survey (Reconnaissance and Project) activities in British Columbia.

A.C. Molnar (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To obtain information on the occurrence, abundance, and severity of forest disease in British

Columbia, and to investigate and report on conditions of unusual or noteworthy occurrence.

Reports and Publications:

Foster, R.E. and W.G. Ziller. Forest disease survey in British Columbia. In, Annual Report of the Forest Insect and Disease Survey, Div. For. Biol. 1951.

Thomas, R.W. Forest disease survey activities. Can. Dept. Agr. Div. For. Biol., Victoria. (Typewritten). Nov. 1951.

Ziller, W.G. and A.C. Molnar. Forest disease survey in British Columbia. In, Annual Report of the Forest Insect and Disease Survey, Div. For. Biol. 1952.

5. Disease Survey (Mycological and Herbarium) activities in British Columbia.

W.G. Ziller (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.)

Objectives: To identify collections arising through the forest disease survey and to report on collections of mycological interest. To maintain collections of representative disease material and the causal agents of disease. To maintain representative host material.

Publications:

Ziller, W.G. Maintenance of a herbarium for forest pathology. Can. Dept. Agr. Div. For. Biology. Victoria. (Multigraphed). 1952.

CONE, SEED AND SEEDLING DISEASES

1. Seed borne diseases of Douglas fir.

J. Cockerill and D.C. Buckland (sponsored by the Research Committee, University of B.C.).

Objectives: To isolate internally and externally borne fungi of Douglas fir seed and to test the pathogenicity of such fungi. To obtain antibiotic materials to develop a temporary protection for seed used in germination tests.

2. Control of diseases of seeds and seedlings of forest trees.

P.C. Lightle (U.S. Division of Forest Pathology, San Francisco, Calif.) in cooperation with the U.S. Forest Service).

Objectives: To determine the causes for losses of seedlings and transplants in forest nurseries, to develop treatments for preventing such losses, and to find means of overcoming the deterioration of nursery stock in storage.

3. Studies on microflora of conifer seed.

P.J. Salisbury (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To examine the microflora of conifer seed and determine their effect on viability and germination under various conditions of seed storage.

4. Nursery diseases.

E. Wright (U.S. Division of Forest Pathology, Portland, Ore.).

Objectives: To reduce losses resulting from disease in forest nurseries and transplantings as well as in storage.

5. Damping-off of coniferous seedlings.

P.J. Salisbury (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.

Objectives: To study fungi responsible for damping-off of conifers; to study representative isolates of these fungi; to determine disease-producing potentialities under various conditions, and possibilities for control.

Reports and Publications:

Salisbury, P.J. Investigations on the control of damping-off and top-blight of Douglas fir seedlings at the Duncan forest nursery in British Columbia in 1948 and 1949. Can. Dept. Agr. Div. For. Biol., Victoria. (Typewritten). 1951.

_____. Studies in damping-off in forest nurseries in British Columbia. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 7: (1). 1951.

ROOT AND SOIL FUNGI

1. Soil fungi of forest nurseries.

D.C. Buckland (sponsored by Research Committee, University of British Columbia).

Objectives: To isolate fungi from forest nursery soils and to test such fungi for pathogenicity and the production of antibiotic substances.

2. Some mycorrhiza of Douglas fir.

D.C. Buckland (Sponsored by the Cdn. National Research Council and the Research Committee, University of British Columbia).

Objectives: To isolate the dominant mycorrhiza associated with Douglas fir plantations, to determine the fungal symbiotes and maintain same in culture.

3. Poria weirii root rot of Douglas fir.

T.W. Childs (U.S. Division of Forest Pathology, Portland, Ore.).

Objectives: To determine the amount of damage caused by the disease within the region; the rate of damage under various conditions; the effect of partial cutting and other management practices on spread; the distribution of infection centres within stands with reference to the lay out of logging operations; and to accumulate information necessary for eventual control.

Reports and Publications:

Childs, T.W. Poria weirii root rot of second-growth Douglas fir. U.S. Div. For. Path. (Portland). Typewritten. 13 pp. 1949.

_____. A case study of root and butt rot in second-growth Douglas fir. U.S. Div. For. Path. (Portland). Typewritten. 11 pp. 1951.

_____. Douglas fir root rot survey - 1952. U.S. Div. For. Path. (Portland). Typewritten. 7 pp. 1953.

4. Poria weirii root rot of Douglas fir.

G.W. Wallis (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To study Poria weirii and the factors contributing to its occurrence and development in young stands of Douglas fir and associated species; to provide an appreciation of the capabilities of the disease and the factors which may lead to its control.

Reports and Publications:

Mounce, I., J.E. Bier, and M.K. Nobles. A root rot of Douglas fir caused by Poria weirii. Can. Jour. Res. C. 18: 522-533. 1940.

Bier, J.E. and D.C. Buckland. Relation of research in forest pathology to the management of second growth forests. I. Poria weirii root rot, an important disease affecting immature stands of Douglas fir. B.C. Lumberman. Feb., 1947.

Wallis, G.W. Root rot of Douglas fir. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 9 (1). 1953.

Buckland, D.C., G.W. Wallis and A.C. Molnar. Yellow laminated root rot of Douglas fir. C. J. Bot. (in press).

5. Characteristics and ecology of the root system of western white pine.

R.G. McMinn (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To determine the rooting characteristics of healthy western white pine and their relationship to the environment; to determine the rooting characteristics of diseased western white pine and their relationship to the various stages of the pole blight disease.

6. Characteristics and ecology of the rooting system of Douglas fir.

7. Phytophthora root rot of Port Orford cedar and Douglas fir.

L.F. Roth (Sponsored by Oregon State College and Oregon State Board of Forestry).

Objectives: To observe and record the spread of Phytophthora lateralis and P. cinnamomi in the timber producing parts of the State, especially Coos County; to determine whether or not the fungi are acclimated to survival and spread under forest conditions of this region; to test susceptibility of the commercial conifer species of the region.

8. The Phytophthora root rots of Lawson cypress.

P.J. Salisbury (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To determine the importance of Phytophthora root rot of Lawson cypress in British Columbia; to compare in vitro the physiology of P. lateralis with that of other Phytophthora spp. isolated; to test the pathogenicity of P. lateralis relative to other Phytophthora spp.; to undertake control tests; to test Chamaecyparis lawsoniana for disease resistance.

Reports and Publications:

Salisbury, P.J. Root and crown rot of Lawson cypress. B.C. Dept. Agr., Victoria. (mimeographed). Aug., 1952.

9. Root diseases of forest conifers.

W.W. Wagener (U.S. Division of Forest Pathology, San Francisco, Calif.).

Objectives: To determine the organisms responsible for the killing of forest trees in California and the Intermountain region through attacks on the root systems; to obtain information on their prevalence and distribution; to measure their rate of progress from infection centres; to undertake experimental control.

Reports and Publications:

Mielke, James L. Leptographium root disease of pinon pine, Mesa Verde National Park, Colorado. Mss. Rep't Albuquerque. 6 pp. Dec. 26, 1944.

Mielke, James L. Leptographium root disease of pinon pine, Mesa Verde National Park, Colorado. 1945 Report. Mss. Report. Albuquerque. 4 pp. May 22, 1946.

Wagener, Willis W. and Marion Cave. Pine killing by the root fungus, Fomes annosus, in California. Jour. Forestry 44: 47-54. Jan. 1946.

Mielke, James L. Leptographium root disease of pinyon pine, Mesa Verde National Park, Colorado. 1947 Report. Mss. Rep't. Albuquerque. 4 pp. Feb. 17, 1948.

Mielke, James L. Leptographium root disease of pinyon pine, Mesa Verde National Park, Colorado. 1948 Report. Mss. Rep't. San Francisco. 4 pp. Oct. 12, 1948.

Mielke, James L. Leptographium root disease of pinyon pine, Mesa Verde National Park, Colorado. Mss. Rep't Logan. 6 pp. Mar. 11, 1953.

FOLIAGE DISEASES

1. Elytroderma deformans needle cast of ponderosa pine.

T.W. Childs. (U.S. Division of Forest Pathology, Portland, Ore.).

Objectives: To determine the rate and character of damage, the best marking practices for infected stands, trends in the current outbreak in seriously infected stands, modifications that the disease may necessitate in stand improvement practices, and to accumulate information necessary for eventual control.

2. Rhabdocline and Rhabdogloeum needle casts of Douglas fir.

A.K. Parker (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To undertake studies directed towards an understanding of life histories, variation, symptomatology, and host response.

Reports and Publications:

Parker, A.K. Interim report of investigations on the association between Rhabdogloeum pseudotsugae Syd. and Rhabdocline pseudotsugae Syd. Can. Dept. Agric. Div. For. Biol., Victoria. (Typewritten). 1952.

3. Keithia needle blight of western red cedar.

W.A. Porter (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To evaluate factors contributing to variation in the occurrence and severity of red cedar needle blight and to undertake studies of the causal fungus.

4. Needle diseases of western pines.

W.W. Wagener (U.S. Division of Forest Pathology, San Francisco, Calif.).

Objectives: To determine the effect of the needle fungus, Hypodermella medusa, on the insect risk-rating of ponderosa and Jeffrey pines in the nearly pure pine stands of northeastern California; to study the biology of the fungus, particularly in relation to control.

Reports and Publications:

Wagener, Willis W. and William H. Shaw. Report on sample strip observations of effects of the needle fungus, Elytroderma deformans, on ponderosa pine, Warm Lake Area, Boise National Forest. Mss. Report, 22 pp. San Francisco. Mar. 16, 1951.

Lightle, Paul Charles. The pathology of Elytroderma deformans on ponderosa pine. Dissertation, Univ. of Calif. 57 pp. Sept. 1951.

Lightle, Paul C. The pathology of Elytroderma deformans on ponderosa pine. Mss. for publ. 46 pp. Aug. 18, 1952.

5. The Hypodermataceae of conifers in British Columbia.

W.G. Ziller. (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To determine the occurrence and distribution of the needle diseases of conifers in British Columbia and to undertake further studies on those which warrant mycological consideration.

MISTLETOE DISEASES

1. Biological and chemical control of dwarf mistletoe.

R. J. Bourchier. (Cdn. Forest Biology (Pathology) Laboratory, Calgary, Alta.).

Objectives: To conduct biological studies on the two major fungus parasites in an effort to further illuminate their life histories and taxonomic positions; to determine a method for increasing the occurrence of these parasites of dwarf mistletoe; to carry out a screening of selective herbacides to discover if any of these chemicals will provide satisfactory control of dwarf mistletoe.

Reports and Publications:

Bourchier, R.J. Dwarf mistletoe on spruce in Alberta. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 9 (2): 4. 1953.

2. Dwarfmistletoes of the Rocky Mountain Region.

L.S. Gill (U.S. Division of Forest Pathology, Albuquerque, New Mexico.).

Objectives: To determine the current regional losses in mortality, increment, and quality caused by dwarf-mistletoes in ponderosa pine, lodgepole pine, and Douglas fir; to evaluate the effect of dwarfmistletoes on stocking, composition, and production of future stands; to develop control methods which might be applicable to stands under management or protection for aesthetic purposes.

Publications:

Gill, L.S. and F.G. Hawksworth. Dwarfmistletoe control in southwestern Ponderosa pine forests under management. Jour. For. (in press).

3. Biological studies of Canadian dwarf mistletoe.

J. Kuijt. (Cdn. Forest Biology (Pathology) Laboratory, Calgary, Alta.).

Objectives: To clarify the taxonomy of the Canadian species and forms of the genus Arceuthobium as segregated by Gill; to determine the extent of susceptibility of white spruce (Picea glauca (Moench) Voss) to the lodgepole pine mistletoe (Arceuthobium americanum Nutt.); to test the susceptibility of the coastal Douglas fir to the Douglas fir mistletoe (A. douglasii Engel.).

Reports and Publications:

Kuijt, J. Dwarf mistletoe on Ponderosa pine in British Columbia. Can. Dept. Agr. Div. Forest Biol., Bi-monthly Progress Rept. 9 (5): 4. 1953.

Kuijt, J. Larch mistletoe on lodgepole and western white pine. Can. Dept. Agr. Div. Forest Biol., Bi-monthly Progress Rept. 9 (5): 3. 1953.

Bourchier, R.J., and Kuijt, J. Lodgepole pine mistletoe on white spruce in Alberta. Can. Dept. Agr. Div. Forest Biol., Bi-monthly Progress Rept. (in press).

Bourchier, R.J. Dwarf mistletoe on spruce in Alberta. Can. Dept. Agr. Div. Forest Biol., Bi-monthly Progress Rept. 9 (2): 4. 1953.

4. Dwarf mistletoe of ponderosa pine.

L.F. Roth (sponsored in cooperation with the Oregon State Board of Forestry, Oregon State College, and the Pacific Northwest Forest and Range Experiment Station).

Objectives: To provide information relating to the distribution, spread, and damage caused by the northwestern ponderosa pine mistletoe as a basis for developing control measures.

DECAY STUDIES

1. Red rot (Polyporus anceps) in ponderosa pine.

S.R. Andrews (U.S. Division of Forest Pathology, Albuquerque, New Mexico.).

Objectives: To determine the existing and potential importance of red rot as a source of cull; to develop and evaluate indirect measures for reducing losses.

Publications:

Andrews, Stuart R. Effect of pruning on western red rot in young ponderosa pine in the southwest. Journal of Forestry. (in press).

_____and Lake S. Gill. Western red rot control for the Black Hills. Journal of Forestry 39: 817-823. 1941.

_____and _____. Western red rot in immature ponderosa pine in the southwest. Journal of Forestry 41: 565-573. 1943.

2. Decay analyses of commercial tree species in British Columbia.

J.E. Browne (Forest Surveys Division, British Columbia Forest Service, Victoria, B.C.).

Objectives: To derive cull factors for all commercial tree species in British Columbia for use in Provincial inventory, working circles, and timber sale cruises.

3. Decay in high elevation tree species of the Central Rockies.

R.W. Davidson (U.S. Division of Forest Pathology, Fort Collins, Colo.).

Objectives: To obtain information on decay in trees of various age and diameter classes, of different species and on different sites; to compare the decay fungi isolated with those occurring in other regions; to determine infection courts and decay indicators; to establish pathological concepts as aids in forest management.

4. Decay of subalpine spruce on the Rocky Mountain Forest Reserves in Alberta.

D.E. Etheridge (Cdn. Forest Biology (Pathology) Laboratory, Calgary, Alta.).

Objectives: To elucidate such relationships as may exist between age, diameter, and site conditions and the amount of decay in subalpine spruce; to provide an accurate basis for the correction of inventory cruise estimates; to extend knowledge of the ecology, distribution, and relative importance of the decay fungi occurring in the region.

Publications:

Etheridge, D.E. Decay of subalpine spruce on the Rocky Mountain Forest Reserves in Alberta. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. (in press).

5. Root and butt rot of subalpine spruce on the Rocky Mountain Forest Reserves in Alberta.

D.E. Etheridge. (Cdn. Forest Biology (Pathology) Laboratory, Calgary, Alta.).

Objectives: To provide information on the occurrence, and distribution of root and butt rot in subalpine spruce; to analyze site in relation to root and butt rot infections; to provide information to serve as a basis for indexing the incidence and kinds of decay occurring in a given stand.

6. Management of defective grand fir.

E.E. Hubert (Forest, Wildlife and Range Experiment Station, University of Idaho).

Objectives: To establish a pathological rotation for grand fir and to study other aspects of decay in relation to forest management to return a less defective stand of residual trees following logging.

7. Cull and breakage factors for California.

J.W. Kimmey.(U.S. Division of Forest Pathology, San Francisco, Calif.).

Objectives: To determine for each forest tree species, by subregions in California, the percentage of cull and breakage by tree classes, or diameter classes; to establish external cull indicators where practical for use in the forest survey; to determine and evaluate the causal agents of cull.

Publications:

Kimmey, James W. Cull factors for forest-tree species in Northwestern California. Calif. For. and Range Exp. Sta., Forest Survey Release No. 7. 30 pp. illus. 1950.

_____ and E.M. Hornibrook. Cull and breakage factors and other tree measurement tables for redwood. Calif. For. and Range Exp. Sta., Forest Survey Release No. 13. 28 pp. illus. 1952.

8. Cull and breakage factors for southeast Alaska.

J.W. Kimmey. (U.S. Division of Forest Pathology, San Francisco, Calif.).

Objectives: To determine the cull and breakage percentages in old growth stands of Sitka spruce and western hemlock by tree diameter classes in the various forest types and at different locations throughout Southeast Alaska; to determine and evaluate external indicators of cull in trees.

9. Decay of Douglas fir in coastal British Columbia.

G.P. Thomas. (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To determine the fungi causing decay in mature Douglas fir; to investigate possible relationships between external abnormalities and hidden decay; to determine possible relationships between cull and other tree or stand characteristics.

Publications:

Thomas, G.P. Decay of Douglas-fir on the coast of British Columbia. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 8 (6). 1952.

10. Some aspects of the ecology of the Indian Paint fungus (Echinodontium tinctorium) and one of its major hosts, western hemlock.

Thomas, G.P. (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To describe the range of forest conditions in British Columbia within which the fungus occurs; to compare the critical values of the major influencing factors that operate on the fungus in nature with the values peculiar to the different forest associations.

Publications:

Thomas, G.P. Relation of the Indian Paint fungus to losses in western hemlock. In, Annual Rept. of the Forest insect and Disease Survey, Can. Dept. Agr. Div. For. Biol. 1952.

11. Decay of western hemlock in the upper Columbia region, British Columbia.

R.E. Foster. (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To determine the frequency of occurrence, and importance of the fungi responsible for decay; to interpret the significance of visible abnormalities in relation to hidden defect; to determine and appraise the factors contributing to excessive loss.

Reports and Publications:

Foster, R.E. and H.M. Craig. Preliminary decay analyses of western hemlock in the Big Bend Region of British Columbia. Can. Dept. Agr. Div. For. Biol., Victoria. (Mimeographed). 1950.

_____. Decay in western hemlock in the Upper Columbia region. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 8:(5).1952.

Foster, R.E., H.M. Craig and G.W. Wallis. Studies in forest pathology. XII. Decay of western hemlock in the Upper Columbia Region, British Columbia. C. J. Bot. (in press).

12. Decay following logging injury to western hemlock, Sitka spruce and true firs.

Wright, E. and L.A. Isaac. (U.S. Division of Forest Pathology, Portland, Ore., and Pacific Northwest Forest and Range Experiment Station, U.S. Forest Service).

Objectives: To determine the frequency with which logging injuries become infected with wood decay fungi and the relation of age and size of logging scars to decay volume.

Publications:

Englerth, G.H. and Leo A. Isaac. Decay of western hemlock following logging injury. The Timberman 45 (8): 34-35, 56. 1944.

Wright, E., A.S. Rhoads and L.A. Isaac. Decay losses following logging injury (In partially cut stands of western hemlock and sitka spruce). The Timberman 48: 52-54, 72-76. 1947.

13. Deterioration of slash of lodgepole pine.

V.J. Nordin. (Cdn. Forest Biology (Pathology) Laboratory, Calgary, Alta.).

Objectives: To assess the relation of different silvicultural cutting treatments to the subsequent rate of deterioration of slash; the relative effects of spraying of slash with nutrient and the artificial inoculations of slash with mixed cultures of wood-destroying fungi; the identification, ecological succession, and significance of fungi associated with deterioration; the relationship between slash decay and fire danger; the significance

of moisture, temperature, pH, and other factors that may influence decay; and the role of insects in the deterioration and distribution of slash fungi.

14. "Red stain" and decay of lodgepole pine injured by fire.

V. J. Nordin. (Cdn. Forest Biology (Pathology) Laboratory, Calgary, Alta.).

Objectives: To determine the identity and significance of fungi associated with "red stain" and decay in lodgepole pine; to determine the importance of basal fire scars in relation to the incidence of decay.

Publications:

Nordin, Vidar J. and Sutton, W. Miscellaneous fungi in lodgepole pine in Alberta. Can. Dept. Agr. Div. Forest Biol., Bi-monthly Progress Dept. 9 (2): 4. 1953.

Nordin, Vidar J., Sutton, W., and Heming J.W. Red stain and decay of lodgepole pine in Alberta. Can. Dept. Agr. Div. Forest Biol., Bi-monthly Progress Rept. 9 (3): 4. 1953.

15. Deterioration of windthrown white spruce and alpine fir.

Engelhardt, N.T. (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To determine the identity and relative importance of the fungi responsible for deterioration and to determine the progress of decay in windthrown white spruce and alpine fir in the Crescent Spur area, B.C.

Publications:

Engelhardt, N.T. Deterioration of white spruce and alpine fir. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 8: (4). 1952.

16. Deterioration of looper-defoliated western hemlock on Lower Vancouver Island.

N.T. Engelhardt. (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To determine the identity and relative importance of the fungi responsible for deterioration and to determine the progressive rate of stand deterioration.

Publications:

Foster, R.E. and D.R. Hurn. A preliminary report on deterioration in western hemlock-Douglas fir type on Vancouver Island following attack by the western hemlock looper (Lambdina f. lugubrosa) (Lepidoptera, Geometridae). For. Chron. 25: 3. 202-204. 1949.

17. Survival of fire damaged trees.

W.W. Wagener (U.S. Division of Forest Pathology, San Francisco, Calif.).

Objectives: To establish guides for estimating the survival probabilities of damaged trees in making fire-damage appraisals and in marking timber in burns for salvage in stands of ponderosa, Jeffrey and sugar pine, Douglas fir, white fir and incense cedar.

18. Deterioration of fire-killed timber in California.

J. W. Kimmey. (U.S. Division of Forest Pathology, San Francisco, Calif.).

Objectives: To determine and evaluate the causal agents and different organisms of deterioration and to determine the rate at which commercial forest trees of different species and various diameter

classes deteriorate in California after being killed by fire.

19. Decay in boats.

P.C. Lightle, (U.S. Division of Forest Pathology, San Francisco, Calif.).

Objectives: (a) Carrier flight decks: To ascertain the amount of decay currently present in Douglas fir planking, the hazard of future development of decay, and means of control.

(b) Minesweepers and other large wooden craft: To determine if woods used in new construction are the best obtainable, the construction practices leading to increased and decreased effective use of wood, inherent weaknesses of design in relation to the development of decay, and means of control.

(c) Amphibious landing craft and other small boats: To determine the present condition of small craft in storage and afloat in relation to decay, the best methods of storage, and the effectiveness of present materials and workmanship during repair in eliminating existing decay and preventing further recurrence.

OTHER STUDIES

1. Cankers, diebacks and witches brooms.

D.C. Buckland et al (Dept. of Biology & Botany, University of B.C.).

Objectives: To determine the cause and study the characteristics of cankers and related diseases of western hemlock, red alder, Douglas fir, and other species.

Publications:

Denyer, W.B.G. Cephalosporium canker of western hemlock. C. J. Bot. 31: 4. 361-366. July, 1953.

2. Pole blight of western white pine.

L.S. Gill. (U.S. Division of Forest Pathology, Albuquerque, New Mexico.).

Objectives: To determine the cause of pole blight through inoculation, lesion dissection, root mortality, topping, fertilizer and other experiments.

Reports and Publications:

Gill, Lake S., Charles D. Leaphart, Stuart R. Andrews. Preliminary results of inoculations with a species of Leptographium on western white pine. Bureau of Plant Industry, Soils, and Agricultural Engineering. Forest Pathology Special Release No. 35. 14 pp., illus. (Processed). 1951.

Anonymous. Pole blight--this is how to recognize it. Joint publication by University of Idaho, School of Forestry; Bureau of Plant Industry, Soils and Agricultural Engineering, Division of Forest Pathology; and U.S. Forest Service, Northern Rocky Mountain Forest and Range Exp. Sta., 5 pp., illus. (Processed). 1949.

Anonymous. Pole blight -- what is known about it. Pole Blight Investigations Steering Committee. U.S. Forest Service, Northern Rocky Mountain Forest and Range Experiment Station, Miscl. Pub. No. 4. 1952.

3. Pole blight of western white pine.

E.E. Hubert. (Forest, Wildlife and Range Experiment Station, University of Idaho).

Objectives: To study the cause and control of pole blight in northern Idaho through: sample plot studies designed to provide information on rate of spread, intensification, mortality and symptomatology; soil and foliar analyses; fertilizer studies; root washings; virus experiments; isolation of fungi; inoculation tests; radioisotope studies on translocation in healthy and diseased trees.

Publications:

Buchanan, T.S., Geo. Harvey and D.S. Welch. Pole blight of western white pine; a numerical evaluation of the symptoms. Phytopath. Vol. XLI, No. 3, pp. 199-208. March 1951.

Fitzgerald, O.A. Idaho's pole blight clinic. Am. Forests Vol. 57, No. 10. October 1951.

Shaw, Charles Gardner and Ernest E. Hubert. A review of the Leptographium-Scopularia-Hantzschia nomenclature. Mycologia 44: 693-704. 1952.

Hubert, E.E. A study of recently killed trees in the western white pine type. Jour. For. 51: 624-627. 1953.

4. Pole blight of western white pine.

A.K. Parker. (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To study the pathogenicity of fungi associated with western white pine with a view to determining their relationship to pole blight.

Reports and Publications:

Parker, A.K., Waldie, R.A. and R.E. Foster. Pole blight, a previously unreported disease of western white pine in British Columbia. Forest Path. Note No. 3. Can. Dept. Agr. Div. For. Biol., Victoria. (Mimeographed). 1950.

_____. Pole blight recorded on the British Columbia coast. Forest Path. Note No. 4. Can. Dept. Agr. Div. For. Biol., Victoria. (Mimeographed), 1951.

_____. Pole blight, 1951 interim report for British Columbia. Can. Dept. Agr. Div. For. Biol., Victoria. (Typewritten). 1952.

_____ and A.C. Molnar. Pole blight of western white pine. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 7: (6). 1951.

_____. Pole blight of western white pine. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 9: (1). 1953.

5. Pole blight of western white pine.

A.C. Molnar. (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To study the progress of pole blight and determine the effect of sanitation thinning in retarding progress or affecting control of the disease.

Publications:

Parker, A.K. and A.C. Molnar. Pole blight of western white pine. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 7: (6). 1951.

6. Testing progeny of resistant pines for susceptibility to white pine blister rust in the Inland Empire.

J. W. Kimmey. (U.S. Division of Forest Pathology, San Francisco, Calif.).

Objectives: To establish the unquestionable resistance to blister rust of F_1 progeny of resistant five-needle pines to be used in establishing seed orchards which will supply seed for resistant planting stock.

7. White pine blister rust in British Columbia.

W.A. Porter. (Cdn. Forest Biology (Pathology) Laboratory, Victoria, B.C.).

Objectives: To determine if blister rust western white pine occur in British Columbia; to study the nature and inheritance of any resistance found; to study the causal fungus for appreciation of its genetic stability.

Reports and publications:

Porter, W.A. Testing for resistance to the blister rust disease of western white pine in British Columbia for the period June 1948 to August 1951. Can. Dept. Agr. Div. For. Biol. Victoria. (Typewritten).

_____. Blister rust resistant white pine. Can. Dept. Agr. Div. For. Biol., Bi-monthly Progress Rept. 8: (6). 1952.

8. Blister rust project: canker development following artificial and natural inoculation.

A.W. Slipp. (Forest, Wildlife and Range Experiment Station, University of Idaho, in collaboration with the U.S. Forest Service and U.S. Dept. of Agriculture Bureau of Entomology and Plant Quarantine).

Objectives: To investigate the growth and development of cankers of white pine blister rust on western white pine in Northern Idaho; to establish a statistically

reliable body of data from which conclusions may be drawn concerning canker incubation, rate of canker growth, threat to life of infected tree, periodicity and interrelationship of production of spore stages, all as affected branches and crowns, occurrence of parasitic or secondary fungi on cankers, various aspects of site, tree and branch age, vigour, stand density.

Reports and Publications:

Ehrlich, John. Blister rust project. Working plan. 1937.

_____. Blister rust project. Annual Progress Reports. 1937-43.

Slipp, A.W. Blister rust project. Progress Report on 1944 Field Season. 1944.

_____. Blister rust project. Progress Report on 1945-46 Biennium. 1945-46.

_____. Growth rate of cankers of white pine blister rust along branch leaders toward the trunk in western white pine. Research Note 1. Forest, Wildlife & Range Exp. Sta., University of Idaho: 3 p. 2 fig. January 31, 1951.

_____. Survival probability and its application to damage survey in western white pine infected with blister rust. Research Note 7. Forest, Wildlife & Range Exp. Sta., University of Idaho: 13 p. June 30, 1953.

9. Native rusts of western pines.

J.L. Mielke. (U.S. Division of Forest Pathology, Logan, Utah.).

Objectives: To investigate the Cronartium coleosporioides complex (C. harknessii, C. filamentosum and C.