Province of
British Columbia
Ministry of
Forests

PEST MANAGEMENT PROGRESS

A summary of pest management activities in the British Columbia Ministry of Forests

Volume 2, Number 1 (File: 190-4 PMP) ISSN 0714-1610 May, 1983

CPMAB, CCREM, EBAP, NEED AND PPMABC

Discussions on the formation of a Canadian Pest Management Advisory Board (CPMAB) have been completed, and a recommendation will be made for the consideration of provincial and federal forestry deputies next month. If accepted, this national group will serve to assist both policy makers and field practitioners in developing progressive pest management programs. The national linkage, possibly through the Canadian Council of Resource and Environment Ministers (CCREM), will undoubtedly result also in increased awareness of pest problems and the development of much needed statements of consensus on special issues.

Restraint in government spending has had considerable impact on many aspects of the Ministry's programs, but not all effects have been negative. Through special programs for the unemployed, notably the Employment Bridging Assistance Program (EBAP) and the New Employment Expansion and Development Program (NEED), many labour-intensive pest management activities are either underway or being planned. This is an excellent opportunity to contribute to stand sanitation programs and to conduct certain surveys or appraisals.

Finally, we urge pest management staff to consider membership in our association - the Professional Pest Management Association of British Columbia (PPMABC). This organization has pest management as its only purpose and needs strong representation from the forestry fraternity. Conditions and applications for memberships can be obtained by contacting personnel(*) who are presently members (pp. 31-33). Have a good summer.

R.F. DeBoo, Protection Branch, Victoria

CONTENTS

SUBJECT	PAGE NO.	SUBJECT	PAGE NO.
Pest Management General	3	Personnel	31
Forest Entomology	6	Meetings	33
Forest Pathology	16	Tabulations & Graphics	37
Pesticides	24	Publications & Reports	44

PEST MANAGEMENT PROGRESS

EDITORIAL AND COORDINATING STAFF

Publisher: R.F. DeBoo, Protection Branch
Editor: R.A.V. Jenkins, Protection Branch
Production: A.G. Bowker, Protection Branch
L.J. Webb, Protection Branch
P.J. Humphreys, Protection Branch

ADVISORS

Forestry: - P.K. Diggle, Silviculture Branch
Pathology: - J.A. Muir, Protection Branch
Entomology: - P.M. Hall, Protection Branch
Pesticides: - J.F. Henigman, Protection Branch
Vegetation Management: - R.C. Jones, Silviculture Branch
Range Management: - A.E. Jenson, Range Management Branch
Research & Development: - H.J. Benskin, Research Branch

Address all correspondence to:
Ms. P.J. Humphreys
c/o Protection Branch
1450 Government Street
Victoria, B.C.
V8W 3E7

Publisher's and Editor's Note:

To maintain the maximum input of information and opinion, authors of Pest Management Progress articles are being encouraged to give us the benefit of their knowledge and experience.

Pest Management Progress is intended to provide basic information on projects and proposals which may be of interest to colleagues and associates. Authors should be contacted for any further clarification as the contents of this report do not necessarily constitute official statements of the Ministry of Forests.

PEST MANAGEMENT GENERAL

Abies Mortality Study. Abies mortality is becoming a greater concern in several areas of the province. To further define the problem, a study will be conducted to determine the distribution and extent of current mortality. The study should provide needed information on the interrelationship of insect and disease pests in causing mortality. The study will involve compilation of current and historic data and ground observations.

- P.M. Hall, J.A. Muir and S.P. Taylor, Protection Branch, Victoria, and Regional Staff

Technical Audits. Technical audits were conducted on pest management activities in Forest Regions by Regional staff. The audits examined activities under the regular Ministry accounts and the Emergency Bark Beetle Program for 1982 fiscal year.

The Nelson Region audit examined four main activities, Detection, Control, Training and Extension services. A total of 9,985 man days were expended on these activities with the main emphasis directed at mountain pine beetle and spruce beetle detection and control, and the remaining time spent on dwarf mistletoe, root rot, defoliator surveys and training and extension services. A total of 5,149 man days was used for Detection which included aerial and ground detection surveys, ground probe cruises to priorize areas for salvage/control logging, cut and burn and trap tree programs; 4,042 man days were used for Control which included salvage/control logging, cut and burn and trap tree programs; 784 man days were used for Training and Extension Services which included training district pest management staff and extension services to other government agencies, forest industry and the general public.

- E. Morris, Nelson Forest Region, Nelson

(Editor's Note: For other Regions, contact Regional Pest Management Coordinator)

Employment Bridging Assistance Program. Several pest management projects were carried out under this program (Also see Pest Management Progress Vol. 1, No. 2). In the Nelson Region during the winter of 1982/83, the following projects were undertaken:

1. Mountain Pine Beetle Control. Single trees were cut and burned for spot control treatment of small mountain pine beetle infestations. Several thousand green infested trees were treated.
2. Bark Beetle Ground Surveys. Ground detection surveys were undertaken for bark beetles to priorize areas for cut and burn, trap tree programs and salvage/control logging.

3. Dwarf Mistletoe Control. A sanitation cutting of lodgepole pine infested with dwarf mistletoe was undertaken on 50 hectares in the Invermere District.

4. White Pine Blister Rust Control. Western white pine crop trees were pruned in conjunction with other juvenile stand treatments at several locations in the Nelson Region.

- E. Morris, Nelson Forest Region, Nelson

(Editor's Note: Contact other Pest Management Coordinators re local programs.)

Professional Biologists in British Columbia. The Association of Professional Biologists of British Columbia (APB) was formed in 1980 to meet the need for a strong voice in decisions that affect British Columbia's living natural resources. The APB was also founded to pursue legislated recognition of biologists as professionals in British Columbia. Following such recognition, only persons certified to be professional biologists, as a result of their training and experience, would be permitted to identify themselves as Professional Biologists.

Similar associations to the APB have been formed and are active in other provinces in Canada. An APB draft "Biologist Act" is being prepared and it is hoped that legal certification will be obtained in 1983. For further details contact: Dr. D.A. Birdsall, President, Association of Professional Biologists of B.C., Box 48475, Bentall Centre, Vancouver, B.C., V7X 1A2.

- R.S. Hodgkinson, Prince George Forest Region, Prince George

Kamloops Forest Pest Management Committee. A committee was formed to ensure a coordinated approach to develop solutions for dealing with pest problems. A forum was required to exchange ideas, make others aware of what individual sections are doing and to develop a team approach to solving some of these problems. The "Regional Forest and Range Related Pest Management Committee" with membership from several sections is chaired by the Pest Management Coordinator and the Secretary is the Silviculture Planning Coordinator.

The goals and objectives of this committee are:

1. Identify problems common or unique to Regional programs.
2. Identify training needs for Region and District staff.
3. Update committee members on current programs in individual sections.
4. Identify solutions to problems and make recommendations to the Regional Management Team.

- R. Edward and B. Ivanco, Kamloops Forest Region, Kamloops

Pest Management Training. Kamloops Regional and District staff will hold training sessions to familiarize Ministry and industry staff with pest identification and control methods. Root Rots, Mistletoe and Bark Beetles will be emphasized during these sessions.

- R. Chorney, J. Kumi, Kamloops Forest Region, Kamloops, and E.A. Haupt, Vernon Forest District, Vernon

Prince Rupert Pest Management Plans. The Morice, Bulkley and Lakes Forest Districts have completed pest management plans. These plans outline problems, organize information and set priorities for management. Currently, bark beetles are emphasized but the plans will be expanded to include other forest pests.

- R. Rowsell and V. Barge, Prince Rupert Forest Region, Smithers

Cariboo Forest Region Pest Management Priorities. In the 1982/83 budget year, the Cariboo Region with the cooperation of the Regional Management Team administered the pest management budget from the Region on a project basis similar to the Emergency Funding Program. This method proved unwieldy. The Region developed, with input from the Districts, regional pest management priorities. The Districts were funded on the basis of these priorities. A statement of the priorities and areas is available.

- D. Doidge, Cariboo Forest Region, Williams Lake

Treatment of Pests and Residual Stems in Lodgepole Pine Type Cutblocks. In a combined effort, Silviculture and Protection staff formulated regional guidelines to deal with lodgepole pine residuals in cutblocks.

The residual stems and patches tend to act as infestation centres for a wide variety of insects, diseases, and rodents, which then spread into natural regeneration as well as physically inhibiting the establishment of new stands.

Application of the regional guideline is intended to reduce pest losses and encourage the establishment of healthy natural or planted regeneration on lodgepole pine cutblocks.

The guideline will apply to current harvesting.

- T. Wilford, Cariboo Forest Region, Williams Lake

Mylar Mapping System for Forest Pests. Williams Lake Forest District has developed a pest mapping information system using 1:50,000 mylars. Cost in 1982 was $532.00 for 3 sets of 14 sheets. The sets included one for bark beetles, one for dwarf mistletoe and root rots, and one for updating (cut blocks, roads, etc.) to print next year's mylars. Advantages of this system are that it is durable, provides a source for multicopy printing, provides overlay function, and reduces time for information transfer.

Pest infestations are mapped and coded by zone, map letter and the "fire grid". Drafting staff maintain status book and maps for disturbances. Pest management staff maintain maps and status sheets of surveys and pest control work done.

Route cards are used to maintain the mylars and status sheets in an up-to-date manner. A route card also provides pest information and recommendations to other sections, i.e. Silviculture and Timber.

- A. Wallach, Cariboo Forest Region, Williams Lake

Stand Tending Guidelines. A chapter on diseases and insects of importance in stand tending was prepared for the Silviculture Manual.

- J.A. Muir and P.M. Hall, Protection Branch, Victoria.

FOREST ENTOMOLOGY

Bark Beetle Guidelines. The first draft of all sections of the proposed guidelines has now been completed and is being reviewed by Regional staff and by the Canadian Forestry Service. Revised guidelines should be available in the summer of 1983. Updating and modifications will be done on a continuing basis.

- P.M. Hall, Protection Branch, Victoria

Bark Beetle Pheromones. A supply of attractant pheromones is available for spruce and mountain pine beetle. A variety of operational trials will be conducted using these chemicals in several Regions in 1983. Details of individual projects should be available from Regional Pest Management Coordinators. If current trials are effective, the use of pheromones will be a fully operational technique available in the near future. Currently, the use of bark beetle pheromones for monitoring or trapping purposes is not considered as a use of pesticide. Therefore no Federal or Provincial permits are required. The rationale for this exclusion is that the amounts of

pheromones placed in forests for management purposes are less than the amounts which would be there naturally as a result of normal beetle aggregation mechanisms. Pheromones used for confusion or mating disruption programs would require permits.

- P.M. Hall, Protection Branch, Victoria

Semiochemicals for Mountain Pine Beetle. Dr. J. Borden (Simon Fraser University) plans on further mountain pine beetle pheromone research in the Nelson Region in cooperation with the regional and district staff in 1983. Several small M.P.B. infestations in the Kootenay Lake and Cranbrook Districts will be used for this research work.

- D. Gray, Nelson Forest Region, Nelson, and J. Borden, Simon Fraser University, Burnaby

Pheromone and Insecticide to Combat Mountain Pine Beetle. Kamloops Region and Kamloops District staff will be helping Dr. J. Borden, Simon Fraser University, with a pheromone-insecticide standing trap tree project against the mountain pine beetle. The research plots will be located in the Red Lake area of the Kamloops District. Green infested trees will be treated with Dursban or Sevin and baited with pheromone prior to the beetle flight. Surrounding healthy trees will be treated with MSMA and baited with pheromone, also prior to beetle flight period. It is anticipated that: 1) the beetles emerging from the infested trees will be killed by the insecticide; 2) the pheromone will attract beetles to the treated, infested trees, thus killing the beetles; and, 3) the brood from those beetles which develop in the healthy pheromone-MSMA treated trees will not be successful due to the MSMA.

- R. Chorney and L. Friskie, Kamloops Forest Region, Kamloops

Pheromone Trials with Felled Trap Trees for Spruce Beetle. Kamloops Region, in conjunction with Salmon Arm District and Branch staff will be conducting trap tree-pheromone trials for spruce beetle in the Bolean Lake area. Pheromone baits have been used to induce attack on standing spruce. These trials will be used to determine if pheromone will increase the attack density on felled spruce tree trap logs. The proposed objectives will be to:

1) compare attack density on baited and non-baited logs,
2) compare the time and rate of attack on baited and non-baited logs,
3) compare attack density with respect to distance from bait.

Crown Zellerbach and Federated Co-op have agreed to this proposal and have cooperated whenever necessary.

- R. Chorney, Kamloops Forest Region, Kamloops

Bark Beetle Surveys and Training. Beetle detection surveys have reached an all time high in the Prince Rupert Forest Region. Along with the complete air recce and ground detection of the problem areas throughout the Region, the Pest Management staff have developed their instructional skills to a high degree.

A successful training program on ground survey systems for probing for spruce and pine bark beetles was recently held in the Kalum Forest District.

An E.B.A.P. crew consisting of unemployed mine workers from Kitsault (a mining town in Alice Arm) were instructed in an "on-location" teaching environment.

- B. Rowsell and V. Barge, Prince Rupert Region, Smithers

Aerial Insect Surveys. Results of the 1982 aerial survey of the Cariboo Forest Region became available early last December. The figures given below are for losses in mature timber due to bark beetle attack. These figures represent red-top trees attacked within the last several years.

1981 Survey			1982 Survey		
	Ha Infested	m^3 Lost		Ha Infested	m^3 Lost
Spruce	21,700	691,000	Spruce	12,200	789,000
Douglas-fir	30,000	345,000	Douglas-fir	18,800	212,000
Pine	134,000	2,190,000	Pine	287,000	3,120,000
TOTAL	186,000	3,230,000	TOTAL	313,000	4,120,000

Budget restraint in 1983 will necessitate a decrease in the extent of coverage. Forest Service personnel will sketch-map (1:40,000 scale) the greater part of the Region using the method described by Stuart Taylor, while the CFS Forest Insect and Disease Survey Ranger will map (1:250,000 scale) the large infestations in the Chilcotin Forest District as well as Bowron Lake Park. Volume compilations this year will likely be done by computer, thus easing the time constraint and further decreasing costs. In any event, results will be available by 15 September.

Emphasis will be put upon ground-truthing the sketch-mapping through strip cruises of attack polygons and colour change plots. It is hoped that through this work, more accurate figures and a percent-error estimate can be obtained.

- M. Hamm, Cariboo Forest Region, Williams Lake

Prince George Bark Beetle Program.

a) Probe Crew Activity

Since November 1, 1982, the Prince George Regional Probe Crew has conducted probing and detection mostly for spruce beetle in 3 Forest Districts.

District	Weeks of Detection Work
Dawson Creek	8
McBride	5
Prince George East	1

One week in McBride was spent marking mountain pine beetle infested lodgepole pine for disposal by an E.B.A.P. crew. In addition, one day was allotted for Douglas-fir beetle detection in the Prince George West District.

b) Spruce Beetle Outbreak Persists

The major spruce beetle outbreak persisted in the Prince George Region in 1982. Over 57 455 ha were infested, most of this damage occurred in the Prince George East Forest District. According to the latest F.I.D.S.* survey, the degree of infestation appears as follows:

Infestation Intensity and Hectares			Total Hectares
Light	Moderate	Severe	Infested
30 625	14 280	12 550	57 455

*(Spring File Report, Forest Insect and Disease Survey, C.F.S.)

Other Forest Districts sustaining various lesser degrees of damage were Prince George West, McBride, Dawson Creek, Fort St. James, Mackenzie and Vanderhoof.

Continued detection, harvesting of currently-attacked timber, and deployment of felled trap trees will remain major objectives of the Prince George Region in 1983.

- R.S. Hodgkinson, Prince George Forest Region, Prince George

NC and CIR Aerial Detection of Spruce Beetle. During the summer and early fall of 1982, normal colour (NC) and colour infrared (CIR) aerial photographs were taken of two beetle infested spruce stands on the north shore of Narrow Lake, 30 miles southeast of Prince George. The purpose of the study was to

determine if trees recently attacked by the spruce beetle (Dendroctonus rufipennis) could be differentiated from healthy, unattacked trees.

There was more contrast between healthy and 1981-attacked trees on the colour infrared photos than appeared between the same trees on the normal colour film. Due to the heavy rain in Prince George during the 1982 beetle flight, there was an insufficient number of successful 1982 attacks recorded to provide proper analysis of more recent damage. Statistical analysis of film dye layer densities is continuing. A final report, in the form of an M.Sc. thesis for the University of British Columbia, is expected to be completed by early fall. The research was supported by the Protection Branch of the Ministry of Forests, the B.C. Science Council, and the University of British Columbia.

- J. Churcher, Faculty of Forestry, University of B.C., Vancouver (and former employee, Prince George Forest Region)

Control Program Results. In 1981 single tree treatments in the Prince Rupert Forest Region bark beetle control program were apparently very successful.

Follow-up 1982 air detection revealed very little "red" attack. Ground checks revealed little or no current attack.

A few areas that contained current attacks were the result of falling timber during the high snow period of the winter resulting in higher stumps with surviving broods remaining. Steps have been taken to avoid this problem in the future.

- B. Rowsell and V. Barge, Prince Rupert Forest Region, Smithers.

Use of Initial-Attack Crews for Single-Tree Burning of Mountain Pine Beetle Infested Lodgepole Pine. During the 1982 aerial survey, red-topped lodgepole pine were noted in the Narcosli P.S.Y.U., along the Clisbako River. There is no road access in this area, so a helicopter was used to ferry single tree burning crews in to treat currently infested-trees. Location of currently-infested trees depended on using the red-tops as markers and working out from them. It is assumed that most of the currently-infested trees near red-tops were treated; however, it is probable that brood-filled trees exist with no nearby red-tops to mark them. It is proposed that the Central Initial Fire Attack Crew (CIFAC) be used to treat these trees in May and June of 1983. CIFAC is made up of six three-man fire-fighting crews with previous pest management experience. The benefits are doubled in that the crews will be able to identify attacked trees and are also experienced in dealing with fire - which is how the infested trees will be treated.

It is hoped that the trees will begin to turn colour in mid-May so they can be identified from the air. The crews will move by helicopter to the site: they are completely self-contained and if need be can camp overnight. The crews used will rotate in accord with their required standby for fire fighting. They will be in radio contact with the CIFAC base and if needed on a fire can be picked up by helicopter. Because they are completely self-contained, they need not check back to CIFAC base, but will be able to proceed directly to the fire. At present this is a trial program only.

- D. Doidge, Cariboo Forest Region, Williams Lake

Mountain Pine Beetle in Manning Park. The Manning District of the Parks and Outdoor Recreation Division (Min. of Lands, Parks and Housing) has completed a control proect for mountain pine beetle attack at Eastgate in Manning Park. Utilizing EBAP crews, the remaining attacked trees (reported in P.M.P., Vol. 1, No. 2) were felled, bucked and burned.

An aerial survey of the area was conducted in March, 1983. Subsequent ground surveys found an additional 32 attacked trees along the highway corridor within the park. EBAP crews have removed these trees as well.

An aerial survey of Manning Park is conducted annually as a joint Vancouver Region/Manning District project.

- D.G. Heppner, Vancouver Forest Region, Burnaby

Mountain Pine Beetle Cut and Burn. A total of 12,800 infested lodgepole pine trees were cut and burned in small infestations in 1982, to prevent or slow down the spread of beetle infestations in the Nelson Region. In most areas the projects have been fairly successful.

- E.J. Morris, Nelson Forest Region, Nelson

Monitoring Mountain Pine Beetle Flight Period. In conjunction with guidelines for hauling of beetle infested timber, the Prince Rupert Forest Region is planning to use Lindgren funnel traps baited with mountain pine beetle pheromone. It is hoped that these traps will allow us to monitor beetle flight periods and thus more accurately time required periods of hauling restriction.

- A. Stock, Prince Rupert Forest Region, Smithers

Mountain Pine Beetle Log-hauling Ban. The Cariboo Forest Region will institute a ban on hauling infested lodgepole pine logs during the flight period of the mountain pine beetle. The ban will be in effect from July 4 until August 14, 1983. The intention of the ban is to protect those

areas which have been sanitized by felling and burning of infested trees and also to protect those areas which are free of beetle infestation.

- D. Doidge, Cariboo Forest Region, Williams Lake

Salvage/Control Logging in Bark Beetle Infested Stands. Salvage/control logging of mountain pine and spruce bark beetle infestations in the Nelson Region total over 9,000 hectares in 1982. Of this total 8,100 hectares were mountain pine beetle infestations and 1,250 in spruce beetle infestations.

- E.J. Morris, Nelson Forest Region, Nelson

Results of Spruce Beetle Suppression with Felled Lethal Trap Trees in Prince George Region 1982. Results of experiments to determine effective dosages of MSMA indicated that MSMA at 80 g/l a.i. (1/4 strength) had no significant repellency on spruce beetle adults attacking felled lethal trap trees. In addition, the MSMA:

(i) reduced egg gallery success by 61%
(ii) reduced egg gallery length by 27%
(iii) reduced larval survival by at least 84%*, and
(iv) killed at least 29%* of parent adults that remained in treated trap trees

*Further mortality would be expected after this sampling period.

- R.S. Hodgkinson, Prince George Forest Region, Prince George

Spruce Beetle Trap Trees. A total of 8,764 non-lethal and lethal spruce beetle trap trees were used in 1982 to trap beetles in small infestations in accessible and inaccessible infestations in the Nelson Region. In most areas the trap trees have been effective.

- E. Morris, Nelson Forest Region, Nelson

Trap Tree Guidelines. It is intended to use trap trees as a normal part of management of Douglas fir and spruce stands in the Cariboo Region. We feel that trap trees are effective against light populations of Douglas-fir and spruce beetles, and should be used operationally to reduce the population of these beetles. At present we are attempting to determine how this management of the stand and the bark beetles will be paid for: i.e. either by Section 88 or in the appraisal. These guidelines are intended to be in place by 1984.

- D. Doidge, Cariboo Forest Region, Williams Lake

Site Specific Weevil Management System. A site specific management system has been developed in the Vancouver Region for Pissodes strobi in Sitka spruce. The system involves the identification of stand management objectives and the isolation of a management approach to meet these objectives, given the specifics of the spruce plantation in question.

The system is based on a chart with height of the sitka spruce on one axis, the percentage of S_S stems infested with weevil on the other axis, and the Vancouver Region's Minimum Stocking Standards, colour-coded on the chart. A weevil survey system developed in the Region (see PMP 1:2 p. 8) determines these three factors. The chart then identifies the recommended management strategy. At this time, these strategies are limited to: do nothing, resurvey at a specified later date, clip and burn infested leaders, or silvicultural rehabilitation.

An internal report is being prepared.

- P.M. Wood, Vancouver Forest Region, Burnaby

Weevil study: Aerial detection, pine-oil repellency and adult dispersal. J.A. Carlson and Dr. J.A. MacLean of the University of B.C. have completed a threefold Pissodes strobi study reported in PMP Vol. 1:2, p. 9.

The study indicates that the aerial detection of weevil using 70 mm 1:1200 colour infra-red transparencies is likely to be an operationally feasible detection method. 64% of current (1982) attacked leaders were detectable on the transparencies. Normal colour transparencies were less effective.

Topical application of two formulations of pine oil to unattacked leaders resulted in 45% and 71% reduction in the incidence of weevil attack, although some phytotoxic effects were observed.

Pine-oil release devices were not successful in protecting the plots from weevil damage although none of the trees in which they were placed were attacked.

Fall dispersal observations suggest that newly emerged weevils remain on the brood trees (release trees) and feed occasionally on 2 and 3 year old laterals in the upper crown during the fall and winter months.

This study was funded and supported by the Vancouver Forest Region, in the form of a contract to the University of B.C. as a Section 88 research project with the Tahsis Company.

- P.M. Wood, Vancouver Forest Region, Burnaby

Leader Clipping as a Method to control Weevils. Data from the fourth year of a five-year operational trial to determine the efficiency of leader clipping

as method to control Pissodes strobi (PMP Vol. 1:2, p. 8) has been analyzed. Results to date indicate that infestation rates can be kept at lest than one prcent per year providing that clipping is implemented before the population builds to 4-5% infestation. Results from a clipped area and an analyzed untreated check block area are attached. (p. 40)

- P.M. Wood, Vancouver Forest Region, Burnaby

Propagation of Weevil Resistant Sitka Spruce. Scions from four putatively weevil resistant Sitka spruce trees were collected, via helicopter, from Green Timbers Nursery in Surrey. These scions are to be grafted onto root stock at the Mesachie Lake Research Forest to further test their resistance to attack by Pissodes strobi.

- D.G. Heppner, Vancouver Forest Region, Burnaby

A Method to Identify Weevil Resistant Sitka Spruce Trees. A method is being developed by Julie Brooks, a Masters degree student at Simon Fraser University, with assistance from the Vancouver Region, to identify Sitka spruce trees that may be resistant to Pissodes strobi attack.

The method is based on differences in the monoterpane profile between resistant and susceptible phenotypes.

- P.M. Wood, Vancouver Forest Region, Burnaby

Lodgepole Terminal Weevil Leader Clipping Project Trial. The project as reported in PMP Volume 1, No. 2 is continuing with surveys and clipping to be completed by June 1st. Costs last year were $4.51 per hectare.

- D. Doidge, Cariboo Forest Region, Williams Lake

Douglas-fir Tussock Moth Value Study. An initial study on the effects of the current Douglas-fir tussock moth outbreak on resource values has been completed. Quantitative estimates for timber losses resulting from growth reduction and mortality plus tree cover property value damages have been made for impacts to date and for the anticipated development of the outbreak. Effects on certain other resources are identified and described in qualitative terms.

Information developed should be of assistance in placing an economic perspective on DFTM activity and may be of value in assessing damages caused by other forest defoliators.

- D.W. Ross and S.P. Taylor, Protection Branch, Victoria

Tussock Moth on T.V. The Douglas-fir Tussock Moth audio-visual production has been updated and transferred to three-quarter inch videotape. As an aid to the public in treating infested trees, this six and one-half minute program explains the biology of this pest, the damage it causes and what treatments the private landowner can apply. This videotape will be made available to all local T.V. stations in the Region as well as all community cable channels to reach as wide an audience as possible.

- R.D. Edward, Kamloops Forest Region, Kamloops

Results of the Douglas-Fir Tussock Moth Fall Egg Mass Survey, 1983. One of the most extensive surveys to date was conducted to determine the amount of defoliation which can be expected in 1983. The data was collected by District, Branch, F.I.D.S. and Regional staff. It is predicted that 6951 ha. will be defoliated within the Kamloops Region (See attachment). Of this total, 594 ha. (8.5%) is Crown land, 5968 ha. (85.9%) is private land (includes leased lands) and 389 ha. (5.6% is Indian Reserve land).

Kamloops Forest Region	Predicted Defoliation for 1983
District	Area (ha)
Clearwater	0
Kamloops	6488
Salmon Arm	132
Vernon	176
Penticton	155
Merritt	0
Lillooet	0
Regional Total	6951

- R. Chorney, Kamloops Forest Region, Kamloops

Douglas-Fir Tussock Moth - The Veasy Lake Follow-Up. Further Douglas-fir tussock moth population monitoring of the 1982 virus-treated areas near Veasy Lake is proposed for the summer of 1983. It is anticipated that this monitoring will strengthen the 1982 findings and confirm the effectiveness of the nuclear polyhedrosis virus as a control agent.

- L. Friskie, Kamloops Forest Region, Kamloops

Douglas-Fir Tussock Moth in the Grand Forks Area. Douglas-fir trees that were severely defoliated by the Douglas-fir tussock moth in 1982 at the Christina Lake Golf Course near Grand Forks will be treated with the insecticide Sevin to protect the trees from attack by the Douglas-fir bark beetle. No DFTM defoliation is expected in 1983 at this locality.

A pre-flight preventive spray will be applied by the golf course staff by April 15 to all severely defoliated trees. A solution of 2% active ingredient using water as the diluent will be sprayed on the main bole to a height of 5-7 meters. The insecticide should be effective for a one month period.

- D. Gray, Nelson Forest Region, Nelson

Spruce Budworm. Kamloops Regional staff will be assisting Jon Sweeney, a graduate student of Dr. J. MacLean (Forestry, UBC), with his planned pheromone trapping trials for western spruce budworm in the Oregon Jack Creek area.

- R. Chorney, Kamloops Forest Region, Kamloops

Green Spruce Aphid in the Charlottes. As reported by the Canadian Forestry Service, a severe winter in 1981 has reduced aphid populations substantially. The mild winter of 1982 seems to have resulted in another upswing in populations, although defoliation noted this far is minor.

There is some concern that aphids activity in young managed stands may be causing appreciable growth losses, and perhaps even mortality. This might be a suitable research project for interested persons.

- A. Stock, Prince Rupert Forest Region, Smithers

FOREST PATHOLOGY

Demonstration Areas for Control of Diseases. A demonstration area of mistletoe control options at time of logging or juvenile spacing was established in the Palmer Lake area in the Cariboo Region. Further demonstrations of operational methods to control dwarf mistletoes and root diseases are planned for 1983-84. Proposed activities include selection of suitable areas for mistletoe control in Cariboo, Kamloops, Prince Rupert and Nelson Regions; and design and layout of a juvenile spacing trial in young stands infected by root disease. Establishment of demonstrations might be possible under EBAP or NEED programs.

- J.A. Muir, Protection Branch, Victoria, T. Wilford, Cariboo Forest Region, Williams Lake, and J. Kumi, Kamloops Forest Region, Kamloops

Kamloops Root Disease Demonstration Areas. Areas infested with Phellinus weirii and Armillaria mellea root diseases will be chosen in the Clearwater and Merritt Districts to serve as permanent training and demonstration areas. The areas will be surveyed, mapped and monitored for disease progression. Although these areas will be set up primarily as an education aid in root rot identification for District staff and other interested groups, disease spread will be monitored and should provide valuable data on a site-specific basis.

- J. Kumi, Kamloops Forest Region, Kamloops

Dwarf Mistletoe Control Projects. A number of cut blocks were treated via EBAP and NEED programs. Several companies used Section 88 funds and harvesting techniques to reduce the occurrence of the parasite.

- T. Wilford, Cariboo Forest Region, Williams Lake

Guidelines. Two sets of guidelines intended for Ministry Protection Manuals were drafted:

1) Revised dwarf mistletoe guidelines were re-distributed for comment. These should be finalized by June 1983.

2) A preliminary draft for Phellinus root disease was completed by A.C. Molnar under contract with Protection Branch. These guidelines are being expanded into a more comprehensive chapter for the major B.C. root diseases. The draft will be distributed soon for review.

- J. Muir, Protection Branch, Victoria

Lillooet Mistletoe Control Projects. A large flat area (1800 +ha) in the Lillooet Forest District contains heavily mistletoe infected timber. Stand growth has virtually stagnated and some of the older stems are dying. Mountain pine beetle is also attacking some of the older stems.

To date three forest management projects have been used to eradicate the mistletoe. For the larger stems a Small Business Sale (Category 2) was issued on approx. 80 ha with some success. A post and rail sale has also been issued with little success. Recently $30,000.00 was spent on a mistletoe trial control project.

This project will be carefully monitored to determine the feasibility of treating more area.

Six blocks, for a total of 60 ha, were treated and costs ranged from $300.00/ha to $600.00/ha depending on ground conditions and the actual treatment. Most of the 60 ha were windrowed or rough bunched to prepare the site for burning in the fall. The cheapest treatment area was prepared for broadcast burning. A 50 meter wide fire-break was made to encircle the block and the remaining material was flattened to ground level.

A D8K was used to prepare the blocks in conjunction with a labourer who felled any remaining live stems. An LKS was issued to a local operator to utilize any merchantable stems. When the project is completed, no live stems will be left standing except the odd Douglas-fir.

Follow-up action will include burning of all slash accumulations this fall and planting of lodgepole pine and Douglas-fir stock during the spring of 1984. Grass seeding will also take place in a number of blocks.

- E. Holley, Lillooet Forest District, Lillooet

Pathology and Silvicultural Projects. Three silviculture projects in the Kamloops District were undertaken to control diseases:

1) Mistletoe control - on 235 ha, E.B.A.P. crews removed mistletoe-infected residual stems left after old diameter-limit logging.

2) Site Rehabilitation - E.B.A.P. crews removed dense thickets of tussock moth and root rot killed Douglas-fir on 22 ha. The areas will be planted with ponderosa pine.

3) Balco Forest Industries under Section 88 planted 19 ha of "rust resistant" White Pine stock. Site preparation for the area included removing root rot infected Douglas-fir stumps.

- J.B. Olsen, Kamloops Forest District, Kamloops

Lodgepole Pine Dwarf Mistletoe Prespacing Examination. A prespacing examination of dense lodgepole pine stands for pests in the Hawkins-Freeman drainages in the Kootenay Lake District indicated little or no mistletoe infestations. However, re-examination during the actual thinning process indicated a significant amount of dwarf mistletoe. Because of stand density, lodgepole pine stems gave almost no visual signs, i.e. abnormal growth or basal swellings with aerial shoots. Examination of felled trees revealed mistletoe aerial shoots on the majority of trees.

Most field surveys used at present to detect the presence and extent of dwarf mistletoe infections would fail in stands of this type unless a great deal of time was spent examining individual trees with binoculars. These types of stands are quite common in the Nelson Region.

- E. Morris, Nelson Forest Region, Nelson

Mistletoe Appraisal Technique. John Laut, forest pathologist under contract with Protection Branch, will complete evaluation of a mistletoe appraisal technique, LPMIST, for management of interior lodgepole pine stands by August, 1983. Results of preliminary 1982 tests suggested that LPMIST might overestimate stand growth and perhaps should be adjusted.

- J.A. Muir, Protection Branch, Victoria

Operational Methods for Root Disease Surveys. In the Vancouver Region survey, several modifications to data collection and data analyses methods, described by Bloomberg, et al 1980, were made. A new column was added to a revised and shortened Root Disease Survey form (F.S. 1061 Prot 83-3) which enabled simultaneous field recording of up to nine root diseases. The RRSAMP (C.F.S.) analysis program was revised accordingly.

The survey design was modified to standardize the number of grids and lines per grid for given baseline ranges, and to provide systematic transect starting points.

Other minor changes included development of a sub-routine to calculate the survey area which was made during the Protection Branch installation of the RRSAMP root rot analysis program into the Ministry of Forests computer system.

A description of office and field procedures for the survey method including a discussion of the analysis outputs will be available as an internal report from the Vancouver Forest Region by late spring 1983.

- J.D. Beale, Vancouver Forest Region, Burnaby, and P. Fuglem, Protection Branch, Victoria

Potential Root Disease Losses. In the graphical presentation of "Volume Over Age Curve, Estimated Losses to Root Disease" in PMP Vol. 1, No. 2, p. 40, timber volume losses to root disease should be considered to be included or at least partially included in the empirical VAC's. Upon consultation with the Inventory Branch, Ministry of Forests, it was determined that the forest samples measured to derive VAC's probably already include losses to root diseases.

Although losses due to root diseases include mortality and incremental losses, "opportunity losses" from non-productive "holes" in the forest due to the root diseases might be much more important for planning purposes and yield analyses.

If root disease losses were accounted for in the Ministry's VAC's and if there were substantial opportunity losses, then root disease management could substantially enhance productivity in coastal Douglas-fir types. These concepts are discussed more fully in the Vancouver Region Protection Internal Report PM-V-2.

Results of the Vancouver Region Root Disease Survey (PMP Vol 1, No 2) should provide a basis for estimating the magnitude of these potential productivity gains.

- P.M. Wood and D.G. Heppner, Vancouver Forest Region, Burnaby

Rotation age of root disease-infected stands. A problem with nearly mature second growth Douglas-fir stands on the coast is trying to decide when a root-diseased stand should be harvested.

A method is being developed in the Vancouver Region to calculate rotation age using the percentage of root rot (area basis), stand age, stocking, and site quality as criteria. The objective is to determine a optimum harvest date that balances maximum mean annual increment and acceptable tree size.

- P.M. Wood, Vancouver Forest Region, Burnaby

Tree Species Selection Guidelines for Root-Disease-infested Sites. Planting prescriptions for sites infested with Phellinus weirii should designate tree species that are both resistant (or less susceptible) to the disease and suitable for the site conditions. In cooperation with Dr. Karel Klinka, Forest Pedologist in this region, edatopic grids of several coastal biogeoclimatic subzones have been examined to determine suitable P. weirii-resistant species to use. Western white pine in particular appears especially suitable for "microsite" planting of disease pockets.

- J.D. Beale, Vancouver Forest Region, Burnaby

Trials of Aerial Surveys of Root Disease. A fixed wing airplane, flying at 100-150 kph at 300m elevation above ground, was used to survey root rot centres near Merritt last year. Although the snow cover hampered observations, several root disease infection centers were located.

Further aerial root disease surveys are planned in 1983 in the Kamloops Region. Areas of known or suspected root disease centers will be flown and results of aerial and ground surveys will be compared. This type of disease survey, if feasible, should be useful to Timber, Silviculture and Protection to detect disease in proposed cut blocks and schedule more detailed surveys.

- J.A. Muir and S.P. Taylor, Protection Branch, Victoria, and
  J.W. Kumi, Kamloops Forest Region, Kamloops

Barriere Root Disease Surveys. As part of the requirements of the advanced Pest Management course, a root rot survey was completed in the Barriere P.S.Y.U. Using the RRSAMP package developed by P.F.R.C., the data analyses showed that both Phellinus weirii and Armillaria mellea were very widespread and destructive in this area.

The results graphically illustrated what this survey can accomplish. Several forest companies and Districts will initiate surveys this summer and analyses will be completed by Regional Pest Management Staff.

- J.W. Kumi, Kamloops Forest Region, Kamloops

Black Stain Root Disease Survey. In cooperation with the Canadian Forestry Service survey in the Kamloops Region for black stain root disease this summer, maps of the Clearwater area identifying susceptible pine stands and including understory vegetation, have been prepared. Black Stain in lodgepole pine occurs at higher elevations (c.a. 1200 m) in almost pure, well-stocked stands 70 years or older. It is hoped that indicator species can be found which may be useful in characterizing infested sites.

- J.W. Kumi, Kamloops Forest Region, Kamloops

Spruce Root Disease Study. A U.B.C. Master's degree thesis project in forest pathology is planned. Hadrian Merler under direction of Dr. B.J. Vander Kamp, Faculty of Forestry, University of B.C., will survey root disease of white spruce caused by Polyporus tomentosus in young forests near Prince George. Aspects of the study include: incidence of disease in young stands, rates of spread and tree species resistance to the disease.

- A. MacKinnon and R. Cozens, Prince George Forest Region, Prince George, and J. Muir, Protection Branch, Victoria

Root Disease in the Cariboo. Coincident with a Canadian Forestry Service (P.F.R.C.) root disease course held in Horsefly in June of 1981, various root diseases have been discovered throughout the Cariboo Region. There have been four seminars to date with one more planned for June 1983. Root diseases are now being considered in forest management, as their impact is readily apparent, and in some cases options such as species conversion are available to maintain the productivity of a site.

- T. Wilford, Cariboo Forest Region, Williams Lake

Horsefly root disease survey. The PFRC Intersection Length Root Disease survey was used in the Horsefly District on a Polyporous tomentosus/Armillaria infested spruce (Douglas-fir, Lodgepole pine) stand. All three tree species are susceptible to Armillaria but the infection centres are very small and the company doing the harvesting will be encouraged to stump Armillaria pockets. Following Armillaria stumping, as the spruce and pine are susceptible to P. tomentosus, the entire cut block will be planted with Douglas-fir stock.

- T. Wilford, Cariboo Forest Region, Williams Lake.

Armillaria Root Disease Control. An operational trial of stump removal in a stand of Douglas-fir infected by Armillaria root disease is being carried out in the Golden District.

Objective of the trial is to determine if it is economically feasible to stump a harvested area at no added cost to the Ministry of Forests.

Two areas were selected for treatment. Each was three hectares in size and contained fir, spruce and lodgepole pine types heavily infested with root rot.

The timber was disposed under LNS tenure to a small contractor under the condition that all stumps on the area be torn out of the ground with a minimum of root breakage.

The areas were harvested with a D4 crawler tractor. Stump removal is being performed with a "Proclain" Excavator which is being rented at $60.00 per hour.

Preliminary results have shown the operation to be economically feasible.

Two larger-scale stumping operations, 25 and 30 hectares, are scheduled for the fall of 1983 on two areas in the Golden District, under Section 88 funds.

- L. Price, Golden Forest District, Golden

Pruning white pine for control of blister rust. Several EBAP or NEED projects were undertaken to prune young western white pine to protect trees from blister rust (Cronartium ribicola).

1. White Pine Pruning on Texada Island. Early in 1983 an EBAP trial was initiated on Texada Island to investigate the effectiveness of pathological pruning (low branch removal). Approximately 250 ha were pruned by late spring under the direction of the Powell River Forest District.

   Relatively low infection levels were found on the Island. From 25 to 85% of the white pine stems were infected with either stem or threatening branch cankers. White pine showed superior growth relative to all other species on the Island's poorly stocked, poor quality sites. Pruning guidelines were developed, based on R.S. Hunt, 1982, article in the Forestry Chronicle, for heights to prune to by tree height class, timing of prunings (more specific to plantation management), slope and site restrictions.

   Pruning of pine is underway in blocks of mixed age and height classes. In some blocks where stocking is high, a precommercial thinning is anticipated before year's end. All treatment blocks have control strips established for monitoring treatment effectiveness.

   - J.D. Beale, Vancouver Forest Region, Vancouver

2. Nelson Region projects. Under EBAP and NEED programs, white pines were pruned in conjunction with juvenile stand treatments at several locations (see Table 1 below).

Table 1 Areas Treated in 1982

Forest District	Compartment	Stand Treatment	Ha	PW Stems Treated/ha	Avg. Age of Post-treated Stand
Revelstoke	140	Juvenile Spacing	23	458	15
Arrow	174	Brushing & Weeding	6	281	9
Arrow	214	Brushing & Weeding	77	108	13
Arrow	218	Conifer Release	7	296	8

In spacing operations in stands of mixed tree species, white pine was treated as a favoured species. Spacers/weeders made quick checks of each potential white pine crop tree, leaving only those trees without apparent stem cankers. A pruning crew subsequently pruned all white pine crop trees. For trees under 5.0 m height, all branches from mineral soil up to 50% of tree height were removed flush with stem. For trees over 5.0 m height, all branches from mineral soil up to 2.5 m were removed flush with stem. Hand tools, rather than chainsaws, were found to be more effective and faster to use. (See Table 2).

Table 2 Suitable pruning hand tools

Tree height	Tool
Under 1 m	Small hand-pruning shears
1-2 m	Small hand-pruning shears Long-handled lopping shears
Over 2 m	Long-handled lopping shears Small pruning saws (for large branches)

Several additional proposals were submitted under NEED and EBAP programs for white pine pruning, in conjunction with other stand treatments, for 500 ha.

It is intended to establish some experimental plots to measure the effectiveness of the pruning treatment.

Some work may also be done to hazard rate white pine stands.

- M.W. Mack, Silviculturist, B.C. Timber Ltd., Nakusp

3. Western White Pine Seed Trees. With a renewed interest in the establishment and maintenance of western white pine, a project is underway to develop guidelines for the selection of blister rust resistant seed trees in the Vancouver Region.

   Exposure to the blister rust, as determined by infection levels, will likely be the main criterion for selection.

   - J.D. Beale, Vancouver Forest Region, Burnaby

4. Kamloops Pruning Trials of White Pine. In June 1983, pathological pruning trials of white pine to protect trees from blister rust will be initiated in Clearwater District.

   - J.W. Kumi, Kamloops Forest Region, Kamloops

Needle blight of Larch seedlings. Needle blight caused by the fungus Meria laricis at Skimikin Nursery has severely limited the production of western larch seedlings. The production of this increasingly important tree species will likely be moved to other nurseries which do not have larch infection sources nearby.

Under the direction of Jack Sutherland, PFRC, fungicide studies with Dithane, Maneb and Captofol will be initiated at Skimikin Nursery as soon as larch seed is available.

- J.W. Kumi, Kamloops Forest Region, Kamloops

PESTICIDES

Felled Lethal Trap Trees - Plans for 1983. The Prince George Forest Region hopes to complete final testing of the most effective dosage of M.S.M.A. for creating felled lethal trap trees for operational use against spruce beetle in B.C. Tentative plans also include injection and felling of lethal trap trees in the fall season - a strategy with promising logistical advantages which requires proper testing in B.C.

To date, four Forest Districts have submitted proposals to Region to use the felled lethal trap tree technique to suppress spruce beetle "hot spots" in isolated and/or inaccessible areas.

- R.S. Hodgkinson, Prince George Forest Region, Prince George

Pesticide Publications and Audio-Visuals Forthcoming. Following a hectic spring of teaching, travelling and other miscellaneous distractions, time is now available to complete a variety of pesticide publications which have been pending for some time.

1. Guidelines for Pesticide Storage and Transportation will be available shortly. It is designed as a technical document and should allow pesticide users and Technical Services Branch to more easily and safely handle the storage and transport of pesticides.

2. An audio-visual slide show designed to assist in training pesticide applicators will be available by the end of this season. This tape show will contain most of the information normally presented by forestry representatives at pesticide use certification courses. As an A/V show the information will be more easily available to interested persons, especially should key staf specialists be unable to attend all local training sessions.

3. B.C. publication for aerial pesticide applicators is being proposed for publications this season as a co-presentation of the Ministries of Forests and Environment.

4. A comprehensive publication entitled the "Forest Pesticide Handbook" will incorporate much of the information planned for some of the above publications plus sections of pesticide registrations. Pesticide labels, use patterns and regulations will be included. This publication will be made available in a three-ring binder to permit regular updates. It is expected that as chapters of the handbook are completed, they will be distributed to the forestry community.

- J.F. Henigman, Protection Branch, Victoria

Pesticide Spray Equipment. The Planning and Development Section at Protection Branch is undertaking a comprehensive review of aerial spray devices for forestry applications. The purpose of the review is to examine the aerial spray equipment presently available; to determine each system's limitations and capabilities, to evaluate user experiences and recommendations, to determine the best system(s) suited to the variety of needs and conditions in British Columbia and, finally, to document the results in a catologue format.

Several agencies throughout North America have been canvassed for suggested individuals whose experience and specialty may prove beneficial to the review and list of applicable references has been developed from library searches. Initial contact has been established with application contractors, and a draft format for the equipment catalogue has been developed.

- D. Langridge, Protection Branch, Victoria

Pesticide Forums - 1983. With the recent profusion of pesticide "committees" and discussion groups in B.C., some confusion exists concerning purpose, membership and relationship to forestry needs. Following is a brief annotated list for general information; please contact the undersigned for additional details if required.

CCREM Task Force on Pesticides in Forest Management. This is a federal/provincial task force of forestry, environment and pesticide regulation officials working on the registration of priority forestry pesticides. The group has identified a core of 9 important insecticides and herbicides for priority registration. Discussion of other needs continues.

Forest Pest Review Committee of British Columbia. The FPRC is the provincial forum for discussion of major insect and disease problems in B.C. It also serves to air proposals for major pesticide applications and issues. Field trips are taken at the spring meeting; recently, pesticide registration authorities from Ottawa were taken on a special vegetation management tour of Vancouver Island. Other like tours are proposed.

B.C. Ad hoc Committee on Forest Pesticides. This Committee is an informal discussion group which meets 4-6 times annually to discuss issues of mutual concern, to suggest solutions, and most importantly, to maintain direct communication. Recent guests have included representatives from Greenpeace, the B.C. Medical Association and the Integrated Vegetation Management Association (See p. 28 for current membership).

Integrated Vegetation Management Association. The IVMA is a new organization which should be of interest to foresters who share vegetation control problems with Highways, Hydro, private applicator companies and similar organizations. The IVMA has a broader base than concern for just undesirable vegetation; it is, in fact, a needed forum in B.C. where negative vegetation situations resulting from mining and other like operations (i.e. extensive forest harvesting) can be discussed as well.

Professional Pest Management Association of B.C. This also is a relatively new organization for professionals engaged in various types of pest control operations, most notably industrial, structural, forest, urban, and agricultural pest management.

Expert Committee on Weeds. The ECW is a national forum for discussion, collation and exchange of data on weed management with an emphasis on herbicides. Representation is from academia, government administrators and scientists and pesticide manufacturers and distributors. There are eastern and western subgroups, each with silviculture sections.

FLULC Pesticide Task Group. A pesticide discussion group was proposed and agreed to at a recent meeting of the Forest Land Use Liaison Committee. The major initial assignment will be the drafting of a consensus statement on the use of pesticides on forest land.

Interbranch Herbicide Action Committee. Representatives from Protection, Range Management, Research, and Silviculture Branches, Ministry of Forests, meet at frequent intervals to discuss and recommend actions on forest herbicide issues of mutual concern. Training, product registration and the designation of roles and responsibilities have been recent topics.

(Note: There are several other groups actively discussing the use of forest pesticides in B.C. and elsewhere. These include CAPCO, ENGO, NRC Associate Committee on Forestry and Agricultural Aviation, Canadian Forest Pest Control Forum, and the B.C. Pesticide Control Committee. Some MOF Regions, especially Prince Rupert and Prince George, have Regional Pesticide Use Committees which meet occasionally and handle Regional issues.)

- R.F. DeBoo, Protection Branch, Victoria

British Columbia

adhoc committee on forest pesticides

MEMBERSHIP (February, 1983)

NAME & OCCUPATION	MAILING ADDRESS	REPRESENTING	PHONE NO.
A.D. Chambers (Alan) Associate Professor	Faculty of Forestry University of British Columbia Vancouver, B.C. V6T 1W5	B.C. Wildlife Federation	228-6582
G.W. Coombs (Wayne) Assistant Silviculturist	B.C. Forest Products P.O. Box 130 Crofton, B.C. V0R 1R0	Association of B.C. Professional Foresters	246-3264
D.L. Cooper (Doug) Manager, Forest Management and Logging	Council of Forest Industries 1500-1055 West Hastings St. Vancouver, B.C. V6E 2H1	Council of Forest Industries	684-0211
D.L. Handley Manager, Designed Forest Section	MacMillan Bloedel Limited 65 Front Street Nanaimo, B.C. V9R 5H9	Council of Forest Industries	753-1112
J.F. Henigman (John) Staff Specialist Pest Control Agents Protection Branch	Ministry of Forests 1450 Government Street Victoria, B.C. V8W 3E7	Ministry of Forests	387-5965
R.W. Kobylnyk (Ron) Director, Pesticide Control Branch	Ministry of Environment 810 Blanshard Street Victoria, B.C. V8W 3E1	Ministry of Environment	387-4321
L.D. Kornder (Lee) Director, Division of Occupational Health	Ministry of Health 828 West 10th Avenue Vancouver, B.C. V5Z 1L8	Ministry of Health	874-2331
R.L. Morley (Rick) i/c Pollution & Pesticides Management Fish & Wildlife Branch	Ministry of Environment 780 Blanshard Street Victoria, B.C. V8W 2H1	Ministry of Environment	387-1493
C.E. Perry (Clay) Legislative Director	International Woodworkers of America 500-1285 West Pender St. Vancouver, B.C. V6E 4B2	International Woodworkers of America	683-1117
R.F. DeBoo (Bob) (Chairman) Manager, Pest Management Protection Branch	Ministry of Forests 1450 Government Street Victoria, B.C. V8W 3E7	----	387-5[illegible]5

Problems in the Registration of Glyphosate (Roundup^{R}). Several important questions pertaining to the registration of glyphosate herbicide remain unresolved. Hopefully, the results of a special meeting of federal registration authorities and key provincial forestry representatives recently held at Ottawa will contribute to a decision as this publication goes to press.

- J.F. Henigman, Protection Branch, Victoria

Mountain Pine Beetle Containment Project Using Pheromone. Kamloops Region and District staff will attempt to contain small infestations of the mountain pine beetle in areas which are not slated to be logged until next year. It is hoped that the pheromone will encourage beetles to remain within the infested area.

- R. Chorney and L. Friskie, Kamloops Forest Region, Kamloops

Cariboo Pesticide Use Committee. A committee with members from Range Management, Silviculture, Research and Protection has been established to ensure that pesticides are used safely and effectively in the Cariboo.

- D. Doidge, Cariboo Forest Region, Williams Lake

Arsenic Analysis of Spruce Phloem from Felled Lethal Trap Trees. Spruce phloem samples from felled lethal trap trees (previously injected with the arboricide M.S.M.A. at 160 g/l a.i.) were recently analyzed for arsenic content under the auspices of Dr. John McLean of the Faculty of Forestry, University of British Columbia. Dr. McLean used "X-ray Energy Dispersive Spectroscopy" to find the parts per million of arsenic (dry weight) in phloem samples sent from the Prince George and Nelson Regions.

Results from Prince George reveal that a mean of 24.7$\pm$ 7.3 ppm of arsenic was translocated to the 20 m height of lethal trap trees. Phloem from untreated trap trees contained natural trace levels of arsenic at a mean of 1.4$\pm$ 1.1 ppm (A significant difference at p 0.001). Further results from projects in 1981 and 1982 will be reported soon.

- R.S. Hodgkinson, Prince George Forest Region, Prince George

Pesticide Applicators Training in the Prince Rupert Region. Pest Management and Silviculture staff combined for the second consecutive year with specialists from Pesticide Branch to train and examine twenty Forest Service and two forest industry employees in pesticide application.

By the use of Forest Service specialists, it was possible to present the required course while emphasizing the Ministry's procedures and position on use. It is expected that a "hands-on" session will follow to permit greater experience with the variety of spray equipment and application strategies used in Prince Rupert Region forestry practices.

- V. Barge, Prince Rupert Forest Region, Smithers

Forest Pesticide Applicator Experience Survey. At a meeting of the Prince George Regional Forest Pesticide Use Review Committee on January 12, 1983, a recommendation was made to poll all District and Regional staff on their pesticide application experience. As a result, staff have been requested to list their:

(i) Pesticide applicator certificate category
(ii) Date of certificate effectiveness/expiry
(iii) Pesticide application field experience (by letter code)

Category

A. Pesticide mixing
B. Spray plot layout
C. Calibration of application equipment
D. Aerial application
E. Ground-rig application
F. Backpack application
G. "Hack n'squirt"
H. Sampling assessments

With anticipated increase in the use of forest pesticides in the near future, this information will now help Regional and District staff better prepare for such operations. The questionnaire used in this survey is available on request from the Prince George Regional Office.

- R.S. Hodgkinson, Prince George Forest Region, Prince George

PEST MANAGEMENT PERSONNEL
(Forest Service Personnel fully or mostly committed to forest pest management activities)

Protection Branch

R.F. (Bob) DeBoo, Manager, Pest Management, Victoria, 387-5965(*)
P.M. (Peter) Hall, Forest Entomologist, Victoria, 387-5965
J.F (John) Henigman, Pesticide Specialist, Victoria, 387-5965(*)
J.A. (John) Muir, Forest Pathologist, Victoria, 387-5965
Vacant, Pest Management Planning Specialist, Victoria, 387-5965
D.W. (Doug) Ross, Acting Pest Management Forester, Victoria, 387-5965
S.P. (Stuart) Taylor, Pest Management Technician, Victoria, 387-5965
P. (Pat) Humphreys, Pest Management Technician, Victoria, 387-5965

Silviculture Branch

D. (Don) Summers, Seed Production Pest Management Officer, Victoria, 387-1191(*)
J. (Jacob) Boateng, Brushing and Weeding Specialist, Victoria, 387-1191
G.M. (Gwen) Shrimpton, Nursery Pest Biologist, Surrey Nursery, 576-9161(*)

Inventory Branch (partial involvement)

D.M. (Doug) Fligg, Manager, Depletion and Update, Victoria, 387-1345
B.M. (Brian) Hall, Depletion Officer, Victoria, 387-1814
J. (John) Kiss, Decay and Waste Officer, Victoria, 387-6729
S. (Steve) Ilnytzky, Depletion Coordinator, Victoria, 387-1814
R. (Ray) Leduc, Depletion Coordinator, Victoria, 387-5436
R.E. (Rick) Woods, Depletion Coordinator, Victoria, 387-1814
K.S. (Ken) Richardson, Decay and Waste Coordinator, Victoria, 387-6729
L.E. (Lloyd) Wilson, Decay and Waste Coordinator, Victoria, 387-6729

Cariboo Forest Region

D.F. (Don) Doidge, Regional Pest Management Coordinator, Williams Lake, 398-7121
E.H. (Ted) Wilford, Forest Pathologist, Williams Lake, 398-7121
M. (Mark) Hamm, Pest Management Technician, Williams Lake, 398-7121
R.M. (Ralph) Kossinn, District Pest Management Coordinator, Quesnel, 992-2147
A.A. (Alex) Wallach, District Pest Management Coordinator, Williams Lake, 398-7121
D.R. (Derek) Poole, District Pest Management Coordinator, Horsefly, 620-3327
K.J. (Kevin) Lukes, District Pest Management Coordinator, 100 Mile House, 395-3844
J.D. (Dave) Peterson, District Pest Management Coordinator, Alexis Creek, 394-4215

Kamloops Forest Region

R.D. (Ron) Edward, Pest Management Coordinator, Kamloops, 374-7741
R.J. (Rick) Chorney, Forest Entomologist, Kamloops, 374-7741
L. (Laurie) Friskie, Specialist, Entomology, Kamloops, 374-7741
J.W. (Janna) Kumi, Forest Pathologist, Kamloops, 374-7741
E. (Eric) Haupt, Pest Management Officer, Protection, Vernon, 542-0264
J. (Jim) Paynter, Pest Management Technician, Penticton, 492-8721
M. (Monika) Fuchs, Pest Management Technician, Princeton, 295-6988
K. (Ken) Brewster, Pest Management Technician, Princeton, 295-6988
R. (Bob) Beck, Pest Management Technician, Kamloops District, 372-5832
R. (Ralph) Otters, Pest Management Technician, Kamloops District, 372-5832
G. (Glen) Sparrow, Pest Management Technician, Kamloops District, 372-5832
P. (Peter) Miller, Pest Management Technician, Clearwater District, 674-2265

Nelson Forest Region

E. (Ernie) Morris, Pest Management Coordinator, Nelson, 354-4181
D. (David) Gray, Regional Forest Entomologist, Nelson, 354-4181(*)
D. (Steve) Byford, Pest Management Officer, Cranbrook 426-3391
E. (Emile) Begin, Pest Management Officer, Invermere, 342-9257
L. (Larry) Price, Pest Management Officer, Golden, 344-5991
H. (Hugh) Kingwell, Pest Management Officer, Arrow, 365-8402
D. (Dan) Reiben, Pest Management Officer, Arrow, 365-8402
B. (Ben) Zuber, Pest Management Officer, Boundary, 422-2766
M. (Mike) Pascuzzo, Pest Management Officer, Kootenay Lake, 428-2030

Prince George Forest Region

R.D. (Russ) Cozens, Pest Management Coordinator, Prince George, 564-0778(*)
R.S. (Bob) Hodgkinson, Forest Entomologist, Prince George, 564-0778(*)
D.J. (Duke) Sample, Pest Management Technician, Prince George, 564-0778
C.E. (Carolyn) Day, Pest Management Technician, Prince George, 564-0778
W.D. (Wendy) Cheeseman, Pest Management Technician, Prince George, 564-0778
B.E. (Brent) Anderson, Pest Management Technician, Prince George, 564-0778
C.J. (Chris) Finke, Pest Management Technician, Prince George, 564-0778
F.L. (Fred) Turner, Resource Officer Protection, Prince George West, 564-6634
G.E. (Gerry) Magee, Resource Officer Protection, Prince George East, 562-4121
R.G. (Roger) Wiltsie, Resource Officer Protection, McBride, 569-2265
S.V. (Sam) Campese, Resource Officer Protection, Vanderhoof, 567-9281
J.A. (John) Reid, Resource Officer Protection, Ft. St. James, 996-7131
B. (Brian) Kempf, Acting Resource Officer Protection, Mackenzie, 997-3310
D.E. (Doug) Swaffield, Resource Officer Protection, Dawson Creek, 782-8195
W. (Walter) Johnston, Resource Officer Protection, Ft. St. John, 785-8177
R. (Roy) Simpson, Resource Officer Protection, Ft. Nelson, 774-3936

Prince Rupert Forest Region

V.G. (Vern) Barge, Pest Management Coordinator, Smithers, 847-4511
A.J. (Art) Stock, Forest Entomologist, Smithers, 847-4511

R.P. (Bob) Rowsell, Bark Beetle Field Specialist, Smithers, 847-4511
W.F. (Bill) Davidson, Protection Resource Officer, Burns Lake, 692-7515
A. (Al) Hunter, Protection Resource Officer, Houston, 845-7712
D. (Dave) Nelson, Protection Resource Officer, Smithers, 847-2631
N.J.L. (Nils) Andersson, Protection Resource Officer, Hazelton, 842-6581
J. (Joe) Katasanoff, Protection Resource Officer, Terrace, 638-8541
W.T.S. (Bill) Jackson, Protection Resource Officer, Prince Rupert, 624-6848
D.E. (Denis) Tippie, Protection Resource Officer, Bella Coola, 799-5352
K. (Ken) Brahniuk, Protection Resource Officer, Queen Charlotte City, 559-4476
W.D. (Bill) Harvie, Protection Resource Officer, Dease Lake, 771-4141

Vancouver Forest Region

P. (Paul) Wood, Pest Management Coordinator, Burnaby, 299-9151
J.D. (Jeff) Beale, Forest Pathologist, Burnaby, 299-9151
Vacant, Entomologist, Burnaby, 299-9151
D.G. (Don) Heppner, Pest Management Assistant, Vancouver, 299-9151
S. (Stuart) Haywood-Farmer, Pest Management Resource Assistant, Chilliwack, 792-8664
L. (Lance) Mitchell, Protection Resource Assistant, Squamish, 898-9671
R. (Ron) Diprose, Protection Resource Assistant, Powell River, 485-9831
W. (Bill) Lougheed, Pest Management Resource Assistant, Duncan, 746-5123
D. (Doug) Harris, Pest Management Resource Assistant, Campbell River, 287-2194
R. (Rob) Furness, Protection Resource Assistant, Sechelt, 885-5174

*Member, Professional Pest Management Association of B.C.

MEETINGS

Forest Herbicide Application Technology Workshop, March 24-25, 1983. The Silviculture Branch of the Ministry of Forests organized a 2-day Forest Herbicide Application Technology Workshop at Delta Town and Country Inn, Delta, and Abbotsford Airport in the latter part of March 1983. Participants included about 40 selected staff from the Ministry of Forests (Silviculture, Protection, Research), Ministry of Environment, Forest Industry and Aerial Pesticide Application companies.

Two renowned professors involved with application technology work for many years, were employed to do the instruction. They were Dr. Wesley Yates from the University of California, Davis, and Dr. Mike Newton from the Oregon State University, Corvallis, Oregon.

The topics treated in the first day of the course included aerial equipment, formation of spray, distributional patterns, spray drift, measuring spray deposits, ground equipment and use, coverage, handling sensitive areas and advising your client. There was an evening presentation and discussion by the Aerial Pesticide Applicators. The Protection Branch of the Ministry of Forests presented Air Operation's Policy and Procedures to the group during this evening session. The next day was devoted to aerial and ground demonstration and practice at the Abbotsford Airport.

The workshop was rated excellent by most of the participants. There has been some suggestions that similar workshops should be organized for other Ministry staff and agencies involved with pesticide application. We hope to have another workshop soon.

- J. Boateng, Silviculture Branch, Victoria

Pesticide Committee Re-established in Prince George Region. A Regional Forest Pesticide Use Review Committee was resurrected in January, 1983, in the Prince George Forest Region to monitor, approve and coordinate forest pesticide use. The committee is chaired by the Pest Management Coordinator, and includes a member each from the Silviculture, Range Management, Research and Protection Sections. All pesticide use permit applications from District offices are now routed through this committee for tentative approval. Applications are then forwarded to Protection Branch for processing.

- R.S. Hodgkinson, Prince George Forest Region, Prince George

Notice of WIFDWC Meeting. The next session of the Western International Forest Disease Work Conference, will be held August 23-26 in Coeur d'Alene, Idaho.

- J.A. Muir, Protection Branch, Victoria

B.C. Ad hoc Committee on Forest Pesticides. During the last two meetings, the terms of reference of the committee have been modified and now state:

> "To provide an informal forum for members to discuss problems, make recommendations and suggest solutions to forest pesticide issues and regulations. The principles of integrated pest management are endorsed including, where there is no economic and practical alternative, the essential, responsible and judicious use of pesticides."

Current membership is given in the list to be found in this issue of PMP (p. 27). All organizations represented now have, or are in the final stages of preparing, position/policy statements on the use of forest pesticides.

The committee recently discussed the new Integrated Vegetation Management Association with the President, Mr. Adrian Millar of B.C. Hydro. This new association could come to represent most of the agencies and private companies conducting vegetation control in B.C. The association currently sees a major role in pesticide use teaching. The next meeting, in May, will include discussions with a representative of the B.C. Medical Association.

- J.F. Henigman, Protection Branch, Victoria

Cariboo District Staff Meeting. A meeting of the District Pest Management Technicians was held on January 26, 1983. At this meeting there was a discussion of the Regional aerial survey, District mapping and recording systems, training needs, field problems and publication requirements.

This meeting allowed the "field person" to discuss his particular type of problem and to learn how the other Districts were coping. Normally any meetings or seminars are at a Resource Officer or Operations Superintendent level, and the field technicians get the information second hand. The District pest technicians will be meeting annually in the Cariboo.

- D. Doidge, Cariboo Forest Region, Williams Lake

Northern Silviculture Committee Workshop and Annual General Meeting. Cariboo Silviculture, Wet and Dry, July 26th, 27th and 28, 1983. For more information contact Alan Vyse, Chairman, at 398-7121 (Williams Lake).

- D. Doidge, Cariboo Forest Region, Williams Lake

Bark Beetle Seminars. Prince Rupert Forest Region, in cooperation with Morice Forest District, has conducted two discussions/seminars on bark beetle control. Les Safranyik of the Pacific Forest Research Centre, Canadian Forestry Service, and Peter Hall, Provincial Entomologist, B.C. Ministry of Forests, led a seminar on control strategies and planning, at which the need for a clear analysis of the existing problem, a clear set of objectives, and a clear understanding of available control tactics was emphasized.

Dr. John Borden, Research Professor, Simon Fraser University, John Henigman, Pest Control Specialist, B.C. Ministry of Forests, and Peter Hall led a discussion on the use, limitations and availability of pheromones and insecticides for bark beetle control.

Both discussion sessions were well attended and well received by licensee and Ministry staff. It is apparent that these sessions give field and management staff an opportunity to have their questions answered and to gain first hand knowledge of state-of-the-art technology. We hope to continue the sessions.

- A. Stock, Prince Rupert Forest Region, Smithers

Forest Vegetation Management Seminar, Prince George, March 17-18, 1983. A vegetation management seminar was held at the Holiday Inn in Prince George for the Silviculture Resource Officers, Operations Superintendents and selected staff from Silviculture and Research in the Prince George Region and District offices. Other participants from the Prince George Region were the Regional Manager, Forestry Manager and representatives from Protection, and Fish and Wildlife. The Cariboo and Kamloops Regions were also represented.

The main speakers at the seminar were R. Jones (Silviculture, Victoria), J. Boateng (Silviculture, Victoria), J. Henigman (Protection, Victoria), Garth Coward (Information, Victoria), Sylvia von Schuckmann (Fish & Wildlife, Victoria), B. Kelpsas (Oregon State University, Corvallis), Al Todd (Silviculture, Prince George), K. Belik (Forestry, Prince George), L. Herring (Research, Prince George), A. McLeod (Research, Prince George), and Wayne Thorpe (Silviculture, Dawson Creek).

The topics presented and discussed were as follows: Overview of Vegetation Management, Ecological Principles of Vegetation Management, Vegetation Complexes causing Brush Problems in the Prince George Region, Review of Vegetation Management Activities in Prince George Region, Forestry Registered Herbicides, Selection of Treatment and Factors affecting Success of Various Treatments, Fish and Wildlife Concerns, Buffer Strip Management and its Impact on other Resources, Herbicide Safety, Public Information Programs, Legislation Requirements including Permit Application and Routing, and Appeal Proceedings. Two slide-tape shows on vegetation management were presented on the evening of March 17.

A questionnaire was completed by the participants. The participants recommended that a course similar to the one presented should be offered to the licensees. A pesticide "applicator" type course was also requested. The overall rating of the seminar was good.

- J. Boateng, Silviculture Branch, Victoria

Canadian Institute of Forestry Seminar. A special C.I.F. Seminar on Herbicides in Forest Management was held in Prince George on November 18, 1982. Chaired by Blake Dickens of the College of New Caledonia, speakers included Bob Nixon of Greenpeace, Charlie Johnson from the Ministry and Frank Dost of Oregon State University.

- R.F. DeBoo, Protection Branch, Victoria

TABULATIONS AND GRAPHICS

PRINCE RUPERT FOREST REGION
ESTIMATE MAN MONTHS SPENT IN PEST MANAGEMENT, 1982

	STAFF SOURCE			
	REGULAR	E.B.B.C.P.[1]	E.B.A.P.[2]	TOTAL
Mid Coast	1	6	Nil	7
North Coast	2	Nil	Nil	2
Q.C.I.	3	Nil	Nil	3
Kalum	4.5	12	330	330
Kispiox	9.5	24	Nil	33.5
Bulkley	17	22	Nil	39
Morice	18.5	46	Nil	64.5
Lakes	5	44	Nil	49
Cassiar	0.5	Nil	Nil	0.5
Total	154	61.0	330	545.0

[1]Emergency Bark Beetle Control Program

[2]Employment Bridging Assistance Program

- V. Barge, Prince Rupert Forest Region, Smithers

PRINCE RUPERT FOREST REGION
BARK BEETLE STATUS AND CONTROL ACTIVITIES
1982-83

Forest District	Infested Area (Ha)		Potential Losses (m^3)		Area Harvested	Single Tree Disposal	Trap Trees	Ground Surveys & Probes (Ha)	
	MPB*	SPRUCE	MPB	SPRUCE		TOTAL TREES	TOTAL TREES	MPB	SPRUCE
LAKES	1,081	4,485	19,750,000	9,700,000	1,474	774	180	20	900
MORICE	2,949	2,008	3,000,000	7,500,000	2,500	2,074	7,557	500	2,500
BULKLEY	1,698	2,671	17,620,000	-	1,580	2,381	1,100	1,000	2,000
KISPIOX	1,500	270	317,000	5,000,000	487	280	Nil	800	200
KALUM	1,916	5,500	900,000	6,000,000	150	230	2,000	Four hours aerial only	
TOTAL	9,135	14,934	41,587,000	28,200,000	6,191	5,739	10,837	2,590	5,600

* Mountain pine beetle
**Spruce beetle

- Prepared by: V. Barge, Prince Rupert Forest Region, Smithers

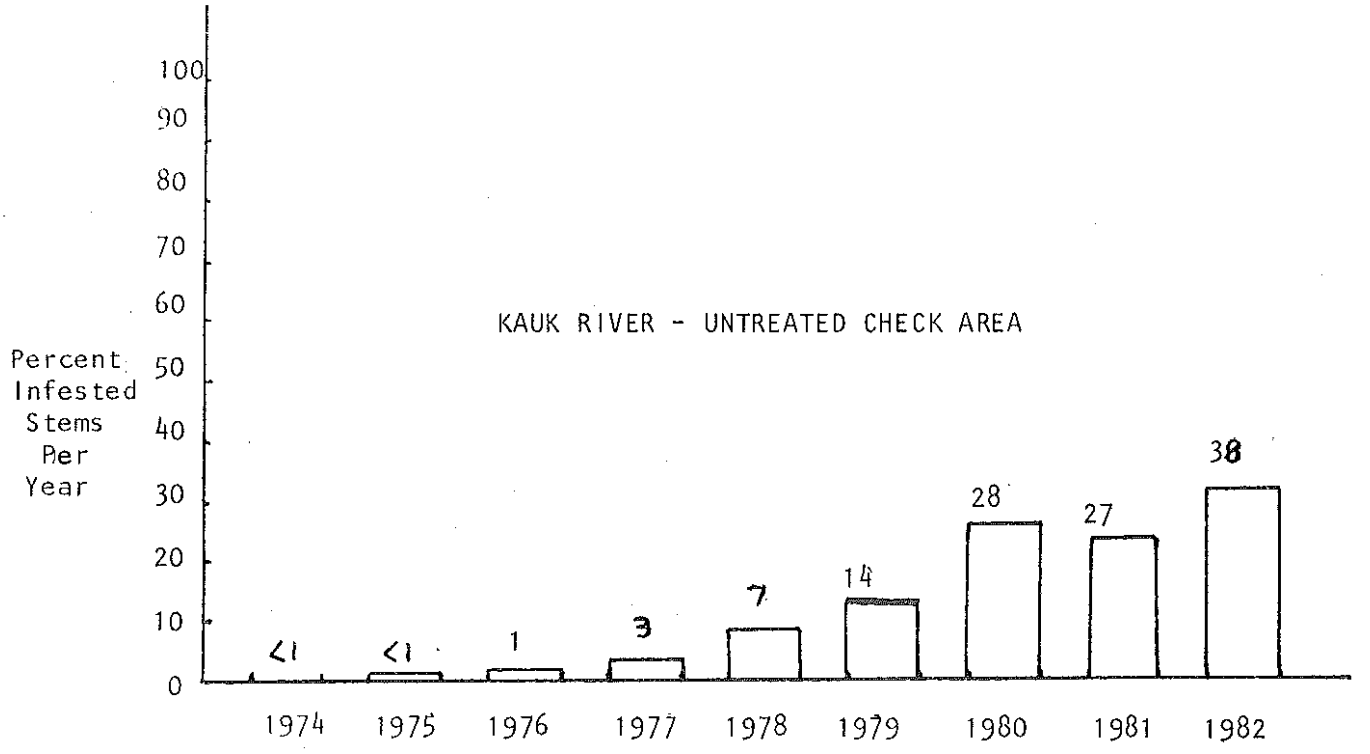
SUMMARY OF ANNUAL PESTICIDE USE IN CANADA

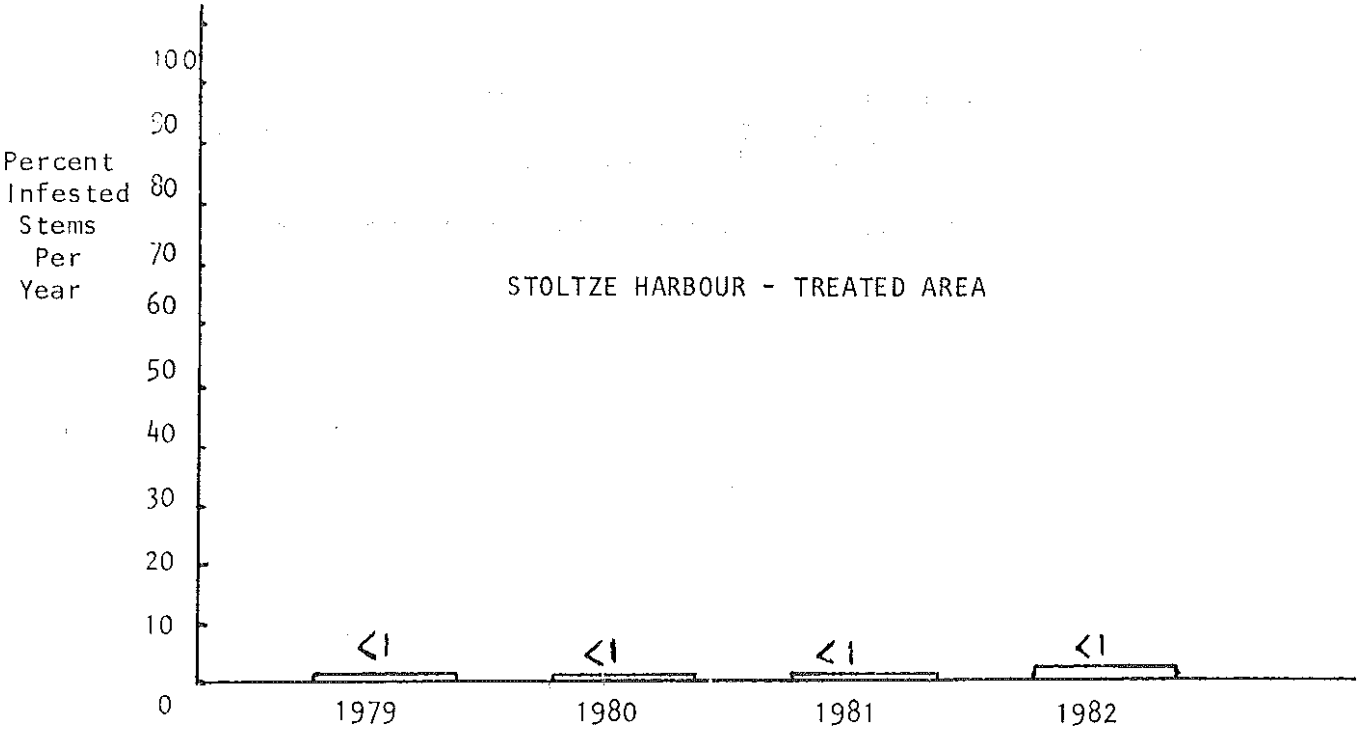
1977 - 1982[1]

PESTICIDE APPLICATIONS	Kg USED	%
Canada - All uses	34,648,000	100.00
Agricultural, Industrial & Structural Pest Control	31,840,000	91.90
Home & Garden	2,280,000	6.60
Forestry - All Uses	504,000	1.43
B.C. Forestry - All Uses	24,000	0.07

[1]Sources: Available information based on sales during the period 1977 - 1982 from Statistics Canada, Canadian Forestry Service, B.C. Ministry of Forests; Figures are approximate and have been rounded.

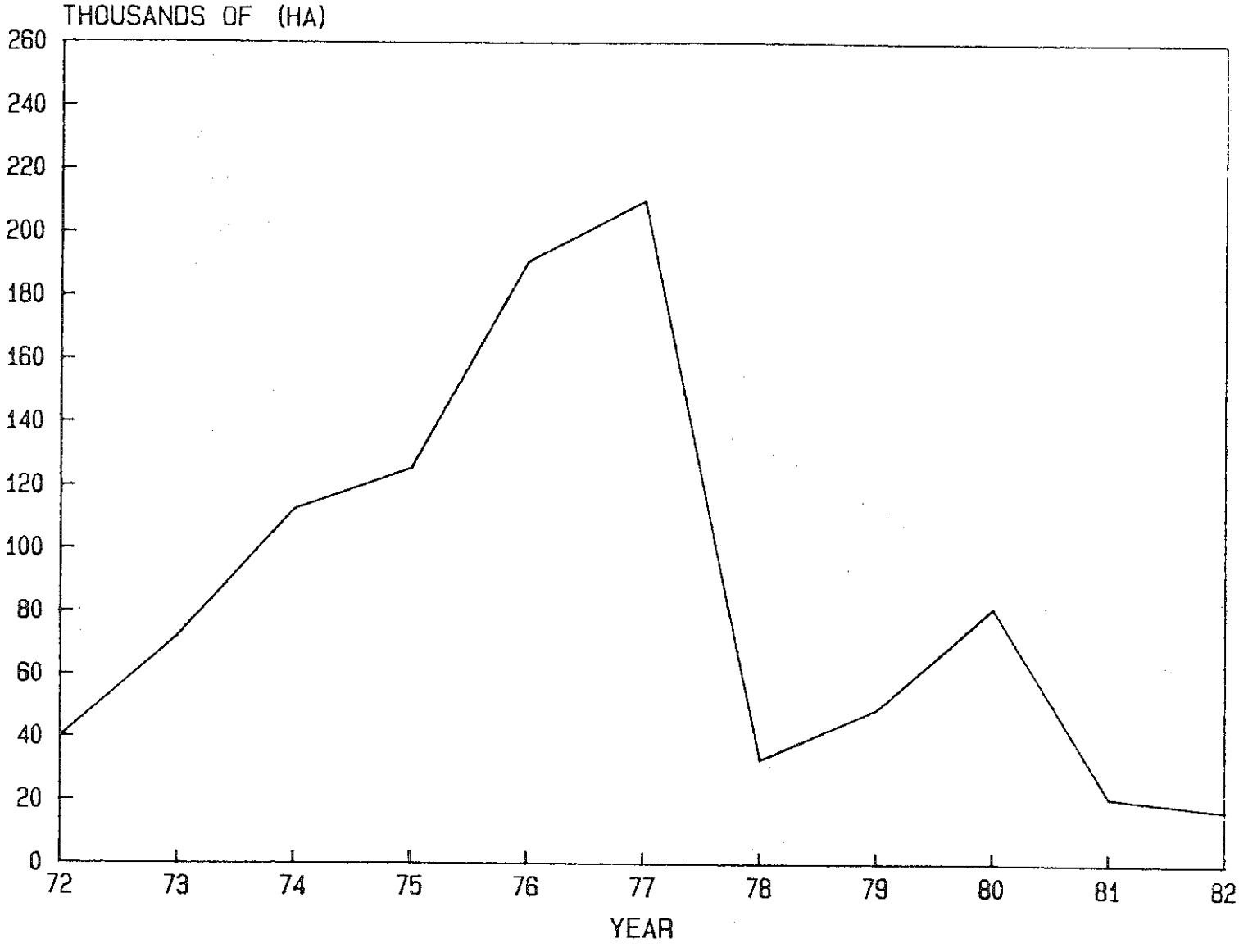
- J.F. Henigman and P.J. Humphreys, Protection Branch, Victoria





Results of leader clipping trials for control of Pissodes strobi. (Prepared by P.M. Wood, Vancouver Forest Region, Burnaby).

TRENDS IN VISIBLE DEFOLIATION OF DOUGLAS FIR
CAUSED BY THE WESTERN SPRUCE BUDWORM IN
BRITISH COLUMBIA (YEARS 1972-1982)

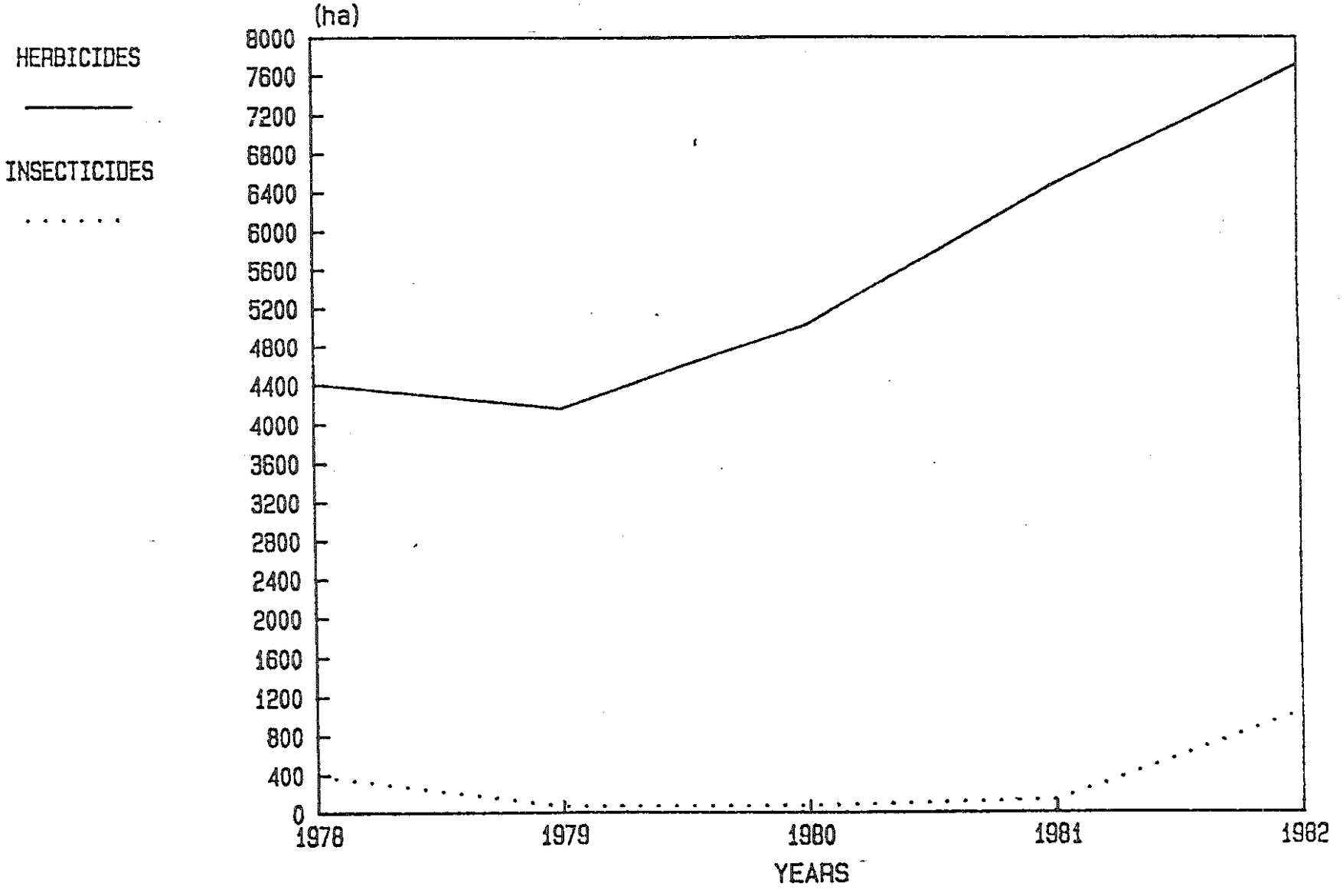


REF. CANADA DEPT.OF THE ENVIRONMENT FOREST INSECT AND DISEASE SURVEY ANNUAL REPORTS (1972-1982)

(Prepared by P.J. Humphreys and C. Mille Protection Branch, Victoria)

HECTARES OF FOREST TREATED WITH HERBICIDES
AND INSECTICIDES IN BRITISH COLUMBIA

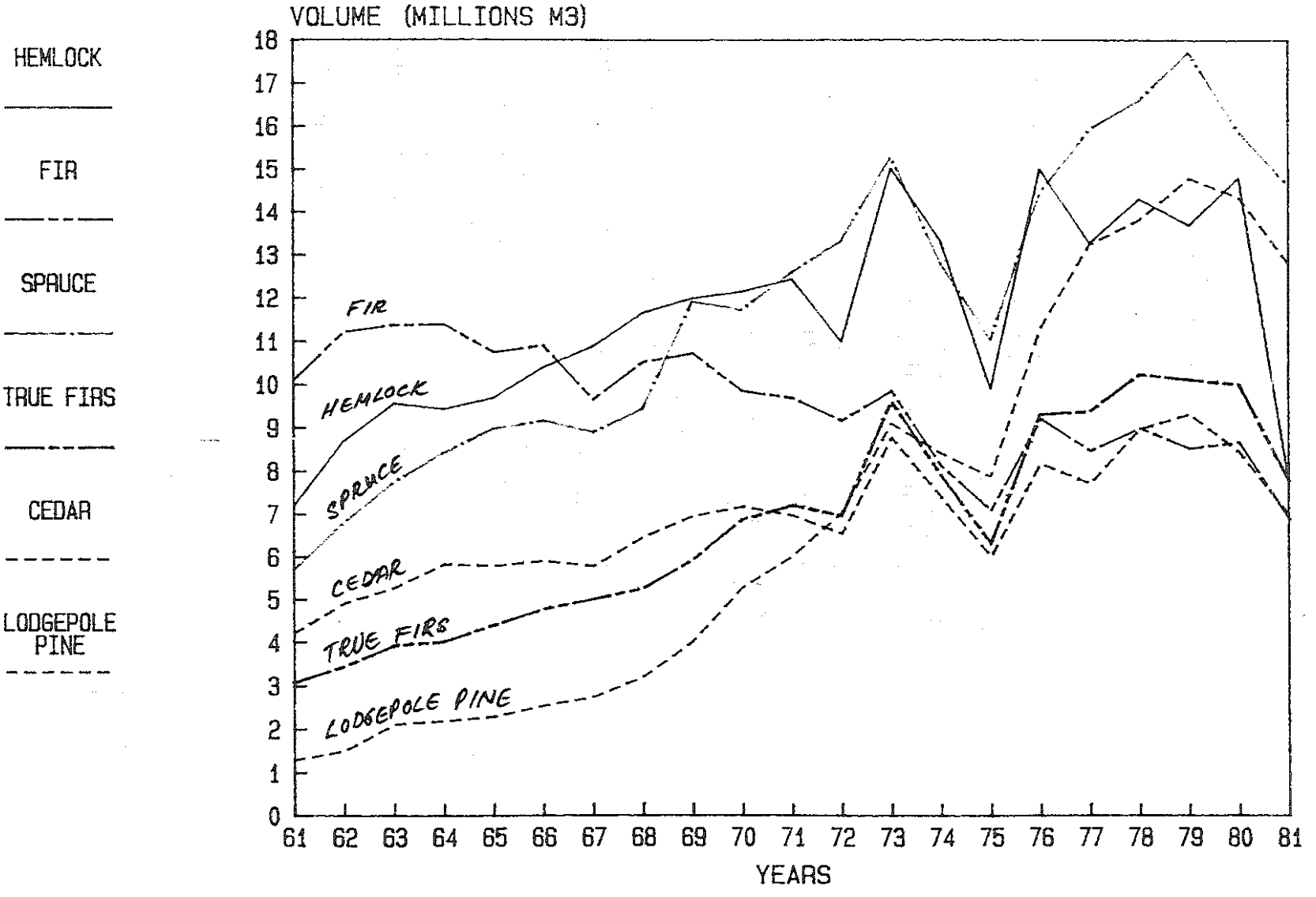
1978 - 1982



(Prepared by P.J. Humphreys and
J.F. Henigman, Protection Bra h, Victoria

SPECIES CUT IN BRITISH COLUMBIA

1961 - 1981



SOURCE: MINISTRY OF FORESTS ANNUAL REPORTS

(Prepared by P.J. Humphreys and C. Miller, Protection Branch, Victoria)

PUBLICATIONS AND REPORTS

Beale, J.D. 1983. A description of the Intersection Length Method of surveying for root diseases. B.C. For. Serv. Int. Rpt. PM-V-3, in press.

Campbell, C.A., and R.D. Edward, 1983. Pests of ornamental trees and shrubs in the Kamloops Forest Region. B.C. For. Serv. Int. Rep. PM-K-2.

DeBoo, R.F., 1983. Efficacy of chlorpyrifos-methyl for control of spruce budworm, Choristoneura fumiferana (clem.) (Lepidoptera: Tortricidae). B.C. For. Serv. Int. Rep. PM-PB-7, 18 pp.

Heppner, D.G., and P.M. Wood, 1983. Estimation of insect and disease losses and pest management opportunities in the Soo T.S.A. B.C. For. Serv. Int. Rep. PM-V-1, 16 pp.

Humphreys, P. 1982. Pesticide Use in British Columbia Forestry, 1981. B.C. Forest Service Int. Rep. PM-PB-8, 24 pp., appen.

Ministry of Forests, 1982. Cankers and Rusts: Tree Trunk Diseases. B.C. Min. For. PesTopic No. 8, 2pp.

Ministry of Forests, 1983. Pesticides in Forest Management. Inf. Serv. Br., B.C. Min of Forests, Victoria, Publ. G30-82067, 11 pp.

Muir, J.A., 1983. Forest pathology and forest management in British Columbia, B.C. For. Serv. Int. Rep. PM-PB-5, 21 pp.

Wood, P.M., 1983. A conceptual basis for the optimization of pest management in the Vancouver Region. A brief discussion paper. B.C. For. Serv. Int. Rep. PM-V-2, 18 pp.

In addition to the above citations, other reference and working documents have been produced by Silviculture Branch and the Cariboo and Prince Rupert Forest Regions. These are:

Cariboo Pest Digest. A collection of information entitled "Sporers, Borers and Chewers; Pests of the Cariboo Forest Region" (A condensation of the latest available pest information intended to assist staff in dealing with pest problems) is currently being produced. Information now available includes:

No. 1 Hylobius root collar weevil
No. 2 Dwarf mistletoe
No. 3 2-Year budworm
No. 4 Spruce beetle
No. 5 Stem rusts
No. 6 Mountain pine beetle
No. 7 Atropellis canker
No. 8 Pitch nodule moth

No. 9 Lodgepole terminal weevil
No. 10 Douglas-fir beetle
No. 11 Western gall rust

- D. Doidge, Cariboo Forest Region, Williams Lake

Prince Rupert Region Documents. The year 1982 has been a year of producing much needed operational guidelines and Protection Manual inserts. The following documents are now in use in the Prince Rupert Forest Region:

1. Bark beetle detection manual
2. Hauling restriction guidelines
3. Pesticide Safety and use guidelines
4. Guidelines for the use of pesticides and pheromones
5. Pest management harvesting guidelines
6. Section 88 pest management guidelines (presently being revised)

Further guidelines and manual inserts are underway and others will be produced as the need arises.

- V. Barge, Prince Rupert Forest Region, Smithers

Forest Vegetation Management Publication. Silviculture Branch has produced a booklet, titled "Guide for Conducting a Herbicide Project and Instructions for completing a Pesticide Use Permit Application Form." This guide deals with pre-treatment planning, the need for various licences and the filling out of forms particularly the "Application for a Pesticide Use Permit". In addition, project summaries such as the Stand Tending Report (F.S. 758), Annual Summary of Pesticide Use (Ministry of Environment) and Annual Summary of Forest Permit Operation (Ministry of Forests, Protection Branch) are shown.

Copies of the booklet are available from Silviculture Branch, Victoria.

- J.R. Gilmour, Silviculture Branch, Victoria