

**PESTICIDE USE
IN BRITISH COLUMBIA FORESTRY**

1987

by

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FOREWORD

"Pesticide Use in British Columbia Forestry, 1987" is the latest in a series of internal reports published since 1981. A cooperative survey project was initiated in that year by the B.C. Council of Forestry Industries, the B.C. Ministry of Forests (Protection Branch) and the B.C. Ministry of Environment (Pesticide Control Branch). Information used to generate these reports is now an annual requirement, by the Pesticide Control Branch, of all pesticide use permit holders. Data included represents all B.C. forest companies and B.C. Forest Service pesticide use permits that were active in 1987. Summarized in tables and illustrated graphically, information presented includes amounts (kg of active ingredient) of each pesticide used and areas (ha) treated; areas treated by control purpose and method of application; forest region and district summaries of pesticide use, as well as herbicide and insecticide use trends from 1977-1987.

INTRODUCTION

"Pesticide Use In British Columbia Forestry, 1987" is the latest report of its kind in a series which have been published since 1981.

These reports were initiated originally through a cooperative project by the B.C. Council of Forest Industries, the B.C. Ministry of Environment (Pesticide Control Branch) and the B.C. Ministry of Forests (Protection Branch) to establish annual records of actual pesticide applications to B.C. forest and range land.

Since 1983, the B.C. Ministry of Environment and Parks, Pesticide Control Branch has required all pesticide use permit holders to submit follow-up reports by December 31 of each year for that year. This report was generated from such data¹, which is summarized and illustrated in tables² and graphs, and includes the following information:

1. Numbers of 1987 forestry permit applications submitted; withdrawn; denied; cancelled and appealed.
2. Environmental Appeal Board decisions on all appealed permits.
3. Provincial summary of area (ha) treated and active ingredient (kg a.i.) used by individual pesticide.
4. Forest region and district summaries of area (ha) treated by pesticide, control purpose and method of application.

5. Provincial summaries of area (ha) treated by control purpose and method of application.
6. Area (ha) of forest land treated with herbicides and insecticides, 1977-1987.

The above mentioned information is further differentiated by the user (i.e., B.C. Forest Service or forestry industry).

1. This report was based upon all follow-up data recieved as of March 15, 1988.
2. Totals in ha may differ slightly from table to table (i.e. 1 - 5 ha) because of rounding.

RESULTS¹ OF THE 1986 PESTICIDE USE SURVEY

Pesticide Control Branch processed 635 pesticide use applications in 1987, of which 480 were forestry related. Of the latter, 448 permits were actually issued - 214 to the B.C. Forest Service applicants and 234 to forest industry applicants (Table 1).

Twenty-seven permits were appealed in 1987. Environmental Appeal Board decisions on these permits were as follows: fourteen supported and two amended. One permit was cancelled prior to an appeal board hearing and appeals for eight permits were withdrawn by the appellants.

A total of 42 948 ha of B.C. forest and range land were treated with pesticides in 1987. The B.C. Forest Service was responsible for 15 851 ha (37%) and forestry industry for 27 097 (63%).

The herbicides glyphosate and 2,4-D continued to be those most utilized in B.C. forestry. Glyphosate was applied to 36 671 hectares (ha) of forest land, 85% of the total area treated with pesticides in 1987. 2,4-D was applied to 3564 ha (8%), hexazinone to 1208 ha (3%) and picloram to 1056 ha (2%) (Table III, Figure 1).

In terms of the weight of active ingredient (kg. a.i.) applied, the three most commonly used pesticides were glyphosate (42 349 kg. a.i.) 2,4-D amine/ester (4 784 kg a.i.), and hexazinone (3555 kg. a.i.), (Table III, Figure 2).

¹ This report was based upon follow-up data received as of March 15, 1988.

Summaries of pesticide use by individual forest regions and district are shown on pages 14 - 60.

Eighty-six percent of provincial forestry pesticide use was concentrated in the Prince George, Vancouver and Prince Rupert forest regions, with, respectively, 16 465 ha (38%), 14 092 ha (33%) and 6 408 ha (15%) treated (Table IV, Figure 3).

Stand tending operations to control unwanted vegetation and enhance crop tree survival and growth remained the most common purpose of pesticide treatments.

Herbicides were applied to 8 533 ha to prepare harvested sites for planting, to 9 528 ha to release established crop trees and to 20 646 ha to enhance crop seedling survival. Weed seed tree control and site rehabilitation operations were conducted on 1 647 ha. Other pesticide use projects included insect control (419 ha), right-of-way maintenance (1086 ha) and fungus, nursery weed and vertebrate control (33 ha). (Tables V and VII, Figure 4.)

Most forestry pesticide treatments involved ground spray or tree injection methods. Tree injection methods, employing such equipment as brush saws, lance injectors and hypo hatchets were used to treat 16 603 ha (39%); backpack sprayers and truck mounted sprayers were used on 9 303 ha (21%). Helicopters and fixed wing aircraft were used to apply pesticides to 17 043 ha (40%), (Tables VI and VII, Figure 5).

TABLE I
THE STATUS OF 1987 PESTICIDE USE APPLICATIONS AND PERMITS ISSUED
BY THE PESTICIDE CONTROL BRANCH

	B.C. FOREST SERVICE	FOREST INDUSTRY	TOTAL
APPLICATIONS SUBMITTED	222	258	480
APPLICATIONS WITH- DRAWN OR DENIED	2	7	9
PERMITS ISSUED ¹ (TOTAL)	214	234	448
PERMITS CANCELLED REVOKED OR SUSPENDED BY THE PESTICIDE CONTROL BRANCH	45	49	94

¹As of April 1988 - permits for some applications submitted in 1987 had not been issued.

TABLE II
THE STATUS OF APPEALED 1987 PESTICIDE USE PERMITS
AS DETERMINED BY THE B.C. ENVIRONMENTAL APPEAL BOARD

	B.C. FOREST SERVICE	FOREST INDUSTRY	TOTAL
PERMITS APPEALED	21	6	27
APPEALED PERMITS CANCELLED/REVOKED	1 ¹	0	1
APPEALED PERMITS AMENDED	1	1	2
APPEALED PERMITS SUPPORTED	11	3	14
APPEALS WITHDRAWN	6	2	8
DECISION PENDING	2	0	2

¹ Permit was cancelled prior to appeal hearing.

TABLE III PROVINCIAL SUMMARY OF AREA (ha)
TREATED AND ACTIVE INGREDIENT (kg a.i.) USED
BY PESTICIDE, 1987¹.

PESTICIDE	B.C. FOREST SERVICE		FORESTRY INDUSTRY	
	ha treated	kg a.i. applied	ha treated	kg a.i. applied
acephate	21.0	5.0		
asulam	4.0	5.0		
B.t. ²			214.0	520.0 ⁴
carbaryl	0.5	6.0	64.0	170.0
denatonium B ³	1.0	0.003		
dimethoate	0.006	0.06		
ferbam	0.01	0.1		
glyphosate	13392.0	20443.0	23279.0	21906.0
hexazinone	186.0	552.0	1022.0	3003.0
lactofen	0.005	0.01		
maneb	0.004	0.03		

TABLE III PROVINCIAL SUMMARY OF AREA (ha)
TREATED AND ACTIVE INGREDIENT (kg a.i.) USED
BY PESTICIDE, 1987¹.

PESTICIDE	B.C. FOREST SERVICE		FORESTRY INDUSTRY	
	ha treated	kg a.i. applied	ha treated	kg a.i. applied
metalaxyl	0.2	0.2		
metsulfuron	0.05	0.006		
MSMA	115.0	214.0	5.0	24.0
oxydemeton	0.006	0.2		
oxydiazon	0.004	0.02		
oxyfluorfen	0.01	0.006		
permethrin	0.01	0.002		
picloram	1055.0	601.0	1.0	5.0
putrescent egg solids			23.0	4.0
simazine	0.004	0.03		
sulfometuron	0.04	0.04		
thiram	0.004	0.03		
triadimefon	0.006	0.02		
triclopyr	0.4	1.0	1.0	2.0
2,4-D	1076.0	1362.0	2488.0	3422.0

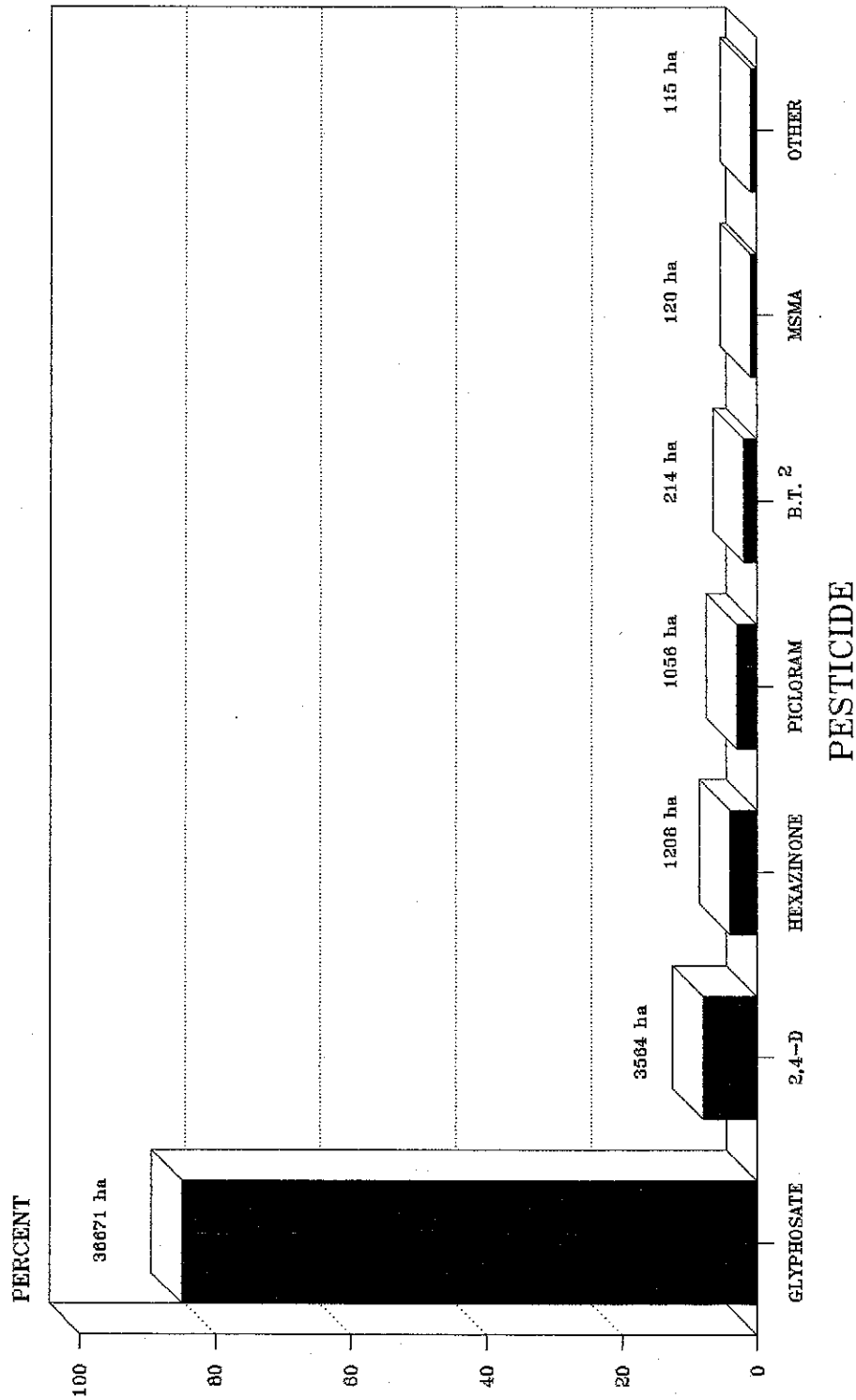
¹ Data presented includes pesticides applied to rangeland administered by the B.C. Forest Service.

² Bacillus thuringiensis.

³ denatonium benzoate

⁴ Approximately 6432 BIU (Billion International Units) of B.t. in a solution of approximately 520 litres.

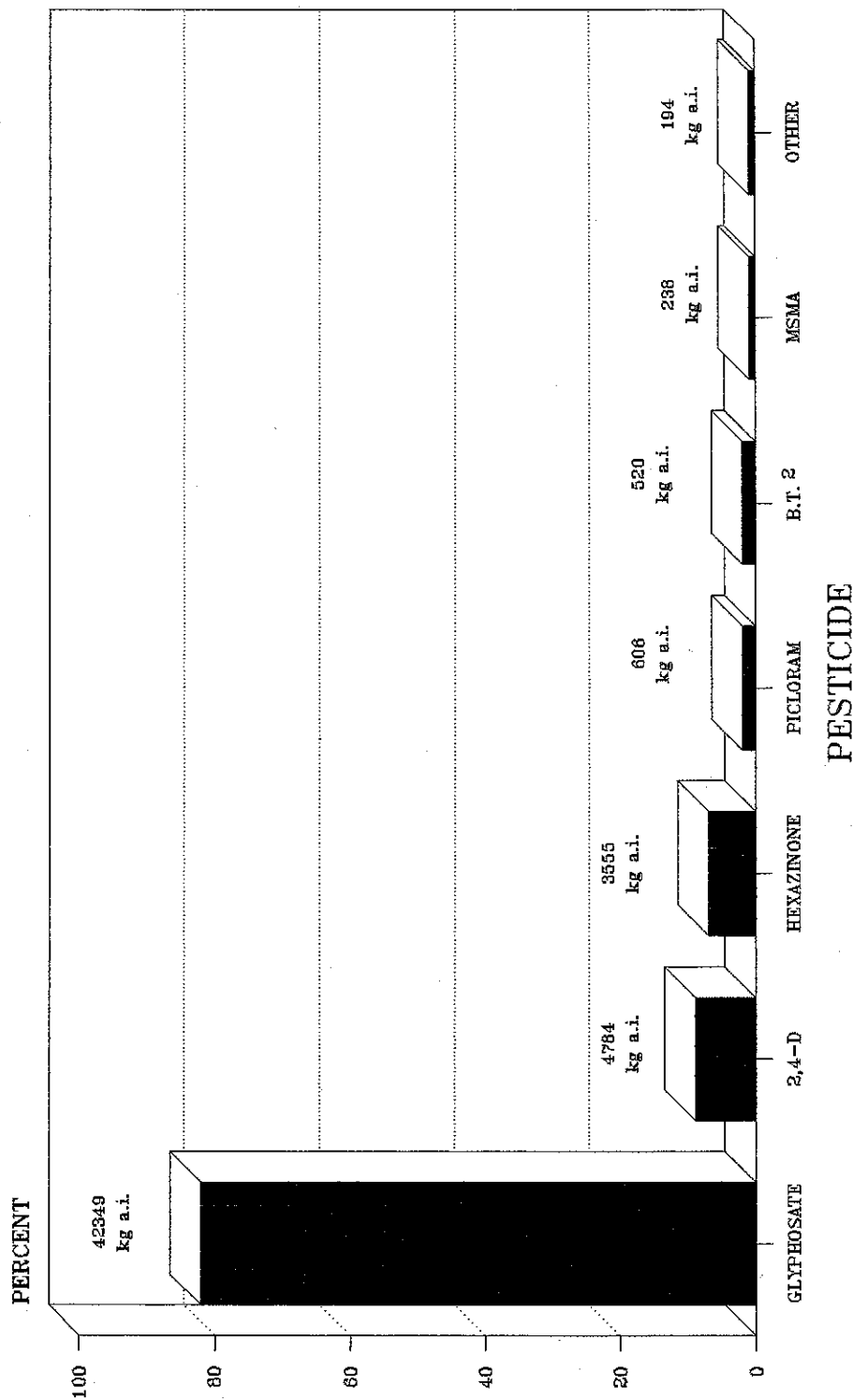
PESTICIDE USE IN PERCENT (ha) TREATED, 1987 ¹



1 B.C.FOREST SERVICE IND. COMBINED

2 BACILLUS THURINGIENSIS

PESTICIDE USE IN PERCENT ACTIVE INGREDIENT (kg. ai.) APPLIED 1987 1



Series 1

1 B.C. FOREST SERVICE & IND. COMBINED

2 BACILLUS THURINGIENSIS

TABLE IV REGIONAL SUMMARY OF AREA (ha) TREATED
BY PESTICIDE, 1987

BCFS AND FOREST INDUSTRY

FOREST REGION	glyphosate	2,4-D	hexazone	picloram	Other	Totals	%
VANCOUVER	10498.0	3546.0	4.0	1.0	43.0	14092.0	33.0
PR. RUPERT	6159.0		219.0		30.0	6408.0	15.0
PR. GEORGE	15574.0		841.0	50.0	0.1	16465.0	38.0
KAMLOOPS	3167.0	0.5	6.0	728.0	368.0	4270.0	10.0
NELSON	983.0	16.0	5.0	207.0	8.0	1219.0	3.0
CARIBOO	289.0	1.0	134.0	70.0	0.4	494.0	1.0
TOTALS	36670.0	3564.0	1209.0	1056.0	450.0	42948.0	100.0
(%)	85.4	8.3	2.8	2.5	1.0	100.0	

TABLE V REGIONAL SUMMARY OF AREA (ha) TREATED
BY CONTROL PURPOSE, 1987

BCFS AND FOREST INDUSTRY

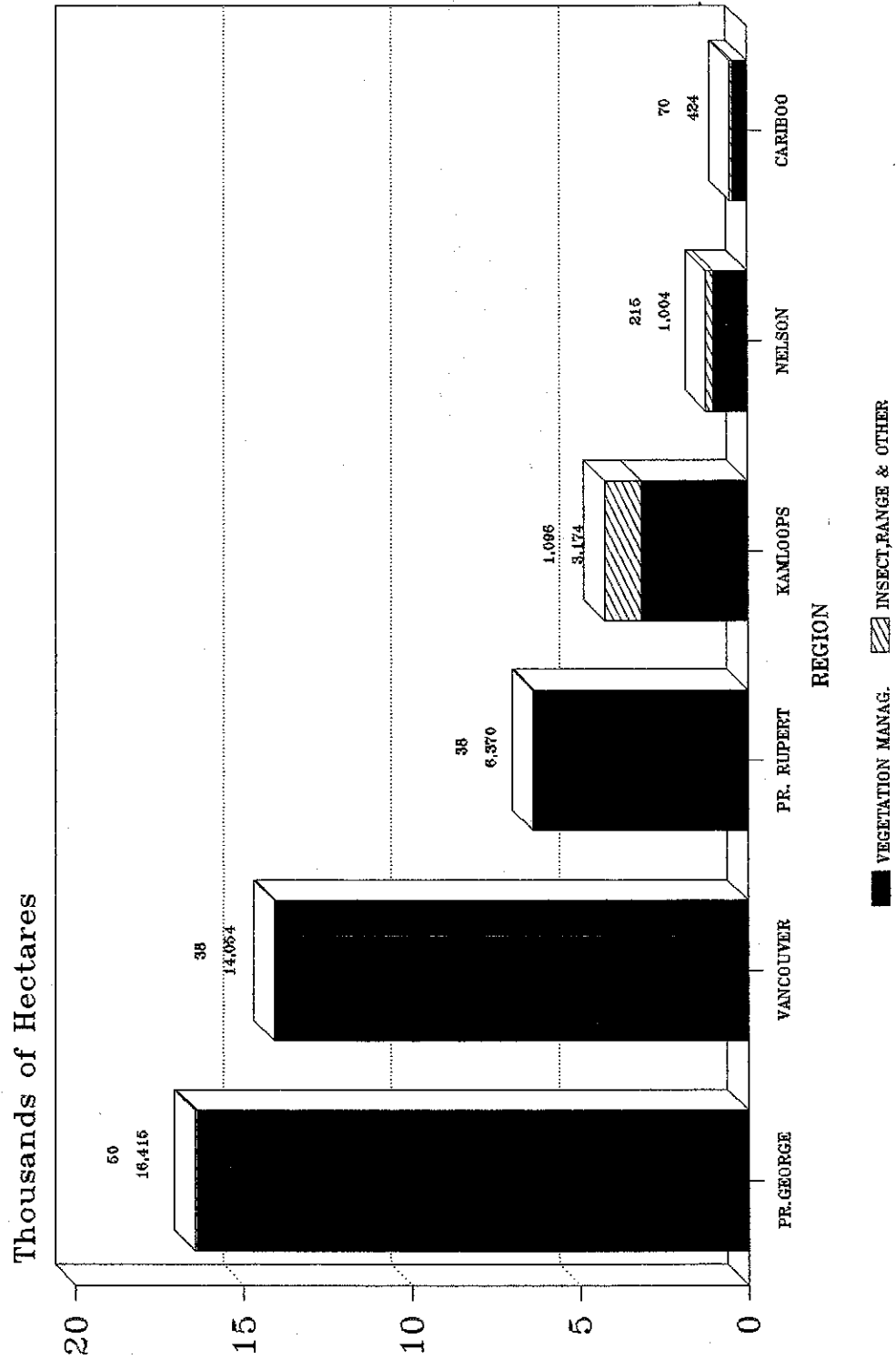
FOREST REGION	VEGETATION MANAGEMENT	INSECT MANAGEMENT	RANGE MANAGEMENT	OTHERS	TOTALS
VANCOUVER	14054.0	14.0	0.0	24.0	14092.0
PR. RUPERT	6370.0	30.0	0.0	8.0	6408.0
PR. GEORGE	16415.0	0.0	50.0	0.1	16465.0
KAMLOOPS	3174.0	368.0	728.0	0.0	4270.0
NELSON	1004.0	8.0	207.0	0.0	1219.0
CARIBOO	424.0	0.4	70.0	0.0	494.0
TOTALS	41441.0	420.0	1055.0	32.0	42948.0
(%)	96.5	1.0	2.4	0.1	100.0

TABLE VI REGIONAL SUMMARY OF AREA (ha)
TREATED BY METHOD OF APPLICATION, 1987

BCFS AND FOREST INDUSTRY

FOREST REGION	AERIAL SPRAY	GROUND APPLICATION	STEM INJECTION	TOTALS
VANCOUVER	3454.0	3310.0	7328.0	14092.0
PR. RUPERT	4751.0	1537.0	120.0	6408.0
PR. GEORGE	6673.0	1978.0	7815.0	16466.0
KAMLOOPS	1670.0	1940.0	660.0	4270.0
NELSON	495.0	326.0	398.0	1219.0
CARIBOO	0.0	212.0	282.0	494.0
TOTALS	17043.0	9303.0	16603.0	42949.0
(%)	40.0	21.0	39.0	100.0

AREA TREATED WITH PESTICIDES PROV. SUMMARY BY FOREST REGION 1987



1 B.C. FOREST SERVICE IND. COMBINED

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2)

FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	641.0	asulam		4.0	
		glyphosate	312.0	152.0	
		lactofen		0.005	
		metsulfuron		0.05	
		triclopyr		0.2	
		2,4-D	70.0	102.0	0.4
Conifer Release	877.0	glyphosate	90.0		327.0
		2,4-D	22.0	13.0	425.0
Site Preparation	937.0	glyphosate	341.0	169.0	
		2,4-D			427.0
Site Rehabilitation	60.0	glyphosate	59.0	0.5	
Nursery Fungus	0.01	maneb		0.004	
		oxidiazon		0.004	
		simazine		0.004	
		thiram		0.004	
Nursery Insect	0.01	acephate		0.006	
		dimethoate		0.006	
		oxydemetonmethyl		0.006	
Nursery Weed	0.01	oxyfluorfen		0.01	
Vertebrate Control	1.0	denatonium B ¹		1.0	
Weed Seed Tree	30.0	glyphosate	30.0		
Sub-totals	2546.0		924.0	442.0	1179.0

¹denatonium benzoate

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>FOREST INDUSTRY:</u>					
Brushing	4980.0	glyphosate hexazinone 2,4-D triclopyr	1091.0	604.0 4.0 0.5	3260.0 20.0
Conifer Release	4616.0	glyphosate 2,4-D	943.0	899.0 226.0	1033.0 1515.0
Pre-harvest Brushing	3.0	glyphosate			3.0
Site Preparation	559.0	glyphosate	482.0	77.0	
Insect Control	14.0	B.t. ¹	14.0		
Right-Of-Way	1086.0	glyphosate picloram 2,4-D		443.0 1.0 579.0	63.0
Vertebrate Control	23.0	putrescent egg solids		23.0	
Weed Seed Tree	266.0	glyphosate 2,4-D		11.0	171.0 84.0
Sub-totals	11547.0		2530.0	2868.0	6149.0
Totals	14093.0		3454.0	3310.0	7328.0

¹Bacillus thuringiensis

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Chilliwack (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	78.0	glyphosate	78.0		
Conifer Release	60.0	glyphosate	60.0		
Site Preparation	315.0	glyphosate	315.0		
Site Rehabilitation	59.0	glyphosate	59.0		
<hr/>					
Sub-totals	512.0		512.0		
<hr/>					
<u>FOREST INDUSTRY:</u>					
Brushing	40.0	glyphosate	30.0	10.0	
Conifer Release	49.0	glyphosate	49.0		
Pre-harvest Brushing	3.0	glyphosate			3.0
Site Preparation	370.0	glyphosate	366.0	4.0	
<hr/>					
Sub-totals	462.0		445.0	14.0	3.0
<hr/>					
Totals	974.0		957.0	14.0	3.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Maple Ridge (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	0.005	lactofen		0.005	
Conifer Release	10.0	2,4-D glyphosate			8.0 2.0
Nursery Fungus	0.02	maneb oxidiazon simazine thiram		0.004 0.004 0.004 0.004	
Nursery Weed	0.01	oxyflurofen		0.01	
Sub-Totals	10.0			0.03	10.0
<u>Forest Industry:</u>					
Conifer Thinning	0.5	glyphosate			0.5
Insect Control	14.0	B.t. ¹	14.0		
Site Preparation	3.0	glyphosate	3.0		
Sub-Totals	18.0		17.0		0.5
Totals	28.0		17.0		11.0

¹ Bacillus thuringiensis

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Squamish (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	16.0	glyphosate		16.0	
Range Management	0.2	glyphosate		0.2	
Site Preparation	20.0	glyphosate		20.0	
Sub-totals	36.0			36.0	
<u>FOREST INDUSTRY:</u>					
Brushing	72.0	glyphosate		70.0	2.0
Conifer Release	546.0	glyphosate	546.0		
Right-of-Way	49.0	glyphosate		49.0	
Sub-totals	667.0		546.0	119.0	2.0
Totals	703.0		546.0	155.0	2.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Sechelt (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	146.0	glyphosate	66.0	80.0	
Site Preparation	70.0	glyphosate	16.0	54.0	
Sub-totals	216.0		82.0	134.0	
<u>FORESTRY INDUSTRY:</u>					
Brushing	146.0	glyphosate	22.0	124.0	
Conifer Release	50.0	glyphosate	50.0		
Site Preparation	44.0	glyphosate	44.0		
Sub-totals	240.0		116.0	124.0	
Totals	456.0		198.0	258.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Powell River (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	2.0	glyphosate		2.0	
Conifer Release	149.0	glyphosate	20.0		129.0
Vertebrate Control	1.0	denatonium B ¹		1.0	
Totals	152.0		20.0	3.0	129.0
<u>FOREST INDUSTRY:</u>					
Brushing	30.0	glyphosate		30.0	
Site Preparation	1.0	glyphosate		1.0	
Sub-totals	31.0			31.0	
Totals	183.0		20.0	34.0	129.0

¹denatonium benzoate

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Duncan (06)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	112.0	2,4-D glyphosate	30.0 70.0	12.0	
Nursery Insect	0.02	acephate dimethoate oxydemeton		0.006 0.006 0.006	
<hr/>					
Sub-totals		112.0	100.0	12.0	
<hr/>					
<u>FOREST INDUSTRY:</u>					
Brushing	116.0	glyphosate hexazinone	26.0	37.0 4.0	49.0
Conifer Release	1004.0	2,4-D glyphosate		14.0	734.0 256.0
Right-Of-Way	488.0	2,4-D glyphosate picloram		420.0 67.0 1.0	
Site Preparation	36.0	glyphosate	28.0	8.0	
Weed Seed Tree	11.0	glyphosate		11.0	
Vertebrate Control	5.0	putrescent egg solids		5.0	
<hr/>					
Sub-totals	1660.0		54.0	567.0	1039.0
<hr/>					
Totals	1772.0		154.0	579.0	1039.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Port Alberni (07)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	8.0	asulam glyphosate metsulfuron triclopyr		4.0 4.0 0.05 0.1	
Site Preparation	95.0	glyphosate		95.0	
Site Rehabilitation	0.5	glyphosate		0.5	
Sub-totals	104.0			104.0	
<u>FOREST INDUSTRY:</u>					
Brushing	332.0	2,4-D glyphosate triclopyr		0.1 0.3	6.0 326.0
Conifer Release	448.0	2,4-D glyphosate		190.0	54.0 204.0
Vertebrate Control	12.0	putrescent egg solids		12.0	
Sub-totals	792.0			202.0	590.0
Totals	896.0			306.0	590.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Campbell River (08)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	66.0	2,4-D glyphosate triclopyr		38.0 28.0 0.1	0.4
Conifer Release	324.0	2,4-D glyphosate	22.0 10.0	13.0	279.0
Site Preparation	437.0	2,4-D glyphosate	10.0		427.0
Weed Seed Tree	30.0	glyphosate	30.0		
Sub-totals	857.0		72.0	79.0	706.0
<u>FOREST INDUSTRY:</u>					
Brushing	1070.0	2,4-D glyphosate	834.0	173.0	14.0 49.0
Conifer Release	1240.0	2,4-D glyphosate	16.0	226.0 358.0	302.0 338.0
Right-of-Way	127.0	2,4-D glyphosate		12.0 115.0	
Site Preparation	64.0	glyphosate		64.0	
Weed Seed Tree	255.0	2,4-D glyphosate			84.0 171.0
Vertebrate Control	2.0	putrescent egg solids		2.0	
Sub-totals	2758.0		850.0	950.0	958.0
Totals	3615.0		922.0	1029.0	1664.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Port McNeill (09)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	74.0	2,4-D glyphosate		64.0 10.0	
Conifer Release	310.0	2,4-D glyphosate			138.0 172.0
Sub-totals	384.0			74.0	310.0
<u>FOREST INDUSTRY:</u>					
Brushing	3042.0	2,4-D glyphosate hexazinone triclopyr	47.0	160.0 0.2 0.2	0.2 2834.0
Conifer Release	294.0	glyphosate	45.0	249.0	
Right-Of-Way	325.0	2,4-D glyphosate		147.0 178.0	
Site Preparation	41.0	glyphosate	41.0		
Sub-totals	3702.0		133.0	734.0	2834.0
Totals	4086.0		133.0	808.0	3144.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Mid Coast (10)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	138.0	glyphosate	138.0		
Conifer Release	24.0	glyphosate			24.0
Sub-totals	162.0		138.0		24.0
<u>FOREST INDUSTRY:</u>					
Brushing	132.0	glyphosate	132.0		
Conifer Release	325.0	glyphosate	237.0	88.0	
Right-of-Way	8.0	glyphosate		8.0	
Sub-totals	465.0		369.0	96.0	
Totals	627.0		507.0	96.0	24.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Queen Charlotte
Islands (11)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>FOREST INDUSTRY:</u>					
Conifer Release	661.0	2,4-D glyphosate			425.0 236.0
Right-of-Way	89.0	2,4-D glyphosate		26.0	63.0
Vertebrate Control	4.0	putrescent egg solids		4.0	
Totals	754.0			30.0	724.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	1944.0	glyphosate hexazinone	985.0	826.0 51.0	82.0
Conifer Release	716.0	glyphosate	618.0	98.0	
Site Preparation	2769.0	glyphosate	2655.0	114.0	
Fungus Control	8.0	glyphosate			8.0
Insect Control	30.0	MSMA			30.0
Sub-totals	5467.0		4258.0	1089.0	120.0
<u>FOREST INDUSTRY:</u>					
Brushing	774.0	glyphosate hexazinone	493.0	280.0 1.0	
Conifer Release	59.0	hexazinone		59.0	
Site Preparation	108.0	hexazinone		108.0	
Sub-totals	941.0		493.0	448.0	
Totals	6408.0		4751.0	1537.0	120.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Lakes (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	326.0	glyphosate	326.0		
Fungus Control	8.0	glyphosate			8.0
Insect Control	17.0	MSMA			17.0
Site Preparation	199.0	glyphosate	199.0		
Sub-totals	550.0		525.0		25.0
<u>FOREST INDUSTRY:</u>					
Site Preparation	108.0	hexazinone		108.0	
Sub-totals	108.0			108.0	
Totals	658.0		525.0	108.0	25.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Morice (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	9.0	glyphosate hexazinone		2.0 7.0	
Conifer Release	58.0	glyphosate	58.0		
Insect Control	13.0	MSMA			13.0
Site Preparation	15.0	glyphosate		15.0	
Totals	95.0		58.0	24.0	13.0
<u>FOREST INDUSTRY:</u>					
Brushing	632.0	glyphosate hexazinone	351.0	280.0 1.0	
Conifer Release	59.0	hexazinone		59.0	
Sub-totals	691.0		351.0	340.0	
Totals	786.0		409.0	364.0	13.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Bulkley (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	140.0	glyphosate hexazinone	94.0	2.0 44.0	
Conifer Release	8.0	glyphosate		8.0	
Site Preparation	2375.0	glyphosate	2370.0	5.0	
Sub-totals	2523.0		2464.0	59.0	
<u>FOREST INDUSTRY:</u>					
Brushing	142.0	glyphosate	142.0		
Sub-totals	142.0		142.0		
Totals	2665.0		2606.0	59.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Kispiox (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	1795.0	glyphosate	891.0	822.0	82.0
Conifer Release	234.0	glyphosate	234.0		
Site Preparation	180.0	glyphosate	86.0	94.0	
Totals	2209.0		1211.0	916.0	82.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Kałum (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			<u>AERIAL SPRAY</u>	<u>GROUND APPLIC.</u>	<u>STEM INJECTION</u>
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	64.0	glyphosate		64.0	
Totals	64.0			64.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: North Coast (08)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	26.0	glyphosate		26.0	
Totals	26.0			26.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	1566.0	glyphosate hexazinone sulfometuron	1267.0	299.0 0.5 0.04	
Conifer Release	309.0	glyphosate	110.0	150.0	49.0
Pre-harvest Brushing	669.0	glyphosate			669.0
Range Management	50.0	picloram		50.0	
Site Preparation	287.0	glyphosate hexazinone	126.0	43.0 90.0	28.0
Nursery Fungus	0.1	metalaxy1		0.1	
Sub-totals	2881.0		1503.0	633.0	746.0
<u>FOREST INDUSTRY:</u>					
Brushing	5127.0	glyphosate hexazinone	4259.0	217.0 64.0	587.0
Conifer Release	995.0	glyphosate	731.0	112.0	152.0
Pre-harvest Brushing	2834.0	glyphosate			2834.0
Site Preparation	3574.0	glyphosate hexazinone	180.0	266.0 46.0	3082.0
Weed Seed Tree	1053.0	glyphosate hexazinone		640.0	413.0
Conifer Thinning	1.0	glyphosate hexazinone			0.5 0.2
Subtotals	13584.0		5170.0	1345.0	7069.0
Totals	16465.0		6673.0	1978.0	7815.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Prince George West (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	556.0	glyphosate	407.0	149.0	
Insect Control	0.004	MSMA			0.004
Pre-harvest Brushing	669.0	glyphosate			669.0
Range Management	0.5	picloram		0.5	
Site Preparation	162.0	glyphosate hexazinone	72.0	90.0	
Sub-totals	1388.0		479.0	240.0	669.0
<u>FOREST INDUSTRY:</u>					
Conifer Release	360.0	glyphosate	360.0		
Pre-harvest Brushing	1189.0	glyphosate			1189.0
Site Preparation	18.0	glyphosate		18.0	
Weed Seed Tree	1053.0	glyphosate hexazinone		640.0	413.0
Sub-totals	2620.0		360.0	658.0	1602.0
Totals	4008.0		839.0	898.0	2271.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Prince George East (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	370.0	glyphosate	370.0		
Conifer Release	49.0	glyphosate			49.0
Nursery Fungus	0.1	metalaxyl		0.1	
Range Management	12.0	picloram		12.0	
Site Preparation	28.0	glyphosate			28.0
Sub-totals	459.0		370.0	12.0	77.0
<u>FOREST INDUSTRY:</u>					
Brushing	3284.0	glyphosate	3118.0	166.0	
Conifer Release	88.0	glyphosate	88.0		
Sub-totals	3372.0		3206.0	166.0	
Totals	3831.0		3576.0	178.0	77.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: McBride (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	74.0	glyphosate	74.0		
Range Management	3.0	picloram		3.0	
Site Preparation	54.0	glyphosate	54.0		
Totals	131.0		128.0	3.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Vanderhoof (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Range Management	1.0	picloram		1.0	
Sub-totals	1.0				
<u>FOREST INDUSTRY:</u>					
Brushing	391.0	glyphosate			391.0
Pre-harvest Brushing	286.0	glyphosate			286.0
Site Preparation	593.0	glyphosate		248.0	345.0
Sub-totals	1270.0				
Totals	1271.0			249.0	1022.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Fort St. James (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	150.0	glyphosate		150.0	
Totals	150.0			150.0	
<u>FOREST INDUSTRY:</u>					
Pre-harvest Brushing	1359.0	glyphosate			1359.0
Site Preparation	26.0	hexazinone		26.0	
Sub-totals	1385.0			26.0	1359.0
Totals	1535.0			176.0	1359.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: McKenzie (06)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	98.0	glyphosate		98.0	
Sub-totals	98.0			98.0	
<u>FOREST INDUSTRY:</u>					
Brushing	540.0	glyphosate hexazinone	438.0	64.0	38.0
Conifer Release	507.0	glyphosate	283.0	72.0	152.0
Conifer Thinning	1.0	glyphosate hexazinone			0.5 0.2
Site Preparation	2937.0	glyphosate hexazinone	180.0	20.0	2737.0
Sub-totals	3985.0		902.0	156.0	2928.0
Totals	4083.0		902.0	254.0	2928.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Dawson Creek (07)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	33.0	glyphosate		33.0	
Conifer Release	110.0	glyphosate	110.0		
Range Management	19.0	picloram		19.0	
Sub-totals	162.0		110.0	52.0	
<u>FOREST INDUSTRY:</u>					
Brushing	51.0	glyphosate		51.0	
Conifer Release	40.0	glyphosate		40.0	
Sub-totals	91.0			91.0	
Totals	253.0		110.0	143.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Fort St. John (08)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	435.0	glyphosate hexazinone sulfometuron	416.0	19.0 0.5 0.04	
Range Management	17.0	picloram		17.0	
Site Preparation	43.0	glyphosate		43.0	
Sub-totals	495.0		416.0	78.0	
<u>FOREST INDUSTRY:</u>					
Brushing	861.0	glyphosate	703.0		158.0
Sub-totals	861.0		703.0		158.0
Totals	1356.0		1119.0	78.0	158.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5)

FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C FOREST SERVICE:</u>					
Brushing	1188.0	glyphosate	360.0	828.0	
Conifer Release	1332.0	2,4-D glyphosate hexazinone	1046.0	0.5 279.0 6.0	
Insect Control	102.0	acephate carbaryl metalaxyl MSMA		21.0 0.5 0.05 54.0	26.0
Nursery Insect	0.01	permethrin		0.01	
Pre-harvest Brushing	12.0	glyphosate			12.0
Range Management	728.0	picloram		728.0	
Seed and Cone	0.01	ferbam triadimefon		0.01 0.006	
Site Preparation	36.0	glyphosate triclopyr		21.0 0.2	15.0
Weed Seed Tree	228.0	glyphosate			228.0
Sub-totals	3626.0		1406.0	1938.0	281.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5)

FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>FOREST INDUSTRY:</u>					
Brushing	159.0	glyphosate			159.0
Conifer Release	219.0	glyphosate			219.0
Insect Control	266.0	B.t. ¹ carbaryl MSMA	200.0 64.0	0.5 1.0	1.0
Site Preparatation	0.2	glyphosate hexazinone		0.1 0.1	
Sub-totals	644.0		264.0	2.0	379.0
Totals	4270.0		1670.0	1940.0	660.0

¹Bacillus thuringiensis

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5)

FOREST DISTRICT: Clearwater (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	184.0	glyphosate		184.0	
Pre-harvest Brushing	12.0	glyphosate			12.0
Site Preparation	15.0	glyphosate triclopyr		0.2	15.0
Range Management	99.0	picloram		99.0	
Totals	310.0			283.0	27.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5)

FOREST DISTRICT: Kamloops (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	28.0	glyphosate	27.0	1.0	
Conifer Release	7.0	2,4-D glyphosate hexazinone		0.5 0.05 6.0	
Insect Control	2.0	MSMA			2.0
Range Management	99.0	picloram		99.0	
Site Preparation	21.0	glyphosate		21.0	
Weed Seed Tree	106.0	glyphosate			106.0
Sub-totals	263.0		27.0	128.0	108.0
<u>FOREST INDUSTRY:</u>					
Insect Control	201.0	B.t. ¹ MSMA	200.0		1.0
Sub-totals	201.0		200.0		1.0
Totals	464.0		227.0	128.0	109.0

¹Bacillus thuringiensis

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5)

FOREST DISTRICT: Salmon Arm (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	377.0	glyphosate	129.0	248.0	
Conifer Release	42.0	glyphosate	42.0	0.3	
Insect Control	0.1	metalaxyl MSMA		0.05	0.06
Nursery Insect	0.01	permethrin		0.01	
Range Management	99.0	picloram		99.0	
Seed and Cone	0.02	ferbam triadimefon		0.01 0.006	
Sub-totals	518.0		171.0	347.0	0.06
<u>FOREST INDUSTRY:</u>					
Brushing	53.0	glyphosate			53.0
Insect Control	64.0	carbaryl	64.0		
Sub-totals	117.0		64.0		53.0
Totals	635.0		235.0	347.0	53.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5)

FOREST DISTRICT: Vernon (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	291.0	glyphosate		291.0	
Conifer Release	19.0	glyphosate		19.0	
Insect Control	28.0	acephate MSMA		21.0	7.0
Weed Seed Tree	70.0	glyphosate			70.0
Range Management	99.0	picloram		99.0	
Sub-totals	507.0			429.0	77.0
<u>FOREST INDUSTRY:</u>					
Brushing	53.0	glyphosate			53.0
Insect Control	2.0	carbaryl MSMA		0.5 1.0	0.3
Sub-totals	55.0			2.0	53.0
Totals	562.0			431.0	130.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5)

FOREST DISTRICT: Penticton (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	102.0	glyphosate	90.0	12.0	
Insect Control	15.0	MSMA			15.0
Range Management	134.0	picloram		134.0	
Weed Seed Tree	52.0	glyphosate			52.0
Sub-totals	303.0		90.0	146.0	67.0
<u>FOREST INDUSTRY:</u>					
Brushing	53.0	glyphosate			53.0
Conifer Release	219.0	glyphosate			219.0
Sub-totals	272.0				272.0
Totals	575.0		90.0	146.0	339.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5)

FOREST DISTRICT: Merritt (06)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	251.0	glyphosate		251.0	
Conifer Release	76.0	glyphosate		76.0	
Insect Control	54.0	carbaryl MSMA		0.5 54.0	
Range Management	99.0	picloram		99.0	
Sub-totals	480.0			480.0	
<u>FOREST INDUSTRY:</u>					
Site Preparation	0.2	glyphosate hexazinone		0.1 0.1	
Sub-totals	0.2			0.2	
Totals	480.0			480.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5)

FOREST DISTRICT: Lillooet (07)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	139.0	glyphosate	114.0	25.0	
Conifer Release	1004.0	glyphosate	1004.0		
Insect Control	2.0	MSMA			2.0
Range Management	99.0	picloram		99.0	
Totals	1244.0		1118.0	124.0	2.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6)

FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	553.0	glyphosate	354.0	36.0	163.0
Conifer Release	22.0	2,4-D glyphosate hexazinone		5.0 5.0	11.0 1.0
Insect Control	5.0	MSMA			5.0
Range Management	207.0	glyphosate picloram		0.1 207.0	
Site Preparation	195.0	glyphosate	122.0	73.0	
Sub-totals	982.0		476.0	326.0	180.0
<u>FOREST INDUSTRY:</u>					
Brushing	36.0	glyphosate			36.0
Conifer Release	198.0	glyphosate	19.0		179.0
Insect Control	3.0	MSMA			3.0
Sub-totals	237.0		19.0		218.0
Totals	1219.0		495.0	326.0	398.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6)

FOREST DISTRICT: Cranbrook (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Range Management	74.0	glyphosate picloram		0.1 74.0	
Sub-totals	74.0			74.0	
<u>FOREST INDUSTRY:</u>					
Insect Control	0.4	MSMA			0.4
Sub-totals	0.4				0.4
Totals	74.0			74.0	0.4

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6)

FOREST DISTRICT: Invermere (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	0.2	glyphosate		0.2	
Conifer Release	1.0	glyphosate			1.0
Insect Control	3.0	MSMA			3.0
Range Management	31.0	picloram		31.0	
Sub-totals	35.0			31.0	4.0
<u>FOREST INDUSTRY:</u>					
Insect Control	0.4	MSMA			0.4
Sub-totals	0.4				0.4
Totals	35.0			31.0	4.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6)

FOREST DISTRICT: Golden (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	5.0	2,4-D		5.0	
Insect Control	0.1	MSMA			0.1
Sub-totals	5.0			5.0	0.1
<u>FOREST INDUSTRY:</u>					
Brushing	36.0	glyphosate			36.0
Conifer Release	179.0	glyphosate			179.0
Insect Control	0.4	MSMA			0.4
Sub-totals	215.0				215.0
Totals	220.0			5.0	215.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6)

FOREST DISTRICT: Revelstoke (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	390.0	glyphosate	354.0	36.0	
Site Preparation	189.0	glyphosate	122.0	67.0	
Sub-totals	579.0		476.0	103.0	
<u>FOREST INDUSTRY:</u>					
Conifer Release	19.0	glyphosate	19.0		
Insect Control	0.4	MSMA			0.4
Sub-totals	19.0		19.0		0.4
Totals	598.0		495.0	103.0	0.4

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6)

FOREST DISTRICT: Arrow (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	5.0	hexazinone		5.0	
Site Preparation	2.0	glyphosate		7.0	
Sub-totals	7.0			7.0	
<u>FOREST INDUSTRY:</u>					
Insect Control	0.4	MSMA			0.4
Sub-totals	0.4				0.4
Totals	7.0			7.0	0.4

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6)

FOREST DISTRICT: Boundary (06)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	163.0	glyphosate			163.0
Insect Control	2.0	MSMA			2.0
Range Management	102.0	picloram		102.0	
Sub-totals	267.0			102.0	165.0
<u>FOREST INDUSTRY:</u>					
Insect Control	0.4	MSMA			0.4
Sub-totals	0.4				0.4
Totals	267.0			102.0	165.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6)

FOREST DISTRICT: Kootenay Lake (07)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	11.0	2,4-D			11.0
Site Preparation	4.0	glyphosate		4.0	
Sub-totals	15.0			4.0	11.0
<u>FOREST INDUSTRY:</u>					
Insect Control	0.4	MSMA			0.4
Sub-totals	0.4				0.4
Totals	15.0			4.0	11.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7)

FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C FOREST SERVICE:</u>					
Brushing	85.0	glyphosate		1.0	84.0
Conifer Release	121.0	glyphosate hexazinone		34.0	87.0
Insect Control	0.4	MSMA			0.4
Range Management	70.0	picloram		70.0	
Site Preparation	68.0	glyphosate			68.0
Site Rehabilitation	6.0	glyphosate		6.0	
Sub-totals	350.0			111.0	239.0
<u>FOREST INDUSTRY:</u>					
Brushing	75.0	2,4-D glyphosate hexazinone		1.0 0.4 31.0	43.0
Conifer Release	65.0	hexazinone		65.0	
Weed Seed Tree	4.0	hexazinone		4.0	
Sub-totals	144.0			101.0	43.0
Totals	494.0			212.0	282.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7)

FOREST DISTRICT: Quesnel (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	34.0	hexazinone		34.0	
Site Rehabilitation	6.0	glyphosate		6.0	
Sub-totals	40.0			40.0	
<u>FOREST INDUSTRY:</u>					
Brushing	75.0	2,4-D		1.0	
		glyphosate		0.4	43.0
		hexazinone		31.0	
Conifer Release	65.0	hexazinone		65.0	
Weed Seed Tree	4.0	hexazinone		4.0	
Sub-totals	144.0			101.0	43.0
Totals	184.0			141.0	43.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7)

FOREST DISTRICT: Williams Lake (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Brushing	85.0	glyphosate		1.0	84.0
Insect Control	0.4	MSMA			0.4
Range Management	70.0	picloram		70.0	
Site Preparation	68.0	glyphosate			68.0
Totals	223.0			71.0	152.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7)

FOREST DISTRICT: Horsefly (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
<u>B.C. FOREST SERVICE:</u>					
Conifer Release	87.0	glyphosate			87.0
Totals	87.0				87.0

TABLE VII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY CONTROL PURPOSE, 1987

PURPOSE	PESTICIDES	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
BRUSHING ¹	asulam	4.0	
	glyphosate	6430.0	13866.0
	hexazinone	52.0	100.0
	lactofen	0.005	
	metsulfuron	0.05	
	sulfometuron	0.04	
	triclopyr	0.2	0.5
	2,4-D	172.0	21.0
CONIFER RELEASE	glyphosate	2855.0	4287.0
	hexazinone	45.0	124.0
	2,4-D	476.0	1741.0
CONIFER THINNING	glyphosate		0.5
	hexazinone		0.2
NURSERY WEED CONTROL	oxyfluorfen	0.01	
RANGE WEED CONTROL	glyphosate	0.1	
	picloram	1055.0	
RIGHT-OF-WAY MAINTENANCE	glyphosate		443.0
	picloram		1.0
	2,4-D		642.0
SITE PREPARATION	glyphosate	3775.0	4087.0
	hexazinone	90.0	154.0
	triclopyr	0.2	
	2,4-D	427.0	
SITE REHABILITATION	glyphosate	66.0	

¹ Includes both pre-harvest and post-harvest treatments

TABLE VII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY CONTROL PURPOSE, 1987

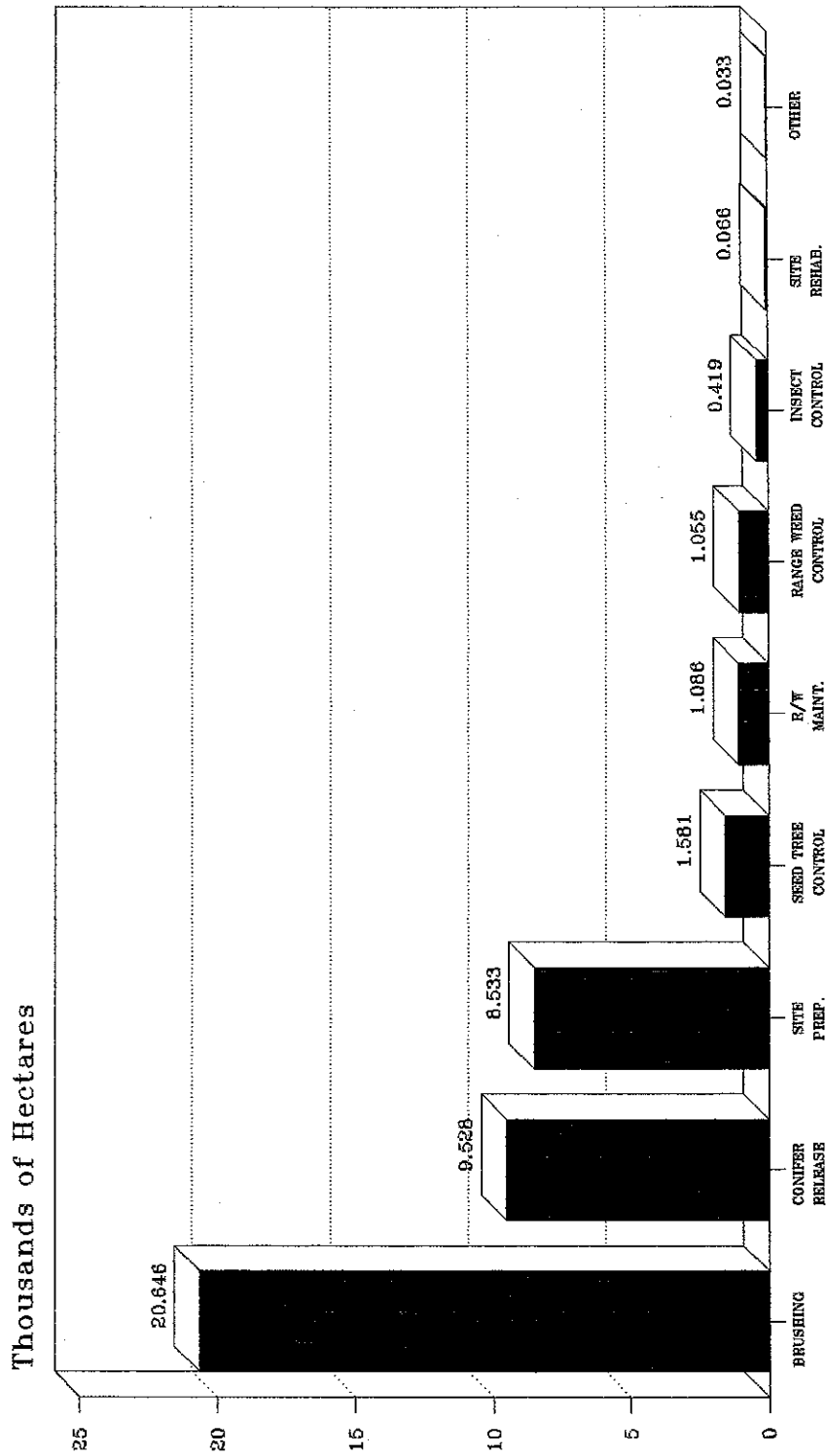
PURPOSE	PESTICIDES	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
WEED SEED TREE CONTROL	glyphosate	258.0	595.0
	hexazinone		644.0
	2,4-D		84.0
FUNGUS CONTROL ²	ferbam	0.01	
	glyphosate	8.0	
	maneb	0.004	
	metalaxyl	0.2	
	oxidiazon	0.004	
	simazine	0.006	
	thiram	0.004	
	triadimefon	0.006	
INSECT CONTROL ²	acephate	21.0	
	B.t. ³		214.0
	carbaryl	0.5	64.0
	dimethoate	0.04	
	glyphosate		0.2
	MSMA	115.0	4.0
	oxydemeton	0.006	
	permethrin	0.01	
VERTEBRATE CONTROL	denatonium B ⁴	1.0	
	putrescent egg solids		23.0

² Includes both forest nursery and forest treatments

³ Bacillus thuringiensis

⁴ denatonium benzoate

PROVINCIAL SUMMARY OF AREA (ha) TREATED WITH PESTICIDES BY CONTROL PURPOSE, 1987¹



PURPOSE

■ Series 1

¹ B.C. FOREST SERVICE & INDUSTRY COMBINED

TABLE VIII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY METHOD OF APPLICATION, 1987

METHOD OF APPLICATION	PESTICIDES USED	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
AERIAL SPRAY HELICOPTER	glyphosate 2,4-D	6068.0 52.0	4377.0
AERIAL SPRAY FIXED WING	B.t. ¹ carbaryl glyphosate	2445.0	214.0 64.0 3823.0
BACKPACK AND HAND HELD SPRAY EQUIPMENT ²	acephate carbaryl denatonium B ³ dimethoate ferbam glyphosate hexazinone lactofen maneb metalaxyl metsulfuron MSMA oxidiazon oxydemeton oxyfluorfen picloram putrescent egg solids simazine sulfometuron thiram triclopyr 2,4-D	20.0 0.5 1.0 0.006 0.006 626.0 187.0 0.005 0.004 0.1 0.05 54.0 0.004 0.006 0.01 1.0 0.004 0.04 0.004 0.4 19.0	0.5 1517.0 938.0 1.0 22.0 1.0 226.0
TREE INJECTION/ CUT SURFACE TREATMENTS ⁴	glyphosate hexazinone MSMA 2,4-D	1821.0 61.0 863.0	12172.0 0.2 4.0 1682.0

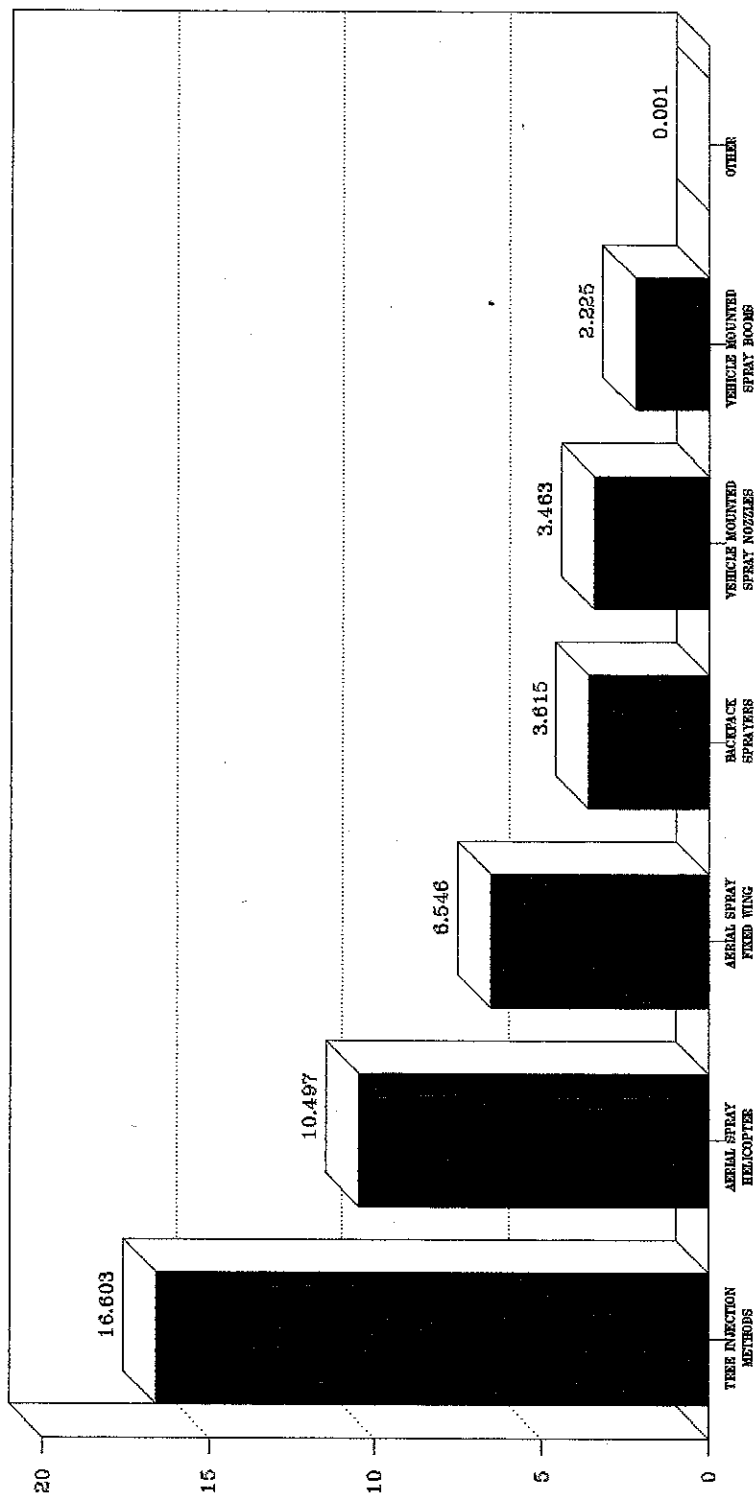
TABLE VIII PROVINCIAL SUMMARY OF AREA (ha)
BY METHOD OF APPLICATION, 1987

METHOD OF APPLICATION	PESTICIDES USED	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
VEHICLE MOUNTED SPRAY BOOMS ⁵	glyphosate	316.0	544.0
	picloram	936.0	
	2,4-D	38.0	391.0
VEHICLE MOUNTED SPRAY NOZZLES ⁶	asulam	4.0	
	ferbam	0.006	
	glyphosate	2141.0	819.0
	hexazinone		84.0
	oxydemeton	0.03	
	permethrin	0.01	
	picloram	122.0	
	triadimefon	0.006	
	2,4-D	76.0	217.0
OTHER	picloram		1.0

- 1 B.t. = Bacillus thuringiensis
- 2 Includes mistblowers, ultra low volume sprayers, spot guns and granule spreaders.
- 3 denatonium benzoate
- 4 Involves hack and squirt, frill and squirt and cut stump treatments. Includes brush saws, lance injectors, and hypo hatchets.
- 5 Any fixed system which involves a boom with one or more nozzles attached to create a continuous broadcast spray. (Source: Pesticide Control Branch).
- 6 Any system which involves tank, hose and nozzle. Nozzle is hand held and can be selectively directed. (Source: Pesticide Control Branch).

PROVINCIAL SUMMARY OF AREA (ha) TREATED WITH PESTICIDES BY METHOD OF APPLICATION, 1987 ¹

Thousands of Hectares



PURPOSE

Series 1

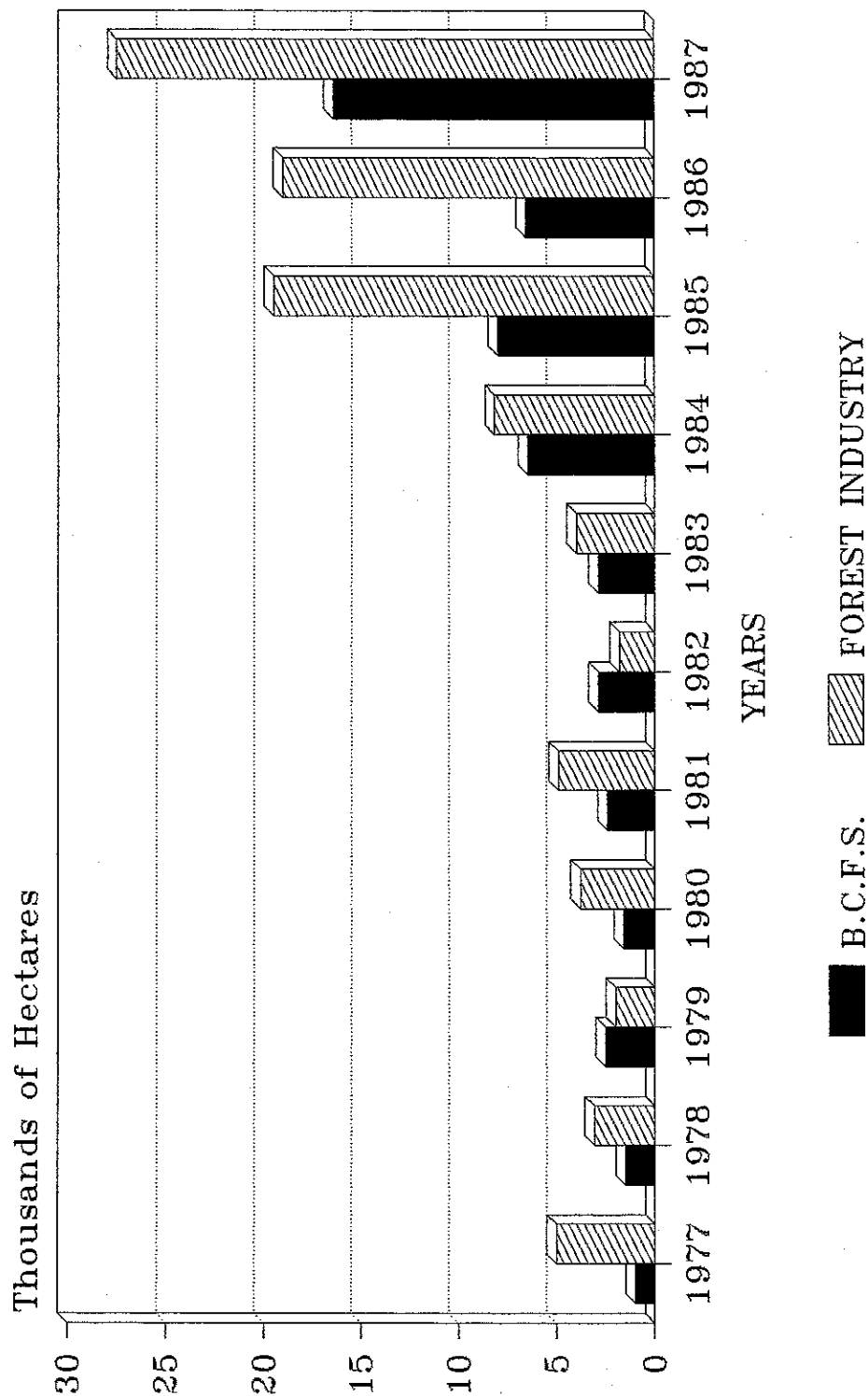
¹ B.C. FOREST SERVICE & INDUSTRY COMBINED

TABLE IX TOTAL AREA (ha) TREATED WITH HERBICIDES AND INSECTICIDES
FOR FORESTRY PURPOSES, 1977 - 1987

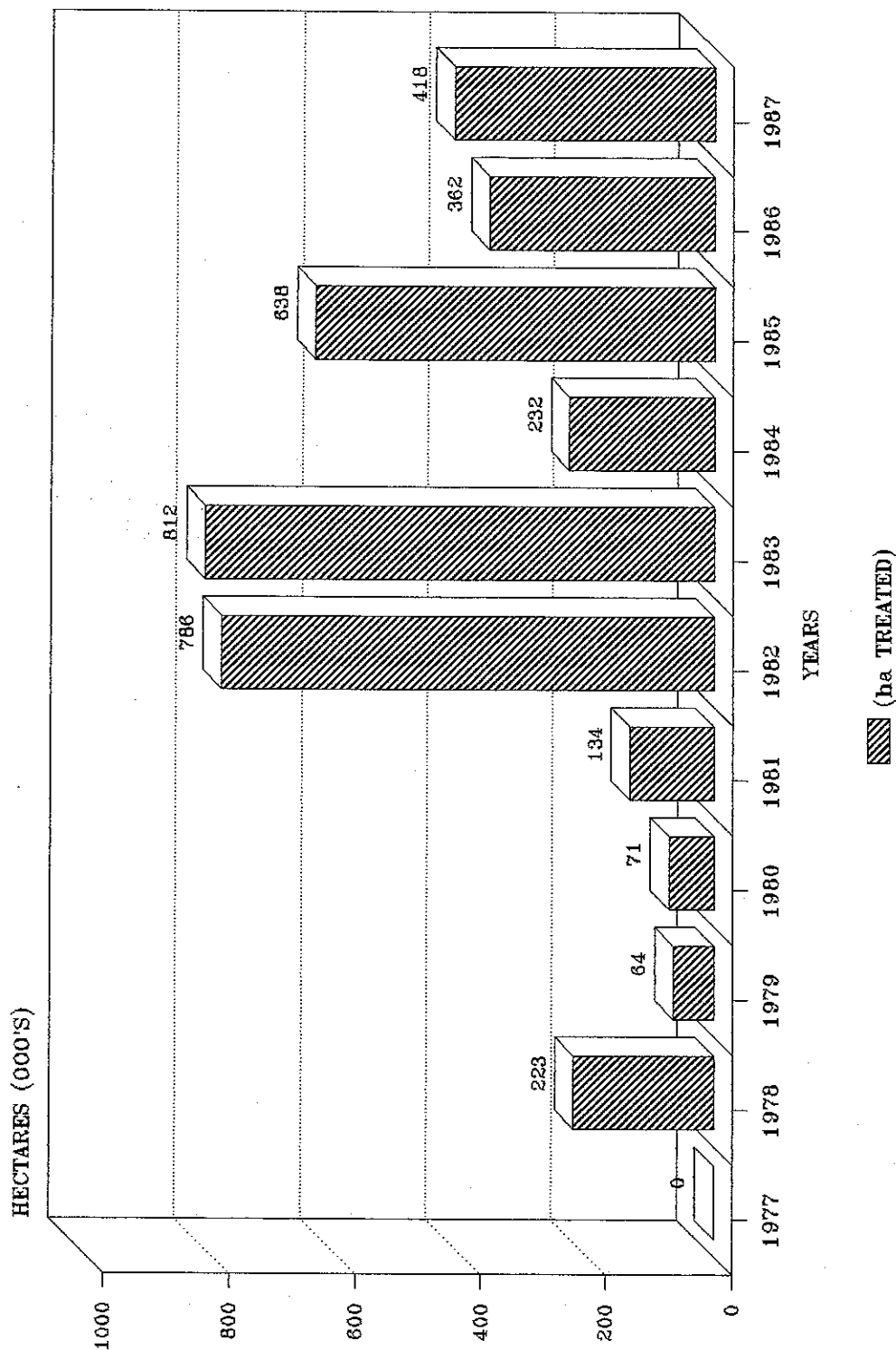
YEAR	B.C. FOREST SERVICE HERB.	INSECT.	FOREST INDUSTRY HERB.	INSECT.	TOTALS HERB.	INSECT.
1977	798.0	0.0	4 899.0	0.0	5 697.0	0.0
1978	1 347.0	223.0	3 065.0	0.0	4 412.0	223.0
1879	2 256.0	64.0	1 840.0	0.0	4 096.0	64.0
1980	1 614.0	1.0	3 412.0	70.0	5 026.0	71.0
1981	2361	134.0	4 232.0	0.4	6 593.0	134.0
1982	2 630.0	786.0	1 636.0	<0.1 ¹	4 266.0	786.0
1983	2 586.0	807.0	3 595.0	5.0	6 181.0	812.0
1984	6 184.0	199.0	7 709.0	33.0	13 893.0	232.0
1985	8 018.0	612.0	19 133.0	26.0	27 151.0	638.0
1986	6 434.0	162.0	18 487.0	200.0	24 921.0	362.0
1987	1 5705.0	136.0	26 791.0	282.0	42 496.0	418.0

¹Area treated was less than 0.1 ha.

AREA TREATED WITH HERBICIDES FOR FORESTRY PURPOSES 1977-1987



AREA TREATED WITH INSECTICIDES FOR FORESTRY PURPOSES 1977-1987¹



¹ B.C. FOREST SERVICE & IND. COMBINED

DISCUSSIONS AND CONCLUSIONS

Forestry pesticide treatments increased by approximately 18 000 hectares (ha) in 1987. Glyphosate was applied to 36 671 ha, an increase of approximately 16 000 ha, from 20 706 ha in 1986. Areas treated with 2,4-D hexazinone and picloram also increased slightly in 1987.

Site preparation and conifer release projects were conducted at approximately the same levels as in 1986. However, brushing projects to enhance crop seedling survival, increased by approximately 14 000 ha.

The use of tree injection or cut surface application methods remained about the same as the previous year. Applications using ground sprayers increased by approximately 5 000 ha. Helicopters and fixed wing aircraft were used to spray approximately 17 000 ha in 1987, as compared to 7 000 in 1986.

Insecticides were used to treat 418 ha in 1987. This area represented mostly Bacillus thuringiensis and carbaryl applications for spruce budworm control, and MSMA and permethrin treatments for, respectively, bark beetle and black army cutworm control.

The B.C. Forest Service and forest industry had both increased their pesticide use operations by approximately 10 000 ha in 1987.

ACKNOWLEDGEMENTS

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