

PESTICIDE USE
IN BRITISH COLUMBIA FORESTRY

1989

by

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FOREWORD

"Pesticide Use in British Columbia, 1989" is the result of a cooperative annual survey project initiated in 1981 by the B.C. Council of Forest Industries, the B.C. Ministry of Forests (Protection Branch) and the B.C. Ministry of Environment (Pesticide Control Branch). Information contained in this report is a yearly reporting requirement, by the Pesticide Control Branch, of all pesticide use permit holders in the province. Pesticide use by the B.C. Forest Service and B.C. forest companies is summarized in this report and represents all pesticide use permits that were active in 1989. Information on hectares treated and kilograms of active ingredient applied is summarized in tables and graphs. Area 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 1979-1989 are also reported.

INTRODUCTION

"Pesticide Use in British Columbia Forestry" is an annual report on forestry pesticide use in the province. Yearly reports were initiated in 1981 through a cooperative project by the B.C. Council of Forest Industries, the B.C. Ministry of Forests (Protection Branch) and the B.C. Ministry of Environment (Pesticide Control Branch).

Since 1983, the Pesticide Control Branch has required all pesticide use permit holders to submit follow-up reports by December 31 of each year summarizing pesticide use in that year. This report was generated from such data, which is presented in tables and graphs and includes the following information:^{1, 2}

1. Numbers of 1989 forestry permit applications submitted; 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.

INTRODUCTION (continued)

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, 1979-1989.

The above information is also divided by the user - i.e., B.C. Forest Service or forest industry.

- 1 This report was based on all follow-up reports received by June, 1989.
- 2 Totals in hectares may differ slightly in each table and graph, because of rounding. Totals in forest regional summaries are slightly lower than provincial summaries because provincial summaries reflect permits that were used to apply pesticides in several regions.

RESULTS OF THE 1989 PESTICIDE USE SURVEY

Pesticide Control Branch reviewed 486 forestry pesticide use permits in 1989. Four hundred and sixty-nine forestry pesticide use permits were issued in 1989 (Table I).

Forty-two permits were appealed in 1989. Environmental Appeal Board decisions on these permit appeals were as follows: 35 supported, 2 amended and 1 cancelled (Table II)..

A total of 59 425 hectares (ha) of B.C. forest and range land were treated with pesticides in 1989. The B.C. forestry service applied pesticides to 17 749 ha (30%) and forest companies applied pesticides to 41 512 ha (70%).

The herbicides glyphosate and 2,4-D were the most heavily used products. Glyphosate was applied to 52 720 ha of forest land, 89% of the total area treated with pesticides in 1989. 2,4-D was applied to 2 761 ha (5%), hexazinone to 1 594 ha (3%) and picloram to 906 ha (1.5%) (Table III, Figure 1).

In terms of weight of active ingredient applied, the breakdown was as follows: glyphosate (91 512 kg a.i., 92%), 2,4-D (3 346 kg a.i., 3%), B.t.k. (1 082 kg a.i., 1%) and picloram (899 kg a.i., 0.9%) (Table III, Figure 2).

Summaries of pesticide use by individual forest regions and districts are shown on pages 15 - 72.

Forestry pesticide use was concentrated mainly in the Prince George, Vancouver and Prince Rupert forest regions, with respectively, 28 016 ha (47%), 14 408 ha (24%) and 7 569 ha (13%) treated (Table IV, Figure 3).

Herbicide applications for the purpose of controlling unwanted vegetation to ensure crop tree survival and enhance growth remained the most common reason for pesticide use.

Herbicides were applied to 6 544 ha to prepare harvested sites for planting, to 9 051 ha for crop growth enhancement and to 38 288 ha to ensure crop establishment. Weed seed control and site rehabilitation operations were conducted on 1 328 ha. Other pesticide uses included insect control (1 300 ha), right-of-way maintenance (670 ha) and fungus, vertebrate pest and nursery weed control (29 ha) (Tables V and VII, Figure 4).

Most forestry pesticide treatments employed fixed-wing aircraft or helicopters. Tree injection methods, involving equipment such as brush saws, lance injectors and hypo hatchets were used to treat 9 610 ha (16%), backpack sprayers and truck mounted sprayers were used to treat 9 257 ha (16%). Aerial pesticide applications were made to 40 434 ha (68%) (Tables VI and VIII, Figure 5).

TABLE I
THE STATUS OF 1989 PESTICIDE USE APPLICATIONS AND PERMITS ISSUED
BY THE PESTICIDE CONTROL BRANCH

	B.C. FOREST SERVICE	FOREST INDUSTRY	TOTAL
APPLICATIONS SUBMITTED	193	293	486
APPLICATIONS WITH- DRAWN OR DENIED	6	10	16
PERMITS ISSUED (TOTAL)	187	282	469
PERMITS CANCELLED REVOKED OR SUSPENDED BY THE PESTICIDE CONTROL BRANCH	0	1	1

TABLE II
THE STATUS OF APPEALED 1989 PESTICIDE USE PERMITS
AS DETERMINED BY THE B.C. ENVIRONMENTAL APPEAL BOARD

	B.C. FOREST SERVICE	FOREST INDUSTRY	TOTAL
PERMITS APPEALED	25	17	42
APPEALED PERMITS CANCELLED/REVOKED	1	0	1
APPEALED PERMITS AMENDED ¹	1	1	2
APPEALED PERMITS SUPPORTED	20	15	35
HEARINGS OR DECISION PENDING	3	1	4

1. Permits extended one year by the Appeal Board are not considered to be amended.

TABLE III PROVINCIAL SUMMARY OF AREA (ha)
TREATED AND ACTIVE INGREDIENT (kg a.i.) USED
BY PESTICIDE, 1989¹

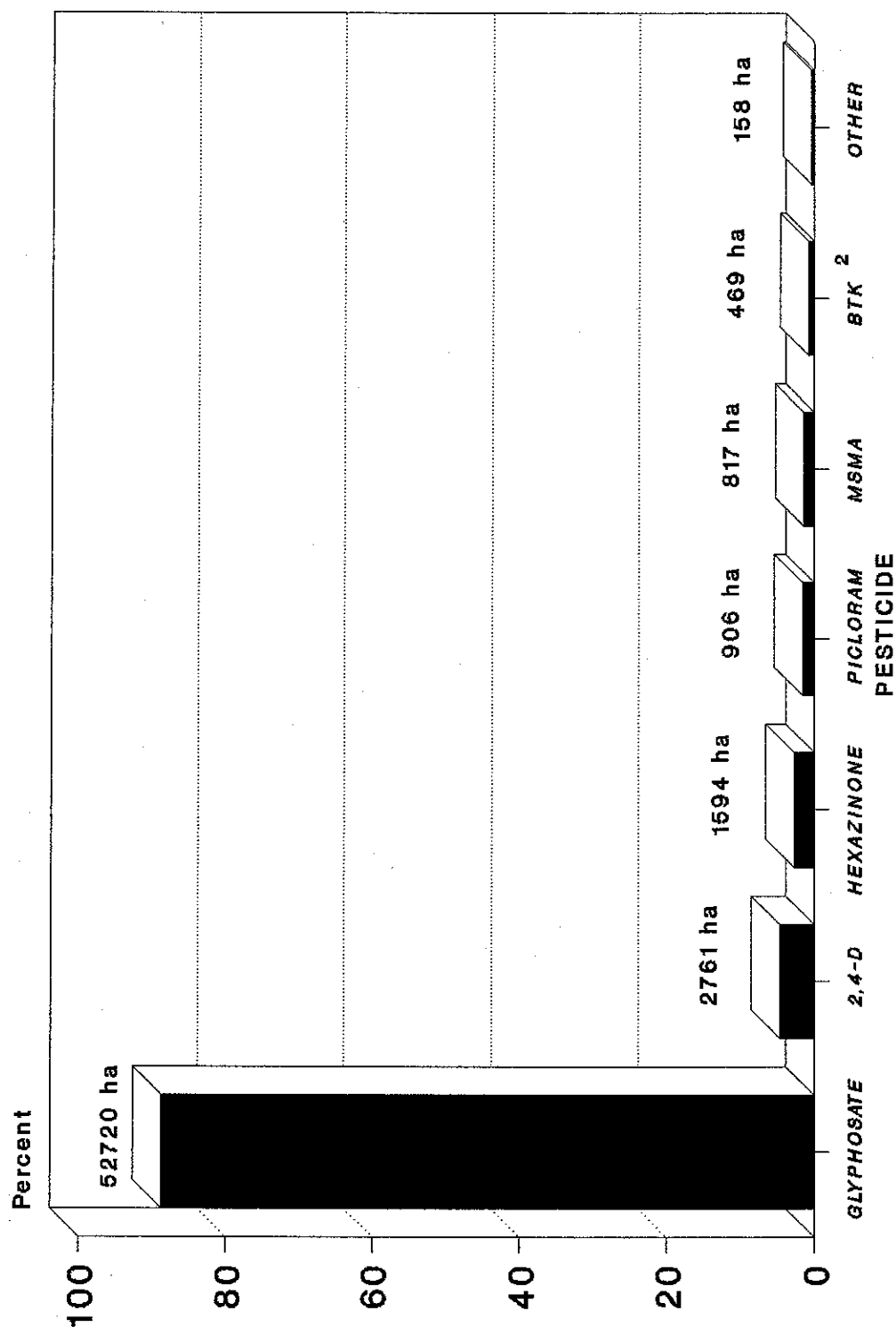
PESTICIDE	B.C. FOREST SERVICE		FORESTRY INDUSTRY	
	ha treated	kg a.i. applied	ha treated	kg a.i. applied
2,4-D amine	805.30	958.48	1730.60	1697.77
2,4-D ester	47.10	114.08	177.80	575.80
acephate ²	13.20	2.88		0.20
B.t.k. ³	350.00	815.00	119.40	267.33
chlorpyrifos	0.40	6.20		
denatonium B ⁴	0.50	3.96	2.58	0.51
dichlorprop	13.00	28.80		
dry peppers			1.08	0.43
glyphosate	15271.05	26248.24	37449.48	65263.24
hexazinone	60.05	15.21	1533.69	785.72
imadazolinon			0.01	1.92
lactofen	0.01			
LI-700 ⁵			0.20	0.64
metalaxyl	1.10	1.49		

TABLE III PROVINCIAL SUMMARY OF AREA (ha)
TREATED AND ACTIVE INGREDIENT (kg a.i.) USED
BY PESTICIDE, 1989

PESTICIDE	B.C. FOREST SERVICE		FORESTRY INDUSTRY	
	ha treated	kg a.i. applied	ha treated	kg a.i. applied
mineral oil	0.45	22.60		
MSMA	201.93	604.46	615.00	91.10
oxydemeton ²	0.05	175.20		0.12
picloram	906.05	899.37		
pinosylvin			13.00	0.16
putrescent egg solids			0.80	0.45
saturated fatty acid			0.05	2.00
simazine			4.30	85.16
synthetic predator odor	1.92	0.87		
triadimefon	0.51	0.02		
triclopyr	99.34	177.56	5.00	8.20

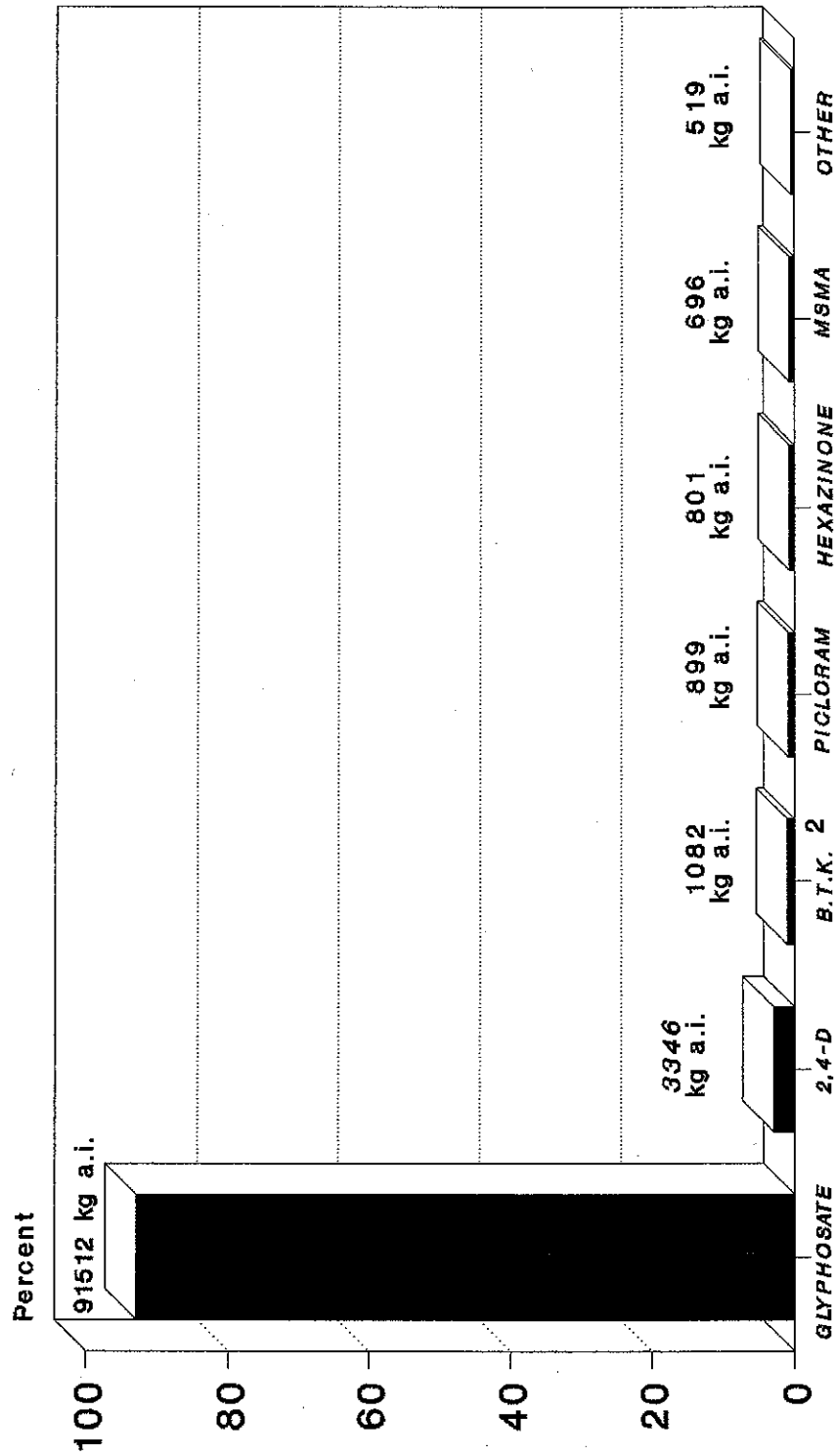
- 1 Totals in this table may not exactly agree with Forest Region and District summaries, as some treatments included here were done in several regions. Data presented includes pesticides applied to rangeland administered by the B.C. Forest Service.
- 2 Area treated was less than 0.1 ha and/or kg active ingredient applied was less than 0.1 kg.
- 3 Bacillus thuringiensis var Kurstaki.
- 4 Denatonium benzoate
- 5 Phosphatidylcholine and methyl acetic acid.

PESTICIDE USE IN PERCENT (ha) TREATED, 1989¹



¹ B.C. Forest Service & Industry Combined ² *Bacillus thuringiensis* var. *kurstaki*

PESTICIDE USE IN PERCENT ACTIVE INGREDIENT (kg a.i.) APPLIED, 1989¹



PESTICIDE

¹ B.C. Forest Service & Industry Combined ² Bacillus thuringiensis var. kurstaki

TABLE IV REGIONAL SUMMARY OF AREA (ha) TREATED
BY PESTICIDE, 1989

BCFS AND FOREST INDUSTRY

FOREST REGION	glyphosate	2,4-D	hexazone	picloram	B.t.	Others	Totals	%
VANCOUVER	11580.78	2583.0	0.0	0.0	119.4	125.0	14408.25	24.3
PR. RUPERT	7561.22	0.0	0.0	0.0	0.0	7.89	7569.11	12.8
PR. GEORGE	26745.23	177.8	891.59	80.95	0.0	120.89	28016.46	47.3
KAMLOOPS	2466.87	0.0	6.0	761.85	350.0	711.17	4295.89	7.2
NELSON	174.89	0.0	0.0	53.2	0.0	8.6	236.69	0.4
CARIBOO	4027.68	0.0	695.9	10.04	0.0	0.75	4734.37	8.0
TOTALS	52556.67	2760.8	1593.49	906.04	469.4	974.37	59260.7	100.0
(%)	88.7	4.7	2.7	1.5	0.8	1.6		

TABLE V REGIONAL SUMMARY OF AREA (ha) TREATED
BY CONTROL PURPOSE, 1989

BCFS AND FOREST INDUSTRY

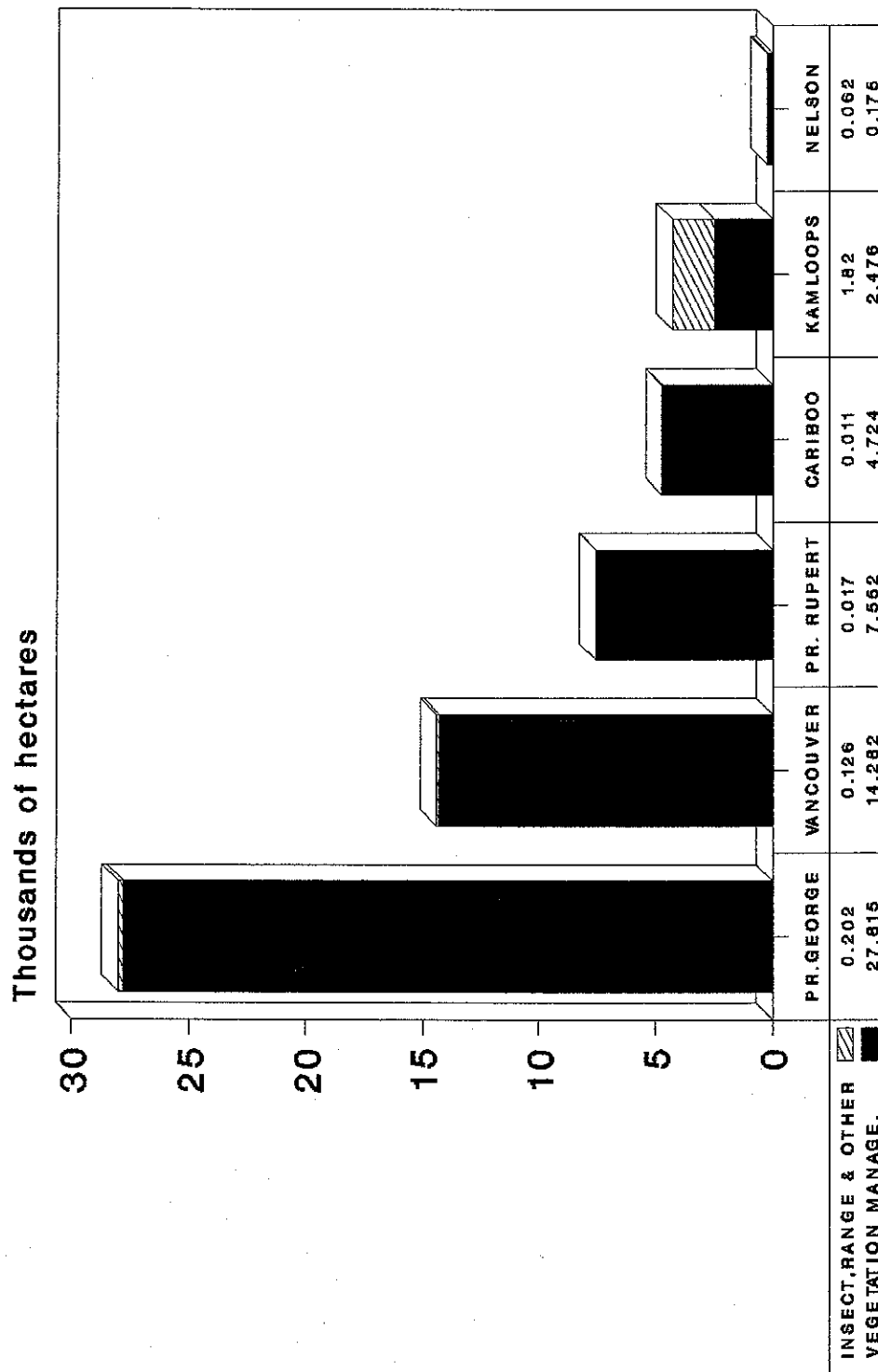
FOREST REGION	VEGETATION MANAGEMENT	INSECT MANAGEMENT	RANGE MANAGEMENT	OTHERS	TOTALS
VANCOUVER	14282.39	120.4	0.0	5.46	14408.25
PR. RUPERT	7552.22	5.95	0.0	10.94	7569.11
PR. GEORGE	27814.96	107.34	81.0	13.16	28016.46
KAMLOOPS	2475.87	1057.94	761.85	0.23	4295.89
NELSON	174.89	8.0	53.2	0.6	236.69
CARIBOO	4723.58	0.75	10.04	0.0	4734.37
TOTALS	57023.91	1300.38	906.09	30.39	59260.77
(%)	96.2	2.2	1.5	0.1	100.0

TABLE VI REGIONAL SUMMARY OF AREA (ha)
TREATED BY METHOD OF APPLICATION, 1989

BCFS AND FOREST INDUSTRY

FOREST REGION	AERIAL SPRAY	GROUND APPLICATION	STEM INJECTION	TOTALS
VANCOUVER	5481.76	2434.32	6492.17	14408.25
PR. RUPERT	6308.5	1245.66	14.95	7569.11
PR. GEORGE	25437.24	1449.55	1129.67	28016.46
KAMLOOPS	855.4	2219.51	1220.98	4295.89
NELSON	37.9	53.89	144.9	236.69
CARIBOO	2206.88	1920.54	606.95	4734.37
TOTALS	40327.68	9323.47	9609.62	59260.77
(%)	68.1	15.7	16.2	100.0

AREA TREATED WITH PESTICIDES¹ PROV. SUMMARY BY FOREST REGION 1989



¹ REGION
 B.C. Forest Service & Industry Combined

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	1543.74	2,4-D amine 2,4-D ester dichlorprop glyphosate	220.6 1059.3	 13.0 13.0 236.37	 1.47
Conifer Release	1530.0	2,4-D amine 2,4-D ester glyphosate triclopyr	 34.0 353.0 	55.0 0.1 50.1 99.1	529.7 409.0
Conifer Thinning	5.4	glyphosate			5.4
Nursery Fungus	0.5	triadimefon		0.5	
Nursery Weed	0.01	lactofen		0.01	
Site Preparation	279.5	glyphosate	279.5		
Site Rehabilitation	281.6	glyphosate	263.6	18.0	
Vertebrate Control	0.5	denatomium B		0.5	
Sub-totals	3641.25		2210.0	485.68	945.57

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	7729.11	2,4-D amine glyphosate Li-700	2082.06	23.7 845.45 0.2	1588.1 3189.6
Conifer Release	1777.22	2,4-D amine glyphosate triclophy	614.6 5.0	389.72	105.0 662.9
Insect Control	120.4	acephate B.t.k. MSMA oxydemeton	119.4		1.0
Pre-harvest Brushing	28.0	glyphosate		28.0	
Right-of-Way	650.81	2,4-D amine glyphosate		11.6 639.21	
Site Preparation	457.0	2,4-D amine glyphosate simazine	2.2 448.5	5.0 1.3	
Vertebrate Control	4.46	denatonium dry peppers putrid eggs		2.58 1.08 0.8	
Sub-totals	10767.0		3271.76	1948.6	5546.6
Totals	14408.25		5481.76	2434.32	6492.17

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	772.97	2,4-D ester dichlorprop glyphosate	669.8	13.0 13.0 77.17	
Conifer Release	227.3	2,4-D ester glyphosate triclopyr	34.0 94.0	0.1 0.1 99.1	
Conifer Thinning	5.4	glyphosate			5.4
Site Preparation	190.0	glyphosate	190.0		
Site Rehabilitation	205.6	glyphosate	205.6		
Sub-totals	1401.27		1193.4	202.47	5.4
<u>FOREST INDUSTRY:</u>					
Brushing	650.16	glyphosate	615.06	35.0	0.1
Conifer Release	77.92	2,4-D amine glyphosate	64.6	13.32	
Insect Control	15.4	B.t.k. MSMA	14.4		1.0
Pre-harvest Brushing	28.0	glyphosate		28.0	
Site Preparation	442.4	2,4-D amine glyphosate	2.2 442.2		
Sub-totals	1213.88		1136.46	76.32	1.1
Totals	2615.15		2329.86	278.79	6.5

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	207.41	glyphosate	205.8	0.14	1.47
Conifer Release	126.7	glyphosate	87.0		39.7
Site Preparation	52.4	glyphosate	52.4		
Site Rehabilitation	47.0	glyphosate	29.0	18.0	
Sub-totals	433.51		374.2	18.14	41.17
<u>FOREST INDUSTRY:</u>					
Brushing	289.7	glyphosate	230.1	49.6	10.0
Conifer Release	72.7	glyphosate	72.7		
Sub-totals	361.9		302.3	49.6	10.0
Totals	795.41		676.5	67.74	51.17

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Sunshine Coast (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	7.0	glyphosate		7.0	
Conifer Release	67.0	glyphosate	67.0		
Site Preparation	37.1	glyphosate	37.1		
Site Rehabilitation	29.0	glyphosate	29.0		
Vertebrate Control	0.5	denatonium B		0.5	
Sub-totals	140.6		133.1	7.5	
<u>FOREST INDUSTRY:</u>					
Brushing	774.3	glyphosate	558.5	48.8	167.0
Conifer Release	331.5	glyphosate	313.5	18.0	
Sub-totals	1105.8		872.0	66.8	167.0
Totals	1264.4		1005.1	74.3	167.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	228.3	2,4-D amine glyphosate	220.6 7.7		
Conifer Release	105.0	glyphosate	105.0		
Fungus Control	0.5	triadimefon		0.5	
Sub-totals	333.8		333.3	0.5	
<u>FOREST INDUSTRY:</u>					
Brushing	389.5	2,4-D amine glyphosate	32.6	23.7 200.0	133.2
Conifer Release	216.1	glyphosate triclopyr	5.0	36.20	174.9
Right-of-Way	71.6	glyphosate		71.6	
Site Preparation	1.1	glyphosate		1.1	
Vertebrate Control	1.3	denatonium B putrid eggs		0.5 0.8	
Sub-totals	679.6		37.6	333.9	308.1
Totals	1013.4		370.9	334.9	308.1

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	152.0	glyphosate		152.0	
Sub-totals	152.0			152.0	
<u>FOREST INDUSTRY:</u>					
Brushing	1857.8	2,4-D amine glyphosate	193.5	32.2	1253.7 378.4
Right-of-Way	114.81	glyphosate		114.81	
Sub-totals	1972.61		193.5	147.01	1632.1
Totals	2124.61		193.5	299.01	1632.1

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	176.06	glyphosate	176.0	0.06	
Conifer Release	424.0	2,4-D amine glyphosate		55.0 50.0	319.0
Sub-totals	600.06		176.0	105.06	319.0
<u>FOREST INDUSTRY:</u>					
Brushing	648.3	2,4-D amine glyphosate	59.9	122.85	334.4 131.3
Conifer Release	352.8	2,4-D amine glyphosate		44.8	79.0 229.0
Right-of-Way	106.0	glyphosate		106.0	
Site Preparation	13.5	glyphosate simazine	8.3	3.9 1.3	
Vertebrate Control	0.5	denatonium B		0.5	
Sub-totals	1121.25		68.2	279.35	773.7
Totals	1721.31		244.2	384.41	1092.7

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Conifer Release	369.3	glyphosate			369.3
Sub-totals	369.3				369.3
<u>FOREST INDUSTRY:</u>					
Brushing	1902.5	glyphosate LI-700	147.4	179.9 0.2	1575.0
Conifer Release	441.7	glyphosate	164.3	277.4	
Insect Control	105.0	B.t.k.	105.0		
Right-Of-Way	333.4	2,4-D glyphosate		11.6 321.8	
Vertebrate Control	0.5	denatonium B		0.5	
Sub-totals	2783.1		416.7	791.4	1575.0
Totals	3152.4		416.7	791.4	1944.3

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>FOREST INDUSTRY:</u>					
Brushing	422.1	glyphosate	245.0	177.1	
Totals	422.1		245.0	177.1	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>B.C. FOREST SERVICE:</u>					
Conifer Release	210.7	2,4-D amine			210.7
Sub-totals	210.7				210.7
<u>FOREST INDUSTRY:</u>					
Brushing	794.6	glyphosate			794.6
Conifer Release	285.0	2,4-D amine glyphosate			26.0 259.0
Right-of-Way	25.0	glyphosate		25.0	
Vertebrate Control	2.16	denatonium B dry peppers		1.08 1.08	
Sub-totals	1106.76			27.16	1079.6
Totals	1317.46			27.16	1290.3

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	2235.6	glyphosate	1209.0	1026.6	
Conifer Release	69.2	glyphosate	69.2		
Fungus Control	9.0	glyphosate			9.0
Insect Control	5.95	MSMA			5.95
Nursery Fungus	0.02	metalaxyl		0.02	
Site Preparation	8.72	glyphosate		8.72	
Site Rehabilitation	25.9	glyphosate		25.9	
Vertebrate Control	1.92	syn pred od		1.92	
Sub-totals	2356.31		1278.2	1063.16	14.95
<u>FOREST INDUSTRY:</u>					
Brushing	4348.7	glyphosate	4183.4	165.3	
Conifer Release	574.0	glyphosate	574.0		
Site Preparation	290.1	glyphosate	272.9	17.20	
Sub-totals	5212.8		5030.3	182.5	
Totals	7569.11		6308.5	1245.66	14.95

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	141.7	glyphosate	107.7	34.0	
Fungus Control	9.0	glyphosate			9.0
Insect Control	5.95	MSMA			5.95
Sub-totals	156.65		107.7	34.0	14.95
<u>FOREST INDUSTRY:</u>					
Brushing	2592.8	glyphosate	2489.5	103.3	
Conifer Release	574.0	glyphosate	574.0		
Site Preparation	225.9	glyphosate	208.7	17.2	
Sub-totals	3392.7		3272.2	120.5	
Totals	3549.35		3379.9	154.5	14.95

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	286.3	glyphosate	286.3		
Conifer Release	69.2	glyphosate	69.2		
Site Preparation	0.72	glyphosate		0.72	
Sub-totals	356.22		355.5	0.72	
<u>FOREST INDUSTRY:</u>					
Brushing	1755.9	glyphosate	1693.9	62.0	
Sub-totals	1755.9		1693.9	62.0	
Totals	2112.12		2049.4	62.72	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Kalum (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	1807.6	glyphosate	815.0	992.6	
Fungus Control	0.02	metalaxyl		0.02	
Site Preparation	8.0	glyphosate		8.0	
Site Rehabilitation	25.9	glyphosate		25.9	
Vertebrate Control	1.92	syn pred od ¹		1.92	
Totals	1843.44		815.0	1028.44	

1 Synthetic predator odor

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>FOREST INDUSTRY:</u>					
Site Preparation	64.2	glyphosate	64.2		
Totals	64.2		64.2		

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	5966.83	glyphosate hexazinone triclopyr	5436.52	482.07 48.0 0.24	
Conifer Release	307.4	glyphosate	153.3	98.6	55.5
Insect Control	107.34	MSMA			107.34
Nursery Fungus	0.16	metalaxyl		0.16	
Nursery Weed	0.1	metalaxyl		0.1	
Range Management	81.0	glyphosate picloram		0.05 80.95	
Site Preparation	908.1	glyphosate	845.1	63.0	
Site Rehabilitation	427.0	glyphosate	427.0		
Sub-totals	7797.93		6861.92	773.17	162.84

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>FOREST INDUSTRY:</u>					
Brushing	12821.69	2,4-D ester glyphosate hexazinone	177.8 11500.47	249.83 394.4	50.0 449.19
Conifer Release	4072.54	glyphosate	4069.8	2.5	0.24
Pre-harvest Brushing	441.8	glyphosate			441.8
Right-of-Way	16.6	glyphosate		16.6	
Site Preparation	2852.9	glyphosate sat fat acid	2827.25	0.05	25.6
Vertebrate Control	13.0	pinosylvin		13.0	
Sub-totals	20218.53		18575.32	676.38	966.83
Totals	28016.46		25437.24	1449.55	1129.67

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Prince George (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	1566.7	glyphosate	1534.2	32.5	
Fungus Control	0.16	metalaxyl		0.16	
Nursery Weed	0.1	metalaxyl		0.1	
Range Weed Control	36.72	picloram		36.72	
Site Preparation	216.0	glyphosate	216.0		
Site Rehabilitation	427.0	glyphosate	427.0		
Sub-totals	2246.68		2177.2	69.48	
<u>FOREST INDUSTRY:</u>					
Brushing	8160.53	2,4-D ester glyphosate hexazinone	177.8 7475.46	8.08	50.0 449.19
Conifer Release	4072.3	glyphosate	4069.8	2.5	
Pre-harvest Treatment	241.8	glyphosate			241.8
Right-of-Way	16.6	glyphosate		16.6	
Site Preparation	2160.70	glyphosate sat fat acid ¹	2160.65	0.05	
Vertebrate Control	13.0	pinosylvin		13.0	
Sub-totals	14664.33		13883.11	40.23	740.99
Totals	16911.01		16060.31	109.71	740.99

1 Saturated fatty acid

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Range Weed Control	15.81	picloram		15.81	
Total	15.81			15.81	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Insect Control	0.2	MSMA			0.2
Range Weed Control	10.0	picloram		10.0	
Totals	10.2			10.0	0.2

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Brushing	1266.57	glyphosate	1017.0	249.57	
Insect Control	107.1	MSMA			107.1
Site Preparation	214.0	glyphosate	214.0		
Sub-totals	1587.67		1231.0	249.57	107.1
<u>FOREST INDUSTRY:</u>					
Brushing	1805.4	glyphosate hexazinone	1326.0	85.0 394.4	
Conifer Release	0.24	glyphosate			0.24
Pre-harvest Brushing	200.0	glyphosate			200.0
Site Preparation	233.0	glyphosate	233.0		
Sub-totals	2238.64		1559.0	479.4	200.24
Totals	3826.31		2790.0	728.97	307.34

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	183.36	glyphosate	183.0	0.36	
Conifer Release	251.9	glyphosate	153.3	98.6	
Insect Control	0.04	MSMA			0.04
Site Preparation	439.2	glyphosate	376.2	63.0	
Sub-totals	874.5		712.5	161.96	0.04
<u>FOREST INDUSTRY:</u>					
Brushing	1487.44	glyphosate	1330.69	156.75	
Site Preparation	88.8	glyphosate	63.2		25.6
Sub-totals	1576.24		1393.89	156.75	25.6
Totals	2450.74		2106.39	318.71	25.64

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	1092.68	glyphosate hexazinone triclopyr	844.8	199.64 48.0 0.24	
Range Management	9.47	glyphosate picloram		0.05 9.42	
Sub-totals	1102.15		844.8	257.35	
<u>FOREST INDUSTRY:</u>					
Brushing	107.2	glyphosate	107.2		
Sub-totals	107.2		107.2		
Totals	1209.35		952.0	257.35	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	962.1	glyphosate	962.1		
Conifer Release	55.5	glyphosate			55.5
Range Management	9.0	picloram		9.0	
Site Preparation	38.9	glyphosate	38.9		
Sub-totals	1065.5		1001.0	9.0	55.5
<u>FOREST INDUSTRY:</u>					
Brushing	1261.12	glyphosate	1261.12		
Site Preparation	371.0	glyphosate	371.0		
Sub-totals	1632.12		1632.12		
Totals	2697.62		2633.12	9.0	55.5

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Fort Nelson (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	895.42	glyphosate	895.42		
Totals	895.42		895.42		

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	422.94	glyphosate	167.0	255.94	
Conifer Release	410.34	glyphosate	220.5	187.04	2.8
Insect Control	443.49	acephate		13.2	
		B.t.	350.0		
		chlorpyrifos		0.4	
		MSMA		58.6	21.29
Nursery Fungus	0.23	metalaxyl		0.22	
		triadimefon		0.01	
Nursery Insect	0.45	mineral oil		0.45	
Range Management	761.85	picloram		761.85	
Site Preparation	82.8	glyphosate		76.8	
		hexazinone		6.0	
Weed Seed Tree	555.64	glyphosate			555.64
Sub-totals	2677.74		737.5	1360.51	579.73

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	638.93	glyphosate	34.4	604.52	0.01
Conifer Release	150.12	glyphosate		149.88	0.24
Insect Control	614.0	MSMA			614.0
Pre-harvest Brushing	27.0	glyphosate			27.0
Right-of-Way	3.0	simazine		3.0	
Site Preparation	185.1	glyphosate	83.5	101.6	
Sub-totals	1618.15		117.9	859.0	641.25
Totals	4295.89		855.4	2219.51	1220.98

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Brushing	57.27	glyphosate		57.27	
Range Management	13.8	picloram		13.8	
Totals	71.07			71.07	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	21.05	glyphosate		21.05	
Conifer Release	47.14	glyphosate		47.14	
Insect Control	1.45	MSMA mineral oil		0.45	1.0
Range Management	485.0	picloram		485.0	
Site Preparation	82.8	glyphosate hexazinone		76.8 6.0	
Sub-totals	637.44			636.44	1.0
<u>FOREST INDUSTRY:</u>					
Site Preparation	101.6	glyphosate		101.6	
Sub-totals	101.6			101.6	
Totals	739.04			738.04	1.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Conifer Release	152.8	glyphosate	150.0		2.8
Nursery Fungus	0.23	metalaxyl triadimefon		0.22 0.01	
Range Management	7.25	picloram		7.25	
Weed Seed Tree	133.9	glyphosate			133.9
Sub-totals	294.18		150.0	7.48	136.7
<u>FOREST INDUSTRY:</u>					
Conifer Release	149.3	glyphosate		149.3	
Insect Control	421.0	MSMA			421.0
Sub-totals	570.3			149.3	421.0
Totals	864.48		150.0	156.78	557.7

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	177.62	glyphosate		177.62	
Conifer Release	35.9	glyphosate		35.9	
Insect Control	220.2	acephate		13.2	
		B.t.k.	200.0		
		chlorpyrifos		0.4	
		MSMA			6.6
Sub-totals	483.72		200.0	227.12	6.6
<u>FOREST INDUSTRY:</u>					
Brushing	245.4	glyphosate	26.8	218.6	
Pre-harvest Brushing	27.0	glyphosate			27.0
Site Preparation	83.5	glyphosate	83.5		
Sub-totals	355.9		110.3	218.6	27.0
Totals	839.62		310.3	495.72	33.6

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Insect Control	163.26	B.t.k. MSMA	150.0		13.26
Range Management	16.83	picloram		16.83	
Weed Seed Tree	421.74	glyphosate			421.74
Sub-totals	601.83		150.0	16.83	435.0
<u>FOREST INDUSTRY:</u>					
Brushing	339.92	glyphosate		339.92	0.01
Conifer Release	0.82	glyphosate		0.58	0.24
Insect Control	193.0	MSMA			193.0
Sub-totals	533.75			340.5	193.25
Totals	1135.58		150.0	357.33	628.25

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Conifer Release	85.0	glyphosate		85.0	
Insect Control	58.6	MSMA		58.6	
Range Weed Control	208.4	picloram		208.4	
Sub-totals	352.0			352.0	
<u>FOREST INDUSTRY:</u>					
Brushing	46.0	glyphosate		46.0	
Right-of-Way	1.6	simazine		1.6	
Sub-totals	47.6			47.6	
Totals	399.6			399.6	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	167.0	glyphosate	167.0		
Conifer Release	89.5	glyphosate	70.5	19.0	
Insect Control	0.43	MSMA			0.43
Range Weed Control	30.57	picloram		30.57	
Sub-totals	287.5		237.5	49.57	0.43
<u>FOREST INDUSTRY:</u>					
Brushing	7.6	glyphosate	7.6		
Right-of-Way	1.4	simazine		1.4	
Sub-totals	9.0		7.6	1.4	
Totals	265.93		245.1	20.4	0.43

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	20.3	glyphosate	20.3		
Conifer Release	16.9	glyphosate			16.9
Insect Control	8.0	MSMA			8.0
Nursery Fungus	0.6	metalaxyl		0.6	
Pre-harvest Brushing	120.0	glyphosate			120.0
Range Management	53.2	picloram		53.2	
Site Preparation	17.6	glyphosate	17.6		
Sub-totals	236.61		37.9	53.81	144.9
<u>FOREST INDUSTRY:</u>					
Conifer Release	0.08	glyphosate		0.08	
Sub-totals	0.08			0.08	
Totals	236.69		37.9	53.89	144.9

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	43.97	picloram		43.97	
Totals	43.97			43.97	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Conifer Release	16.9	glyphosate			16.90
Insect Control	8.0	MSMA			8.0
Range Management	9.23	picloram		9.23	
Totals	34.13			9.23	24.9

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	20.3	glyphosate	20.3		
Site Preparation	17.6	glyphosate	17.6		
Totals			37.9		

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>FOREST INDUSTRY:</u>					
Conifer Release	0.08	glyphosate		0.08	
Totals	0.08			0.08	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Pre-harvest Brushing	120.0	glyphosate			120.0
Totals	120.0				120.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Nursery Fungus	0.6	metalaxyl		0.6	
Totals	0.6			0.6	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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	290.7	glyphosate	10.0	280.7	
Conifer Release	30.5	glyphosate hexazinone		24.7 5.8	
Insect Control	0.75	MSMA			0.75
Range Management	10.04	picloram		10.04	
Site Preparation	668.98	glyphosate	219.48	347.0	102.5
Weed Seed Tree	38.0	glyphosate			38.0
Sub-totals	1038.97		229.48	668.24	141.25
<u>FOREST INDUSTRY:</u>					
Brushing	2140.57	glyphosate hexazinone	1899.4	156.17 85.0	
Conifer Release	78.0	glyphosate	78.0		
Pre-harvest Brushing	684.4	glyphosate hexazinone		218.7	465.7
Site Preparation	792.43	glyphosate hexazinone		406.03 386.4	
Sub-totals	3695.4		1977.4	1252.3	465.7
Totals	4734.37		2226.88	1920.54	606.95

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Site Preparation	566.48	glyphosate	219.48	347.0	
Sub-totals	566.48		219.48	347.0	
<u>FOREST INDUSTRY:</u>					
Brushing	1606.6	glyphosate	1468.5	120.1	
Conifer Release	78.0	glyphosate	78.0		
Site Preparation	792.43	glyphosate hexazinone		406.03 386.4	
Sub-totals	2477.03		1564.5	912.53	
Totals	3043.51		1783.98	1259.53	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Range Management	10.04	picloram		10.04	
Site Preparation	102.5	glyphosate			102.5
Sub-totals	112.54			10.04	102.5
<u>FOREST INDUSTRY:</u>					
Brushing	10.9	glyphosate		10.9	
Pre-Harvest Treatment	67.3	glyphosate			67.3
Sub-totals	78.2			10.9	67.3
Totals	190.74			20.94	169.8

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
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>					
Brushing	290.7	glyphosate	10.0	280.7	
Sub-totals	290.7		10.0	280.7	
<u>FORESTY INDUSTRY:</u>					
Brushing	438.07	glyphosate	412.9	25.17	
Pre-Harvest Treatment	102.6	glyphosate			102.6
Sub-totals	540.67		412.9	25.17	102.6
Totals	831.37		422.9	305.87	102.6

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7)

FOREST DISTRICT: 100 Mile House (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>					
Conifer Release	30.5	glyphosate hexazinone		24.7 5.8	
Weed Seed Tree Control	38.0	glyphosate			38.0
Sub-totals	68.5			30.5	38.0
<u>FOREST INDUSTRY:</u>					
Brushing	85.0	hexazinone		85.0	
Pre-Harvest Treatment	514.5	glyphosate hexazinone		218.7	295.8
Sub-totals	599.5			303.7	295.8
Totals	668.0			334.2	333.8

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1989
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7)

FOREST DISTRICT: Chilcotin (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>					
Insect Control	0.75	MSMA			0.75
Totals	0.75				0.75

TABLE VII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY CONTROL PURPOSE, 1989

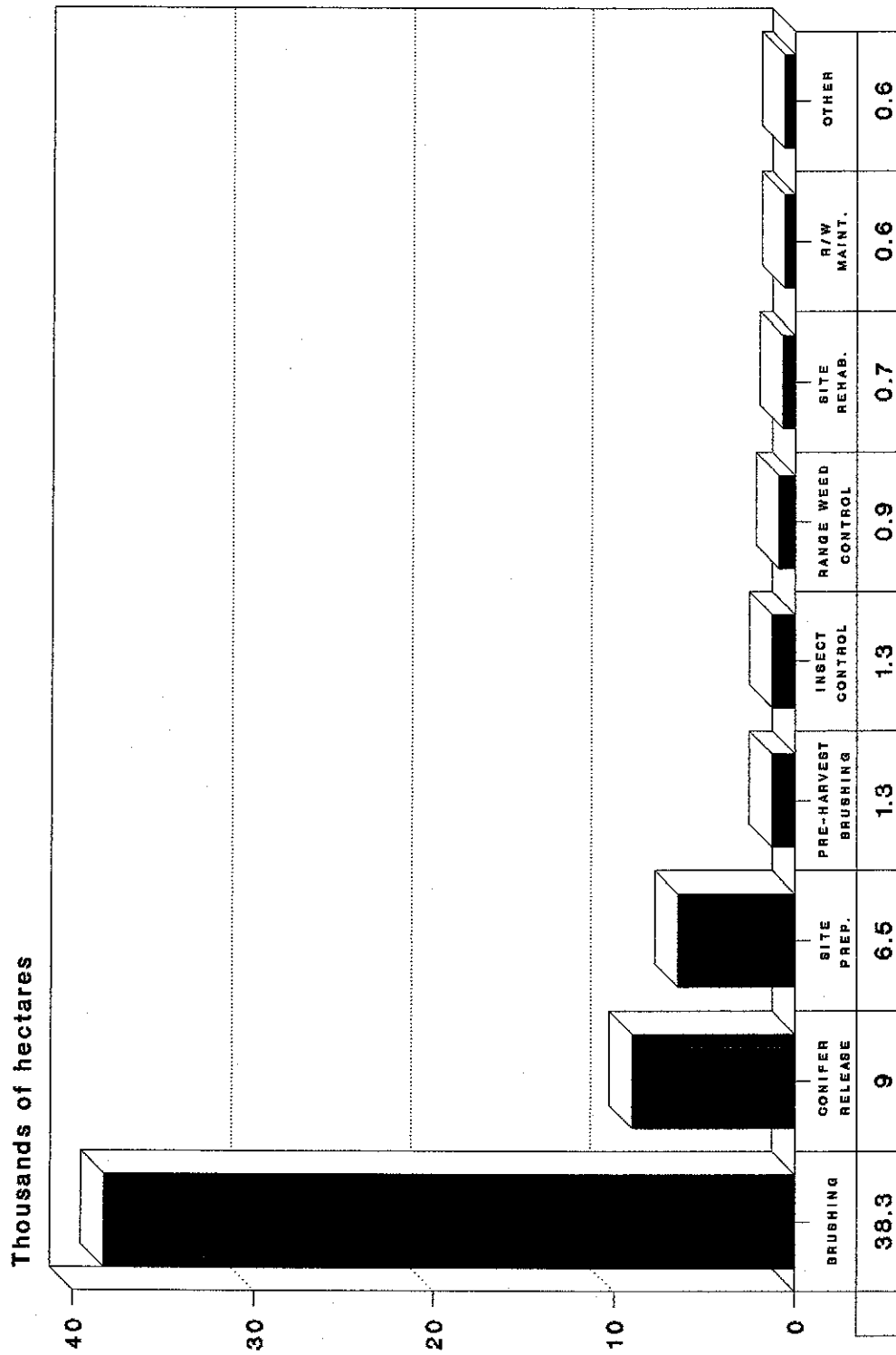
PURPOSE	PESTICIDES	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
BRUSHING	2,4-D amine	220.6	1611.8
	2,4-D ester	13.0	177.8
	dichlorprop	13.0	
	glyphosate	10208.12	25066.63
	hexazinone	48.0	928.59
TOTAL:	LI-700		0.2
38287.98	triclopyr	0.24	
CONIFER RELEASE	2,4-D amine	584.7	105.0
	2,4-D ester	34.1	
	glyphosate	1640.64	6576.96
TOTAL:	hexazinone	5.8	
9051.3 ha	triclopyr	99.1	5.0
CONIFER THINNING	glyphosate	5.4	
TOTAL: 5.40 ha			
INSECT CONTROL	acephate	13.2	
	B.t.k.	350.0	119.4
	chlorpyrifos	0.4	
	MSMA	201.93	615.0
TOTAL:	mineral oil	0.45	
1300.43 ha	oxydemeton	0.05	
FUNGUS CONTROL	glyphosate	9.0	
	metalaxyl	1.0	
	triadimefon	0.51	
TOTAL: 10.51 ha			
NURSERY WEED CONTROL	lactofen	0.01	
	metalaxyl	0.1	
TOTAL: 0.11 ha			
PRE-HARVEST TREATMENT	glyphosate	120.0	962.5
	hexazinone		218.7
TOTAL:			
1301.2 ha			

TABLE VII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY CONTROL PURPOSE, 1989

PURPOSE	PESTICIDES	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
RANGE WEED CONTROL TOTAL: 906.1 ha	glyphosate picloram	0.05 906.05	
RIGHT-OF-WAY MAINTENANCE TOTAL: 670.41 ha	2,4-D amine glyphosate simazine		11.6 655.81 3.0
SITE PREPARATION TOTAL: 6543.48 ha	2,4-D amine glyphosate hexazinone sat fat acid ¹ simazine	1959.7 6.25	2.2 4187.58 386.4 0.05 1.3
SITE REHAB TOTAL: 734.5 ha	glyphosate	734.5	
VERTEBRATE CONTROL TOTAL: 17.96 ha	denatonium B dry peppers pinosylvin putrid eggs	0.5	2.58 1.08 13.0 0.8
WEED SEED TREE CONTROL TOTAL: 593.64 ha	glyphosate	593.64	

1 Saturated fatty acid

PROVINCIAL SUMMARY OF AREA (ha) TREATED WITH PESTICIDES BY CONTROL PURPOSE, 1989¹



¹ B.C. Forest Service & Industry Combined

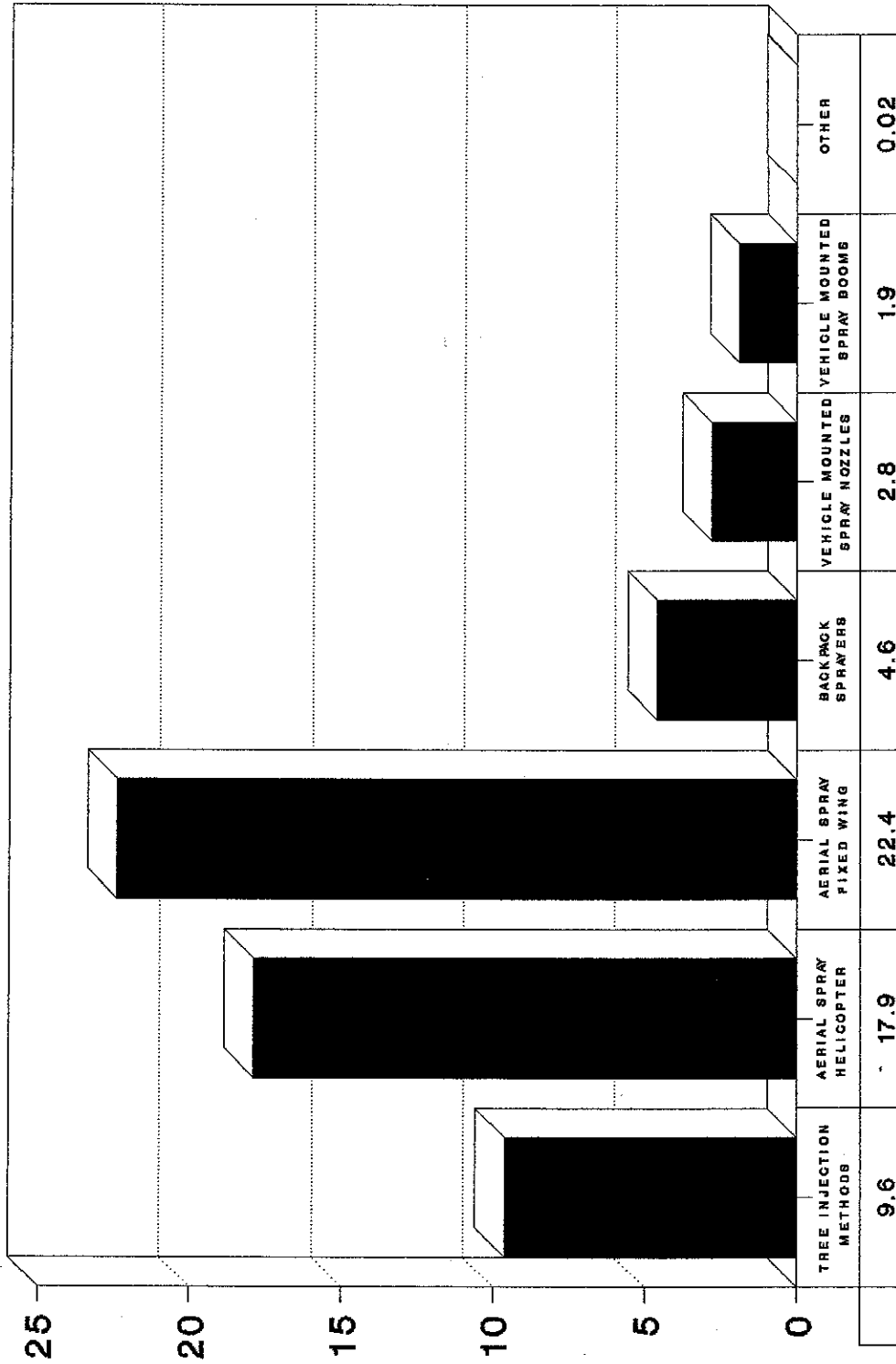
TABLE VIII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY CONTROL METHOD, 1989

PURPOSE	PESTICIDES	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
VEHICLE MOUNTED SPRAY BOOM	2,4-D amine glyphosate hexazinone	50.0 128.9	11.6 827.21 294.4
TOTAL: 1935.5 ha	picloram triadimefon	622.89 0.5	
BACK PACK AND HANDHELD SPRAY EQUIPMENT	2,4-D ester acephate chlorpyrifos dichlorprop glyphosate hexazinone lactofen metalaxyl mineral oil MSMA picloram sat fat acid triclopyr	13.1 13.2 0.4 13.0 1338.67 60.05 0.01 0.24 0.45 58.6 2.13 99.34	2186.28 790.1 0.05
TOTAL: 4575.62 ha			
VEHICLE MOUNTED SPRAY NOZZLES	2,4-D amine glyphosate LI-700 oxydemeton picloram simazine triadimefon	5.0 1736.87 0.05 281.02 0.01	23.7 798.6 0.2 4.3
TOTAL: 2849.75 ha			

TABLE VIII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY CONTROL METHOD, 1989

PURPOSE	PESTICIDES	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
TREE INJECTION/ CUT SURFACE TREATMENT	2,4-D amine acephate glyphosate hexazinone imadazolinon	529.7 1316.21 	1693.1 4863.11 499.19 0.01
TOTAL: 9659.65 ha	MSMA oxydemeton	143.33	615.0
AERIAL SPRAY FIXED WING TOTAL: 22445.15 ha	2,4-D ester B.t.k. glyphosate	 350.0 4049.72	177.8 119.4 17748.23
AERIAL SPRAY HELICOPTER TOTAL: 17988.53 ha	2,4-D amine 2,4-D ester glyphosate triclopyr	220.6 34.0 6700.68	2.2 11026.05 5.0
OTHER TOTAL: 20.74 ha	denatomium B denatonium B dry peppers metalaxyl pinosylvin putrid eggs syn pred od	0.5 0.86 1.92	 2.58 1.08 13.0 0.8

PROVINCIAL SUMMARY OF AREA (ha) TREATED WITH PESTICIDES BY METHOD OF APPLICATION, 1989 ¹ Thousands of hectares



¹ B.C. Forest Service & Industry Combined

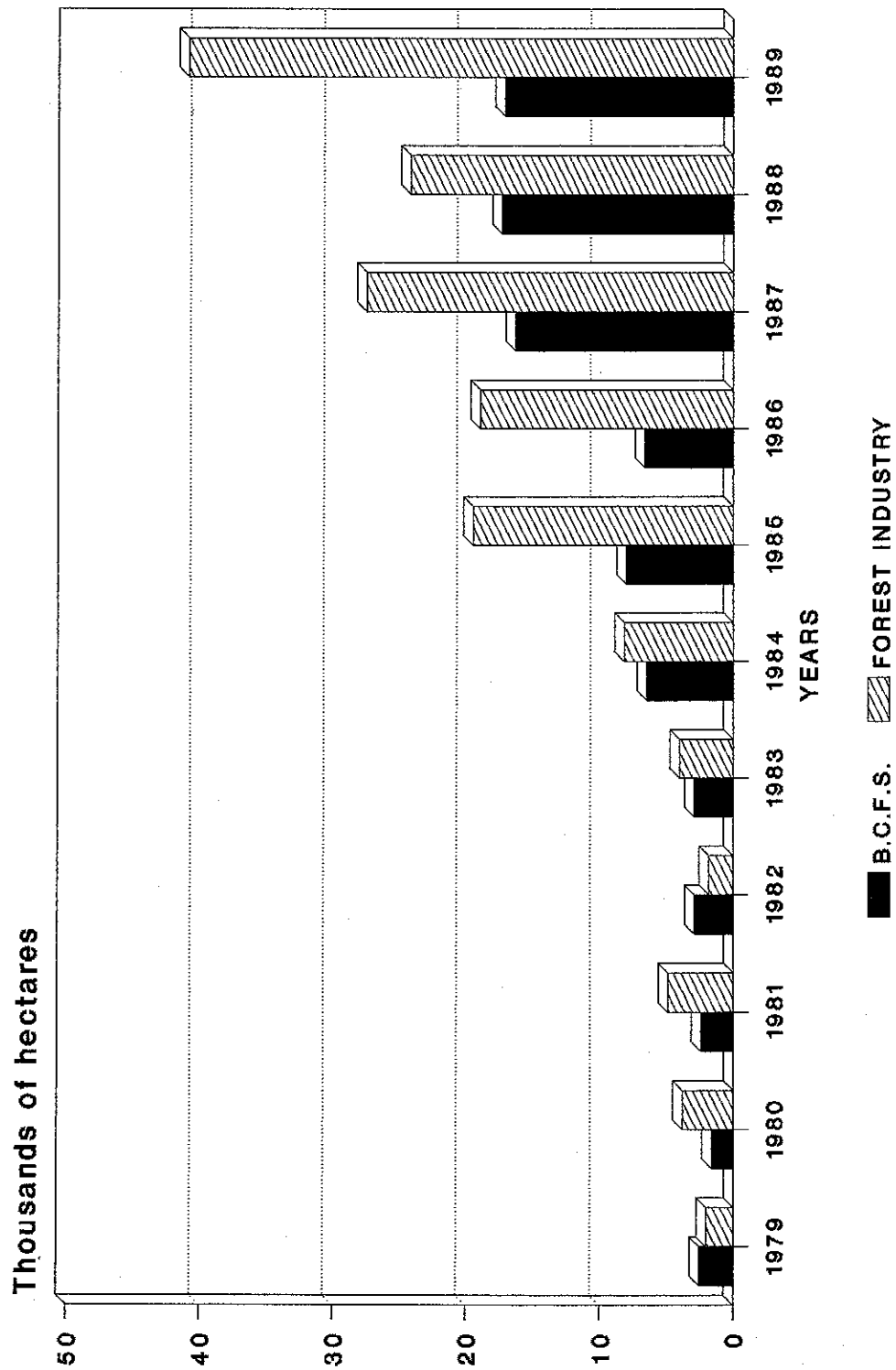
TABLE IX TOTAL AREA (ha) TREATED WITH HERBICIDES AND INSECTICIDES
FOR FORESTRY PURPOSES, 1978 - 1989

YEAR	B.C. FOREST SERVICE HERB. INSECT.	FOREST INDUSTRY HERB. INSECT.	TOTALS HERB. INSECT.
1979	2256.0 64.0	1840.0 0.0	4096.0 64.0
1980	1614.0 1.0	3412.0 70.0	5026.0 71.0
1981	2361 134.0	4232.0 0.4	6593.0 134.0
1982	2630.0 786.0	1636.0 0.1 ¹	4266.0 786.0
1983	2586.0 807.0	3595.0 5.0	6181.0 812.0
1984	6184.0 199.0	7709.0 33.0	13893.0 232.0
1985	8018.0 612.0	19133.0 26.0	27151.0 638.0
1986	6434.0 162.0	18487.0 200.0	24921.0 362.0
1987	15705.0 1035.0 ²	26791.0 282.0	42496.0 1317.0
1988	17378.0 1876.0	24224.0 270.0	41602.0 2146.0
1989	17201.9 566.03	40901.13 734.4	58103.03 1300.43

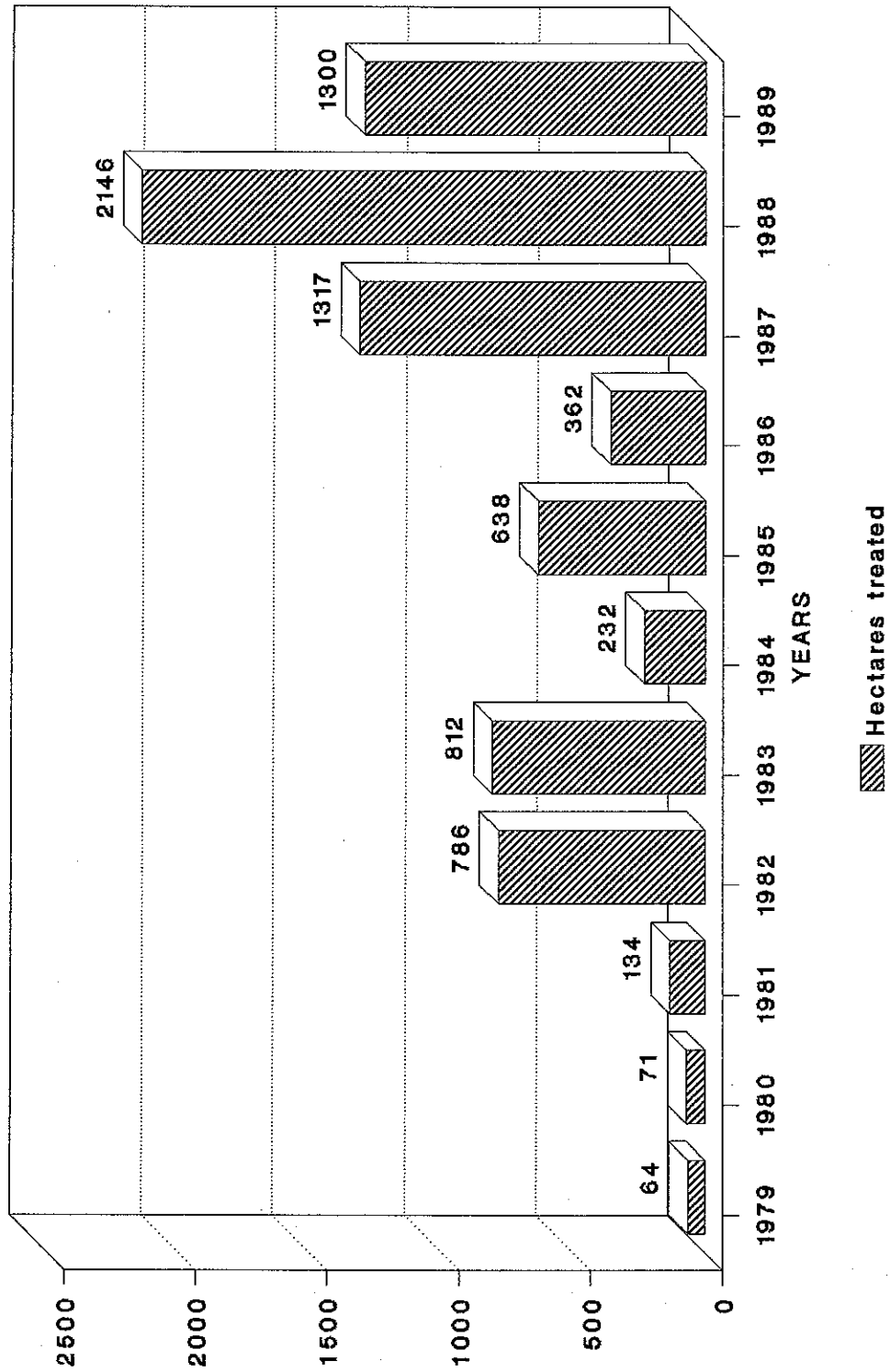
¹Area treated was less than 0.1 ha.

²Insectide figures for 1987 have been revised.

AREA TREATED WITH HERBICIDES FOR FORESTRY PURPOSES 1979-1989



AREA TREATED WITH INSECTICIDES FOR FORESTRY PURPOSES 1979-1989 ¹



¹ B.C. Forest Service & Industry Combined

DISCUSSIONS AND CONCLUSIONS

The area treated with pesticides in 1989 increased by approximately 16 000 ha over the previous year. Forest companies were responsible for 70% of the area treated in 1989, as compared to roughly 60% in the previous two years.

The use of glyphosate increased from 78% of the area treated in 1988 to 89% in 1989.

Herbicide applications for the purpose of controlling unwanted vegetation to promote crop establishment increased from 22 949 ha to 38 288 ha in 1989.

The use of helicopters and fixed-wing aircraft has risen dramatically in the past three years, from 40% of the total area treated in 1987 to almost 70% in 1989.

ACKNOWLEDGEMENTS

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