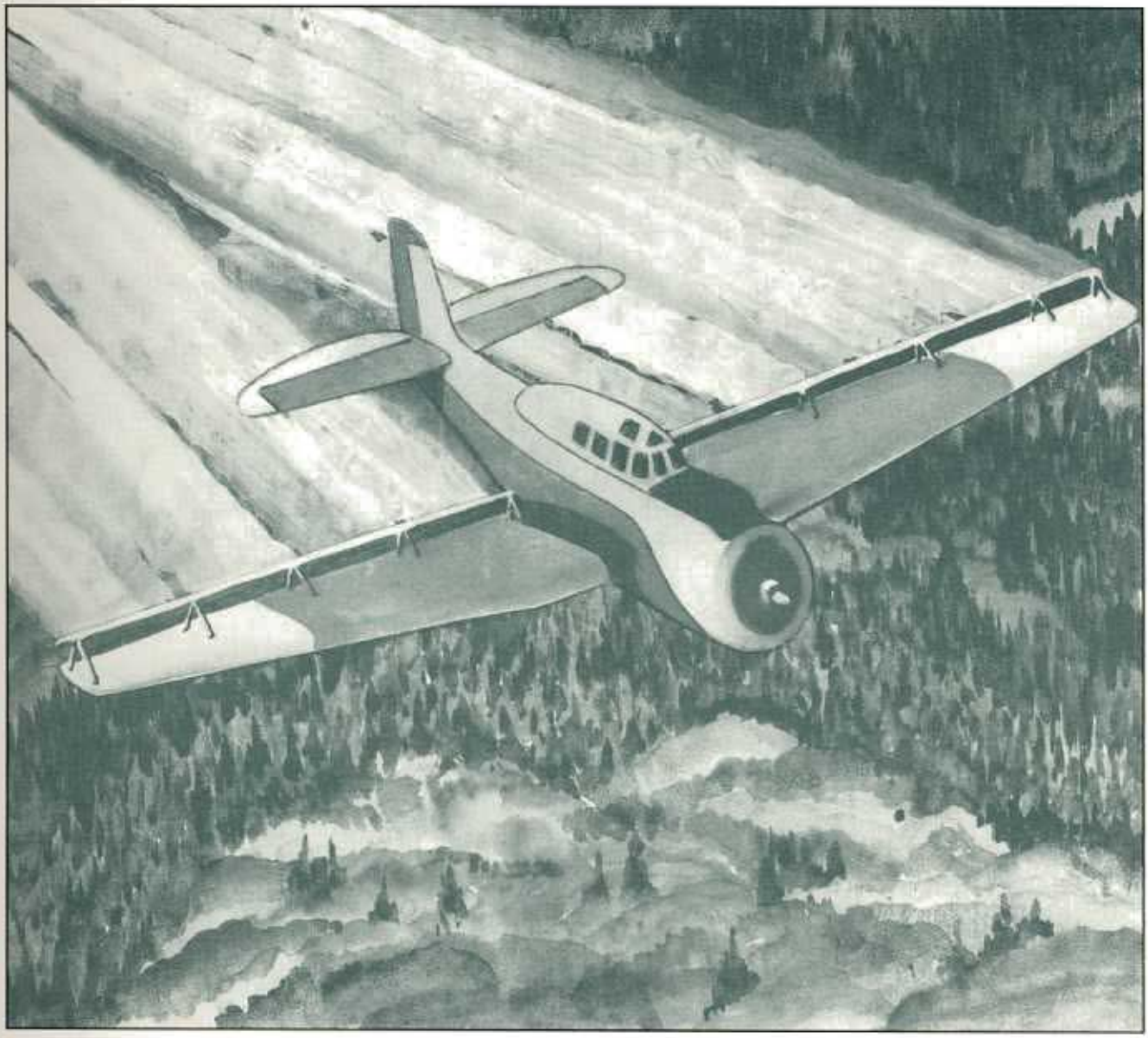
Aerial spray applications on Canadian forests: 1945 to 1990

J. A. Armstrong and C. A. Cook
Information Report ST-X-2
Forestry Canada



Forestry Canada Forêts Canada

Canada

Forestry Canada

Forestry Canada is the main focus for forestry matters in the federal government. It provides national leadership through the development, coordination, and implementation of federal policies and programs to enhance long-term economic, social, and environmental benefits from the forest sector for Canadians.

Forestry Canada is a decentralized organization with six regions, two national research institutes, and seven regional sub-offices located across Canada. Headquarters is located in the National Capital Region in Hull, Quebec.

In support of its mandate, Forestry Canada carries out the following activities:

- administers forest development agreements negotiated with the provinces
- undertakes and supports research, development, and technology transfer in forest management, utilization and environment
- compiles, analyzes, and disseminates information about national and international forest resources and related matters
- monitors disease and insect pests in Canada's forests
- provides information, analyses, and policy advice on economics, industry, markets, and trade related to the forest sector
- promotes employment, education, and training opportunities in the forest sector
- promotes public awareness of all aspects of the forest sector.

Forestry Canada interacts regularly with provincial and territorial governments, industry, labor, universities, conservationists, and the public through such bodies as the Canadian Council of Forest Ministers, the Forest Sector Advisory Council, the Forestry Research Advisory Council of Canada, the Canadian Forest Inventory Committee, the Canadian Committee on Forest Fire Management, the Canadian Interagency Forest Fire Centre, and regional consultative committees. Forestry Canada is also active in international forestry agencies such as the International Union of Forestry Research Organizations and the Food and Agriculture Organization, as well as in technical and trade missions.

Forêts Canada

Forêts Canada est l'organisme principal en matière de foresterie à l'intérieur du gouvernement fédéral. Chef de file sur le plan national, il assure la préparation, la coordination et la mise en œuvre des politiques et des programmes fédéraux dans le but d'améliorer les avantages économiques, sociaux et environnementaux à long terme offerts aux Canadiens par le secteur forestier.

Forêts Canada est une organisation décentralisée: six régions, deux instituts de recherche nationaux ainsi que sept sous-bureaux régionaux sont répartis dans tout le Canada. L'administration centrale est établie dans la région de la Capitale nationale, à Hull (Québec).

Pour remplir son mandat, Forêts Canada assume les tâches suivantes:

- il administre les accords de développement forestier conclus avec les provinces
- il entreprend et appuie la recherche, la mise au point et le transfert technologique dans le domaine de la gestion, de l'utilisation et de l'environnement des forêts
- il rassemble, analyse et diffuse de l'information sur les ressources forestières nationales et internationales et les domaines connexes
- il fait des relevés des maladies et des insectes ravageurs des forêts canadiennes
- il fournit de l'information, des analyses et des conseils (quant aux politiques) concernant l'économie, l'industrie, les marchés et le commerce reliés au secteur forestier
- il favorise les occasions d'emploi et de formation universitaire et technique dans le secteur forestier
- il encourage les Canadiens à prendre conscience de tous les aspects du secteur forestier.

Forêts Canada entretient des rapports sur une base régulière avec les gouvernements provinciaux et territoriaux, l'industrie, le monde du travail, les universités, les environnementalistes et le public par l'entremise d'organismes comme le Conseil canadien des ministres des Forêts, le Conseil consultatif du secteur forestier, le Conseil consultatif de la recherche forestière du Canada, le Comité de l'Inventaire des forêts du Canada, le Comité canadien de la gestion des incendies de forêt, le Centre interservices des feux de forêt du Canada et des comités consultatifs régionaux. Forêts Canada joue également un rôle actif dans des organismes internationaux de foresterie comme l'Union internationale des instituts de recherches forestières et l'Organisation pour l'alimentation et l'agriculture, de même qu'au sein de délégations de nature technique ou commerciale.

Aerial spray applications on Canadian forests: 1945 - 1990

J.A. Armstrong and C.A. Cook
Science and Sustainable Development Directorate
Forestry Canada

Information Report ST-X-2
Forestry Canada, Ottawa 1993

Catalogue No. Fo29-33/2-1992E
ISBN 0-662-19858-1
ISSN 1192-1064

Copies of this publication may be obtained free of charge from:

Forestry Canada
Public Enquiries Centre
Hull, Quebec
K1A 1G5

Phone: (819) 953-2312
Fax: (819) 953-7048

A microfiche edition of this publication may be purchased from:

Micromedia Ltd.
Place du Portage
165 Hôtel-de-Ville St.
Hull, Quebec
J8X 3X2

Cover: Grumman Avenger aircraft in action.

CANADIAN CATALOGUING IN PUBLICATION DATA

Armstrong, J. (Jack)

Aerial spray applications on Canadian forests: 1945-1990

(Information report ; ST-X-2)
Issued also in French under title: Traitements aériens des forêts canadiennes de 1945 à 1990.
Issued by Science and Sustainable Development Directorate.
ISBN 0-662-19858-1
DSS cat. no. Fo29-33/2-1992E

1. Forest insects -- Control -- Canada.
2. Aerial spraying and dusting in forestry -- Canada.
3. Insecticides -- Canada. I. Cook, C.A.
II. Canada. Forestry Canada. Science and Sustainable Development Directorate. III. Title. IV. Series: Information report (Canada, Forestry Canada) ; ST-X-2.

SB953.A75 1993 634.9'694'0971 C93-099497-3

Contents

Preface

This report presents a summary of the aerial spray applications carried out to protect Canadian forests from insect attack from 1945 to 1990. The data are taken from reports to the Annual Pest Control Forum and its predecessor organization, the Interdepartmental Committee on Forest Spraying Operations, referred to hereafter as ICFSO. It must be noted that there was very little information from earlier years (pre-1960).

The early spruce budworm sprays were the first large-area aerial sprays on a natural ecosystem with the new chemical insecticide DDT. The ICFSO was established because of the concern about possible adverse impact on the aerial, terrestrial and aquatic ecosystems, as well as on human health, and the fate of DDT and its metabolites. Its members are from the following departments and services: Agriculture Canada, Health and Welfare Canada, Forestry Canada, Fisheries and Oceans Canada, the Canadian Wildlife Service, The Canadian Parks Service, the Fisheries Research Board, and provincial agencies associated with aerial spray programs. At the annual meetings of the ICFSO, reports were presented on aerial spray programs and research to study problems related to the application and effects of the spray.

The ICFSO was formed before the existence of any formal permit system for aerial sprays. At its annual meetings, plans were presented for proposed sprays, and members of the ICFSO had the opportunity to suggest changes to protect different parts of the environment, and to propose new research programs. With the introduction of formal permits for aerial sprays, and with the same agencies reviewing the spray plans, the ICFSO became redundant, and the Pest Control Forum was created. Its membership was expanded to include representatives from state and federal forestry services in the United States as well as forest industries involved in protection schemes. Consequently, although this report is on spray applications in Canada, data supplied by U.S. representatives has been included, with an emphasis on the state of Maine, in Appendix A.

Meetings of the Pest Control Forum are held annually at the end of November. At these meetings, reports of operational sprays and research associated with forest pest control operations are presented. These data form a unique historical record of insecticides applied, areas treated, and aircraft and equipment used in each province. It was felt that rather than leaving this information buried in archives, it should be compiled in a format useful to interested persons. At this time, complete records are not available. However provincial agencies were given the opportunity to correct the records, and where this was done, the records are marked as 'corrected'.

In Chapter 1, we have presented the information on the operational spray applications by province (East to West), with the data on each province ordered chronologically by year. In Chapter 2, the data on research spray applications are presented by year, with the data arranged by province, again from East to West within each year. Subsequently, we extracted the information on all the insecticides and aircraft used in each year, dividing them according to operational and research applications. These data are presented in Appendices B, C, D and E. In listing the specifics for each insecticide, the actual numbers reported from ICFSO and Pest Control Forum are reported; the numbers in brackets represent a conversion to either Imperial or SI units. (The early 1980s were the cross-over period from Imperial to SI). A conversion table is provided in Appendix G.

We have made no attempt in this report to record locations of areas sprayed, since this would require the inclusion of many maps. At the annual meetings, some provinces showed exact locations of these areas; others did not, or reported only general locations. If information on exact locations is desired, it can be obtained by writing to the appropriate provincial or U.S. agency listed in Appendix F.

Abstract

The data presented in this report are taken from reports to the annual Pest Control Forum, published by Canadian Forestry Service, the Interdepartmental Committee on Forest Spray Operations (ICFSO) and preceding committees.

These reports were prepared for presentation at the end of November and as a result are sometimes incomplete in that data are missing or there was not time for them to be fully analyzed.

In compiling the data for this report it was decided to make corrections where possible. Provincial agencies were given the opportunity to correct and update operational spray records.

Acknowledgement

The authors acknowledge the work of Andrew Armstrong in preparing the summaries of the Research and Operational Spray application data and the cooperation of the federal and provincial establishments in reviewing the information presented.

The Department regrets to add that the senior author, Jack A. Armstrong, died August 1991.

CHAPTER 1
OPERATIONAL SPRAY APPLICATIONS

Newfoundland

Year: **1968 (corrected)**
Area: 430 380 acres (174 304 ha)
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Sumithion	2 oz/ac (140 g/ha)	0.2 gal/ac (1.87 L/ha)
	4 oz/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)
Phosphamidon	2 oz/ac (140 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: emulsion and wettable powder
Aircraft: 8 Grumman Avengers
Guidance: 6 Cessna 180s
Application system: Boom and Nozzle

Year: **1969 (corrected)**
Area: 2 054 900 acres (832 235 ha)
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Sumithion	2 oz/ac (140 g/ha)	0.2 gal/ac (1.87 L/ha)
	3 oz/ac (210 g/ha)	0.2 gal/ac (1.87 L/ha)
Phosphamidon	2 oz/ac (140 g/ha)	0.2 gal/ac (1.87 L/ha)
	3 oz/ac (210 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: emulsion (water)
Aircraft: 1 Pilatus Porter
18 Grumman Avengers
2 DC-3s
15 Cessna 172s
Guidance: Decca System
Application system: Boom and Nozzle
Micronair (modified)

Year: **1978 (corrected)**
Area: 152 412 acres (61 727 ha)
Insect: Eastern spruce budworm

Newfoundland

Insecticide	Active ingredient	Application rate
Matacil	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)

Formulation: oil solution
Aircraft: 3 DC-6Bs
2 Cessna AgWagons
1 Aerostar
Guidance: Litton International Guidance System or topographical maps and photographs
Application system: Boom and Nozzle

Year: **1979 (corrected)**
Area: 13 961 acres (5 654 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)

Formulation: wettable powder
Aircraft: 4 Cessna AgTrucks
Guidance:
Application system: Boom and Nozzle

Year: **1980 (corrected)**
Area: 7 441 ha (18 387 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	5.84 L/ha (80 fl oz/ac)

Formulation: wettable powder
Aircraft: 4 Piper Pawnees
1 Grumman AgCat
Guidance: 3 Bell Jet Ranger 206B helicopters
Application system: Boom and Nozzle

Year: **1981 (corrected)**
Area: 239 983 ha (592 998 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil (1.8D)	70 g/ha (1.02 oz/ac)	1.46 L/ha (20 fl oz/ac)

	86 g/ha (1.23 oz/ac)	1.46 L/ha (20 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	7.0 L/ha (96 fl oz/ac)
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	7.0 L/ha (96 fl oz/ac)
Formulation:	oil solution wettable powder	
Aircraft:	5 DC-4s 2 AgCats 1 Constellation	
Guidance:	Litton LTN-51 2 Cessna 337s 1 Shrike Commander Bell Jet Ranger 206B helicopter (with maps and photos)	
Application system:	Boom and Nozzle	

Year: **1982 (corrected)**
Area: 47 834 ha (118 198 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Matacil (1.8D)	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	7.0 L/ha (96 fl oz/ac)
Formulation:	oil solution wettable powder	
Aircraft:	4 AgCats (600 h.p.) 4 AgCats (450 h.p.)	
Guidance:	Cessna 172 (with topographical maps) Cessna 337 Bell Jet Ranger 206B helicopter	
Application system:	Boom and Nozzle	

Year: **1983 (corrected)**
Area: 73 380 ha (181 322 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Matacil (1.8D)	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
Matacil (180F)	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
Formulation:	oil solution	
Aircraft:	1 DC-6 4 AgCats	
Guidance:	Litton LTN-22 Bell Jet Ranger 206B helicopter	

Newfoundland

	Piper Aerostar 601P
	Cessna 337
Application system:	Boom and Nozzle

Year: **1984 (corrected)**
Area: 26 336 ha (65 076 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Matacil (1.8D)	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
Dipel 132	20 BIU/ha (8.1 BIU/ac)	1.57 L/ha (21.5 fl oz/ac)
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	7.0 L/ha (96 fl oz/ac)

Formulation:	oil solution
	wettable powder
	undiluted
Aircraft:	6 AgCats (600 h.p.)
Guidance:	2 Bell Jet Ranger 206B helicopters (and maps)
	Cessna 336/337
Application system:	Boom and Nozzle
	Micronair AU5000

Year: **1985 (corrected)**
Area: 138 691 ha (342 706 acres)
Insect: Eastern hemlock looper

Insecticide	**Active ingredient**	**Application rate**
Folithion	280 g/ha (4 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.36 L/ha (32.0 fl oz/ac)

Formulation:	oil solution
	undiluted
Aircraft:	7 AgCats
	1 DC-6B
Guidance:	Litton LTN 51 system
	Hughes 500 helicopter
	Bell Jet Ranger 206B
	Cessna 336/337
Application system:	Micronair AU5000
	Boom and Nozzle

Newfoundland

Year: **1985 (corrected)**
Area: 3 450 ha (8 525 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	20 BIU/ha (8.1 BIU/ac)	1.57 L/ha (21.5 fl oz/ac)

Formulation:	undiluted
Aircraft:	3 Grumman AgCats (600 h.p.)
Guidance:	Cessna 336
	1 helicopter
Application system:	Micronair AU5000

Year: **1986 (corrected)**
Area: 84 448 ha (208 671 acres)
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Fenitrothion	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Dipel	30 BIU/ha (12.2 BIU/ac)	2.36 L/ha (32.0 fl oz/ac)

Formulation:	oil solution
	undiluted
Aircraft:	1 Douglas DC-4
	4 Grumman AgCats (600 h.p.)
Guidance:	Litton LTN-51
	Piper Aerostar
	1 helicopter
	1 Cessna 337
Application system:	Boom and Nozzle
	Micronair AU5000

Year: **1987**
Area: 168 595 ha (416 430 acres)
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Folithion	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.36 L/ha (32.3 fl oz/ac)

Formulation:	undiluted
	emulsion
Aircraft:	Douglas DC-6
	Grumman AgCats (600 h.p.)

Newfoundland

	Ayres Bull Thrushes (1 200 h.p.)
Guidance:	twin-engine fixed-wings
	helicopters
Application system:	Boom and Nozzle
	Micronair AU5000

Year: **1988**
Area: 72 000 ha (177 840 acres)
Insect: Eastern hemlock looper

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Dipel 176	30 BIU/ha (12.2 BIU/ac)	-
Futura XLV*	30 BIU/ha (12.2 BIU/ac)	

Formulation:	emulsion
	wettable powder*
Aircraft:	4 Grumman AgCats (600 h.p.)
	4 Ayres Bull Thrushes (1 200 h.p.)
Guidance:	2 fixed wing
	2 helicopters
Application system:	Micronair AU5000

Year: **1989**
Area: 5 362 ha (13 244 acres)
Castors River
Leg Pond
Insect: Eastern hemlock looper

Insecticide	**Active ingredient**	**Application rate**
Futura XLV	30 BIU/ha (12.2 BIU/ac)	

Formulation:	
Aircraft:	Bull Thrush
Guidance:	-
Application system:	Micronair AU4000

Year: **1990**
Area: 10 616 ha (26 222 acres)
Insect: Eastern hemlock looper

Newfoundland

Insecticide	Active ingredient	Application rate
Futura XLV	30 BIU/ha (12.2 BIU/ac)	
Foray 48B	30 BIU/ha (12.2 BIU/ac)	
Formulation:		
Aircraft:	3 AgCats	
Guidance:	1 helicopter 1 fixed-wing	
Application system:	Micronair AU5000	

New Brunswick

Year: **1952 (corrected)**
Area: 186 000 acres (75 330 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.34 L/ha)
Formulation:	oil solution	
Aircraft:	20 Stearmans	
Guidance:	Visual and Spray Pilot	
Application system:	Boom and Nozzle	

Year: **1953 (corrected)**
Area: 1 811 000 acres (733 455 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
Formulation:	oil solution	
Aircraft:	77 Stearmans	
Guidance:	Visual and Spray Pilot	
Application system:	Boom and Nozzle	

Year: **1954 (corrected)**
Area: 1 141 000 acres (462 105 ha)
Insect: Eastern spruce budworm

New Brunswick

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft: 42 Stearmans
Guidance: Visual and Spray Pilot
Application system: Boom and Nozzle

Year: **1955 (corrected)**
Area: 1 124 000 acres (455 220 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft: 40 Stearmans
Guidance: Visual and Spray Pilot
Application system: Boom and Nozzle

Year: **1956 (corrected)**
Area: 1 974 000 acres (799 470 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft: 89 Stearmans
Guidance: Visual and Spray Pilot
Application system: Boom and Nozzle

Year: **1957 (corrected)**
Area: 5 196 000 acres (2 104 380 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft: 200 Stearmans

Guidance: Visual and Spray Pilot
Application system: Boom and Nozzle

Year: **1958 (corrected)**
Area: 2 600 000 acres (1 053 000 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft: Stearmans
TBMs
Guidance: Stearman - visual
Pointer in Cessna 185 (with radio contact)
above teams of 2 TBMs
Application system: Boom and Nozzle

Year: **1960 (corrected)**
Area: 2 640 000 acres (1 069 200 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.37 lb/ac (414 g/ha)	0.75 gal/ac (7.0 L/ha)
	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation:
Aircraft: Stearmans
Grumman Avengers
Guidance: Stearman - visual
Pointer in Cessna 185 (with radio contact)
above teams of 2 TBMs
Application system: Boom and Nozzle

Year: **1961 (corrected)**
Area: 6 400 acres (2 592 ha)
Gagetown
Insect: Mosquito

Insecticide	Active ingredient	Application rate
	1 lb/ac (1.12 kg/ha)	

New Brunswick

Formulation: -
Aircraft: Dakota
Guidance: -
Application system: -

Year: **1961 (corrected)**
Area: 2 188 000 acres (886 140 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: -
Aircraft: Stearmans
TBMs
Guidance: Stearman - visual
Pointer in Cessna 185 (with radio contact)
above teams of 2 TBMs
Application system: Boom and Nozzle

Year: **1962 (corrected)**
Area: 1 366 000 acres (553 230 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: -
Aircraft: Stearmans
TBMs
Guidance: F.P.L. pointer guidance system
Application system: Boom and Nozzle

Year: **1963 (corrected)**
Area: 668 000 acres (270 540 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
Phosphamidon	0.5 lb/ac (560 g/ha)	0.75 gal/ac (7.0 L/ha)

Formulation:

New Brunswick

Aircraft:	Stearmans
	TBMs
Guidance:	F.P.L. pointer guidance system
Application system:	Boom and Nozzle

Year: **1964 (corrected)**
Area: 2 090 900 acres (846 815 ha)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
DDT	0.5 lb/ac (560 g/ha)	0.7 gal/ac (6.55 L/ha)
Phosphamidon	0.5 lb/ac (560 g/ha)	0.75 gal/ac (7.0 L/ha)
	0.25 lb/ac (280 g/ha)	0.75 gal/ac (7.0 L/ha)

Formulation:	oil solution
	wettable powder
Aircraft:	Stearmans
	TBMs
Guidance:	F.P.L. pointer guidance system
Application system:	Boom and Nozzle

Year: **1965 (corrected)**
Area: 2 119 051 acres (858 216 ha)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
DDT	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
Phosphamidon	0.25 lb/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)
	0.25 lb/ac (280 g/ha)	0.4 gal/ac (3.74 L/ha)

Formulation:	oil solution
Aircraft:	19 Grumman Avengers
	38 Stearman Avengers
Guidance:	F.P.L. pointer guidance system
Application system:	Boom and Nozzle

Year: **1966 (corrected)**
Area: 1 969 700 acres (797 127 ha)
Miramichi River
Tobique River
Nashwaak River
Insect: Eastern spruce budworm

New Brunswick

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.33 lb/ac (373 g/ha)	0.5 gal/ac (4.68 L/ha)
Phosphamidon	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
Formulation:	-	
Aircraft:	TBM Grumman Avengers	
	Grumman AgCats	
	S-2-D Snow Commanders	
	Stearmans	
Guidance:	F.P.L. pointer guidance system	
Application system:	Boom and Nozzle	

Year: **1967 (corrected)**
Area: ~1 039 180 acres (420 868 ha)
Taxes and Doaktown
Durphy and Renous
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	
Formulation:	-	
Aircraft:	TBMs	
	Stearmans	
	AgCats	
	S-2-D Snow Commanders	
Guidance:	F.P.L. pointer guidance system	
Application system:	Boom and Nozzle	

Year: **1968 (corrected)**
Area: 487 000 acres (197 235 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.375 lb/ac (420 g/ha)	0.375 gal/ac (3.5 L/ha)
	0.188 lb/ac (210 g/ha)	0.375 gal/ac (3.5 L/ha)
	0.125 lb/ac (140 g/ha)	0.25 gal/ac (2.34 L/ha)
Formulation:		
Aircraft:	TBMs	
	AgCats	
Guidance:	F.P.L. pointer guidance system	

Application system: Boom and Nozzle

Year: **1969 (corrected)**
Area: 3 109 560 acres (1 259 372 ha)
Miramichi River basin
St. John River basin
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: emulsion
Aircraft: TBMs
AgCats
Guidance: F.P.L. pointer guidance system
Application system: Boom and Nozzle

Year: **1970 (corrected)**
Area: 4 237 500 acres (1 716 188 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	0.125 lb/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
	0.188 lb/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)
Dimecron 110	0.188 lb/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: emulsion
Aircraft: 27 TBMs
Guidance: F.P.L. pointer guidance system
Application system: Boom and Nozzle

Year: **1971 (corrected)**
Area: 6 003 477 acres (2 431 408 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: emulsion
Aircraft: TBMs
Guidance: F.P.L. pointer guidance system
Application system: Boom and Nozzle

New Brunswick

Year: **1972 (corrected)**
Area: 4 570 000 acres (1 850 850 ha)
Sussex
Juniper
Blissville
Sevogle
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)
	4 oz/ac (280 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: oil solution
emulsion
Aircraft: TBMs
Guidance: F.P.L. pointer guidance system
Application system: Boom and Nozzle

Year: **1973 (corrected)**
Area: 4 554 000 acres (1 844 370 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: oil solution
emulsion
Aircraft: TBMs
Guidance: F.P.L. pointer guidance system
Application system: Boom and Nozzle

Year: **1974 (corrected)**
Area: 5 923 000 acres (2 398 815 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	
Dimecron	2 oz/ac (140 g/ha)	
	1 oz/ac (70 g/ha)	
Dylox	6.4 oz/ac (448 g/ha)	

Formulation:

New Brunswick

Aircraft:	TBMs
	DC-6s
Guidance:	F.P.L. pointer guidance system for TBM
	Litton for DC-6
Application system:	Boom and Nozzle

Year: **1975 (corrected)**
Area: 6 660 000 acres (2 697 300 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2.5 oz/ac (175 g/ha)	0.125 gal/ac (1.17 L/ha)
	4 oz/ac (280 g/ha)	0.125 gal/ac (1.17 L/ha)
Dimecron	2.5 oz/ac (175 g/ha)	0.125 gal/ac (1.17 L/ha)
	4 oz/ac (280 g/ha)	0.125 gal/ac (1.17 L/ha)
Matacil	0.75 oz/ac (52.5 g/ha)	0.125 gal/ac (1.17 L/ha)
Dylox	4 oz/ac (280 g/ha)	0.125 gal/ac (1.17 L/ha)

Formulation:	emulsion
	wettable powder
	oil solution
Aircraft:	Grumman Avengers
	Cessna AgWagons
	Thrush Commanders
Guidance:	F.P.L. pointer guidance system for TBM
	Litton for DC-6
Application system:	Boom and Nozzle

Year: **1976 (corrected)**
Area: 9 592 000 acres (3 884 760 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	20 fl oz/ac (1.46 L/ha)
	4 oz/ac (280 g/ha)	20 fl oz/ac (1.46 L/ha)
Dylox	8 oz/ac (560 g/ha)	10 fl oz/ac (0.73 L/ha)
Matacil	1 oz/ac (70 g/ha)	-
Dimecron	2 oz/ac (140 g/ha)	

Formulation:	oil solution
	emulsion
Aircraft:	3 DC-6
	6 Thrush Commanders
	4 C-46s
	4 Cessna AgTrucks

New Brunswick

	38 Grumman Avengers
Guidance:	Litton as in previous years
	F.P.L. as in previous years
Application system:	Micronair
	Boom and Nozzle

Year: **1977 (corrected)**
Area: 4 149 600 acres (1 680 588 ha)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	4 oz/ac (280 g/ha)	20 fl oz/ac (1.46 L/ha)
	3 oz/ac (210 g/ha)	20 fl oz/ac (1.46 L/ha)
	3 oz/ac (210 g/ha)	64 fl oz/ac (4.67 L/ha)
	3 oz /ac (210 g/ha)	10 fl oz/ac (0.73 L/ha)
Dylox	8 oz/ac (560 g/ha)	20 fl oz/ac (1.46 L/ha)
	16 oz/ac (1.12 kg/ha)	64 fl oz/ac (4.67 L/ha)
Matacil	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)
	0.75 oz/ac (52.5 g/ha)	20 fl oz/ac (1.46 L/ha)

Formulation:	emulsion
	oil solution
	wettable powder
Aircraft:	Grumman Avengers
	Thrush Commanders
	helicopters
Guidance:	F.P.L. System
Application system:	Boom and Nozzle

Year: **1978 (corrected)**
Area: 3 840 000 acres (1 555 200 ha)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Matacil	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)
Fenitrothion	3 oz/ac (210 g/ha)	20 fl oz/ac (1.46 L/ha)
	4 oz/ac (280 g/ha)	20 fl oz/ac (1.46 L/ha)

Formulation:	oil solution
	emulsion (water)
Aircraft:	TBMs
	Thrushes
Guidance:	F.P.L. System
Application system:	Boom and Nozzle

New Brunswick

Year: **1979 (corrected)**
Area: 3 956 000 acres (1 602 180 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	70 g/ha (1 oz/ac)	0.73 L/ha (10 fl oz/ac)
	86 g/ha (1.23 oz/ac)	0.73 L/ha (10 fl oz/ac)
Fenitrothion	210 g/ha (3 oz/ac)	
Formulation:	-	
Aircraft:	30 Grumman Avengers (TBM-3)	
	3 Thrushes	
Guidance:	F.P.L. System	
Application system:	Boom and Nozzle	

Year: **1980 (corrected)**
Area: 1 614 000 ha (3 988 194 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	210 g/ha (3 oz/ac)	0.73 L/ha (10 fl oz/ac)
Matacil	70 g/ha (1 oz/ac)	0.73 L/ha (10 fl oz/ac)
Formulation:	oil solution	
Aircraft:	3 Standard Thrushes	
	29 TBMs	
	1 DC-6	
	1 Bell 206	
	3 Ayres Turbo Thrushes	
Guidance:	F.P.L. System	
Application system:	Micronair	
	Boom and Nozzle	

Year: **1981 (corrected)**
Area: 1 899 636 ha (4 694 000 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	210 g/ha (3 oz/ac)	1.46 L/ha (20 fl oz/ac)
	210 g/ha (3 oz/ac)	0.73 L/ha (10 fl oz/ac)
Formulation:	emulsion	
	oil solution	
Aircraft:	TBM-3s	

New Brunswick

	AgCats
	DC-6s
	Cessna AgTrucks
	Thrushes
	Piper Pawnees
	M-18s
Guidance:	F.P.L. System
Application system:	Boom and Nozzle
	Micronair

Year: **1982 (corrected)**
Area: 1 694 051 ha (4 186 000 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	210 g/ha (3 oz/ac)	0.73 L/ha (10 fl oz/ac)
	120 g/ha (1.7 oz/ac)	0.73 L/ha (10 fl oz/ac)
	210 g/ha (3 oz/ac)	1.46 L/ha (20 fl oz/ac)
Bt	-	-
Matacil (flowable)	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
	70 g/ha (1 oz/ac)*	1.46 L/ha (20 fl oz/ac)
Formulation:	emulsion	
	oil solution	
	water solution*	
Aircraft:	AgCats	
	Cessna AgTrucks	
	TBMs	
	M-18s	
Guidance:	F.P.L. System	
Application system:	Boom and Nozzle	
	Micronair	

Year: **1983 (corrected)**
Area: 1 494 557 ha (3 693 050 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Matacil (180F)	70 g/ha (1 oz/ac)*	1.46 L/ha (20 fl oz/ac)
Fenitrothion	210 g/ha (3 oz/ac)*	1.46 L/ha (20 fl oz/ac)
	210 g/ha (3 oz/ac)**	1.46 L/ha (20 fl oz/ac)
Novabac-3	30 BIU/ha (12.1 BIU/ac)	4.68 L/ha (64 fl oz/ac)
Formulation:	emulsion (oil)*	
	emulsion (water)**	

	wettable powder
Aircraft:	1 DC-6
	6 AgCats
	27 TBMs
	6 Cessna 188s
	4 M-18s
Guidance:	F.P.L. System
Application system:	Boom and Nozzle
	Micronair

Year: **1983 (corrected)**
Area: 182 ha (450 acres)
Insect: Gypsy moth

Insecticide	**Active ingredient**	**Application rate**
Dipel 88	30 BIU/ha (12.2 BIU/ac)	9.4 L/ha (1.01 gal/ac)
	40 BIU/ha (16.2 BIU/ac)	11.7 L/ha (1.25 gal/ac)

Formulation:	wettable powder
Aircraft:	Piper Pawnee
Guidance:	visual maps
Application system:	Micronair

Year: **1984 (corrected)**
Area: 1 030 567 ha (2 546 531 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	210 g/ha (3 oz/ac)	1.46 L/ha (20 fl oz/ac)
	280 g/ha (4 oz/ac)	1.46 L/ha (20 fl oz/ac)
Thuricide (48LV)	30 BIU/ha (12.2 BIU/ac)	-
Matacil	90 g/ha (1.29 oz/ac)	1.46 L/ha (20 fl oz/ac)
	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)

Formulation:	emulsion (water)
	undiluted
Aircraft:	5 Cessna AgTrucks
	4 Piper Pawnees
	1 Brave
	21 TBMs
	12 AgCats
	1 Hiller 12E helicopter
	2 Bell 206 helicopters
Guidance:	F.P.L. System
	Modified F.P.L. System

New Brunswick

Application system:	Boom and Nozzle Micronair

Year: **1985 (corrected)**
Area: 700 859 ha (1 731 823 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Sumithion	210 g/ha (3 oz/ac)*	1.46 L/ha (20 fl oz/ac)
	210 g/ha (3 oz/ac)**	1.46 L/ha (20 fl oz/ac)
Matacil (180F)	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
	70 g/ha (1 oz/ac)	0.44 L/ha (6 fl oz/ac)
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.35 L/ha (32.2 fl oz/ac)
Thuricide (48LV)	30 BIU/ha (12.2 BIU/ha)	2.35 L/ha (32.2 fl oz/ac)
Formulation:	emulsion (oil)*	
	emulsion (water)**	
	undiluted	
Aircraft:	12 TBM Avengers	
	8 AgCats	
	8 AgTrucks	
	4 M-18s	
	2 Piper Pawnees	
	4 Bell 206 helicopters	
Guidance:	F.P.L. System	
Application system:	Boom and Nozzle	
	Micronair	

Year: **1986 (corrected)**
Area: 496 091 ha (1 226 000 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Matacil	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
	70 g/ha (1 oz/ac)*	0.44 L/ha (6 fl oz/ac)
Sumithion	210 g/ha (3 oz/ac)	1.46 L/ha (20 fl oz/ac)
	210 g/ha (3 oz/ac)	0.44 L/ha (6 fl oz/ac)
Dipel 132	30 BIU/ha (12.2 BIU/ac)*	2.36 L/ha (32.3 fl oz/ac)
Formulation:	emulsion (water)	
	undiluted*	
Aircraft:	9 TBM Avengers	
	8 AgCats	
	8 Cessna 188s	
	4 Bell 206 helicopters	

New Brunswick

Guidance:	F.P.L. System
Application system:	Boom and Nozzle Micronair

Year: **1987**
Area: 478 300 ha (1 181 401 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Sumithion	210 g/ha (3 oz/ac)	
	140 g/ha (1 oz/ac)	
Dipel	15 BIU/ha (6.1 BIU/ac)	
	30 BIU/ha (12.2 BIU/ac)	
Futura	30 BIU/ha (12.2 BIU/ac)	
Matacil + Sumithion	70 g/ha (1 oz/ac) + 210 g/ha (3 oz/ac)	
Sumithion + Dipel	210 g/ha (3 oz/ac) + 30 BIU/ha (12.2 BIU/ac)	
Formulation:	-	
Aircraft:	AgTruck	
	AgCat	
	TBM	
Guidance:	-	
Application system:	Micronair AU4000	

Year: **1988**
Area: 478 300 ha (1 181 401 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Sumithion	210 g/ha (3 oz/ac)	
	280 g/ha (4 oz/ac)	
Dipel 132	30 BIU/ha (12.2 BIU/ac)	
Futura XLV	30 BIU/ha (12.2 BIU/ac)	
Sumithion + Futura XLV	210 g /ha (3 oz/ac) + 30 BIU/ha (12.2 BIU/ac)	
Formulation:		
Aircraft:	12 TBMs	
	1 DC-6	
	2 AgTrucks	
Guidance:		
Application system:		

New Brunswick

Year: **1988**
Area: 183 ha (452 acres)
Mohannes
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1989**
Area: 576 900 ha (1 424 943 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion	210 g/ha (3 oz/ac)	1.46 L/ha (20 fl oz/ac)
Futura XLV	30 BIU/ha (12.2 BIU/ac)	1.01 L/ha (13.8 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	2.02 L/ha (27.6 fl oz/ac)
Dipel 176	15 BIU/ha (6.1 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)
Dipel 176 +	15 BIU/ha (6.1 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)
Futura XLV	+ 15 BIU/ha (6.1 BIU/ac)	+ 1.10 L/ha (15.1 fl oz/ac)
Dipel 176 +	30 BIU/ha (12.2 BIU/ac)	2.36 L/ha (32.3 fl oz/ac)
Futura XLV	+ 30 BIU/ha (12.2 BIU/ac)	+ 2.02 L/ha (27.6 fl oz/ac)
Formulation:	undiluted	
	wettable powder	
Aircraft:	12 TBMs	
	2 DC-6s	
	11 single-engine planes	
Guidance:	-	
Application system:	Micronair AU4000	

Year: **1990**
Area: 21 160 ha (52 265 acres)
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Fenitrothion	210 g/ha (3 oz/ac)	1.46 L/ha (20 fl oz/ac)
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.03 L/ha (27.8 fl oz/ac)

Formulation:

New Brunswick

Aircraft:	TBM
Guidance:	
Application system:	Boom and Nozzle

Year: **1990**
Area: 533 200 ha (1 317 004 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Futura XLV-HP	30 BIU/ha (12.2 BIU/ac)	0.9 L/ha (12.3 fl oz/ac)
	15 BIU/ha (6.1 BIU/ac)	0.45 L/ha (6.2 fl oz/ac)
Biodart	15 BIU/ha (6.1 BIU/ac)	0.89 L/ha (12.2 fl oz/ac)
Sumithion*	210 g/ha (3 oz/ac)	1.46 L/ha (20 fl oz/ac)
	210 g/ha (3 oz/ac)	0.44 L/ha (6 fl oz/ac)
Sumithion + Futura XLV-HP	210 g/ha (3 oz/ac) + 15 BIU/ha (6.1 BIU/ac)	0.45 L/ha (6.2 fl oz/ac)

Formulation:	undiluted
	wettable powder*
Aircraft:	12 TBMs
	AgCats
	AgTrucks
	Thrushes
	M-18s
Guidance:	
Application system:	Boom and Nozzle
	Sergonairs
	Micronair AU4000

Nova Scotia

Year: **1980 (corrected)**

Area:	17 510 ha (43 267 acres)	Cape Breton Highlands
	8 160 ha (20 163 acres)	Mainland
	25 670 ha (63 430 acres)	

Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)

Formulation:	emulsion
Aircraft:	4 AgCats
	1 Stearman

Nova Scotia

	1 Cessna AgTruck
Guidance:	Cessna 172
	2 navigators
Application system:	Boom and Nozzle
	- Tee Jet
	- Flat Fan 8006

Year:	**1981 (corrected)**	
Area:	10 528.8 ha (26 017 acres)	Mainland
	20 666.2 ha (51 066 acres)	Cape Breton Highlands
	31 145.0 ha (77 083 acres)	
Insect:	Eastern spruce budworm	

Insecticide	**Active ingredient**	**Application rate**
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	7.1 L/ha (97 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.3 L/ha (80 fl oz/ac)

Formulation:	emulsion
Aircraft:	12 AgCats (A)
Guidance:	Cessna 172
	2 navigators
Application system:	Boom and Nozzle
	- Tee Jet
	- Flat Fan 8006

Year:	**1982 (corrected)**	
Area:	629 ha (1 554 acres)	Cape Breton Highlands
	18 524.2 ha (45 773 acres)	Mainland
	19 153.2 ha (47 327 acres)	
Insect:	Eastern spruce budworm	

Insecticide	**Active ingredient**	**Application rate**
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	7.1 L/ha (97 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.85 L/ha (80 fl oz/ac)
Thuricide 32LV	20 BIU/ha (8.1 BIU/ac)	5.85 L/ha (80 fl oz/ac)

Formulation:	emulsion
Aircraft:	Grumman AgCats (A)
Guidance:	Cessna 172
	2 navigators
Application system:	Boom and Nozzle
	- Tee Jet
	- Flat Fan 8006

Nova Scotia

Year: **1983 (corrected)**
Area: 20 240 ha (50 013 acres) Mainland
489 ha (1 208 acres) Cape Breton Highlands
20 729 ha (51 221 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.85 L/ha (80 fl oz/ac)
Thuricide 32LV	20 BIU/ha (8.1 BIU/ac)	5.85 L/ha (80 fl oz/ac)
Novabac-3	20 BIU/ha (8.1 BIU/ac)	4.67 L/ha (64 fl oz/ac)

Formulation: emulsion (water)
Aircraft: 9 Grumman AgCats
1 Hughes 500 helicopter
Guidance: 5 Cessna 172s
2 navigators per plane
Application system: Boom and Nozzle
- Tee Jet
- Flat Fan 8006

Year: **1983 (corrected)**
Area: 25 ha (62 acres) Town of Yarmouth
Insect: Gypsy moth

Insecticide	**Active ingredient**	**Application rate**
Thuricide 32LV	20 BIU/ha (8.1 BIU/ac)	5.85 L/ha (80 fl oz/ac)

Formulation: emulsion
Aircraft: ground
Guidance: people on foot
Application system: Micronair AU5000 in Mistblower

Year: **1984**
Area: 621.7 ha (1 536 acres) Pictou County
176.0 ha (435 acres) Kings County
117.0 ha (289 acres) Colchester County
19 622.3 ha (48 487 acres) Cumberland County
20 537.0 ha (50 747 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.6 L/ha (35.6 fl oz/ac)
	20 BIU/ha (8.1 BIU/ac)	1.6 L/ha (21.9 fl oz/ac)
Dipel 176 (experimental)	20 BIU/ha (8.1 BIU/ac)	1.1 L/ha (15.1 fl oz/ac)

Nova Scotia

Formulation: undiluted
Aircraft: 1 Hughes 500 helicopter
6 Grumman AgCats
Guidance: 4 Cessna 172s
Application system: Micronair AU5000

Year: **1984 (corrected)**
Area: 25 ha (62 acres) Town of Yarmouth
Insect: Gypsy moth

Insecticide	Active Ingredient	Application rate
Thuricide 32LV	20 BIU/ha (8.1 BIU/ac)	5.85L/ha (80 fl oz/ac)

Formulation: emulsion
Aircraft: ground
Guidance: people on foot
Application System: Micronair AU5000 in Mistblower

Year: **1985 (corrected)**

Area:	5 384.9 ha (13 306 acres)	Antigonish County
	2 367.0 ha (5 849 acres)	Colchester County
	37 367.8 ha (92 336 acres)	Cumberland County
	4 167.7 ha (10 298 acres)	Pictou County
	85.2 ha (211 acres)	Inverness County, Cape Breton Highlands
	348.0 ha (860 acres)	Victoria County, Cape Breton Highlands
	49 720.6 ha (122 860 acres)	

Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	20 BIU/ha (8.1 BIU/ac)	1.6 L/ha (21.9 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)

Formulation: undiluted
Aircraft: 1 Piper Pawnee
6 Thrush Commanders
9 Grumman AgCats
1 Hughes 500 helicopter
Guidance: Cessna 172
Bell 206B helicopter
Application system: Micronair AU5000

Nova Scotia

Year: **1986 (corrected)**
Area: 135.8 ha (336 acres) Cumberland County
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.1 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)

Formulation: undiluted
Aircraft: 3 AgCats
Guidance: 2 Cessna 172s
Micronair AU5000

Year: **1986 (corrected)**
Area:

3 806.5 ha (9 406 acres)	Antigonish County
3 389.1 ha (8 375 acres)	Colchester County
41 507.6 ha (102 565 acres)	Cumberland County
7 451.6 ha (18 413 acres)	Pictou County
56 154.8 ha (138 759 acres)	

Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)

Formulation: undiluted
Aircraft: 3 Piper Pawnees
6 Grumman AgCats
3 Ayres Thrushes
Guidance: Cessna 172
1 helicopter
Application system: Micronair AU5000

Year: **1987 (corrected)**
Area:

412.4 ha (1 019 acres)	Antigonish County
6 270.0 ha (15 493 acres)	Colchester County
23 102.6 ha (57 087 acres)	Cumberland County
1 295.3 ha (3 201 acres)	Pictou County
31 080.3 ha (76 800 acres)	

Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)

Formulation: undiluted
Aircraft: 7 Grumman AgCats

Nova Scotia

Guidance: Cessna 172
1 helicopter
Application system: Micronair AU5000

Year: **1987 (corrected)**
Area: 98 ha (242 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)

Formulation: undiluted
Aircraft: ground
Guidance:
Application system: Micronair AU5000 in Mistblower

Quebec

Year: **1952 (corrected)**
Area: 8 000 acres (3 240 ha)
Caseault Forest Reserve
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Formulation: oil solution
Aircraft: 1 Beaver
Guidance: -
Application System: -

Year: **1953 (corrected)**
Area: 1 000 acres (405 ha)
Caseault Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Formulation: oil solution
Aircraft: 1 Stearman

Quebec

Guidance:
Application System:

Year: **1954 (corrected)**
Area: 318 000 acres (128 790 ha) Lower St. Lawrence
Gaspé
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft:
Guidance:
Application system:

Year: **1955 (corrected)**
Area: 1 040 000 acres (421 200 ha)
Lower St. Lawrence
Gaspé
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft:
Guidance:
Application system:

Year: **1956 (corrected)**
Area: 400 000 acres (162 000 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft:
Guidance:
Application system:

Quebec

Year: **1957 (corrected)**
Area: 1 255 000 acres (508 275 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft: -
Guidance: -
Application system: -

Year: **1960 (corrected)**
Area: 33 000 acres (13 365 ha)
Kedgwick River
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft: Stearmans
Guidance:
Application system:

Year: **1960**
Area: 2 055 acres (832 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1961 (corrected)**
Area: 77 000 acres (31 185 ha)
Kedgwick River
Insect: Eastern spruce budworm

Quebec

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft: Stearmans
Guidance:
Application system:

Year: **1961**
Area: 1 600 acres (648 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 85 P	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Formulation: oil solution
Aircraft:
Guidance:
Application system:

Year: **1962**
Area: 69 000 acres (27 945 ha)
Kedgwick River
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution
Aircraft: Stearmans
Guidance: -
Application system:

Year: **1962**
Area: 1 600 acres (648 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 80S	1 lb/ac (1.12 kg/ha)	

Formulation: wettable powder

Quebec

Aircraft:
Guidance:
Application system:

Year: **1962**
Area: 200 acres (81 ha)
Drummondville
Insect: Larch sawfly

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Formulation: oil solution
Aircraft: -
Guidance:
Application system:

Year: **1963**
Area: 2 000 acres (810 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 80S	0.8 lb/ac (896 g/ha)	

Formulation: wettable powder
Aircraft: -
Guidance: -
Application system: -

Year: **1964**
Area: 2 000 acres (810 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 80S	0.8 lb/ac (896 g/ha)	

Formulation: wettable powder
Aircraft: -
Guidance: -
Application system: -

Quebec

Year: **1964**
Area: 4 000 acres (1 620 ha)
Roberval
Insect: Swaine jack-pine sawfly

Insecticide	Active ingredient	Application rate
NPV	7 - 14 × 10^9 PIB/ac (17.3 - 34.6 × 10^9 PIB/ha)	1.5 - 2 gal/ac (14 - 18.7 L/ha)

Formulation: water suspension
Aircraft: 2 Stearmans
Guidance:
Application system:

Year: **1965**
Area: 900 acres (365 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 80S	0.8 lb/ac (896 g/ha)	

Formulation: wettable powder
Aircraft:
Guidance:
Application system:

Year: **1965 (corrected)**
Area: 150 000 acres (60 750 ha)
St. Maurice Valley
Insect: Swaine jack-pine sawfly

Insecticide	Active ingredient	Application rate
Dimecron 90	4 oz/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: wettable powder
Aircraft: Stearmans
Guidance: Cessna 172s
Application system: Boom and Nozzle

Year: **1966**
Area: 300 acres (122 ha)
Insect: Gypsy moth

Quebec

Insecticide	Active ingredient	Application rate
Sevin 80S	0.8 lb/ac (896 g/ha)	

Formulation: wettable powder
Aircraft: -
Guidance:
Application system:

Year: **1967**
Area: 18 000 acres (7 290 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 80S	0.8 lb/ac (896 g/ha)	

Formulation: wettable powder
Aircraft:
Guidance:
Application system:

Year: **1967**
Area: 90 000 acres (36 450 ha)
Insect: Swaine jack-pine sawfly

Insecticide	Active ingredient	Application rate
Phosphamidon	4 oz/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)
Fenitrothion	4 oz/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: wettable powder
Aircraft: Stearmans
Guidance: Cessna 172s
Application system: Boom and Nozzle

Year: **1968 (corrected)**
Area: 3 430 acres (1 389 ha)
Grand'Mère
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Phosphamidon	4 oz/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: wettable powder
Aircraft: Bell G4 helicopters
Guidance:
Application system:

Year: **1968**
Area: 15 000 acres (6 075 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 80S	0.8 lb/ac (896 gal/ha)	

Formulation: wettable powder
Aircraft:
Guidance:
Application system:

Year: **1969**
Area: 6 000 acres (2 430 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 80S	0.8 lb/ac (896 g/ha)	

Formulation: wettable powder
Aircraft: -
Guidance: -
Application system:

Year: **1969**
Area: Rouge River (plantations)
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	0.04 g/ac (0.099 g/ha)	1 gal/ac (9.35 L/ha)

Formulation:
Aircraft: ground
Guidance: -
Application system: Mistblower

Quebec

Year: **1970 (corrected)**
Area: 4 500 acres (1 823 ha)
Grand'Mère
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3.5 oz/ac (245 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: wettable powder
Aircraft: Bell G4 helicopters
Guidance:
Application system:

Year: **1970 (corrected)**
Area: 2 700 acres (1 094 ha)
Baskatong Reservoir
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: emulsion (water)
Aircraft: 3 Stearmans
Guidance: 1 Cessna
Application system: -

Year: **1970 (corrected)**
Area: 24 300 acres (9 842 ha)
Gatineau Park
Gatineau River watershed
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: emulsion (water)
Aircraft: 3 Stearmans
Guidance: Cessna
Application system: Boom and Nozzle

Quebec

Year: **1970**
Area: 4 500 acres (1 823 ha)
St. Maurice region
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3.5 oz/ac (245 g/ha)	0.4 gal/ac (3.7 L/ha)

Formulation: -
Aircraft: 2 Bell G4 helicopters
Guidance: Automatic Flagman
Application system:

Year: **1970**
Area: 1 000 acres (405 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 80S	0.8 lb/ac (896 g/ha)	

Formulation: wettable powder
Aircraft:
Guidance:
Application system:

Year: **1971**
Area: 2 030 000 acres (822 150 ha)
Western Quebec
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: emulsion (water)
Aircraft: 9 Grumman Avengers
Guidance: 6 Cessna pointers
Application system:

Year: **1971**
Area: 116 316 acres (47 132 ha)
Témiscouata
Insect: Eastern spruce budworm

Quebec

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)
Formulation:	emulsion (water)	
Aircraft:	TBM Avengers	
Guidance:		
Application system:		

Year: **1972**
Area: 424 391 acres (171 878 ha)
Anticosti Island
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.3 gal/ac (2.81 L/ha)
Formulation:	emulsions	
Aircraft:	15 Grumman Avengers	
Guidance:		
Application system:		

Year: **1972**
Area: 1 200 000 acres (486 000 ha) Gatineau River watershed
235 000 acres (95 175 ha) Dumoine River watershed
1 435 000 acres (581 175 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)
Formulation:	emulsion (water and oil)	
Aircraft:	18 Grumman Avengers 1 DC-7B	
Guidance:	15 Cessnas (with navigators and supervisors) Litton LTN-51	
Application system:		

Year: **1972 (corrected)**
Area: 19 560 acres (7 922 ha)
Gatineau River watershed
Insect: Jack-pine budworm

Quebec

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)
Formulation:	emulsion (water)	
Aircraft:	Grumman Avengers	
Guidance:		
Application system:		

Year: **1972**
Area: 17 585 acres (7 122 ha)
Landron Lake
Insect: Swaine jack-pine sawfly

Insecticide	Active ingredient	Application rate
Fenitrothion	0.5 oz/ac (35 g/ha)	
	1 oz/ac (70 g/ha)	
	2 oz/ac (140 g/ha)	
	4 oz/ac (280 g/ha)	
Formulation:	emulsion	
Aircraft:	Grumman Avengers	
Guidance:	-	
Application system:	-	

Year: **1973**
Area: 25 000 acres (10 125 ha)
Anticosti Island
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	
Phosphamidon	2 oz/ac (140 g/ha)	
Formulation:	-	
Aircraft:	CL-215s	
Guidance:	-	
Application system:	-	

Year: **1973 (corrected)**
Area: 7 600 000 acres (3 078 000 ha)
Gatineau - du Lièvre watersheds

Quebec

Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)
Matacil	0.75 oz/ac (52.5 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: oil solution
Aircraft: 4 DC-6Bs
54 Constellation L-749s
4 Super Constellation L-1049s
Guidance: Decca System
Application system:

Year: **1973 (corrected)**
Area: 1 100 000 acres (445 500 ha)
Témiscouata
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dimecron	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: emulsion (water)
Aircraft: 2 CL-215s
3 Grumman Avengers
Guidance: Litton LTN-51
Cessna pointers
Application system: Boom and Nozzle

Year: **1973 (corrected)**
Area: 1 100 000 acres (445 500 ha)
Gaspé peninsula
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dimecron	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: emulsion (water and oil)
Aircraft: 4 PV-2s
Guidance: Decca System
Application system: -

Quebec

Year: **1974**
Area: 1 614 700 acres (653 954 ha) Lac des Loups
1 722 000 acres (697 410 ha) La Macaza
3 013 300 acres (1 220 386 ha) Casey sector
6 350 000 acres (2 571 750 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	16 fl oz/ac (1.17 L/ha)
	2 oz/ac (140 g/ha)	12 fl oz/ac (0.88 L/ha)
	3 oz/ac (210 g/ha)	16 fl oz/ac (1.17 L/ha)
Matacil	0.75 oz/ac (52.5 g/ha)	16 fl oz/ac (1.17 L/ha)
Zectran	0.75 oz/ac (52.5 g/ha)	16 fl oz/ac (1.17 L/ha)
Bt	3.25 BIU/ac (8.03 BIU/ha)	32 fl oz/ac (2.34 L/ha)
	6.5 BIU/ac (16.1 BIU/ha)	64 fl oz/ac (4.67 L/ha)

Formulation: oil solution
wettable powder
Aircraft: 4 DC-6Bs
3 Super Constellation L-1049
1 Constellation L-749
2 CL-215s
Guidance:
Application system:

Year: **1974**
Area: 600 acres (243 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dylox	1 lb/ac (1.12 kg/ha)	100 gal/ac (935 L/ha)

Formulation: wettable powder
Aircraft:
Guidance:
Application system:

Year: **1975**
Area: 6 647 000 acres (2 692 035 ha)
La Macaza
Pointe Lebel
Casey sector
Bonaventure
Saint-Honoré
Anticosti Island

Quebec

Rivière-du-Loup
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.09 or 0.12 gal/ac (0.84 or 1.12 L/ha)
Matacil	0.75 oz/ac (52.5 g/ha)	0.09 or 0.12 gal/ac (0.84 or 1.12 L/ha)
Phosphamidon	2 oz/ac (140 g/ha)	0.09 or 0.12 gal/ac (0.84 or 1.12 L/ha)
Zectran	0.75 oz/ac (52.5 g/ha)	0.09 or 0.12 gal/ac (0.84 or 1.12 L/ha)

Formulation:
Aircraft: 2 DC-4s
5 DC-6Bs
2 Constellation L-749s
1 Commander 690A
Guidance: 1 Aerostar
3 Baron Beechcraft
2 Cessna 310s
1 Piper Seneca
Application system:

Year: **1975**
Area:

47 754 acres (19 340 ha)	Port-Neuf
34 462 acres (13 957 ha)	Bellechasse
71 660 acres (29 022 ha)	Kamouraska
153 876 acres (62 319 ha)	

Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	6.8 BIU/ac (16.8 BIU/ha)	48 fl oz/ac (3.5 L/ha)
Thuricide 26B	6.8 BIU/ac (16.8 BIU/ha)	66 fl oz/ac (4.82 L/ha)
Thuricide 36B	6.8 BIU/ac (16.8 BIU/ha)	68 fl oz/ac (4.96 L/ha)

Formulation: wettable powder
Aircraft: DC-6Bs
Guidance:
Application system:

Year: **1975**
Area: 1 200 acres (486 ha)
southern Quebec
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	

Quebec

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1976**
Area: 7 300 000 acres (2 956 500 ha)
La Macaza
Rivière-du-Loup
Saint-Honoré
Bonaventure
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	2 oz/ac (140 g/ha)	11.52 fl oz/ac (0.84 L/ha)
Matacil	0.75 oz/ac (52.5 g/ha)	11.52 fl oz/ac (0.84 L/ha)
Dimethoate	2 oz/ac (140 g/ha)	11.52 fl oz/ac (0.84 L/ha)

Formulation: oil solution
Aircraft: 7 DC-6Bs (spray)
3 Constellation L-749s (spray)
1 Turbo Commander (control)
1 Cessna 31 (control)
4 Beechcraft Barons (control)
Guidance: Litton International
Application system:

Year: **1976**
Area: 350 acres (142 ha) La Mauricie National Park
280 acres (113 ha) Forillon National Park
630 acres (255 ha)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	4 oz/ac (280 g/ha)	
Sevin-4-oil	8 oz/ac (560 g/ha)	
	14 oz/ac (980 g/ha)	

Formulation: oil solution
Aircraft: helicopter (and Mistblower)
Guidance:
Application system:

Quebec

Year: **1977**
Area: 3 097 307 acres (1 254 409 ha)
Rivière-du-Loup
Matane
Bonaventure
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	0.09 gal/ac (0.84 L/ha)
Matacil	1 oz/ac (70 g/ha)	0.09 gal/ac (0.84 L/ha)
Phosphamidon	2 oz/ac (140 g/ha)	0.09 gal/ac (0.84 L/ha)

Formulation: oil solution
Aircraft: 7 DC-6Bs
Guidance: Litton LTN-51
Application system: -

Year: **1978**
Area: 2 600 000 acres (1 053 000 ha)
Lower St. Lawrence
Gaspé
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion	3 oz/ac (210 g/ha)	16 or 20 fl oz/ac (1.17 or 1.46 L/ha)
Matacil	0.75 oz/ac (52.5 g/ha)	16 or 20 fl oz/ac (1.17 or 1.46 L/ha)
	1 oz/ac (70 g/ha)	16 or 20 fl/oz/ac (1.17 or 1.46 L/ha)

Formulation: oil solution
emulsion
Aircraft: 3 DC-6Bs
3 DC-3s
3 Constellation L-749s
2 AgCats
Guidance: Litton LTN-51
Application system: Boom and Nozzle

Year: **1978**
Area: 1 200 acres (486 ha)
Oka, Paul Sauvé Park
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dimilin 25% (WP)	0.5 oz/ac (35 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation:	wettable powder
Aircraft:	Grumman AgCat
Guidance:	
Application system:	

Year: **1979**
Area: 581 959 ha (1 438 021 acres)
Rivière-du-Loup
Matane
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	52 g/ha (0.75 oz/ac)	1.122 L/ha (15.4 fl oz/ac)
Fenitrothion	210 g/ha (3 oz/ac)	1.122 L/ha (15.4 fl oz/ac)
Thuricide	29.65 BIU/ha (12 BIU/ac)	7.015 L/ha (96 fl oz/ac)
	19.77 BIU/ha (8 BIU/ac)	4.677 L/ha (64 fl oz/ac)
Novabac-3	29.65 BIU/ha (12 BIU/ac)	7.015 L/ha (96 fl oz/ac)
ABG-6103	19.77 BIU/ha (8 BIU/ac)	5.846 L/ha (80 fl oz/ac)

Formulation:	oil solution
	wettable powder
Aircraft:	3 Constellation L-749s
Guidance:	Litton
Application system:	Boom and Nozzle

Year: **1980**
Area: Montmagny
Rivière-du-Loup
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion	210 g/ha (3 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
Matacil	52 g/ha (0.75 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
Thuricide 32B	29.65 BIU/ha (12 BIU/ac)	7.015 L/ha (96 fl oz/ac)

Formulation:	oil solution
	wettable powder
Aircraft:	2 Constellation L-749s
	2 AgCats
Guidance:	Litton
	Flying Flagman
Application system:	Boom and Nozzle

Quebec

Year: **1980**
Area: 288 ha (710 acres) campgrounds
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin 80S	1.5 lb/ac (1.68 kg/ha)	

Formulation: wettable powder
Aircraft: ground
Guidance: -
Application system:

Year: **1981**
Area: 702 351 ha (1 735 509 acres)
Lower St. Lawrence
Lac Saint-Jean
Gaspésie
Québec
Saguenay
Côte Nord
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	52 g/ha (0.75 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
Fenitrothion	210 g/ha (3 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
Dipel 88	19.76 BIU/ha (8 BIU/ac)	7.0 L/ha (96 fl oz/ac)

Formulation: -
Aircraft: 2 Constellations
2 Grumman AgCats (B)
3 DC-4s
Guidance: Litton or guidance aircraft
Application system: -

Year: **1982**
Area: 1 298 495 ha (3 208 581 acres)
Lower St. Lawrence
Lac Saint-Jean
Gaspésie
Québec
Saguenay
Côte Nord
Insect: Eastern spruce budworm

Quebec

Insecticide	Active ingredient	Application rate
Matacil	52 g/ha (0.75 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
	87.5 g/ha (1.25 oz/ac)	2.34 L/ha (32 fl oz/ac)
Fenitrothion	210 g/ha (3 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
Thuricide 32LV	30 BIU/ha (12.2 BIU/ac)	4.68 L/ha (64 fl oz/ac)
	20 BIU/ha (8.1 BIU/ac)	4.68 L/ha (64 fl oz/ac)
	40 BIU/ha (16.2 BIU/ac)	4.68 L/ha (64 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	3.5 L/ha (48 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	8.8 L/ha (120.4 fl oz/ac)
Formulation:	oil solution	
	wettable powder	
Aircraft:	2 Constellation L-749s	
	2 Piper Pawnees	
	6 DC-4Gs	
	3 Grumman AgCats (B)	
Guidance:	Litton or guidance plane	
Application system:	-	

Year: **1983**
Area: Lower St. Lawrence
Québec
Gaspésie
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	210 g/ha (3 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
Matacil	52 g/ha (0.75 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
	87.5 g/ha (1.25 oz/ac)	2.34 L/ha (32 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.85 L/ha (80 fl oz/ac)
Novabac-3	30 BIU/ha (12.2 BIU/ac)	6.6 L/ha (90 fl oz/ac)
Formulation:	oil solution	
	wettable powder	
Aircraft:	4-engine	
	single-engine	
Guidance:	-	
Application system:		

Year: **1984**
Area: 622 665 ha (1 538 605 acres)
Lower St. Lawrence
Saguenay
Gaspésie

Quebec

Lac Saint-Jean
Québec
Côte Nord

Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil 180D	52 g/ha (0.75 oz/ac)	1.4 L/ha (19.2 fl oz/ac)
Matacil 180D	87.5 g/ha (1.25 oz/ac)	2.34 L/ha (32 fl oz/ac)
Matacil 180F	52 g/ha (0.75 oz/ac)	1.4 L/ha (19.2 fl oz/ac)
Fenitrothion	210 g/ha (3 oz/ac)	1.4 L/ha (19.2 fl oz/ac)
Thuricide 32LV	20 BIU/ha (8.1 BIU/ac)	4.68 L/ha (64 fl oz/ac)
	20 BIU/ha (8.1 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Thuricide 48LV	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Futura	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)
Dipel 132	20 BIU/ha (8.1 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)

Formulation: oil solution
wettable powder

Aircraft: 2 Constellation L-749s
2 AgCats
5 DC-4Gs
1 Turbo Thrush
3 DC-6s

Guidance: Litton LTN-51
guidance plane

Application system: Micronair
Boom and Nozzle

Year: **1985**

Area: 666 452 ha (1 646 803 acres)
Lower St. Lawrence
Gaspésie
Saguenay
Lac Saint-Jean
Québec
Côte Nord

Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	210 g/ha (3 oz/ac)	1.4 L/ha (19.2 fl oz/ac)
Futura (FC)/(XLV)	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)
Thuricide 48LV	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Novabac-3	30 BIU/ha (12.2 BIU/ac)	4.68 L/ha (64 fl oz/ac)

Formulation: oil solution
wettable powder

	undiluted
Aircraft:	1 Constellation L-749
	2 Bull Thrushes
	3 DC-6s
	3 Turbo Thrushes
	5 DC-4Gs
Guidance:	Litton LTN - 51
	guidance plane
Application system:	

Year: **1985 (corrected)**
Area: 30 925 ha (76 415 acres)
Lower St. Lawrence
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Futura	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)

Formulation:	-
Aircraft:	Grumman AgCat
Guidance:	-
Application system:	Boom and Nozzle

Year: **1986**
Area: 51 155 ha (126 404 acres)
Trois-Rivières
Côte Nord
Saguenay
Lac Saint-Jean
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Thuricide 48LV	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Sumithion	210 g/ha (3 oz/ac)	1.4 L/ha (19.2 fl oz/ac)

Formulation:	oil solution
	undiluted
Aircraft:	2 Bull Thrushes
	3 AgCats (B)
Guidance:	guidance plane
Application system:	Micronair AU5000

Quebec

Year: **1986**
Area: 14 629 ha (36 148 acres) private woodlots
Gaspésie
Lower St. Lawrence
La Pocatière
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)

Formulation: wettable powder
Aircraft: 4 Grumman AgCats
Guidance: helium balloons
Hughes 300 C helicopter
Application system: Boom and Nozzle

Year: **1987**
Area: 197 992 ha (489 040 acres)
Lower St. Lawrence
Gaspésie
Côte Nord
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Dipel 176	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)

Formulation: undiluted
Aircraft: 4 DC-4s
4 Bull Thrushes
2 Turbo Thrushes
Guidance: Litton LTN-51
bird-dog plane
Application system: Micronair AU5000
110 "Spraying System" open jets

Year: **1987**
Area: 7 100 ha (17 537 acres) private woodlots
Lower St. Lawrence
Gaspésie
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura		2.5 L/ha (34.2 fl oz/ac)

Formulation:	wettable powder
Aircraft:	2 AgCats (450 h.p.)
Guidance:	helium balloons
	Hughes 500C helicopter
Application system:	Teejet Flat Fan 8004

Year: **1988**
Area: 192 073 ha (474 420 acres)
Lower St. Lawrence
Gaspésie
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)

Formulation:	
Aircraft:	2 DC-4s
	5 AgCats
	2 Thrush Commanders
	5 Bull Thrushes
Guidance:	-
Application system:	Micronair AU5000

Year: **1988**
Area: 16 000 ha (39 520 acres) private woodlots
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura FC		2.5 L/ha (34.2 fl oz/ac)
Futura XLV		2.5 L/ha (34.2 fl oz/ac)

Formulation:	wettable powder
Aircraft:	3 AgCats (600 h.p.)
Guidance:	helium balloons
	Hughes 500C helicopter
Application system:	Boom and Nozzle
	(Teejet Flat Fan 8004)

Year: **1989**
Area: 24 000 ha (59 280 acres) private woodlots
Lower St. Lawrence
Gaspésie
Insect: Eastern spruce budworm

Quebec

Insecticide	Active ingredient	Application rate
Futura XLV		2.5 L/ha (34.2 fl oz/ac)
Dipel 48AF		2.5 L/ha (34.2 fl oz/ac)
Formulation:	wettable powder	
Aircraft:	5 AgCats (600 h.p.)	
Guidance:	helium balloons Hughes 500C helicopter	
Application system:	Boom and nozzle (Teejet Flat Fan 8004)	

Year: **1989**
Area: 165 034 ha (407 634 acres)
Lower St. Lawrence
Gaspésie
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Dipel 176	30 BIU/ha (12.2 BIU/ac)	1.77 L/ha (24.2 fl oz/ac)
Formulation:	undiluted	
Aircraft:	2 DC-4s 1 DC-6 3 Bull Thrushes 2 AgCats	
Guidance:	-	
Application system:	Boom and Nozzle Micronair AU5000	

Year: **1990**
Area: 6 456 ha (15 946 acres) private woodlots
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bt		
Formulation:		
Aircraft:		
Guidance:		
Application system:		

Quebec

Year: **1990**
Area: 479 896 ha (1 185 343 acres)
Lower St. Lawrence
Gaspésie
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 176	30 BIU/ha (12.2 BIU/ac)	1.77 L/ha (24.2 fl oz/ac)
Futura XLV-HP	30 BIU/ha (12.2 BIU/ac)	0.90 L/ha (12.3 fl oz/ac)
Foray 48B	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Biodart	30 BIU/ha (12.2 BIU/ac)	1.77 L/ha (24.2 fl oz/ac)

Formulation: undiluted
Aircraft: 5 DC-6s
4 DC-4s
3 Piper Pawnees
12 AgCats
2 Thrush 800s
2 Turbo Thrushes
Guidance: -
Application system:

Ontario

Year: **1945 (corrected)**
Area: 64 000 acres (25 920 ha)
Lake Nipigon
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Formulation: oil solution
Aircraft: 4 Canso As
Guidance: photo mosaics
Application system: Boom and Nozzle

Year: **1946 (corrected)**
Area: 23 700 acres (9 599 ha)
Insect: Eastern spruce budworm

Ontario

Insecticide	Active ingredient	Application rate
DDT	2 lb/ac (2.24 kg/ha) 3 lb/ac (3.36 kg/ha)	2 gal/ac (18.7 L/ha) 3 gal/ac (28.1 L/ha)
Formulation:	oil solution	
Aircraft:	1 Canso A	
Guidance:	photo mosaics	
Application system:	Boom and Nozzle	

Year: **1950**
Area: 5 - 100 acres (2 - 41 ha)
Muskoka Lakes
Haliburton
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)
Formulation:	oil solution	
Aircraft:	Piper J3 Republic Seabee Cessna T50	
Guidance:	-	
Application system:	-	

Year: **1951**
Area: 5 - 100 acres (2 - 41 ha)
Muskoka Lakes
Haliburton
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)
Formulation:	oil solution	
Aircraft:	Piper J3 Republic Seabee Cessna T50	
Guidance:	-	
Application system:	-	

Year: **1952**
Area: 5 - 100 (2 - 41 ha)
Muskoka Lakes
Haliburton
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Formulation: oil solution
Aircraft: Piper J3
Republic Seabee
Cessna T50
Guidance:
Application system:

Year: **1957**
Area: 33 acres (13 ha)
Blandford Township
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
DDT	4 lb/ac (4.48 kg/ha)	4 gal/ac (37.4 L/ha)

Formulation: oil solution
Aircraft:
Guidance:
Application system:

Year: **1961 - 1966**
Area: 4 715 acres (1 910 ha)
Thessalon
Preston and Clancy Townships
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
DDT	1.7 - 4 lb/ac (1.9 - 4.48 kg/ha)	1.7 - 4 gal/ac (15.9 - 37.4 L/ha)

Formulation: oil solution
Aircraft: helicopters
Guidance:
Application system:

Ontario

Year: **1966 (corrected)**
Area: 3 960 acres (1 604 ha)
Dufferin County
Simcoe County
Peel County
Northumberland County
Durham County
Insect: European pine sawfly

Insecticide	Active ingredient	Application rate
Phosphamidon	1.2 oz/ac (84 g/ha)	1 gal/ac (9.35 L/ha)

Formulation: wettable powder
Aircraft: Bell 47G-5 helicopter
Guidance: -
Application system: Boom and Nozzle

Year: **1968 (corrected)**
Area: 280 000 acres (113 400 ha)
Lakehead Region - Burchell Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	6 oz/ac (420 g/ha)	0.2 gal/ac (1.87 L/ha)
Phosphamidon	4 oz/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: wettable powder
Aircraft: 18 Stearmans
Guidance: 5 Cessna 172s
Application system: Boom and Nozzle

Year: **1968 (corrected)**
Area: 1 180 acres (478 ha)
Rushing River Provincial Park
Blue Lake Provincial Park
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Sumithion	6 oz/ac (420 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: emulsion (water)
Aircraft: 1 Stearman
Guidance:
Application system: Boom and Nozzle

Ontario

Year: **1968**
Area: near Sault Ste. Marie
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	3 lb/ac (3.36 kg/ha)	2 gal/ac (18.7 L/ha)

Formulation: emulsion (water)
Aircraft: Stearman or Super AgCat
Guidance:
Application system: Boom and Nozzle

Year: **1969 (corrected)**
Area: 5 000 acres (2 025 ha) French Lake (Quetico Park)
21 000 acres (8 505 ha) Burchell Lake
26 000 acres (10 530 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion	5.7 oz/ac (399 g/ha)	0.2 gal/ac (1.87 L/ha)
Phosphamidon	3 oz/ac (210 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: wettable powder
Aircraft: 3 Stearmans
Guidance:
Application system: Boom and Nozzle

Year: **1969 (corrected)**
Area: 6 800 acres (2 754 ha)
Petawawa Forest Experiment Station
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Sumithion	4 oz/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: emulsion (water)
Aircraft: 1 Stearman
Guidance: balloon and cloth markers
Application system: Boom and Nozzle

Ontario

Year: **1969 (corrected)**
Area: 4 000 acres (1 620 ha)
Kirkwood Management Unit
Mount Lake
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Sumithion	4 oz/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: emulsion (water)
Aircraft: 1 Stearman
Guidance: -
Application system: Boom and Nozzle

Year: **1969**
Area: 2 220 acres (899 ha)
Kirkwood Management Unit
Army Lake
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	2 lb/ac (2.24 kg/ha)	2 gal/ac (18.7 L/ha)

Formulation: emulsion (water)
Aircraft: Stearman
Guidance: -
Application system: Boom and Nozzle

Year: **1970 (corrected)**
Area: 800 acres (324 ha)
Larose Forest
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	5.1 oz/ac (357 g/ha) 5.6 oz/ac (392 g/ha)	0.2 gal/ac (1.87 L/ha) 0.2 gal/ac (1.87 L/ha)

Formulation: wettable powder
Aircraft: 1 Stearman
1 Super AgCat
Guidance: -
Application system: Boom and Nozzle

Year: **1970 (corrected)**
Area: 450 acres (182 ha)
Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	4.3 oz/ac (301 g/ha) 5.1 oz/ac (357 g/ha)	0.2 gal/ac (1.87 L/ha) 0.2 gal/ac (1.87 L/ha)

Formulation: wettable powder
Aircraft: 1 Stearman
Guidance:
Application system:

Year: **1970 (corrected)**
Area: 11 000 acres (4 455 ha)
Missinaibi Provincial Park
Ivanhoe Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	4.3 oz/ac (301 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: wettable powder
Aircraft: 2 Stearmans
Guidance: -
Application system: Boom and Nozzle

Year: **1970 (corrected)**
Area: 11 000 acres (4 455 ha)
Northern Light Lake
Granite Lake
Gunflint Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	5 oz/ac (350 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: wettable powder
Aircraft: 2 Stearmans
Guidance: -
Application system: Boom and Nozzle

Ontario

Year: **1970**
Area: 6 000 acres (2 430 ha)
Insect: Gypsy moth

Insecticide	**Active ingredient**	**Application rate**
Sevin 80S	0.8 lb/ac (896 g/ha)	
Formulation:	wettable powder	
Aircraft:	-	
Guidance:	-	
Application system:		

Year: **1970**
Area: 1 200 acres (486 ha) Blind River
1 050 acres (425 ha) Kirkwood
2 250 acres (911 ha)
Insect: White pine weevil

Insecticide	**Active ingredient**	**Application rate**
Methoxychlor	2.5 lb/ac (2.8 kg/ha)	2 gal/ac (18.7 L/ha)
Formulation:	emulsion (water)	
Aircraft:	Super AgCat	
Guidance:	-	
Application system:	Boom and Nozzle	

Year: **1971**
Area: 400 acres (162 ha)
Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Accothion	3 oz/ac (210 g/ha)	0.5 gal/ac (4.68 L/ha)
Formulation:	oil solution	
Aircraft:	Hughes 269A helicopter	
Guidance:	-	
Application system:	Boom and Nozzle	

Year: **1971 (corrected)**
Area: 8 620 acres (3 491 ha)
Missinaibi Provincial Park

Lake Superior Provincial Park
Shoals Provincial Park
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	5.3 oz/ac (371 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: wettable powder
Aircraft: 1 Stearman
Guidance:
Application system: Boom and Nozzle

Year: **1971 (corrected)**
Area: 72 380 acres (29 314 ha)
Quetico Provincial Park
Northern Light Lake
Granite Lake
Gunflint Lake
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	4 oz/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: oil solution
Aircraft: 3 Stearmans
Guidance: Cessna
Application system: Boom and Nozzle

Year: **1971**
Area: 8 000 acres (3 240 ha)
Insect: Gypsy moth

Insecticide	**Active ingredient**	**Application rate**
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	

Formulation: oil solution
Aircraft: -
Guidance: -
Application system:

Ontario

Year: **1971**
Area: 1 460 acres (591 ha)
Kirkwood
Township 2A
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	3 lb/ac (3.36 kg/ha)	2 gal/ac (18.7 L/ha)

Formulation: emulsion (water)
Aircraft: 1 Super AgCat
Guidance: -
Application system: Boom and Nozzle

Year: **1972 (corrected)**
Area: 2 000 acres (810 ha)
Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	6 fl oz/ac (0.44 L/ha)

Formulation: oil solution
Aircraft: 1 Stearman
Guidance: -
Application system: Micronair

Year: **1972**
Area: 36 900 acres (14 945 ha)
Quetico Provincial Park
Northern Light Lake
Granite Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran	1.2 oz/ac (84 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: oil solution
Aircraft: 3 Stearmans
Guidance: -
Application system: Micronair

Ontario

Year: **1972 (corrected)**
Area: 9 600 acres (3 888 ha)
Missinaibi Provincial Park
Lake Superior Provincial Park
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Zectran	1.2 oz/ac (84 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: oil solution
Aircraft: 1 Super AgCat
Guidance: -
Application system: Micronair AU3000

Year: **1972**
Area: 1 800 acres (729 ha)
Parry Sound
Insect: Jack-pine budworm

Insecticide	**Active ingredient**	**Application rate**
Zectran	1.2 oz/ac (84 g/ha)	0.2 gal/ac (1.87 L/ha)

Formulation: oil solution
Aircraft: 1 AgCat
Guidance: -
Application system: Micronair AU3000

Year: **1972**
Area: 12 000 acres (4 860 ha)
Insect: Gypsy moth

Insecticide	**Active ingredient**	**Application rate**
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	

Formulation: oil solution
Aircraft: -
Guidance:
Application system:

Year: **1972**
Area: 4 470 acres (1 810 ha)
Sault Ste. Marie (plantations)

Ontario

Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	2.4 lb/ac (2.69 kg/ha)	1 gal/ac (9.35 L/ha)
	2.4 lb/ac (2.69 kg/ha)	2 gal/ac (18.7 L/ha)
Formulation:	emulsion (water)	
Aircraft:	Grumman Super AgCat	
Guidance:	-	
Application system:	Micronair AU3000	

Year: **1973 (corrected)**
Area: 5 750 acres (2 329 ha)
Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	0.5 gal/ac (4.68 L/ha)
	3 oz/ac (210 g/ha)	1 gal/ac (9.35 L/ha)
	3 oz/ac (210 g/ha)	2 gal/ac (18.7 L/ha)
	4 oz/ac (280 g/ha)	0.25 gal/ac (2.34 L/ha)
Formulation:	oil solution	
Aircraft:	1 Stearman	
	1 Cessna AgWagon	
Guidance:	-	
Application system:	Micronair	

Year: **1973 (corrected)**
Area: 77 300 acres (31 307 ha)
Quetico Provincial Park
Northern Light Lake
Granite Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran	1.2 oz/ac (84 g/ha)	0.15 gal/ac (1.4 L/ha)
Formulation:	oil solution	
Aircraft:	3 Stearmans	
Guidance:	-	
Application system:	Micronair AU3000	

Ontario

Year: **1973 (corrected)**
Area: 11 000 acres (4 455 ha)
Missinaibi Provincial Park
Shoals Provincial Park
Five-Mile Provincial Park
Wakami Provincial Park
Lake Superior Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran	1.2 oz/ac (84 g/ha)	0.15 gal/ac (1.4 L/ha)

Formulation: oil solution
Aircraft: 1 Stearman
1 Super AgCat
Guidance:
Application system: Micronair AU3000

Year: **1973**
Area: 2 500 acres (1 013 ha)
Blind River District
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	2.4 lbs/ac (2.69 kg/ha)	2 gal/ac (18.7 L/ha)

Formulation: wettable powder
Aircraft: 1 Stearman
1 AgCat
Guidance:
Application system: Micronair

Year: **1974**
Area: 24 600 acres (9 963 ha) Quetico Provincial Park
21 900 acres (8 870 ha) Lake Superior Park/Shoals Park
1 860 acres (753 ha) Algonquin Provincial Park
48 360 acres (19 586 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran	1.2 oz/ac (84 g/ha)	0.15 gal/ac (1.4 L/ha)
Bt	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: oil solution

Ontario

	wettable powder
Aircraft:	2 Stearmans
	1 AgCat
Guidance:	-
Application system:	-

Year: **1974**
Area: 14 000 acres (5 670 ha)
Insect: Gypsy moth

Insecticide	**Active ingredient**	**Application rate**
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	
Formulation:	oil solution	
Aircraft:		
Guidance:		
Application system:		

Year: **1975**
Area: 20 000 acres (8 100 ha)
Bennett Lake
Fort Frances
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	12 oz/ac (840 g/ha)	24 fl oz/ac (1.75 L/ha)
Formulation:	undiluted	
Aircraft:	1 AgCat	
Guidance:	-	
Application system:	Micronair	

Year: **1975**
Area:

8 715 acres (3 530 ha)	Wawa
2 395 acres (970 ha)	Chapleau
580 acres (235 ha)	Sault Ste. Marie
11 690 acres (4 735 ha)	

Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Dylox	12 oz/ac (840 g/ha)	
Fenitrothion	4 oz/ac (280 g/ha)	

	2.5 oz/ac (175 g/ha)
Formulation:	-
Aircraft:	1 AgCat 2 Stearmans
Guidance:	
Application system:	Micronair

Year: **1975**
Area: 2 370 acres (948 ha)
Algonquin Park
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	2 oz/ac (140 g/ha)	
Thuricide 16B	-	

Formulation:	-
Aircraft:	1 AgCat
Guidance:	-
Application system:	Micronair Mistblower (Thuricide)

Year: **1975**
Area: 5 200 acres (2 106 ha)
Kingston/Gananoque
Long Sault Parkway
Insect: Gypsy moth

Insecticide	**Active ingredient**	**Application rate**
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	

Formulation:	
Aircraft:	
Guidance:	
Application system:	

Year: **1975**
Area: 125 ha (309 acres)
Sandbanks Provincial Park
Insect: European pine sawfly

Ontario

Insecticide	Active ingredient	Application rate
NPV	5.3×10^6 PIB/ha (2.14×10^6 PIB/ac)	9.4 L/ha (1 gal/ac)
Formulation:	wettable powder	
Aircraft:	Piper Supercub	
Guidance:	-	
Application system:	Boom and Nozzle	

Year: **1976**
Area: 87 153 acres (35 297 ha)
Bennett Lake
Fort Frances
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	1.5 oz/ac (105 g/ha)	12.8 fl oz/ac (0.93 L/ha)
Fenitrothion	4 oz/ac (280 g/ha)	12.8 fl oz/ac (0.93 L/ha)
Formulation:	oil solution	
Aircraft:	2 Stearmans	
	2 AgCats	
Guidance:	-	
Application system:	Micronair AU3000	

Year: **1976**

Area:	3 510 acres (1 422 ha)	Chapleau
	8 573 acres (3 472 ha)	Wawa
	12 083 acres (4 894 ha)	

Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	1.5 oz/ac (105 g/ha)	12.8 fl oz/ac (0.93 L/ha)
Fenitrothion	4 oz/ac (280 g/ha)	12.8 fl oz/ac (0.93 L/ha)
Orthene	8 oz/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
	4 oz/ac (280 g/ha)	0.25 gal/ac (2.34 L/ha)
Formulation:	oil solution	
	wettable powder	
Aircraft:	1 Piper Pawnee	
	1 Stearman	
Guidance:	-	
Application system:	Micronair AU3000	

Ontario

Year: **1976**
Area: 2 020 acres (818 ha)
Algonquin Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: wettable powder
Aircraft: 1 Piper Pawnee
Guidance:
Application system: Micronair AU3000

Year: **1976**
Area: 353 acres (143 ha)
Pembroke
Insect: Saratoga spittlebug

Insecticide	Active ingredient	Application rate
Malathion 50% EC	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: wettable powder
Aircraft: Piper Supercub
Guidance:
Application system: Boom and Nozzle

Year: **1977**
Area: 10 717 acres (4 340 ha)
Chapleau
Shoals Park
Kirkland Lake
Five-Mile Park
Wawa
Wakami Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)
Orthene	4 oz/ac (280 g/ha)	20 fl oz/ac (1.46 L/ha)
	8 oz/ac (560 g/ha)	20 fl oz/ac (1.46 L/ha)
	4 oz/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
	8 oz/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
Bt	-	-

Ontario

Formulation: oil solution
wettable powder
Aircraft: 1 AgCat
1 Cessna AgTruck
Guidance: -
Application system:

Year: **1977**
Area: 4 050 acres (1 640 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dimilin	0.5 oz/ac (35 g/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: wettable powder
Aircraft: Grumman AgCat
Guidance: -
Application system: -

Year: **1977**
Area: 4 417 acres (1 789 ha)
Parry Sound
Bracebridge
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Thuricide 16B	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)

Formulation: wettable powder
Aircraft: 2 Cessna AgTrucks
Guidance: -
Application system: Micronair

Year: **1977**
Area: 1 200 acres (486 ha)
Awenda
Insect: Oak leaf shredder

Insecticide	Active ingredient	Application rate
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Formulation: oil solution

Aircraft: Piper Pawnee
Guidance: -
Application system: Boom and Nozzle

Year: **1978**
Area: 200 ha (494 acres)
Kirkland Lake
Hearst
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	87.5 g/ha (1.25 oz/ac)	4.67 L/ha (0.5 gal/ac)
Orthene	560 g/ha (8 oz/ac)	4.67 L/ha (0.5 gal/ac)

Formulation: oil solution
wettable powder
Aircraft: 1 Cessna AgTruck
Guidance: -
Application system: Micronair AU3000

Year: **1978**
Area: 100.2 ha (248 acres)
Chapleau
Kapuskasing
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel WP	1.12 kg/ha (1 lb/ac)	935 L/ha (100 gal/ac)
Orthene	1.12 kg/ha (1 lb/ac)	935 L/ha (100 gal/ac)

Formulation: wettable powder
Aircraft: ground
Guidance: -
Application system: Mistblower
hydraulic sprayer

Year: **1978**
Area: 360 acres (146 ha)
Lancaster
Insect: Gypsy moth

Ontario

Insecticide	Active ingredient	Application rate
Dimilin 25%	0.5 oz/ac (35 g/ha)	0.5 gal/ac (4.68 L/ha)
Formulation:	wettable powder	
Aircraft:	Grumman AgCat	
Guidance:		
Application system:		

Year: **1978**
Area: 1 895 acres (768 ha)
Parry Sound
Bracebridge
Huronia
Owen Sound
Minden
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Thuricide 16B	3 BIU/ac (7.4 BIU/ha)	0.5 gal/ac (4.68 L/ha)
	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)
	4.8 BIU/ac (11.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Dipel WP	2.4 BIU/ac (5.9 BIU/ha)	2 gal/ac (18.7 L/ha)
Formulation:	wettable powder	
Aircraft:	Cessna AgTruck	
	Stearman	
	Piper Pawnee	
Guidance:		
Application system:	Micronair	

Year: **1978**
Area: 758 ha (1 873 acres)
Insect: Oak leaf shredder

Insecticide	Active ingredient	Application rate
Orthene 85	840 g/ha (12 oz/ac)	9.35 L/ha (1 gal/ac)
Formulation:	wettable powder	
Aircraft:	Cessna AgTruck	
	Stearman	
	Hughes 500C helicopter	
Guidance:	-	
Application system:	Micronair	
	Boom and Nozzle	

Ontario

Year: **1979**
Area: 50 032 acres (20 263 ha)
Kirkland Lake
Chapleau
Geraldton
Kapuskasing
Gogama
Hearst
Cochrane
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Orthene	8 oz/ac (560 g/ha)	64 fl oz/ac (4.68 L/ha)
	4 oz/ac (280 g/ha)	20 fl oz/ac (1.46 L/ha)
Matacil	1.25 oz/ac (87.5 g/ha)	20 fl oz/ac (1.46 L/ha)
	0.88 oz/ac (61.6 g/ha)	14 fl oz/ac (1.02 L/ha)
Thuricide 16B	4 BIU/ac (9.9 BIU/ha)	64 fl oz/ac (4.68 L/ha)
	3.8 BIU/ac (9.4 BIU/ha)	60 fl oz/ac (4.38 L/ha)
Novabac 32B	8 BIU/ac (19.88 BIU/ha)	64 fl oz/ac (4.68 L/ha)

Formulation: wettable powder
oil solution
Aircraft: Grumman AgCats
Piper Pawnees
Guidance: -
Application system: Micronair

Year: **1979**
Area: 750 acres (304 ha)
Huronia
Insect: Oak leaf shredder

Insecticide	Active ingredient	Application rate
Orthene 85SP	12 oz/ac (840 g/ha)	1 gal/ac (9.35 L/ha)

Formulation: wettable powder
Aircraft: AgCat
Guidance: -
Application system: Boom and Nozzle

Year: **1980**
Area: 10 310 ha (25 476 acres)
Parry Sound
Cochrane
Kirkland Lake

Ontario

Kapuskasing
Chapleau
Hearst
Gogama

Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Matacil	86.1 g/ha (1.23 oz/ac)	1.46 L/ha (20 fl oz/ac)
Orthene 97SP	560 g/ha (8 oz/ac)	9.34 L/ha (1 gal/ac)
	1.12 kg/ha (16 oz/ac)	9.34 L/ha (1 gal/ac)
Cygon 4E	560 g/ha (8 oz/ac)	18.7 L/ha (2 gal/ac)
	560 g/ha (8 oz/ac)	9.34 L/ha (1 gal/ac)
Novabac-3	24.7 BIU/ha (10 BIU/ac)	4.67 L/ha (64 fl oz/ac)
Thuricide 16B	14.8 BIU/ha (6 BIU/ac)	4.67 L/ha (64 fl oz/ac)
Formulation:	oil solution	
	wettable powder	
Aircraft:	Hughes 300 helicopter	
	Bell 47 helicopter	
	4 Grumman AgCats	
	1 Piper Pawnee	
Guidance:	Guidance plane	
Application system:	Micronair	
	Boom and Nozzle	

Year: **1980**
Area: 486 ha (1 200 acres)
Howe Island, Kingston
Insect: Gypsy moth

Insecticide	**Active ingredient**	**Application rate**
Sevin-4-oil	2.34 L/ha (32 fl oz/ac)	
Formulation:	oil solution	
Aircraft:	-	
Guidance:	-	
Application system:		

Year: **1980**
Area: 849 ha (2 095 acres)
Huronia
Maple
Insect: Oak leaf shredder

Insecticide	Active ingredient	Application rate
Orthene 85SP	840 g/ha (12 oz/ac)	9.35 L/ha (1 gal/ac)
Formulation:	wettable powder	
Aircraft:	AgCat Piper Pawnee	
Guidance:		
Application system:	Boom and Nozzle	

Year: **1980**
Area: 437 ha (1 080 acres)
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
Lecontvirus		
Formulation:	emulsion	
Aircraft:	ground	
Guidance:		
Application system:		

Year: **1981**
Area: 10 170 ha (25 130 acres)
Kirkland
Chapleau
Hearst
Temagami
Kapuskasing
Parry Sound
Gogama
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	86 g/ha (1.23 oz/ac)	4.7 L/ha (64.3 fl oz/ac)
	86 g/ha (1.23 oz/ac)	3 L/ha (41 fl oz/ac)
	86 g/ha (1.23 oz/ac)	9.4 L/ha (1.01 gal/ac)
Thuricide 16B	16 BIU/ha (6.5 BIU/ac)	6.2 L/ha (85 fl oz/ac)
	13-20 BIU/ha (5.3-8.1 BIU/ac)	6.0-7.0 L/ha (82-96 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)
	24 BIU/ha (9.7 BIU/ac)	7.0 L/ha (96 fl oz/ac)
Thuricide 32B	20 BIU/ha (8.1 BIU/ac)	4.7 L/ha (64.3 fl oz/ac)
NPV	0.741×10^{12} PIB/ha (0.3×10^{12} PIB/ac)	9.4 L/ha (1.01 gal/ac)
	2.47×10^{12} PIB/ha (1×10^{12} PIB/ac)	18.8 L/ha (2.01 gal/ac)

Ontario

Formulation:	oil solution
	wettable powder
Aircraft:	3 AgCats
	2 Bell 64A helicopters
	2 Cessna AgTrucks
	1 Stearman
	1 Piper Pawnee
Guidance:	guidance plane with Flying Flagman
Application system:	Micronair

Year: **1981**
Area: 759 ha (1 875 acres)
Insect: Red-headed pine sawfly

Insecticide	**Active ingredient**	**Application rate**
Lecontvirus		

Formulation:	emulsion
Aircraft:	ground
Guidance:	-
Application system:	

Year: **1982**
Area: 3 454 ha (8 535 acres)
Hearst
Kapuskasing
Temagami
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Matacil (1.8D)	90 g/ha (1.29 oz/ac)	9.4 L/ha (1.01 gal/ac)
	90 g/ha (1.29 oz/ac)	3.0 L/ha (41 fl oz/ac)
Orthene 85SP	560 g/ha (8 oz/ac)	9.4 L/ha (1.01 gal/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)
	13 BIU/ha (5.3 BIU/ac)	5.9 L/ha (81 fl oz/ac)
Thuricide 32B	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)
Thuricide 48B	30 BIU/ha (12.2 BIU/ac)	2.36 L/ha (32 fl oz/ac)
Novabac-3	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)
	20 BIU/ha (8.1 BIU/ac)	7.0 L/ha (96 fl oz/ac)

Formulation:	
Aircraft:	2 Piper Pawnees
	Hiller 12-E helicopter
Guidance:	-

Application system: Micronair
Boom and Nozzle

Year: **1982**
Area: 416 ha (1 028 acres)
Kaladar area, Tweed
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Sevin-4-oil	1.1 kg/ha (15.7 oz/ac)	2.4 L/ha (33 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	8.8 L/ha (120 fl oz/ac)
Gypchek	0.25×10^{12} PIB/ha (0.101×10^{12} PIB/ac)	18.8 L/ha (2 gal/ac)

Formulation:
Aircraft: 1 Boeing Stearman
1 Bell 47 helicopter
Guidance:
Application system: Boom and Nozzle

Year: **1982**
Area: 374 ha (924 acres)
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
Lecontvirus		

Formulation: emulsion
Aircraft: ground
Guidance:
Application system:

Year: **1983**
Area: 3 162 ha (7 813 acres)
Hearst
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil (1.8F)	90 g/ha (1.29 oz/ac)	3.0 L/ha (41 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)
Novabac-3	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)

Ontario

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1983**
Area: 579 ha (1 431 acres)
Dufferin County Forest
Simcoe County Forest
Huronia District
Insect: Oak leaf shredder

Insecticide	Active ingredient	Application rate
Sevin-4-oil	1.1 kg/ha (15.7 oz/ac)	9.4 L/ha (1.01 gal/ac)
Dipel 88	40 BIU/ha (16.2 BIU/ac)	4.7 L/ha (0.5 gal/ac)
Orthene 97SP	560 g/ha (8 oz/ac)	9.4 L/ha (1.01 gal/ac)
	840 g/ha (12 oz/ac)	9.4 L/ha (1.01 gal/ac)

Formulation: -
Aircraft: 2 Piper Pawnees
Guidance:
Application system: Micronair

Year: **1983**
Area: 211 ha (521 acres)
Algonquin Park
Parry Sound
Bancroft
North Bay
Bracebridge
Tweed
Carleton Place
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
Lecontvirus	5×10^9 PIB/ha (2.03×10^9 PIB/ac)	25 L/ha (2.68 gal/ac)
	0.33-11.2 $\times 10^9$ PIB/ha ($4\text{-}4.54 \times 10^9$ PIB/ac)	3.4-14.8 L/ha (0.36-1.58 gal/ac)
	0.025-12.5 $\times 10^9$ PIB/ha ($0.01\text{-}5.06 \times 10^9$ PIB/ac)	1-50 L/ha (0.11-5.35 gal/ac)
	15.5×10^9 PIB/ha (6.28×10^9 PIB/ac)	62 L/ha (6.63 gal/ac)
	3.1-10 $\times 10^9$ PIB/ha ($1.26\text{-}4.05 \times 10^9$ PIB/ac)	12.5-40 L/ha (1.34-4.28 gal/ac)
	1.6-13 $\times 10^9$ PIB/ha ($0.65\text{-}5.27 \times 10^9$ PIB/ac)	1.8-32 L/ha (0.19-3.42 gal/ac)

	8.3×10^9 PIB/ha (3.36×10^9 PIB/ac)	20 L/ha (2.14 gal/ac)
	8.7×10^9 PIB/ha (3.52×10^9 PIB/ac)	20 L/ha (2.14 gal/ac)

Formulation: emulsion
Aircraft: ground
Guidance:
Application system:

Year: **1984**
Area: 3 288 ha (8 125 acres)
Hearst District
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil (1.8F)	90 g/ha (1.29 oz/ac)	3.0 L/ha (41 fl oz/ac)
Sevin-4-oil	850 g/ha (12.2 oz/ac)	2.3 L/ha (31.5 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)
Dipel 132	20 BIU/ha (8.1 BIU/ac)	5.9 L/ha (81 fl oz/ac)

Formulation: -
Aircraft: 2 Grumman AgCats
Guidance: Cessna 172 with Del Norte Flying Flagman
Application system: Micronair

Year: **1984**
Area: 11 ha (27 acres)
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
Lecontvirus		

Formulation: emulsion
Aircraft: ground
Guidance:
Application system:

Year: **1985**

Area:	5 643 ha (13 944 acres)	Fort Frances
	19 057 ha (47 090 acres)	Thunder Bay
	4 339 ha (10 722 acres)	Hearst
	29 039 ha (71 756 acres)	

Insect: Eastern spruce budworm

Ontario

Insecticide	Active ingredient	Application rate
Dipel 132	20 BIU/ha (8.1 BIU/ac) 30 BIU/ha (12.2 BIU/ac)	
Thuricide 48LV	20 BIU/ha (8.1 BIU/ac)	
Formulation:	-	
Aircraft:	fixed-wing large helicopters	
Guidance:	-	
Application system:	Micronair	

Year: **1985**
Area: 221 676 ha (547 761 acres)
Chapleau
Espanola
Gogama
Blind River
Kirkland Lake
Sudbury
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Thuricide 48LV	20 BIU/ha (8.1 BIU/ac)	1.57 L/ha (21.5 fl oz/ac)
Dipel 132	20 BIU/ha (8.1 BIU/ac)	1.57 L/ha (21.5 fl oz/ac)
Formulation:	-	
Aircraft:	Piston and Turbo Thrushes Piper Pawnees AgCats Dromadier M-18s helicopters	
Guidance:	Cessnas with Flying Flagman	
Application system:	Micronair	

Year: **1985**
Area: 170 ha (420 acres)
Tweed District
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dipel 88	40 BIU/ha (16.2 BIU/ac)	
Formulation:	wettable powder	
Aircraft:	helicopter	

Guidance:
Application system:

Year: **1985**
Area: 161 ha (398 acres)
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
Lecontvirus		

Formulation: emulsion
Aircraft: ground
Guidance:
Application system:

Year: **1986**
Area: 149 994 ha (370 635 acres)

Sioux Lookout	Thunder Bay
Geraldton	Wawa
Ignace	Nipigon
Terrace Bay	Hearst

Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	20 BIU/ha (8.1 BIU/ac)	1.57 L/ha (21.5 fl oz/ac)
Thuricide 48LV	20 BIU/ha (8.1 BIU/ac)	1.57 L/ha (21.5 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	2.34 L/ha (32 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	6.0 L/ha (82.1 fl oz/ac)

Formulation: -
Aircraft: Cessna AgTrucks
Thrushes
Dromadier M-18s
Turbo Thrushes
Bell Jet Ranger helicopters
Piper Pawnees
Bell Jet Ranger 212 helicopters
AgCats
Sikorsky S55 helicopters
Guidance:
Application system: Micronair

Ontario

Year: **1986**
Area: 487 504 ha (1 204 622 acres)

Kenora	Atikokan
Sioux Lookout	Sudbury
Red Lake	Espanola
Dryden	Chapleau
Fort Frances	Gogama
Thunder Bay	

Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Dipel 132	20 BIU/ha (8.1 BIU/ac)	1.57 L/ha (21.5 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	6.0 L/ha (82.1 fl oz/ac)
Thuricide 48LV	20 BIU/ha (8.1 BIU/ac)	1.57 L/ha (21.5 fl oz/ac)

Formulation:
Aircraft:
Cessna AgTrucks
Thrushes
Dromadier M-18s
Turbo Thrushes
Bell Jet Ranger helicopters
Piper Pawnees
Bell Jet Ranger 212 helicopters
AgCats
Sikorsky S55 helicopters

Guidance: -
Application system: -

Year: **1986**
Area: 103 094 ha (254 745 acres)

Carleton Place
Brockville
Tweed
Pembroke
Napanee

Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	6.0 L/ha (82.1 fl oz/ac)

Formulation: wettable powder
Aircraft:
Cessna Agtrucks
Thrushes
Dromadier M-18s
Turbo Thrushes
Bell Jet Ranger helicopters

	Piper Pawnees Bell Jet Ranger 212 helicopters AgCats Sikorsky S55 helicopters
Guidance:	-
Application system:	Micronair

Year: **1986**
Area: 342 ha (845 acres)
Insect: Red-headed pine sawfly

Insecticide	**Active ingredient**	**Application rate**
Lecontvirus		

Formulation:	emulsion
Aircraft:	ground
Guidance:	
Application system:	

Year: **1987**
Area: 76 526 ha (189 019 acres) North Central
163 ha (403 acres) North West
76 689 ha (189 422 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Dipel 132	20 BIU/ha (8.1 BIU/ac) 30 BIU/ha (12.2 BIU/ac)	1.6 L/ha (21.9 fl oz/ac) 2.3 L/ha (31.5 fl oz/ac)

Formulation:	undiluted
Aircraft:	16 fixed-wing + helicopters
Guidance:	8 pointer aircraft
Application system:	

Year: **1987**
Area: 105 463 ha (260 494 acres)
Kenora
Fort Frances
Dryden
Red Lake
Insect: Jack-pine budworm

Ontario

Insecticide	Active ingredient	Application rate
Dipel 132	20 BIU/ha (8.1 BIU/ac)	1.57 L/ha (21.5 fl oz/ac)

Formulation: -
Aircraft: AgCats
Piper Pawnees
Guidance: -
Application system: rotary atomizers

Year: **1987**
Area: 40 249 ha (99 415 acres)
Tweed
Napanee
Brockville
Carleton Place
Pembroke
Bancroft
Lindsay
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.1-6.1 L/ha (28.7-83.5 fl oz/ac)
Thuricide 48LV	30 BIU/ha (12.2 BIU/ac)	2.1-6.1 L/ha (28.7-83.5 fl oz/ac)
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.1-6.1 L/ha (28.7-83.5 fl oz/ac)

Formulation: undiluted
wettable powder
Aircraft: Sikorsky S55 helicopter
Piper Pawnee
other fixed-wing
helicopters
Guidance:
Application system:

Year: **1988**
Area: 14 023 ha (34 637 acres)
Nipigon
Thunder Bay
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)

Formulation: undiluted

Aircraft: 3 Bell 206 helicopters
Guidance:
Application system: Micronair
Beecomist

Year: **1988**
Area: 13 784 ha (34 046 acres)
southern
Insect: Gypsy moth

Insecticide	**Active ingredient**	**Application rate**
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)

Formulation:
Aircraft: helicopter
fixed-wing
Guidance:
Application system:

Year: **1988**
Area: Bancroft
Bracebridge
Parry Sound
Huronia
Insect: Forest tent caterpillar

Insecticide	**Active ingredient**	**Application rate**
Futura FC	20 BIU/ha (8.1 bIU/ac)	1.35 L/ha (18.5 fl oz/ac)

Formulation: -
Aircraft: ground
Guidance: -
Application system: air blast sprayer
Mistblower

Year: **1988**
Area: 201 ha (497 acres)
Insect: Red-headed pine sawfly

Insecticide	**Active ingredient**	**Application rate**
Lecontvirus		

Ontario

Formulation: emulsion
Aircraft: ground
Guidance:
Application system:

Year: **1989**
Area: 30 516 ha (75 375 acres)
Nipigon
Thunder Bay
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.03 L/ha (27.8 fl oz/ac)

Formulation: undiluted
Aircraft: 5 AgTrucks
Guidance:
Application system: Micronair

Year: **1989**
Area: 4 763 ha (11 765 acres)
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Futura XLV	20 BIU/ha (8.1 BIU/ac)	1.36 L/ha (18.6 fl oz/ac)

Formulation: undiluted
Aircraft: 2 AgTrucks
Guidance:
Application system: Micronair

Year: **1989**
Area: 12 951 ha (31 989 acres)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.03 L/ha (27.8 fl oz/ac)

Formulation: undiluted
Aircraft: 3 Bell 206B helicopters
AgCats
AgTruck

Piper Pawnees

Guidance:
Application system:

Year: **1989**
Area: 373 ha (920 acres)
Bancroft
Minden
Espanola
Parry Sound
Insect: Red-headed pine sawfly

Insecticide	**Active ingredient**	**Application rate**
Lecontvirus		

Formulation: emulsion
Aircraft: ground
Guidance: -
Application system:

Year: **1989**
Area: 14 ha (35 acres)
Collingwood
Insect: European pine sawfly

Insecticide	**Active ingredient**	**Application rate**
Sertifervirus		

Formulation: emulsion
Aircraft: ground
Guidance:
Application system:

Year: **1990**
Area: 49 627 ha (122 579 acres)
Nipigon
Thunder Bay
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Dipel 176	30 BIU/ha (12.2 BIU/ac)	1.8 L/ha (24.6 fl oz/ac)

Ontario

Formulation: -
Aircraft: 3 Thrushes
5 AgTrucks
Guidance: -
Application system: Micronair

Year: **1990**
Area: 33 956 ha (83 871 acres)
southern
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.01 L/ha (27.5 fl oz/ac)
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.01 L/ha (27.5 fl oz/ac)

Formulation:
Aircraft: AgTrucks
AgCats
Piper Pawnees
Bell 206 helicopters
Hughes 500S helicopters
A-Stars (helicopters)
Guidance: -
Application system: Micronair

Year: **1990**
Area: 677 ha (1 672 acres)
Bancroft
Blind River
Espanola
North Bay
Parry Sound
Tweed
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
Lecontvirus		

Formulation: emulsion
Aircraft: ground
Guidance: -
Application system:

Manitoba

Year: **1964 (corrected)**
Area: Lyleton and Winnipeg
Insect: Fall cankerworm

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1.5 gal/ac (14 L/ha)

Formulation:	emulsion
Aircraft:	-
Guidance:	-
Application system:	

Year: **1967 (corrected)**
Area: 1 380 acres (559 ha)
Spruce Woods Provincial Forest
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
DDT	0.75 lb/ac (840 g/ha)	1 gal/ac (9.35 L/ha)
	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)

Formulation:	oil solution
Aircraft:	Piper Pawnee 235B
Guidance:	flagmen
Application system:	Boom and Nozzle

Year: **1973 (corrected)**
Area: 8 125 acres (3 291 ha)
Spruce Woods Provincial Park and Forest
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	4 oz/ac (280 g/ha)	1 gal/ac (9.35 L/ha)
Sevin-4-oil	16 oz/ac (1.12 kg/ha)	40 fl oz/ac (2.92 L/ha)

Formulation:	emulsion
Aircraft:	2 Cessna AgWagons
	1 Piper Pawnee 235B
Guidance:	white marker flags
	coloured helium balloons
Application system:	Micronair (AU2000 and AU3000)
	Boom and Nozzle

Manitoba

Year: **1974**
Area: 1 850 acres (749 ha)
Spruce Woods Provincial Forest and Park
Insect: Eastern spruce budworm
Jack-pine budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	4 oz/ac (280 g/ha)	1 gal/ac (9.35 L/ha)

Formulation: emulsion
Aircraft: 1 Piper Pawnee 235B
Guidance: flagmen with (1) helium balloons or (2) white flags on aluminum poles
Application system: Boom and Nozzle

Year: **1975**
Area: 50 acres (20 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion	4 oz/ac (280 g/ha)	

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1975 (corrected)**
Area: 1 280 acres (518 ha)
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Sumithion	4 oz/ac (280 g/ha)	-
Malathion	5 oz/ac (350 g/ha)	0.99 gpa (9.3 L/ha)

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1975 (corrected)**
Area: 59 094 acres (23 933 ha)
Insect: Forest tent caterpillar

Manitoba

Insecticide	Active ingredient	Application rate
Malathion 50% EC	5 oz/ac (350 g/ha)	1 gal/ac (9.35 L/ha)

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1976**
Area: 76 539 acres (30 998 ha)
Birds Hill Provincial Park
White Shell Provincial Park
Grand Beach Provincial Park
Hecla Island Provincial Park
Porcupine Mountain Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Malathion		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1977**
Area: 135 930 acres (55 052 ha)
Birds Hill Provincial Park
White Shell Provincial Park
Grand Beach Provincial Park
Hecla Island Provincial Park
Porcupine Mountain Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Malathion		

Formulation:
Aircraft:
Guidance:
Application system:

Manitoba

Year: **1977**
Area: 5 239 acres (2 122 ha)
Spruce Woods Provincial Park
Belair Provincial Forest
Insect: Jack-pine budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1978**
Area: 38 894 acres (15 752 ha)
Birds Hill Provincial Park
White Shell Provincial Park
Grand Beach Provincial Park
Hecla Island Provincial Park
Porcupine Mountain Provincial Park
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Malathion		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1980 (corrected)**
Area: 124 acres (50 ha)
Birds Hill and Spruce Woods
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	50 ml in 100 L (H_2O)	

Formulation: water solution
Aircraft: ground
Guidance:
Application system:

Manitoba

Year: **1980**
Area: 77 ha (190 acres)
White Shell Provincial Park
Hecla Island Provincial Park
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion		

Formulation: emulsion
Aircraft: ground
Guidance: -
Application system:

Year: **1981**
Area: 365 ha (902 acres)
Hecla Island
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.6 L/ha (76.6 fl oz/ac)

Formulation: emulsion
Aircraft: Cessna AgWagon
Guidance: helium balloons, meteorological balloons
Application system: Micronair

Year: **1986 (corrected)**
Area: 375 ha (927 acres) Hecla Island
230 ha (568 acres) Tulabi Falls
605 ha (1 495 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Thuricide 48 LV	20 BIU/ha (8.1 BIU/ac)	

Formulation:
Aircraft: Thrush Commanders
Guidance: Cessna 172
Application system: Micronair

Manitoba

Year: **1986 (corrected)**
Area: 19 883 ha (49 131 acres) Sandilands
3 822 ha (9 444 acres) Belair
2 286 ha (5 649 acres) Cowan
541 ha (1 337 acres) Kississing
26 532 ha (65 561 acres)
Insect: Jack-pine budworm

Insecticide	**Active ingredient**	**Application rate**
Bt	20 BIU/ha (8.1 BIU/ac)	

Formulation: -
Aircraft: 3 Dromadier M-18s
Guidance: Cessna
Application system: -

Year: **1987**
Area: 536 ha (1 324 acres)
White Shell Provincial Park
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Thuricide 48LV	20 BIU/ha (8.1 BIU/ac)	

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1988**
Area: 1 182 ha (2 920 acres)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)

Formulation: undiluted
Aircraft:
Guidance:
Application system:

Manitoba

Year: **1989**
Area: 4 984 ha (12 311 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 8L	30 BIU/ha (12.2 BIU/ac)	1.77 L/ha (24.2 fl oz/ac)

Formulation: undiluted
Aircraft: 2 Thrush Commanders
Guidance: Cessna 172
Application system: Micronair

Year: **1990**
Area: 5 647 ha (13 948 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.03 L/ha (27.8 fl oz/ac)
	20 BIU/ha (8.1 BIU/ac)	1.35 L/ha (18.5 fl oz/ac)

Formulation: undiluted
Aircraft: 3 Cessna A188D AgTrucks
Guidance: 2 Cessna C172s
Application system: Micronair AU5000-2

Saskatchewan

Year: **1954**
Area: Indian Head
Insect: Larch sawfly

Insecticide	Active ingredient	Application rate
Malathion		

Formulation: emulsion
Aircraft: 1 Piper Cub
Guidance: -
Application system: -

Saskatchewan

Year: **1955**
Area: Indian Head
Insect: Larch sawfly

Insecticide	**Active ingredient**	**Application rate**
Malathion		

Formulation: emulsion
Aircraft: 1 Piper Cub
Guidance: -
Application system: -

Year: **1980**
Area: 101 ha (250 acres)
Insect: Forest tent caterpillar

Insecticide	**Active ingredient**	**Application rate**
Dipel		
Malathion		250 g (1137 L)

Formulation:
Aircraft: ground
Guidance:
Application system: Mistblower

Alberta

Year: **1980**
Area: -
Insect: Forest tent caterpillar

Insecticide	**Active ingredient**	**Application rate**
Dipel		
Malathion		

Formulation:
Aircraft:
Guidance:
Application system:

Alberta

Year: **1981**
Area: 6 070 ha (14 999 acres)
Edmonton
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Dipel		
Malathion		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1982**
Area: Central and northwestern Alberta
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Dipel		
Malathion		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1984**
Area: Central Alberta
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 88		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1989**
Area: 1 000 ha (2 470 acres)
Insect: Eastern spruce budworm

Alberta

Insecticide	Active ingredient	Application rate
Dipel 176		
Formulation:		
Aircraft:	helicopter	
Guidance:	-	
Application system:	-	

Year: **1989**
Area: Central region
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Bt		
Formulation:		
Aircraft:		
Guidance:		
Application system:		

Year: **1990**
Area: 9 740 ha (24 068 acres)
Northern Alberta
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura XLV-HP	30 BIU/ha (12.2 BIU/ac)	0.9 L/ha (12.3 fl oz/ac)
Formulation:	undiluted	
Aircraft:	AgTractor Thrush	
Guidance:	Cessna Cardinal	
	Cessna 182	
Application system:	Micronair AU4000	

Year: **1990**
Area: 700 ha (1 730 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura XLV-HP	30 BIU/ha (12.2 BIU/ac)	0.9 L/ha (12.3 fl oz/ac)
Futura "O"	54 BIU/ha (21.9 BIU/ac)	0.9 L/ha (12.3 fl oz/ac)

Formulation: undiluted
Aircraft: AgCat
Guidance: -
Application system: Micronair AU4000

British Columbia

Year: **1946 (corrected)**
Area: 12 500 acres (5 063 ha)
Pachena and Frederick Lakes
Nitinat Valley
Wilson Creek
Insect: Western hemlock looper

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Formulation: oil solution
Aircraft: Canso Model A
Guidance: -
Application system: Boom (no nozzles)

Year: **1948**
Area: 11 500 acres (4 658 ha)
Windermere
Insect: False hemlock looper

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	

Formulation: oil solution
Aircraft: -
Guidance:
Application system:

Year: **1956**
Area: 200 acres (81 ha)
Burnaby
Insect: Phantom hemlock looper

British Columbia

Insecticide	Active ingredient	Application rate
DDT	10 %	1 (I) gal/ac (11.23 L/ha)

Formulation: oil solution
Aircraft: 1 Stearman
Guidance:
Application system:

Year: **1957**
Area: 200 acres (81 ha)
Burnaby
Insect: Phantom hemlock looper

Insecticide	Active ingredient	Application rate
DDT	10%	1 (I) gal/ac (11.23 L/ha)

Formulation: oil solution
Aircraft: 1 Stearman
Guidance: -
Application system:

Year: **1957**
Area: 75 acres (30 ha)
Queen's Park
Insect: Phantom hemlock looper

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 (I) gal/ac (11.23 L/ha)

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1957 (corrected)**
Area: 156 000 acres (63 180 ha)
Englewood
Port Hardy
Port Alice
Insect: Black-headed budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)
Formulation:	undiluted emulsion (oil)	
Aircraft:	4 TBM Grumman Avengers	
Guidance:	-	
Application system:	-	

Year: **1959**
Area: 550 acres (223 ha)
Stanley Park
Insect: Western hemlock looper

Insecticide	Active ingredient	Application rate
DDT	10 %	1 gal/ac (9.35 L/ha)
Formulation:	oil solution	
Aircraft:	1 TBM	
Guidance:	-	
Application system:		

Year: **1960 (corrected)**
Area: 31 000 acres (12 758 ha)
Moresby
Skidgegate
Copper River
Insect: Black-headed budworm

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	1 gal/ac (9.35 L/ha)
Formulation:	oil solution	
Aircraft:	TBMs	
Guidance:	-	
Application system:	-	

Year: **1960 (corrected)**
Area: 1 800 acres (729 ha)
Kitimat
Insect: Saddle-back looper

British Columbia

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
Formulation:	oil solution	
Aircraft:	TBM	
Guidance:		
Application system:		

Year: **1961 (corrected)**
Area: 19 500 acres (4 253 ha)
Kitimat
Insect: Saddle-back looper

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	2 gal/ac (18.7 L/ha)
Formulation:	oil solution	
Aircraft:	Bell G2 helicopter	
Guidance:	-	
Application system:		

Year: **1961**
Area: log booms
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
Benzene Hexachloride (BHC)	1 gal/ac (1.12 kg/ha)	10 gal/ac (93.5 L/ha)
Formulation:	oil solution	
Aircraft:	helicopter	
Guidance:	-	
Application system:	-	

Year: **1961**
Area: 1 500 acres (608 ha)
Cameron Lake
Insect: Pine butterfly

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)

Formulation: oil solution
Aircraft: Bell 47G-2 helicopter
Guidance: -
Application system: Boom and Nozzle

Year: **1962**
Area: log booms
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
BHC	1 lb/ac (1.12 kg/ha)	10 gal/ac (93.5 L/ha)

Formulation: oil solution
Aircraft: helicopter
Guidance: -
Application system: -

Year: **1963**
Area: log booms
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
BHC	1 lb/ac (1.12 kg/ha)	10 gal/ac (93.5 L/ha)

Formulation: oil solution
Aircraft: helicopter
Guidance:
Application system:

Year: **1964**
Area: 250 acres (101 ha) of log booms
Cowichan
Comox
Nanaimo
Tansis Lake
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
BHC	1 lb/ac (1.12 kg/ha)	10 gal/ac (93.5 L/ha)

Formulation: oil solution
Aircraft: helicopter

British Columbia

Guidance:
Application system:

Year: **1965**
Area: 200 acres (81 ha) logs
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
BHC	1 lb/ac (1.12 kg/ha)	10 gal/ac (93.5 L/ha)

Formulation: oil solution
Aircraft: helicopter
Guidance:
Application system:

Year: **1966**
Area: log booms
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
BHC	1 lb/ac (1.12 kg/ha)	10 gal/ac (93.5 L/ha)

Formulation: oil solution
Aircraft: helicopter
Guidance:
Application system:

Year: **1967**
Area: 726 acres (294 ha) logs
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
BHC	1 lb/ac (1.12 kg/ha)	10 gal/ac (93.5 L/ha)

Formulation: oil solution
Aircraft: helicopter
Guidance:
Application system:

British Columbia

Year: **1968**
Area: Cowichan Lake
Nanaimo Lake
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
Methyl Trithion	0.83 lb/ac (930 g/ha)	10 gal/ac (93.5 L/ha)

Formulation: oil solution
Aircraft: helicopter
Guidance: -
Application system: -

Year: **1969**
Area: log booms
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
Methyl Trithion	0.83 lb/ac (930 g/ha)	10 gal/ac (93.5 L/ha)

Formulation: oil solution
Aircraft: helicopter
Guidance: -
Application system: -

Year: **1970**
Area: log booms
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
Methyl Trithion	0.83 lb/ac (930 g/ha)	10 gal/ac (93.5 L/ha)

Formulation: oil solution
Aircraft: helicopter
Guidance: -
Application system: -

Year: **1973 (corrected)**
Area: 28 000 acres (11 340 ha)
Port Alice
Insect: Black-headed budworm

British Columbia

Insecticide	Active ingredient	Application rate
Sumithion	2 oz/ac (140 g/ha)	20 fl oz/ac (1.46 L/ha)

Formulation: emulsion
Aircraft: 1 Grumman Avenger
Guidance: Cessna Skymaster
Application system:

Year: **1975**
Area: 31 000 acres (12 555 ha)
Insect: Douglas-fir tussock moth
False hemlock looper

Insecticide	Active ingredient	Application rate
Dipel 36B	6.8 BIU/ac (16.8 BIU/ha)	48 fl oz/ac (3.5 L/ha)
Thuricide 16B	6.8 BIU/ac (16.8 BIU/ha)	64 fl oz/ac (4.67 L/ha)

Formulation: water solution
Aircraft: 3 Cessna AgTrucks
Guidance:
Application system: Micronair AU3000

Year: **1975**
Area: 200 acres (81 ha)
Prince Rupert and Prince George Forest Districts
Insect: Black army cutworm

Insecticide	Active ingredient	Application rate
Dylox	1 lb/ac (1.12 kg/ha)	3 gal/ac (28.1 L/ha)

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1976**
Area: 20 028 acres (8 111 ha)
Kamloops and North Thompson Valley
Insect: Douglas-fir tussock moth

Insecticide	Active ingredient	Application rate
Orthene 75	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)
	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
Thuricide HPC	12 BIU/ac (29.65 BIU/ha)	-

Formulation: water solution
Aircraft: Cessna AgTrucks
Guidance:
Application system: Boom and Nozzle

Year: **1983**
Area: 6 610 acres (2 677 ha)
private landowners
Insect: Douglas-fir tussock moth

Insecticide	Active ingredient	Application rate
Orthene		
Sevin		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1988**
Area: 1 800 ha (4 446 acres)
Kamloops
Nelson
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Bt	30 BIU/ha (12.2 BIU/ac)	2 L/ha (27.4 fl oz/ac)

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1988**
Area: 156.5 ha (387 acres)
Kelowna
Colwood

British Columbia

Parksville
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt	30 BIU/ha (12.2 BIU/ac)	

Formulation: undiluted
Aircraft:
Guidance:
Application system:

Year: **1990**
Area: 85 ha (210 acres)
Parksville
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

CHAPTER 2
RESEARCH SPRAY APPLICATIONS

1951

Province: **Ontario**
Area: Gravenhurst
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
DDT	1.51 lb/ac (1.68 kg/ha)	1.5 gal/ac (14.03 L/ha)

Aircraft: Cessna T50
Application system: -

1952

Province: **Ontario**
Area: 10 acres (4 ha)
Crown Island
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
DDT		

Aircraft: Beaver
Application system: Boom and Nozzle

Province: **Ontario**
Area: 100 acres (41 ha)
Strathroy
Insect: European pine sawfly

Insecticide	Active ingredient	Application rate
NPV	0.45×10^9 PIB/ac (1.11×10^9 PIB/ha)	0.5 gal/ac (4.68 L/ha)
	2.25×10^9 PIB/ac 5.56×10^9 PIB/ha)	0.5 gal/ac (4.68 L/ha)
	11.25×10^9 PIB/ac (27.8×10^9 PIB/ha)	

Aircraft: Piper Cub
Application system: Boom and Nozzle

1955

Province: **Ontario**
Area: 9 acres (4 ha)
Bernice Island
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
DDT	12%	1 gal/ac (9.35 L/ha)

Aircraft: Piper Cub
Application system: -

1956

Province: **British Columbia (corrected)**
Area: 240 acres (97 ha)
Port McNeill
Insect: Westerm black-headed budworm

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	1 (I) gal/ac (11.23 L/ha)
	1 lb/ac (1.12 kg/h)	1 (I) gal/ac (11.23 L/ha)

Aircraft: Stearman
Application system: -

1958

Province: **New Brunswick**
Area: Kent County (Richibucto)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	1 gal/ac (9.35 L/ha)
	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)
DDD (Rothane)	0.25 lb/ac (280 g/ha)	1 gal/ac (9.35 L/ha)
	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
Korlan	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
Sevin	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)

Aircraft:
Application system:

1959

Province: **New Brunswick**
Area: York County
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	1 gal/ac (9.35 L/ha)
	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
Malathion	0.25 lb/ac (280 g/ha)	1 gal/ac (9.35 L/ha)
	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.125 lb/ac (140 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Stearman
Grumman Avenger
Application system: Boom and Nozzle

Province: **New Brunswick**
Area: -
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)
	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.25 lb/ac (280 g/ha)	1 gal/ac (9.35 L/ha)
	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft:
Application system:

Province: **Ontario**
Area: Parry Sound (lab tests)
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Merck's Bacterial Insecticide	2 - 2.5 lb/ac (2.24 - 2.8 kg/ha)	100 gal/ac (935 L/ha)

1959

Aircraft: ground
Application system: Mistblower

Province: **British Columbia**
Area: -
Insect: Oak looper
Western hemlock looper
Western black-headed budworm

Insecticide	Active ingredient	Application rate
Merck's Bacterial Insecticide	2 - 2.5 lb/ac (2.24 - 2.8 kg/ha)	100 gal/ac (935 L/ha)

Aircraft: ground
Application system: Mistblower

Province: **British Columbia**
Area: log booms
Northwest Bay
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
Benzene hexachloride	1 lb/ac (1.12 kg/ha)	10 (I) gal/ac (112.3 L/ha)

Aircraft: helicopter
Application system: Boom and Nozzle

1960

Province: **New Brunswick**
Area: 60 acres (24 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide SO75	2 lb/ac (2.24 kg/ha)	1 gal/ac (9.35 L/ha)

Aircraft: 1 Stearman
Application system: Boom and Nozzle

Province: **Quebec (corrected)**
Area: Chicoutimi
Insect: Swaine jack-pine sawfly

Insecticide	Active ingredient	Application rate
NPV	4.5×10^9 PIB/ac (11.12×10^9 PIB/ha) 36×10^9 PIB/ac (88.96×10^9 PIB/ha)	0.5 gal/ac (4.68 L/ha) 4 gal/ac (37.4 L/ha)

Aircraft: Stearman
Application system: Boom and Nozzle

Province: **British Columbia (corrected)**
Area: 90 acres (37 ha)
Queen Charlotte Islands
Insect: Western black-headed budworm

Insecticide	Active ingredient	Application rate
Thuricide SO75	2.7 lb/ac (3.02 kg/ha) 4.0 lb/ac (4.48 kg/ha)	1.8 gal/ac (16.83 L/ha) 2.67 gal/ac (24.97 L/ha)

Aircraft: Grumman Avenger
Application system: -

1961

Province: **New Brunswick**
Area: 20 000 - 30 000 acres (8 100 - 12 150 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	12.5 % 6.25 %	

Aircraft: TBM
Stearmans
Application system: -

Province: **British Columbia (corrected)**
Area: 100 acres (41 ha)
Kitimat
Insect: Saddle-back looper

1961

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	2 gal/ac (18.7 L/ha)
Dibrom	0.5 lb/ac (560 g/ha)	2 gal/ac (18.7 L/ha)
Phosphamidon	0.5 lb/ac (560 g/ha)	2 gal/ac (18.7 L/ha)
Thuricide	70 BIU/ac (173 BIU/ha)	2 gal/ac (18.7 L/ha)

Aircraft:
Application system:

1962

Province: **New Brunswick (corrected)**
Area: 50 acres (20 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide SO75	8 oz/ac (560 g/ha)	1 gal/ac (9.35 L/ha)

Aircraft:
Application system:

Province: **British Columbia**
Area: 20 acre plots (8 ha plots)
Okanagan Valley
Insect: Douglas-fir tussock moth

Insecticide	Active ingredient	Application rate
DDT	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
Malathion	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Aircraft: 1 Stearman
Application system: -

Province: **British Columbia**
Area: log booms
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
BHC	10 lb/ac (11.2 kg/ha)	10 (I) gal/ac (112.3 L/ha)
Thiodan	10 lb/ac (11.2 kg/ha)	10 (I) gal/ac (112.3 L/ha)

Aircraft: Bell 47G helicopter
Application system:

1963

Province: **Ontario**
Area: 4.2 acres (1.7 ha)
Sudbury
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
NPV	1×10^5 PIB/ml	3.3 gal/ac (30.86 L/ha)
	1×10^6 PIB/ml	3.3 gal/ac (30.86 L/ha)
	1×10^7 PIB/ml	3.3 gal/ac (30.86 L/ha)
	5×10^6 PIB/ml	1.1 gal/ac (10.29 L/ha)

Aircraft: ground
Application system: Mistblower

Province: **British Columbia**
Area: -
Insert: Western hemlock looper

Insecticide	Active ingredient	Application rate
Phosphamidon	12%	1 gal/ac (9.35 L/ha)

Aircraft: helicopter
Application system: -

1964

Province: **Newfoundland**
Area: -
Insect: Balsam woolly aphid

Insecticide	Active ingredient	Application rate
Sumithion		
Zectran		
#47470		

1964

#47772
Diazinon
Phosphamidon
Dimethoate
Nellite
Thiocron
Vamidothion

Aircraft: ground
Application system: hand sprayer
Mistblower

Province: **Alberta**
Area: 16 acres (6.5 ha)
Banff
Insect: Lodgepole needle miner

Insecticide	Active ingredient	Application rate
Dimethoate	1 lb/ac (1.12 kg/ha)	

Aircraft: ground
Application system: Mistblower

Province: **British Columbia (corrected)**
Area: 50 acres (20 ha)
Enderby
Insect: Western hemlock looper

Insecticide	Active ingredient	Application rate
Phosphamidon	0.8 lb/ac (896 g/ha)	1 gal/ac (9.35 L/ha)

Aircraft: helicopter
Application system:

Province: **British Columbia (corrected)**
Area: 1 600 acres (648 ha)
Graham Island
Insect: Green-striped forest looper

Insecticide	Active ingredient	Application rate
Phosphamidon	0.8 lb/ac (896 g/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Bell G2-A helicopter
Application system:

1965

Province: **Newfoundland**
Area: Steady Brook (individual trees)
Insect: -

Insecticide	Active ingredient	Application rate
Baygon	13.9 %	
Diazinon	50 %	
Sayfos	70 %	
Sumithion	50 %	
Meta Systox-R	25.4 %	
Bay 37289	46 %	
Aramite	15 %	
Cygon	45 %	

Aircraft: ground
Application system: "Cooley" mist sprayer

Province: **New Brunswick**
Area: 211 100 acres (85 496 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Phosphamidon	0.25 lb/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)
	0.25 lb/ac (280 g/ha)	0.4 gal/ac (3.74 L/ha)
	0.25 lb/ac (280 g/ha)	0.8 gal/ac (7.48 L/ha)

Aircraft: TBMs
Application system: Boom and Nozzle

Province: **New Brunswick**
Area: 63 000 acres (25 515 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Malathion	4.8 oz/ac (336 g/ha)	
	16 oz/ac (1.12 kg/ha)	

1965

Aircraft:
Application system:

Province: **New Brunswick**
Area: 9 300 acres (3 767 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dimethoate (Roger 40)	16 oz/ac (1.12 kg/ha)	

Aircraft:
Application system:

Province: **New Brunswick**
Area: 4 400 acres (1 782 ha)
Chipman
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran (2E)	25 %	0.1 gal/ac (0.94 L/ha)
Cygon (4E)	45 %	0.05 gal/ac (0.47 L/ha) 0.1 gal/ac (0.94 L/ha)
Phosphamidon	90 %	0.03 gal/ac (0.28 L/ha) 0.05 gal/ac (0.47 L/ha)
Sumithion	100 %	0.05 gal/ac (0.47 L/ha)
Malathion	100 %	0.08 gal/ac (0.75 L/ha)
DDT	10 %	0.08 gal/ac (0.75 L/ha)

Aircraft: Stearmans
Application system: Boom and Nozzle

Province: **Manitoba (corrected)**
Area: 250 acres (101 ha)
Selkirk
Insect: Fall cankerworm

Insecticide	Active ingredient	Application rate
Matacil	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)
Dylox	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)
DDT	1 lb/ac (1.12 kg/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Piper Cub
Application system:

Province: **British Columbia (corrected)**
Area: 100 acres (41 ha)
Vancouver Island
Insect: Hemlock needle miner

Insecticide	Active ingredient	Application rate
Phosphamidon	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
Dimethoate	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)

Aircraft: helicopter
Application system:

Province: **British Columbia**
Area: greater Victoria
Insect: Balsam woolly aphid

Insecticide	Active ingredient	Application rate
BHC		

Aircraft: ground
Application system: -

1966

Province: **New Brunswick**
Area: 4 000 acres (1 620 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion	1 lb/ac (1.12 kg/ha)	0.5 gal/ac (4.68 L/ha)
	0.75 lb/ac (840 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.25 lb/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft:
Application system:

1966

Province: **New Brunswick**
Area: several 3/4-mile blocks
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Phosphamidon	0.25 lb/ac (280 g/ha)	

Aircraft:
Application system:

Province: **New Brunswick**
Area: 4 400 acres (1 782 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion	98 %	0.06 gal/ac (0.56 L/ha)
	100 %	0.04 gal/ac (0.37 L/ha)
Phosphamidon	90 %	0.04 gal/ac (0.37 L/ha)
Zectran	17.9 %	0.03 gal/ac (0.28 L/ha)
	25.3 %	0.03 gal/ac (0.28 L/ha)
Dylox	39.1 %	0.044 gal/ac (0.41 L/ha)
Dibrom	100 %	0.03 gal/ac (0.28 L/ha)
Malathion	100 %	0.06 gal/ac (0.56 L/ha)
Dimethoate	50 %	0.05 gal/ac (0.4 L/ha)
DDT	18 %	0.3 gal/ac (2.8 L/ha)

Aircraft: fixed-wing
Application system: Turbair nozzles

Province: **New Brunswick**
Area: -
(potted balsam fir)
Insect: Balsam woolly aphid

Insecticide	Active ingredient	Application rate
Baygon	2 %	1 gal/ac (9.35 L/ha)
Bidrin	2 %	1 gal/ac (9.35 L/ha)
Meta Systox-R	2 %	1 gal/ac (9.35 L/ha)
Matacil	2 %	1 gal/ac (9.35 L/ha)
NIA-10242	2 %	1 gal/ac (9.35 L/ha)

Aircraft:
Application system:

Province: **British Columbia**
Area: log booms
Nanaimo River
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
Methyl Trithion	10 lb/ac (11.2 kg/ha)	
Baytex	10 lb/ac (11.2 kg/ha)	
Baygon	10 lb/ac (11.2 kg/ha)	
Abate	10 lb/ac (11.2 kg/ha)	

Aircraft: helicopter
Application system: -

1967

Province: **Newfoundland**
Area: Deer Lake
Insect: Balsam woolly aphid

Insecticide	Active ingredient	Application rate
Baygon	5 %	0.25 - 1.0 L/tree
Dursban	5 %	0.25 - 1.0 L/tree
Diazinon	5 %	0.25 - 1.0 L/tree

Aircraft: ground
Application system: packsack sprayer

Province: **New Brunswick**
Area: 221 760 acres (89 813 ha)
Taxes and Doaktown
Dunphy and Renous
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion	0.25 lb/ac (280 g/ha)	
	0.5 lb/ac (560 g/ha)	
	0.375 lb/ac (420 g/ha)	
Phosphamidon	0.125 lb/ac (140 g/ha)	
	0.25 lb/ac (280 g/ha)	
Novathion	0.5 lb/ac (560 g/ha)	

1967

Aircraft: TBM
Stearman
AgCat

Application system: -

Province: **New Brunswick**
Area: 3 800 acres (1 539 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Novathion	95 - 97 %	0.06 gal/ac (0.56 L/ha)
Zectran	22.5 %	0.05 gal/ac (0.47 L/ha)
Matacil	34 %	0.18 gal/ac (1.68 L/ha)
Sumithion	98 %	0.1 gal/ac (0.94 L/ha)
Abate	43 %	0.06 gal/ac (0.56 L/ha)
Malathion	100 %	0.08 gal/ac (0.75 L/ha)
Baytex	81 %	0.04 gal/ac (0.37 L/ha)
Baygon	22.5 %	0.08 gal/ac (0.75 L/ha)

Aircraft:
Application system:

Province: **Manitoba (corrected)**
Area: 200 acres (81 ha)
Belair and Sandilands Provincial Forests
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
DDT	0.25 lb/ac (280 g/ha)	1 gal/ac (9.35 L/ha)
	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
Matacil	0.2 lb/ac (224 g/ha)	1 gal/ac (9.35 L/ha)
Accothion	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Piper Pawnee 235B
Application system: Boom and Nozzle

Province: **Manitoba**
Area: 154 trees
(plantation)
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Dylox	10 %	
Phosphamidon	5 % and 1 %	
Thimet	2 %	
Aircraft:	ground	
Application system:	Kilkens mistblower	

Province: **British Columbia**
Area: Duncan
(20 trees; field test)
Insect: Balsam woolly aphid

Insecticide	Active ingredient	Application rate
Baygon	0.1 % and 0.01 %	
NIA-10242	0.1 % and 0.01 %	
Ortho	0.1 % and 0.01 %	
RE-5305	0.1 % and 0.01 %	
RE-5353	0.1 % and 0.01 %	
RE-5655	0.1 % and 0.01 %	
Matacil	0.1 % and 0.01 %	
C 10015	0.1 % and 0.01 %	
C 9643	0.1 % and 0.01 %	
Invadine (penetrant)	0.1 % and 0.01 %	
Aircraft:	ground	
Application system:	Mistblower	

Province: **British Columbia**
Area: near Cowichan Lake
Insect: Ambrosia beetle

Insecticide	Active ingredient	Application rate
Methyl Trithion	10 lb/ac (11.2 kg/ha)	
Aircraft:	helicopter	
Application system:	-	

1968

Province: **Newfoundland**
Area: 40-acre plots (16 ha plots)
Deer Lake
Insect: Balsam woolly aphid

Insecticide	Active ingredient	Application rate
Diazinon	10 oz/ac (700 g/ha)	2 gal/ac (18.7 L/ha)
Furadan	4 oz/ac (140 g/ha)	2 gal/ac (18.7 L/ha)
Dursban	8 oz/ac (560 g/ha)	2 gal/ac (18.7 L/ha)
Baygon	1 lb/ac (1.12 kg/ha)	2 gal/ac (9.35 L/ha)

Aircraft: 1 Stearman
Application system:

Province: **New Brunswick**
Area: 4 400 acres (1 782 ha)
Insect:

Insecticide	Active ingredient	Application rate
Phosphamidon	6.25 %	0.5 gal/ac (4.68 L/ha)
	90 %	0.04 gal/ac (0.37 L/ha)
DDT	6.25 %	0.5 gal/ac (4.68 L/ha)
	12.5 %	0.28 gal/ac (2.62 L/ha)
Sumithion	98 %	0.05 gal/ac (0.47 L/ha)
	9.3 %	0.5 gal/ac (4.68 L/ha)
Malathion	97 %	0.03 gal/ac (0.28 L/ha)
CIBA 9491	20 %	0.13 gal/ac (1.22 L/ha)
Baygon	22.5 %	0.08 gal/ac (0.75 L/ha)
Matacil	34 %	0.13 gal/ac (1.22 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair
Boom and Nozzle

Province: **New Brunswick**
Area: 480 500 acres (194 603 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion	0.5 lb/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.5 lb/ac (560 g/ha)	0.2 gal/ac (1.87 L/ha)
	0.25 lb/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)
	0.375 lb/ac (420 g/ha)	0.2 gal/ac (1.87 L/ha)
	0.125 lb/ac (140 g/ha)	0.2 gal/ac (1.87 L/ha)

Fenitrothion	0.125 lb/ac (140 g/ha)	0.2 gal/ac (1.87 L/ha)
	0.25 lb/ac (280 g/ha)	0.2 gal/ac (1.87 L/ha)
Phosphamidon	0.375 lb/ac (420 g/ha)	0.2 gal/ac (1.87 L/ha)
	0.375 lb/ac (420 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.125 lb/ac (140 g/ha)	0.2 gal/ac (1.87 L/ha)
DDT + Sumithion	0.1 + 0.125 lb/ac (112 + 140 g/ha)	0.2 gal/ac (1.87 L/ha)
Sumithion + Phosphamidon	0.25 + 0.125 lb/ac (280 + 140 g/ha)	0.2 gal/ac (1.87 L/ha)
	0.125 + 0.25 lb/ac (140 + 280 g/ha)	0.2 gal/ac (1.87 L/ha)
Aircraft:	TBM	
Application system:	Boom and Nozzle	

Province: **Ontario (corrected)**
Area: 40 acres (16 ha)
Dryden area
Insect: Jack-pine budworm

Insecticide	**Active ingredient**	**Application rate**
Sumithion	6 oz/ac (420 g/ha)	0.2 gal/ac (1.87 L/ha)
Aircraft:	Stearman	
Application system:	Boom and Nozzle	

Province: **British Columbia**
Area: Cowichan Lake
Insect: Ambrosia beetle

Insecticide	**Active ingredient**	**Application rate**
Methyl Trithion		
BHC		
Aircraft:	helicopter	
Application system:		

1969

Province: **Newfoundland**
Area: Pasadena
Insect: Eastern hemlock looper

1969

Insecticide	Active ingredient	Application rate
NPV	1-10 x 10^6 PIB/ml	~ 30 gal/ac (20 - 50 ml/tree)
Aircraft:	ground	
Application system:	hand sprayer	

Province: **Newfoundland**
Area: Black Duck
Insect: Balsam woolly aphid

Insecticide	Active ingredient	Application rate
PP511 25% EC	5 %	0.25 - 0.5 L/tree
PP062 50% WP	5 %	0.25 - 0.5 L/tree
Baygon 17% EC	5 %	0.25 - 0.5 L/tree
Dursban 45% EC	5 %	0.25 - 0.5 L/tree
Hercules 134462	5 %	0.25 - 0.5 L/tree
Exp. Ins. 447470	5 %	0.25 - 0.5 L/tree
Exp. Ins. 1642	5 %	0.25 - 0.5 L/tree
Lannate 90% WP	5 %	0.25 - 0.5 L/tree
Aircraft:		
Application system:		

Province: **New Brunswick**
Area: 9 360 acres (3 791 ha)
Chipman
Insect: -

Insecticide	Active ingredient	Application rate
Sumithion	98 %	0.06 gal/ac (0.56 L/ha)
	49 %	0.06 gal/ac (0.56 L/ha)
	49 %	0.05 gal/ac (0.47 L/ha)
	47 %	0.05 gal/ac (0.47 L/ha)
Zectran	2.2 %	0.055 gal/ac (0.51 L/ha)
	6.15 %	0.16 gal/ac (1.5 L/ha)
	11.17 %	0.065 gal/ac (0.61 L/ha)
	11.57 %	0.065 gal/ac (0.61 L/ha)
Phosphamidon	90 %	-
BT	0.734 %	1.25 gal/ac (11.69 L/ha)
Lannate	26.15 %	0.05 gal/ac (0.47 L/ha)
DDT	6.25 %	0.4 gal/ac (3.74 L/ha)
Matacil	17 %	0.044 gal/ac (0.41 L/ha)

Aircraft: Grumman AgCat
Grumman Avenger
Application system: Micronair
Boom and Nozzle

Province: **New Brunswick (corrected)**
Area: 6 000 acres (2 430 ha)
Acadia Forest Experiment Station
Little River
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran	0.0625 lb/ac (70 g/ha)	0.15 gal/ac (1.4 L/ha)

Aircraft: TBM
Application system: Boom and Nozzle

Province: **New Brunswick**
Area: 3 000 acres (1 215 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
DDT	0.125 lb/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)

Aircraft: TBM
Application system: Boom and Nozzle

Province: **New Brunswick (corrected)**
Area: 240 acres (97 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 90TS	0.25 gal/ac (2.34 L/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Grumman AgCat
Application system: Boom and Nozzle

Province: **New Brunswick (corrected)**
Year: 17 000 acres (6 885 ha)
Tobique River watershed
Insect: Eastern spruce budmoth

1969

Insecticide	Active ingredient	Application rate
Phosphamidon	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
Aircraft:	2 Grumman AgCats	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: Iron Bridge
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV	0.5 g/gal	50 - 100 mL/tree
Aircraft:		
Application system:		

Province: **British Columbia**
Area: Vancouver Island
Insect: Balsam woolly aphid

Insecticide	Active ingredient	Application rate
Baygon	10 %	
Dursban	10 %	
Diazinon	10 %	
Matacil	10 %	
Zectran	10 %	
Lannate	10 %	
NIA-10242	10 %	
RE-5305	10 %	
Aircraft:	ground	
Application system:		

1970

Province: **Newfoundland**
Area: 11 plots
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
NPV	1×10^6 polyhedra/ml	151 - 646 gal/ac (1 412 - 6 040 L/ha)
Aircraft:		
Application system:		

Province: **New Brunswick**
Area: 12 500 acres (5 063 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	1.25 oz/ac (87.5 g/ha)	0.15 gal/ac (1.4 L/ha)
Dylox	6 oz/ac (420 g/ha)	0.15 gal/ac (1.4 L/ha)
Lannate	0.8 oz/ac (56 g/ha)	0.15 gal/ac (1.4 L/ha)
Phosphamidon/Panasol	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
Aircraft:	TBM	
Application system:	Boom and Nozzle	

Province: **New Brunswick**
Area: -
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV/CPV	0.5 g/gal	1 gal/ac (9.35 L/ha)
Aircraft:	ground	
Application system:	pressure sprayer	

Province: **New Brunswick**
Area: 5 200 acres (2 106 ha)
Westmoreland County
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Accothion	7.4 oz/ac (518 g/ha)	0.11 gal/ac (1.03 L/ha)
Matacil	3.8 oz/ac (266 g/ha)	0.09 gal/ac (0.84 L/ha)
	1.4 oz/ac (98 g/ha)	0.06 gal/ac (0.56 L/ha)
	2.9 oz/ac (203 g/ha)	0.12 gal/ac (1.12 L/ha)
Zectran	0.5 oz/ac (35 g/ha)	0.19 gal/ac (1.78 L/ha)
Dylox	5.8 oz/ac (406 g/ha)	0.09 gal/ac (0.84 L/ha)

1970

Lannate	0.96 oz/ac (67 g/ha)	0.06 gal/ac (0.56 L/ha)
CIBA 17974	1.9 oz/ac (133 g/ha)	0.06 gal/ac (0.56 L/ha)
Pyrethrin (7014)	0.5 oz/ac (35 g/ha)	0.17 gal/ac (1.31 L/ha)
	0.4 oz/ac (28 g/ha)	0.12 gal/ac (1.12 L/ha)
	0.3 oz/ac (21 g/ha)	0.09 gal/ac (0.84 L/ha)
SBP 1382 0.8 oz/ac (56 g/ha)	0.06 gal/ac (0.56 L/ha)	

Aircraft:
Application system: Micronair AU3000

Province: **Quebec**
Area: Sainte-Jovite
Insect: Red-headed pine sawfly

Insecticide	**Active ingredient**	**Application rate**
NPV	0.125, 0.25, 0.5 and 1 g/gal (1×10^6 polyhedra/ml)	

Aircraft: ground
Application system: Mistblower

Province: **Ontario**
Area: Algoma
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Thuricide 90TS		
Dipel		

Aircraft:
Application system:

Province: **Ontario**
Area: Manitoulin Island
Insect: Jack-pine budworm

Insecticide	**Active ingredient**	**Application rate**
Thuricide 90TS		
Dipel		

Aircraft:
Application system:

1971

Province: **New Brunswick (corrected)**
Area: 72 000 acres (29 160 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran	0.25 oz/ac (17.5 g/ha)	
	0.5 oz/ac (35 g/ha)	
Matacil	0.5 oz/ac (35 g/ha)	
	1.5 oz/ac (105 g/ha)	

Aircraft: TBM
Application system: Boom and Nozzle

Province: **New Brunswick**
Area: Westmoreland County
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion		
Zectran		
Matacil		
Matacil (WP)		
Pyrethroid		

Aircraft: Stearman
Application system: Micronair AU3000

Province: **Quebec (corrected)**
Area: 200 acres (81 ha)
Témiscouata Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide HPC	7.8 BIU/ac (19.3 BIU/ha)	2 gal/ac (18.7 L/ha)

Aircraft: Stearman
Application system: Micronair

Province: **Ontario (corrected)**
Area: 12 acres (5 ha)
Chalk River
Insect: Eastern spruce budworm

1971

Insecticide	Active ingredient	Application rate
NPV	3×10^{11} PIB/ac (7.41×10^{11} PIB/ha)	3 gal/ac (28.05 L/ha)
Aircraft:	helicopter	
Application system:		

Province: **Ontario (corrected)**
Area: Achray
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
EPV	1.2×10^{11} PIB/ac (2.97×10^{11} PIB/ha)	3 gal/ac (23.05 L/ha)
	1.2×10^{10} PIB/ac (2.97×10^{10} PIB/ha)	3 gal/ac (23.05 L/ha)
	1.2×10^{9} PIB/ac (2.97×10^{9} PIB/ha)	3 gal/ac (23.05 L/ha)
Aircraft:	helicopter	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: Parkinson Township
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bt	-	-
Dipel	2 oz/ac (140 g/ha)	2 gal/ac (18.7 L/ha)
	8 oz/ac (560 g/ha)	2 gal/ac (18.7 L/ha)
Thuricide	8 oz/ac (560 g/ha)	1 qt/tree
Aircraft:	ground	
Application system:	Mistblowers	

Province: **Ontario**
Area: Gorge Bay
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
NPV	-	
Poxvirus	0.1, 1.0 and 10 g/gal	
Aircraft:		
Application system:		

Province: **Ontario**
Area: 10.8 acres (4.4 ha)
Orr Lake
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	2 lb/ac (2.24 kg/ha)	100 gal/ac (935 L/ha)
Lindane	1 lb/ac (1.12 kg/ha)	100 gal/ac (935 L/ha)
Dursban	0.5 lb/ac (560 g/ha)	100 gal/ac (935 L/ha)
Gardona	0.5 lb/ac (560 g/ha)	100 gal/ac (935 L/ha)
	1 lb/ac (1.12 kg/ha)	100 gal/ac (935 L/ha)

Aircraft: ground
Application system: hydraulic sprayer

Province: **British Columbia**
Area: Vancouver Island
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Fenitrothion	0.3 lb/ac (336 g/ha)	4 gal/ac (37.4 L/ha)
	0.7 lb/ac (784 g/ha)	4 gal/ac (37.4 L/ha)
	1 lb/ac (1.12 kg/ha)	4 gal/ac (37.4 L/ha)
Methyl Trithion	0.3 lb/ac (336 g/ha)	4 gal/ac (37.4 L/ha)
	0.7 lb/ac (784 g/ha)	4 gal/ac (37.4 L/ha)
	1 lb/ac (1.12 kg/ha)	4 gal/ac (37.4 L/ha)

Aircraft: helicopter
Application system: -

Province: **British Columbia (corrected)**
Area: 46 acres (19 ha)
Vancouver Island
Insect: Cone moth
Gall midge

Insecticide	Active ingredient	Application rate
Dimethoate (EC)	4 oz/ac (280 g/ha)	4 - 148 fl oz/ac (0.29 - 10.8 L/ha)
	8 oz/ac (560 g/ha)	4 - 148 fl oz/ac (0.29 - 10.8 L/ha)
	12 oz/ac (840 g/ha)	4 - 148 fl oz/ac (0.29 - 10.8 L/ha)

Aircraft: Hiller 12E helicopter
Application system: Boom and Nozzle

1972

Province: **New Brunswick (corrected)**
Area: 16 000 acres (6 480 ha)
Dunphy
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
Phosphamidon	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)

Aircraft: 4 Stearmans
Application system: Micronair

Province: **New Brunswick**
Area: 16 000 acres (6 480 ha)
Miramichi Valley
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Phosphamidon	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
Fenitrothion	2 oz/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)

Aircraft: Stearman
Application system: Micronair

Province: **Quebec**
Area: 75 341 acres (30 513 ha)
Lièvre River
Insect: -

Insecticide	Active ingredient	Application rate
Matacil	0.75 oz/ac (52.5 g/ha)	

Aircraft: DC-7B
Application system: -

Province: **Quebec**
Area: 73 193 acres (29 643 ha)
Gatineau River
Insect: -

Insecticide	Active ingredient	Application rate
Zectran	0.75 oz/ac (52.5 g/ha)	
Aircraft:	DC-7B	
Application system:		

Province: **Quebec (corrected)**
Area: 10 300 acres (4 172 ha)
Témiscouata Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide HPC	7.8 BIU/ac (19.3 BIU/ha)	2 gal/ac (18.7 L/ha)
Dipel	8 BIU/ac (19.8 BIU/ha)	2 gal/ac (18.7 L/ha)
Aircraft:	Grumman Avenger	
Application system:	Boom and Nozzle	

Province: **Quebec**
Area: plantations
Insect: Pine needle midge

Insecticide	Active ingredient	Application rate
Malathion Dimethoate Aldicarb	2 lb/ac (2.24 kg/ha)	
Aircraft:	ground	
Application system:	knapsack mist blower compressed air sprayer	

Province: **Quebec**
Area: plantations
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Carbaryl	0.2 %	
Dimethoate	0.1 %	
Gardona	0.5 %	
Imidan	0.4 %	
Malathion	1 %	

1972

Methomyl	0.2 %
Aircraft:	ground
Application system:	Mistblower

Province: **Quebec (corrected)**
Area: 237 600 acres (96 228 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)
Matacil	0.75 oz/ac (52.5 g/ha)	0.15 gal/ac (1.4 L/ha)
Zectran	0.75 oz/ac (52.5 g/ha)	0.15 gal/ac (1.4 L/ha)
Aircraft:	DC-7B	
Application system:	-	

Province: **Quebec**
Area: plantations
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	1 lb/ac (1.12 kg/ha)	
	1.5 lb/ac (1.68 kg/ha)	
	2 lb/ac (2.24 kg/ha)	
Dursban	1 lb/ac (1.12 kg/ha)	
Gardona	1 lb/ac (1.12 kg/ha)	
	1.5 lb/ac (1.68 kg/ha)	
	2 lb/ac (2.24 kg/ha)	
Aircraft:	ground	
Application system:	hydraulic sprayer	

Province: **Ontario**
Area: 1 270 acres (514 ha)
Chapleau
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
EPV	0.4×10^9 PIB/ac (0.988×10^9 PIB/ha)	2 gal/ac (18.7 L/ha)
	0.4×10^9 PIB/ac (0.988×10^9 PIB/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair

Province: **Ontario**
Area: 630 acres (255 ha)
Chapleau
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV	0.4×10^9 PIB/ac (0.988×10^9 PIB/ha)	2 gal/ac (18.7 L/ha)
	0.4×10^9 PIB/ac (0.988×10^9 PIB/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair

Province: **Ontario (corrected)**
Area: 480 acres (194 ha)
Chapleau
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel (WP)	36 BIU/ac (8.9 BIU/ha)	1 gal/ac (9.35 L/ha)
Thuricide HPC	4 BIU/ac (9.9 BIU/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair

Province: **Ontario**
Area:
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Carbaryl	0.2 %	
Dimethoate	0.1 %	
Gardona	0.5 %	
Imidan	0.4 %	
Malathion	1 %	
Methomyl	0.2 %	

Aircraft: ground
Application system: Mistblower

1972

Province: **Ontario (corrected)**
Area: 360 acres (146 ha)
Rankin
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
EPV	76×10^9 PIB/ac (187.8 PIB/ha)	
EPV + Fenitrothion	76×10^9 PIB/ac + 0.25 oz/ac (187.8×10^9 PIB/ha + 17.5 g/ha)	
Fenitrothion	0.25 oz/ac (17.5 g/ha)	
NPV	0.27×10^{12} PIB/ac (0.68 PIB/ha)	
NPV + Fenitrothion	0.27×10^{12} PIB/ac + 0.25 oz/ac (0.68×10^{12} PIB/ha + 17.5 g/ha)	
Aircraft:	Stearman	
Application system:	Micronair AU3000	

Province: **Ontario**
Area: Orr Lake Forest
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	1 lb/ac (1.12 kg/ha)	
	1.5 lb/ac (1.68 kg/ha)	
	2 lb/ac (2.24 kg/ha)	
Dursban	1 lb/ac (1.12 kg/ha)	
Gardona	1 lb/ac (1.12 kg/ha)	
	1.5 lb/ac (1.68 kg/ha)	
	2 lb/ac (2.24 kg/ha)	
Aircraft:	Piper Pawnee 235	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: -
Insect: Pine needle midge

Insecticide	Active ingredient	Application rate
Malathion		
Dimethoate	-	
Aldicarb	2 lb/ac (2.24 kg/ha)	

Aircraft:	ground
Application system:	knapsack Mistblower compressed air sprayer

---

1973

Province: **New Brunswick**
Area: 1 000 acres (405 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dylox	6 oz/ac (420 g/ha)	0.15 gal/ac (1.4 L/ha)

Aircraft:	TBM
Application system:	-

Province: **New Brunswick (corrected)**
Area: 1 600 acres (648 ha)
Upper Blackville
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Insect growth regulators:		
CGA 13353	2 oz/ac (140 g/ha)	0.5 gal/ac (4.68 L/ha)
	1 oz/ac (70 g/ha)	0.5 gal/ac (4.68 L/ha)
GS 42710	2 oz/ac (140 g/ha)	0.5 gal/ac (4.68 L/ha)
	1 oz/ac (70 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft:	Grumman AgCat
Application system:	Boom and Nozzle - Flat Fan 8006

Province: **New Brunswick (corrected)**
Area: 1 000 acres (405 ha)
Chipman
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Pyrethrum	0.25 oz/ac (17.5 g/ha)	0.15 gal/ac (1.4 L/ha)

1973

Aircraft:
Application system:

Province: **New Brunswick (corrected)**
Area: 340 000 acres (137 700 ha)
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Dimecron	2 oz/ac (140 g/ha)	0.09 gal/ac (0.84 L/ha)
	1 oz/ac (70 g/ha)	0.09 gal/ac (0.84 L/ha)
	0.5 oz/ac (35 g/ha)	0.09 gal/ac (0.84 L/ha)
Aircraft:	Grumman Avengers	
Application system:	Boom and Nozzle - Flat Fan	

Province: **Quebec**
Area: 30 acres (12 ha)
Anticosti Island
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Altosid	3 oz/ac (210 g/ha)	2 gal/ac (18.7 L/ha)
	1 oz/ac (70 g/ha)	2 gal/ac (18.7 L/ha)
	0.25 oz/ac (17.5 g/ha)	2 gal/ac (18.7 L/ha)
Aircraft:	Bell Helicopter	
Application system:	Boom and Nozzle	

Province: **Quebec (corrected)**
Area: 300 acres (122 ha)
Témiscouata Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bt	6.8 BIU/ac (16.8 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Aircraft:	TBM CL-215	
Application system:	Boom and Nozzle	

Province: **Ontario (corrected)**
Area: 300 acres (122 ha)
Mashagama Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Thuricide 12B	3 BIU/ac (7.4 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Thuricide 8B	2 BIU/ac (4.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Thuricide 4B	1 BIU/ac (2.5 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Dipel (WP)	1 BIU/ac (2.5 BIU/ha)	0.5 gal/ac (4.68 L/ha)
	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair AU3000

Province: **Ontario (corrected)**
Area: 320 acres (130 ha)
Lake Superior Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	2 BIU/ac (4.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)
	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Stearman
Application system: Micronair AU3000

Province: **Ontario (corrected)**
Area: 2 800 acres (1 134 ha)
Algonquin Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Dipel (WP)	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Cessna AgTruck
Piper Pawnee
Application system: Micronair

1973

Province: **Ontario (corrected)**
Area: 425 acres (172 ha)
Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Dipel + Fenitrothion	4 BIU/ac + 0.25 oz/ac (9.9 BIU/ha + 17.5 g/ha)	0.5 gal/ac (4.68 L/ha)
Fenitrothion	0.25 oz/ac (17.5 g/ha)	-
Thuricide 16B	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Thuricide 16B + Fenitrothion	4 BIU and 0.25 oz/ac (9.9 BIU and 17.5 g/ha)	0.5 gal/ac (4.67 L/ha)

Aircraft: Stearman
Piper Pawnee
Application system: Microair AU3000

Province: **Ontario**
Area: 385 acres (156 ha) Massey
350 acres (142 ha) Mashagama Lake
735 acres (298 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV	10×10^9 PIB/ac (24.71×10^9 PIB/ha)	1 gal/ac (9.35 L/ha)
	20×10^9 PIB/ac (49.42×10^9 PIB/ha)	1 gal/ac (9.35 L/ha)
	25×10^9 PIB/ac (61.78×10^9 PIB/ha)	1 gal/ac (9.35 L/ha)
	50×10^9 PIB/ac (123.55×10^9 PIB/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair

Province: **Ontario**
Area: 726 acres (294 ha)
Kirkwood Forest Management Unit
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	2.5 lb/ac (2.8 kg/ha)	4 gal/ac (37.4 L/ha)
Gardona	2.5 lb/ac (2.8 kg/ha)	2 gal/ac (18.7 L/ha)
	2 lb/ac (2.24 kg/ha)	2 gal/ac (18.7 L/ha)
	1 lb/ac (1.12 kg/ha)	2 gal/ac (18.7 L/ha)

Aircraft: Stearman
Application system: Micronair AU2000

Province: **Ontario (corrected)**
Area: 1 300 acres (527 ha)
Insect: Oak leaf shredder

Insecticide	Active ingredient	Application rate
Sevin-4-oil	0.85 lb/ac (952 g/ha)	0.78 gal/ac (7.29 L/ha)

Aircraft: 1 Stearman
Application system: Micronair AU3000

Province: **Manitoba (corrected)**
Area: 200 acres (81 ha)
Spruce Woods Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel	4 BIU/ac (9.9 BIU/ha)	2 gal/ac (18.7 L/ha)
	4 BIU/ac (9.9 BIU/ha)	4 gal/ac (37.4 L/ha)

Aircraft: Cessna 188 AgWagon
Application system: Micronair AU2000

Province: **British Columbia (corrected)**
Area: 400 acres (162 ha)
Shuswap
Insect: Western false hemlock looper

Insecticide	Active ingredient	Application rate
Dipel	1.8 BIU/ac (4.5 BIU/ha)	2 gal/ac (18.7 L/ha)
	3.6 BIU/ac (8.9 BIU/ha)	2 gal/ac (18.7 L/ha)
	7.2 BIU/ac (17.8 BIU/ha)	2 gal/ac (18.7 L/ha)

Aircraft: Cessna AgWagon A188
Application system: Boom and Nozzle

1974

Province: **New Brunswick**
Area: 600 acres (243 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
CGA 13353	6 oz/ac (420 g/ha)	0.5 gal/ac (4.68 L/ha)
	3 oz/ac (210 g/ha)	0.5 gal/ac (4.68 L/ha)
	1.5 oz/ac (105 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Cessna 188 AgWagon
Application system: -

Province: **New Brunswick** (corrected)
Area: 2 017 000 acres (816 885 ha)
Northeast
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Phosphamidon	1 oz/ac (70 g/ha)	0.09 gal/ac (0.84 L/ha)

Aircraft: TBMs
DC-6s
Application system: Boom and Nozzle

Province: **Quebec**
Area: Lac des Loups
La Macaza
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	2 oz/ac (140 g/ha)	12 fl oz/ac (0.88 L/ha)
	2 oz/ac (140 g/ha)	16 fl oz/ac (1.17 L/ha)

Aircraft: DC-6B
Application system:

Province: **Quebec**
Area: Grand'Mère plantations
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sevin 80S/Bt	2 oz/ac (140 g/ha)	15 gal/ac (140 L/ha)
Methomyl/Bt	1.5 oz/ac (105 g/ha)	15 gal/ac (140 L/ha)
Orthene/Bt	2 oz/ac (140 g/ha)	15 gal/ac (140 L/ha)
Fundal/Bt	4 oz/ac (280 g/ha)	15 gal/ac (140 L/ha)
Sevin 80S	10 oz/ac (700 g/ha)	15 gal/ac (140 L/ha)
Lannate 20L	4 oz/ac(280 g/ha)	15 gal/ac (140 L/ha)
Orthene 90	8 oz/ac (560 g/ha)	15 gal/ac (140 L/ha)
Volaton 47 SC	4 oz/ac (280 g/ha)	15 gal/ac (140 L/ha)
Dipel and Thuricide 16B	4 BIU/ac (9.9 BIU/ha)	15 gal/ac (140 L/ha)
	8 BIU/ac (19.8 BIU/ha)	15 gal/ac (140 L/ha)
	6 BIU/ac (14.8 BIU/ha)	15 gal/ac (140 L/ha)

Aircraft: ground
Application system: Mistblower (John Bean Rotomist 100)

Province: Quebec
Area: Shawville
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Orthene	4 oz/ac (280 g/ha)	44 fl oz/ac (3.21 L/ha)
	6 oz/ac (420 g/ha)	59 fl oz/ac (4.31 L/ha)
	9 oz/ac (630 g/ha)	90 fl oz/ac (6.57 L/ha)
Fenitrothion	-	26 fl oz/ac (1.9 L/ha)
		40 fl oz/ac (2.92 L/ha)
		49 fl oz/ac (3.57 L/ha)
Phoxim		50 fl oz/ac (3.65 L/ha)
		53 fl oz/ac (3.87 L/ha)
		54 fl oz/ac (3.94 L/ha)
		57 fl oz/ac (4.16 L/ha)

Aircraft:
Application system:

Province: Quebec
Area: Témiscouata
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bt	6.8 BIU/ac (16.8 BIU/ha)	0.5 gal/ac (4.68 L/ha)

1974

Aircraft: DC-6B
CL-215
Application system: Boom and Nozzle

Province: **Ontario**
Area: Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Orthene	9 oz/ac (630 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: fixed-wing
Application system: -

Province: **Ontario**
Area: Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel + Orthene	12 BIU + 0.9 oz/ac (29.7 BIU + 63 g/ha)	
	8 BIU + 0.6 oz/ac (19.8 BIU + 42 g/ha)	
	4 BIU + 0.3 oz/ac (9.9 BIU + 21 g/ha)	
Dipel	8 BIU/ac (19.8 BIU/ha)	

Aircraft: Cessna AgTruck
Application system: Micronair AU3000

Province: **Ontario**
Area: Manitoulin Island
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
RO-10-3108	3 oz/ac (210 g/ha)	1 gal/ac (9.35 L/ha)
	5 oz/ac (350 g/ha)	1 gal/ac (9.35 L/ha)
ZR-515	3 oz/ac (210 g/ha)	1 gal/ac (9.35 L/ha)
	5 oz/ac (350 g/ha)	1 gal/ac (9.35 L/ha)
ZR-515 + Bt	3 oz + 3 BIU/ac (210 g + 7.4 BIU/ha)	1 gal/ac (9.35 L/ha)
Thuricide 16B	3 BIU/ac (7.4 BIU/ha)	1 gal/ac (9.35 L/ha)
	6 BIU/ac (14.8 BIU/ha)	1 gal/ac (9.35 L/ha)
PH-60-40 (WP)	5 oz/ac (350 g/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair

Province: **Ontario**
Area: Manitoulin Island
1 280 acres (518 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV	10×10^{12} PIB/ac (24.71×10^{12} PIB/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair

Province: **Ontario**
Area: 1 394 acres (565 ha)
Simcoe County Forest
Torbolton Township Forest
Kirkwood Forest Management Unit
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	2 lb/ac (2.24 kg/ha)	4 gal/ac (37.4 L/ha)
	2 lb/ac (2.24 kg/ha)	2 gal/ac (18.7 L/ha)
	2.5 lb/ac (2.8 kg/ha)	4 gal/ac (37.4 L/ha)
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Aircraft: AgCat
Cessna AgTruck
Cessna 185
Stearman
Application system: Micronair AU2000 and AU3000

Province: **British Columbia**
Area: Golden
Insect:

Insecticide	Active ingredient	Application rate
Diazinon	1 lb/ac (1.12 kg/ha)	4.4 (I) gal/ac (49.4 L/ha)
	2 lb/ac (2.24 kg/ha)	4.4 (I) gal/ac (49.4 L/ha)
	3 lb/ac (3.36 kg/ha)	4.4 (I) gal/ac (49.4 L/ha)

1974

Dylox	1 lb/ac (1.12 kg/ha)	4.4 (I) gal/ac (49.4 L/ha)
	2 lb/ac (2.24 kg/ha)	4.4 (I) gal/ac (49.4 L/ha)
	4 lb/ac (4.48 kg/ha)	4.4 (I) gal/ac (49.4 L/ha)
C. militaris	4.2×10^6 M.P./ac (10.38×10^6 M.P./ha)*	4.4 (I) gal/ac (49.4 L/ha)
Dipel	7.26 BIU/ac (17.9 BIU/ha)	5.4 gal/ac (50.5 L/ha)
NPV	400×10^{12} PIB/ac (988×10^{12} PIB/ha)	16 gal/ac (149.6 L/ha)
Aircraft:	ground	
Application system:	Mistblower	*M.P. = micropropogules

Province: **British Columbia**
Area: 25 acres (10 ha)
Kamloops
Insect: Douglas-fir tussock moth

Insecticide	**Active ingredient**	**Application rate**
NPV	0.5×10^9 PIB/ac (1.24×10^9 PIB/ha)	4 gal/ac (37.4 L/ha)
Aircraft:	Cessna 188 AgWagon	
Application system:	Boom and Nozzle	

Province: **British Columbia**
Area: 120 acres (49 ha)
Chase
Insect: Western false hemlock looper

Insecticide	**Active ingredient**	**Application rate**
Dipel	0.5 lb/ac (560 g/ha)	2 gal/ac (18.7 L/ha)
Juvenile hormone	3 fl oz/ac (0.22 L/ha)	2 gal/ac (18.7 L/ha)
Zoecon 515	-	-
Aircraft:	AgTruck	
Application system:	-	

1975

Province: **New Brunswick**
Area: 11 500 acres (4 658 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dimecron	2 oz/ac (140 g/ha)	
	2.5 oz/ac (175 g/ha)	
Fenitrothion	2.5 oz/ac (175 g/ha)	
	4 oz/ac (280 g/ha)	
Dipel	8 BIU/ac (19.77 BIU/ha)	
Thuricide	8 BIU/ac (19.77 BIU/ha)	
Aircraft:	fixed-wing	
Application system:	-	

Province: **New Brunswick**
Area: 1 500 acres (608 ha)
Doaktown
Upper Blackville
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide	8 BIU/ac (19.8 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Dipel	8 BIU/ac (19.8 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Aircraft:	Cessna AgWagon	
Application system:	Boom and Nozzle	

Province: **New Brunswick**
Area: 6 000 acres (2 430 ha)
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Dimecron	1 oz/ac (70 g/ha)	0.05 gal/ac (0.47 L/ha)
Aircraft:		
Application system:		

Province: **Quebec**
Area: - (study with British Columbia)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide	4 BIU/ac (9.9 BIU/ha)	32 fl oz/ac (2.34 L/ha)
	8 BIU/ac (19.8 BIU/ha)	32 fl oz/ac (2.34 L/ha)

1975

Dipel	9 BIU/ac (22.2 BIU/ha)	32 fl oz/ac (2.34 L/ha)
Aircraft:	Cessna 188 AgWagon DC-6B helicopters	
Application system:	Micronair AU3000 Boom and Nozzle	

Province: **Quebec**
Area: Maniwaki (semi-operational)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Fenitrothion	2 oz/ac (140 g/ha)	16 fl oz/ac (1.17 L/ha)
Aircraft:	Constellation L-749	
Application system:	Boom and Nozzle	

Province: **Quebec**
Area: 1 040 acres (421 ha)
Grand'Mère plantations
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Methomyl	4 oz/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
Phoxim	16 oz/ac (1.12 kg/ha)	0.5 gal/ac (4.68 L/ha)
Trichlorforon	6 oz/ac (420 g/ha)	0.5 gal/ac (4.68 L/ha)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU3000	

Province: **Quebec**
Area: 70 800 acres (28 674 ha)
166 800 acres (67 554 ha) semi-operational
237 600 acres (96 228 ha)
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Thuricide 16B	6.8 BIU/ac (16.8 BIU/ha)	68 fl oz/ac (4.96 L/ha)
Thuricide 26B	6.8 BIU/ac (16.8 BIU/ha)	48 - 66 fl oz/ac (3.50 - 4.82 L/ha)
Dipel	6.8 BIU/ac (16.8 BIU/ha)	48 - 66 fl oz/ac (3.50 - 4.82 L/ha)

Aircraft: DC-6Bs
Application system:

Province: Quebec
Area: Shawville
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Orthene	4 oz/ac (280 g/ha)	40 fl oz/ac (2.92 L/ha)
	2 oz/ac (140 g/ha)	20 fl oz/ac (1.46 L/ha)
Phosvel	4 oz/ac (280 g/ha)	40 fl oz/ac (2.92 L/ha)
	2 oz/ac (140 g/ha)	20 fl oz/ac (1.46 L/ha)
FMC 33297	0.1 oz/ac (7 g/ha)	20 fl oz/ac (1.46 L/ha)
	0.25 oz/ac (17.5 g/ha)	20 fl oz/ac (1.46 L/ha)
	0.5 oz/ac (35 g/ha)	20 fl oz/ac (1.46 L/ha)
	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)
	1 oz/ac (70 g/ha)	40 fl oz/ac (2.92 L/ha)
	2 oz/ac (140 g/ha)	40 fl oz/ac (2.92 L/ha)
TH-60/40	0.6 oz/ac (42 g/ha)	32 fl oz/ac (2.34 L/ha)
	1.3 oz/ac (91 g/ha)	32 fl oz/ac (2.33 L/ha)
	1.3 oz/ac (91 g/ha)	64 fl oz/ac (4.67 L/ha)
	2.6 oz/ac (182 g/ha)	64 fl oz/ac (4.67 L/ha
	2.6 oz/ac (182 g/ha)	128 fl oz/ac (9.34 L/ha)
	5.3 oz/ac (371 g/ha)	128 fl oz/ac (9.34 L/ha)
Fenitrothion	4 oz/ac (280 g/ha)	40 fl oz/ac (2.92 L/ha)
DDT	4 oz/ac (280 g/ha)	40 fl oz/ac (2.92 L/ha)

Aircraft:
Application system:

Province: Quebec
Area: 249 100 acres (100 886 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Cygon	2 oz/ac (140 g/ha)	0.12 gal/ac (1.12 L/ha)
Dylox	6 oz/ac (420 g/ha)	0.09 gal/ac (0.84 L/ha)
	12 oz/ac (840 g/ha)	0.18 gal/ac (1.68 L/ha)
Fenitrothion	2 oz/ac (140 g/ha)	0.12 gal/ac (1.12 L/ha)
Dimecron	1.5 oz/ac (105 g/ha)	0.12 gal/ac (1.12 L/ha)
	2 oz/ac (140 g/ha)	0.12 gal/ac (1.12 L/ha)

Aircraft: DC-6Bs
Constellation L-1049s
Application system:

1975

Province: **Ontario**
Area: Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Orthene	6 oz/ac (420 g/ha)	0.5 gal/ac (4.67 L/ha)
	6 oz/ac (420 g/ha)	20 fl oz/ac (1.46 L/ha)
	20 oz/ac (1.4 kg/ha)	48 fl oz/ac (3.50 L/ha)

Aircraft:
Application system:

Province: **Ontario**
Area: 3 360 acres (1 361 ha)
Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel + Orthene	8 BIU + 0.6 oz/ac (19.8 BIU + 42 g/ha)	1.5 gal/ac (14 L/ha)
	8 BIU + 0.6 oz/ac (19.8 BIU + 42 g/ha)	0.5 gal/ac (4.68 L/ha)
	8 BIU + 0.6 oz/ac (19.8 BIU + 42 g/ha)	0.25 gal/ac (2.34 L/ha)
Dipel	8 BIU/ac (19.8 BIU/ha)	0.5 gal/ac (4.68 L/ha)
	8 BIU/ac (19.8 BIU/ha)	0.25 gal/ac (2.34 L/ha)

Aircraft:
Application system:

Province: **Ontario**
Area: Manitoulin Island
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
N. fumiferanae		

Aircraft: ground
Application system: Mistblower

Province: **Ontario**
Area: >700 acres (>284 ha)
Manitoulin Island
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
PH 60-40	2 oz/ac (140 g/ha)	
RO-10-3108	2 oz/ac (140 g/ha)	
	7 oz/ac (490 g/ha)	
	15 oz/ac (1.05 kg/ha)	
Aircraft:	fixed-wing and ground	
Application system:	Micronair	
	Boom and Nozzle	
	backpack spray system (RO-10-3108)	

Province: **Ontario**
Area: 318 ha (786 acres)
Manitoulin Island
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV	0.44×10^9 PIB/ha	
	(0.178×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
	0.025×10^9 PIB/ha	
	(0.0101×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
	0.0125×10^9 PIB/ha	
	(0.0051×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Grumman AgCat	
Application system:	Micronair	
	Boom and Nozzle	

Province: **Ontario**
Area: 650 acres (263 ha)
Lake Superior Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	7.6 BIU/ac (18.8 BIU/ha)	0.625 gal/ac (5.84 L/ha)
SAN 239 I (24B)	9.6 BIU/ac (23.7 BIU/ac)	0.57 gal/ac (5.33 L/ha)
SAN 239 I (32B)	8.5 BIU/ac (21 BIU/ha)	0.33 gal/ac (3.09 L/ha)
Aircraft:	Stearman	
Application system:	Micronair	

1975

Province: **Ontario**
Area: 30 acres (12 ha)
Searchmont
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sex-attractant (trans-11-tetra-decenal)	2% A.I. in Xylene	
Aircraft:	Stearman	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: 577 acres (234 ha)
Simcoe County Forest
Torbolton Township
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Methoxychlor	2.5 lb/ac (2.8 kg/ha)	2 gal/ac (18.7 L/ha)
Aircraft:	Cessna 185	
Application system:	Micronair AU3000	

Province: **British Columbia**
Area: - (study with Quebec)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide	4 BIU/ac (9.9 BIU/ha)	32 fl oz/ac (2.34 L/ha)
	8 BIU/ac (19.8 BIU/ha)	32 fl oz/ac (2.34 L/ha)
Dipel	9 BIU/ac (22.2 BIU/ha)	32 fl oz/ac (2.34 L/ha)
Aircraft:	Cessna 188 AgWagon DC-6B helicopters	
Application system:	Micronair AU3000	

Province: **British Columbia**
Area: 1 350 acres (547 ha)
Insect: Douglas-fir tussock moth
Western false hemlock looper

1975

Insecticide	Active ingredient	Application rate
Thuricide 16B	10.2 BIU/ac (25.2 BIU/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Cessna AgTruck
Application system: Boom and Nozzle

Province: **British Columbia**
Area: -
Insect: Douglas-fir tussock moth
Western false hemlock looper

Insecticide	Active ingredient	Application rate
Orthene	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)
PH 60-40	4 oz/ac (280 g/ha)	1 gal/ac (9.35 L/ha)

Aircraft:
Application system:

Province: **British Columbia**
Area: -
Insect: Tussock moth

Insecticide	Active ingredient	Application rate
Tussock moth virus		1 gal/ac (9.35 L/ha) 2 gal/ac (18.7 L/ha)

Aircraft:
Application system:

1976

Province: **New Brunswick**
Area: 100 acres (41 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura (micro-encapsulated)	350 g	

1976

Aircraft:
Application system:

Province: **New Brunswick**
Area: -
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dimecron	2 oz/ac (140 g/ha)	
	3 oz/ac (210 g/ha)	
	4 oz/ac (280 g/ha)	
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	20 fl oz/ac (1.46 L/ha)
	8 oz/ac (560 g/ha)	20 fl oz/ac (1.46 L/ha)
Lannate	4 oz/ac (280 g/ha)	-
Orthene	4 oz/ac (280 g/ha)	20 fl oz/ac (1.46 L/ha)
	8 oz/ac (560 g/ha)	20 fl oz/ac (1.46 L/ha)

Aircraft: Cessna 188 AgWagon
Application system: Micronair

Province: **New Brunswick (corrected)**
Area: -
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	
	8 oz/ac (560 g/ha)	
Orthene	4 oz/ac (280 g/ha)	
Dimecron	1 oz/ac (70 g/ha)	
Matacil	1 oz/ac (70 g/ha)	

Aircraft: Cessna AgTruck
TBM
Application system:

Province: **Quebec**
Area: Shawville
Insect: -

Insecticide	Active ingredient	Application rate
NRDC-143 (A)	0.8, 1.4, 1.7, 2.8, 3.4 and 5.6 %	

NRDC-143 (B)	0.8, 1.4, 1.7, 2.8, 3.4 and 5.6 %	
Orthene 75S	10 and 5 %	1.5 L/ha (20.5 fl oz/ac)
Sumithion	10 %	
Reldan	10 %	

Aircraft:
Application system:

Province: Quebec
Area: 1 164 acres (471 ha)
Grand'Mère plantations
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NRDC 143	0.25 oz/ac (17.5 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.5 oz/ac (35 g/ha)	0.5 gal/ac (4.68 L/ha)
FMC 33297	0.5 oz/ac (35 g/ha)	0.5 gal/ac (4.68 L/ha)
	1 oz/ac (70 g/ha)	0.5 gal/ac (4.68 L/ha)
Fenitrothion	4 oz/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Cessna AgTruck
Application system: Micronair AU3000

Province: Quebec
Area: 970 - 1 810 ha (2 397 - 4 473 acres)
Chemical Control Research Institute
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Orthene + Bt	42 g + 20 BIU/ha (0.6 oz + 8.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)
	42 g + 30 BIU/ha (0.6 oz + 12.2 BIU/ac)	9.4 L/ha (1.01 gal/ac)
Bt	20 BIU/ha (8.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)

Aircraft:
Application system:

Province: Quebec
Area: 1 700 000 acres (688 500 ha)
Saint-Honoré
Rivière-du-Loup
La Macaza
Bonaventure
Insect: Eastern spruce budworm

1976

Insecticide	Active ingredient	Application rate
Fenitrothion	1 oz/ac (70 g/ha)	14 fl oz/ac (1.02 L/ha)
	2 oz/ac (140 g/ha)	15 fl oz/ac (1.10 L/ha)
	3 oz/ac (210 g/ha)	15 fl oz/ac (1.10 L/ha)
Phosphamidon	2 oz/ac (140 g/ha)	13 fl oz/ac (0.95 L/ha)
Matacil	0.75 oz/ac (52.5 g/ha)	2 fl oz/ac (0.15 L/ha)
Dimethoate	2 oz/ac (140 g/ha)	5 fl oz/ac (0.37 L/ha)
Aircraft:	fixed-wing	
Application system:		

Province: **Ontario**
Area: 700 acres (284 ha)
Petawawa Forest Experiment Station
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NRDC-143	0.125 oz/ac (8.75 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.25 oz/ac (17.5 g/ha)	0.5 gal/ac (4.68 L/ha)
	0.5 oz/ac (35 g/ha)	0.5 gal/ac (4.68 L/ha)
Fenitrothion	2 oz/ac (140 g/ha)	0.5 gal/ac (4.68 L/ha)
Aircraft:	fixed-wing	
Application system:	Micronair AU3000	

Province: **Ontario**
Area: Insect Pathology Research Institute, Sault Ste. Marie
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
N. fumiferanae	0.25×10^9 spores/tree	1.5 L/tree (50.7 fl oz/tree)
P. shubergi	0.25×10^9 spores/tree	1.5 L/tree (50.7 fl oz/tree)
Aircraft:	ground	
Application system:	Mistblower	

Province: **Ontario**
Area: >500 acres (>203 ha)
Kirkwood
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dimilin	2 oz/ac (140 g/ha)	0.5 gal/ac (4.68 L/ha)
RO-10-3108	4 oz/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
	8 oz/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
Aircraft:	Grumman AgCat	
Application system:	Micronair	

Province: **Ontario**
Area: 120 ha (297 acres)
Kirkwood
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV	12.5×10^{12} PIB/ha (5.06×10^{12} PIB/ac)	9.4 L/ha(1.01 gal/ac)
Aircraft:	Grumman AgCat	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: 43.2 ha (107 acres)
Peterborough area
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	1.25×10^{9} PIB/ha (0.51×10^{9} PIB/ac)	9.4 L/ha (1.01 gal/ac)
	3.75×10^{9} PIB/ha (1.52×10^{9} PIB/ac)	9.4 L/ha (1.01 gal/ac)
	6.25×10^{9} PIB/ha (2.53×10^{9} PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Piper Supercub PA18	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: St. Joseph Island
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV		
Aircraft:	ground	
Application system:	Mistblower	

1976

Province: **British Columbia**
Area:
Insect: Douglas-fir tussock moth

Insecticide	Active ingredient	Application rate
Orthene	0.75 lb/ac (840 g/ha)	1 gal/ac (9.35 L/ha)
	0.5 lb/ac (560 g/ha)	1 gal/ac (9.35 L/ha)
Dimilin	2 oz/ac (140 g/ha)	-
	1 oz/ac (70 g/ha)	
	0.5 oz/ac (35 g/ha)	

Aircraft:
Application system:

1977

Province: Newfoundland
Area: 75 760 ha (187 203 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	88 g/ha (1.26 oz/ac)	1.46 L/ha (20 fl oz/ac)
	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
Fenitrothion	210 g/ha (3 oz/ac)	1.46 L/ha (20 fl oz/ac)
Bt + Orthene	20 BIU + 56 g/ha (8.1 BIU + 0.8 oz/ac)	5.84 L/ha (80 fl oz/ac)
Bt	20 BIU/ac (8.1 BIU/ac)	1.46 L/ha (20 fl oz/ac)
Aircraft:	DC-6Bs Cessna 188 AgWagons	
Application system:		

Province: **New Brunswick (corrected)**
Area: 3 000 ha (7 413 acres)
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Dimecron	70 g/ha (1 oz/ac)	0.73 L/ha (10 fl oz/ac)

Aircraft:
Application system:

Province: Quebec
Area: 180 002 acres (72 901 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	
Phosphamidon	2 oz/ac (140 g/ha)	
Matacil	1 oz/ac (70 g/ha)	

Aircraft: DC-6Bs
Application system: -

Province: Quebec
Area: 395 acres (160 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bactospeine 22.5B		
Dipel SC 36B		
Thuricide 32B		

Aircraft: Grumman AgCat
Application system: Boom and Nozzle

Province: Quebec
Area: Gaspé region (semi-operational)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	280 g/ha (4 oz/ac)	0.84 L/ha (11.5 fl oz/ac)
Matacil	70 g/ha (1 oz/ac)	0.84 L/ha (11.5 fl oz/ac)

Aircraft: DC-6
Application system: -

Province: Quebec
Area: 445 - 1 068 ha (1 100 - 2 639 acres)
near Sainte-Anne-des-Monts
Insect: Eastern spruce budworm

1977

Insecticide	Active ingredient	Application rate
Permethrin	18 g/ha (0.26 oz/ac)	4.7 L/ha (0.5 gal/ac)
	35 g/ha (0.5 oz/ac)	4.7 L/ha (0.5 gal/ac)
	70 g/ha (1 oz/ac)	4.7 L/ha (0.5 gal/ac)
Chlorpyrifosmethyl	52 g/ha (0.74 oz/ac)	4.7 L/ha (0.5 gal/ac)
	140 g/ha (2 oz/ac)	4.7 L/ha (0.5 gal/ac)
Aircraft:	Cessna 185	
Application system:	Micronair AU3000	

Province: **Quebec**
Area: 440 acres (178 ha)
Saint-Antoine-Abbé
Insect: Gypsy moth (larvae)

Insecticide	Active ingredient	Application rate
Dimilin WP 25	0.06 lb/ac (67.2 g/ha)	0.5 gal/ac (4.68 L/ha)
Aircraft:	Grumman AgCat	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: 270 acres (109 ha)
Sault Ste. Marie
Black Sturgeon Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Synthetic attractant		
Aircraft:	Cessna 185	
Application system:	special "pods"	

Province: **Ontario**
Area: Forest Pest Management Institute, Ottawa
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B/Dipel 36B + Orthene	20 BIU + 56 g/ha (8.1 BIU + 0.8 oz/ac)	
Orthene	56 g/ha (0.8 oz/ac)	

Aircraft:
Application system:

Province: **Ontario**
Area: Hearst
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
PH 60-41	1 oz/ac (70 g/ha)	0.5 gal/ac (4.68 L/ha)
	2 oz/ac (140 g/ha)	0.5 gal/ac (4.68 L/ha)
Dimilin	1 oz/ac (70 g/ha)	0.5 gal/ac (4.68 L/ha)
	2 oz/ac (140 g/ha)	0.5 gal/ac (4.68 L/ha)
EL-494	2 oz/ac (140 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft:
Application system:

Province: **Ontario**
Area: 370 acres (150 ha)
Kirkwood Township
Kendall Township
Shetland Township
Insect: Eastern spruce budworm
Western spruce budworm

Insecticide	Active ingredient	Application rate
NPV	10×10^{12} PIB/ac (2.47×10^{12} PIB/ha)	1 gal/ac (9.35 L/ha)
	3×10^{11} PIB/ac (7.41×10^{12} PIB/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Grumman AgCat
Application system: Boom and Nozzle

Province: **Ontario**
Area: 100 acres (41 ha)
Grundy Lake
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Dimilin	1 oz/ac (70 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft:
Application system:

1977

Province: **Ontario**
Area: 50 acres (20 ha)
Huronia
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Thuricide 16B	4 BIU/ac (9.9 BIU/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair

Province: **Ontario**
Area: 400 acres (162 ha)
Key River, Parry Sound
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Dimilin	1 oz/ac (70 g/ha)	0.5 gal/ac (4.68 L/ha)
Orthene	8 oz/ac (560 g/ha)	0.5 gal/ac (4.68 L/ha)
	4 oz/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)
Dylox	4 oz/ac (280 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Grumman AgCat
Application system: Micronair

Province: **Ontario**
Area: 310 acres (126 ha)
Awenda
Insect: Oak leaf shredder

Insecticide	Active ingredient	Application rate
Orthene	12 oz/ac (840 g/ha)	1 gal/ac (9.35 L/ha)
	1 lb/ac (1.12 kg/ha)	1 gal/ac (9.35 L/ha)

Aircraft: Piper Pawnee
Application system: Boom and Nozzle

Province: **Ontario**
Area: 120 acres (49 ha)
Admonston and Rideau Townships
Insect: Red-headed pine sawfly

1977

Insecticide	Active ingredient	Application rate
NPV	2.2×10^9 PIB/ac (5.44×10^9 PIB/ha)	1 gal/ac (9.35 L/ha)
Aircraft:	Balanca Scout Cessna 180	
Application system:	Boom and Nozzle Micronair	

1978

Province: Quebec
Area: 430 000 acres (174 150 ha)
La Pocatière
Rimouski
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	0.75 oz/ac (52.5 g/ha)	16 fl oz/ac (1.17 L/ha)
Aircraft:	fixed-wing (4-engine)	
Application system:	Boom and Nozzle	

Province: Quebec
Area: 450 acres (182 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	3 oz/ac (210 g/ha)	16 fl oz/ac (1.17 L/ha)
Aircraft:	Cessna AgTruck	
Application system:	Micronair	

Province: Quebec
Area: 18 000 acres (7 290 ha)
Sainte-Anne-des-Monts
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 32B		0.5 gal/ac (4.68 L/ha) 1 gal/ac (9.35 L/ha)

1978

Novabac		0.5 gal/ac (4.68 L/ha) 1 gal/ac (9.35 L/ha)
Dipel		0.5 gal/ac (4.68 L/ha) 1 gal/ac (9.35 L/ha)
Aircraft:	DC-6B Grumman AgCat	
Application system:	Boom and Nozzle	

Province: **Quebec**
Area: 350 acres (142 ha)
Insect: Red-headed pine sawfly

Insecticide	**Active ingredient**	**Application rate**
NPV	2×10^9 PIB/ac (4.94×10^9 PIB/ha)	1 gal/ac (9.35 L/ha)
	4×10^9 PIB/ac (9.88×10^9 PIB/ha)	1 gal/ac (9.35 L/ha)
Aircraft:	Cessna 185E Bell 47G-5 helicopter	
Application system:	ground Micronair Beecomist liquid sprayer (Sthill SG17) - ground	

Province: **Quebec**
Area: South Plantagenet Township
Insect: Pine needle midge

Insecticide	**Active ingredient**	**Application rate**
Diazinon	0.03 L/ha (0.01 L/ac)	935 L/ha (100 gal/ac)
	0.24 L/ha (0.1 L/ac)	935 L/ha (100 gal/ac)
	0.35 L/ha (0.14 L/ac)	935 L/ha (100 gal/ac)
Permethrin	0.03 L/ha (0.01 L/ac)	935 L/ha (100 gal/ac)
	0.24 L/ha (0.1 L/ac)	935 L/ha (100 gal/ac)
Aircraft:	helicopter	
Application system:		

Province: **Ontario**
Area: 350 ha (865 acres)
Wawa
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	8.9 BIU/ha (3.6 BIU/ac)	4.68 L/ha (0.5 gal/ac)
	17.8 BIU/ha (7.2 BIU/ac)	4.68 L/ha (0.5 gal/ac)
Dipel (WP)	8.9 BIU/ha (3.6 BIU/ac)	4.68 L/ha (0.5 gal/ac)
	17.8 BIU/ha (7.2 BIU/ac)	4.68 L/ha (0.5 gal/ac)
Novabac-3	8.9 BIU/ha (3.6 BIU/ac)	4.68 L/ha (0.5 gal/ac)
	17.8 BIU/ha (7.2 BIU/ac)	4.68 L/ha (0.5 gal/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair	
	Boom and Nozzle	

Province: **Ontario**
Area: 134 ha (331 acres)
Thessalon
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV	0.75×10^9 PIB/ha (0.30×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Cessna 185E	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: Hearst
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dimilin	4 oz/ac (280 g/ha)	
EL-494	2 oz/ac (140 g/ha)	
BAY SIR 8514	2 oz/ac (140 g/ha)	
Orthene	8 oz/ac (560 g/ha)	
Aircraft:		
Application system:		

Province: **Ontario**
Area: Hearst
Insect: Forest tent caterpillar

1978

Insecticide	Active ingredient	Application rate
Dimilin	1 oz/ac (70 g/ha)	0.5 gal/ac (4.68 L/ha)
Aircraft:		
Application system:		

Province: **Ontario**
Area: 25.9 ha (64 acres)
Sharbot Lake
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	5×10^9 PIB/ha (2.03×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Cessna 185E	
Application system:	Micronair AU3000	

Province: **British Columbia**
Area: near Litton and Lillooet
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
NPV	750 BIU/ha (304 BIU/ac)	
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	
Aircraft:	fixed-wing	
Application system:		

Province: **British Columbia**
Area: Interior
Insect: Mountain pine beetle

Insecticide	Active ingredient	Application rate
Lindane	1%	
Reldan	2%	
Sevin	2%	
Silvisar 510		
Silvisar 550		
Aircraft:	ground	
Application system:	-	

1978

Province: **British Columbia**
Area: southern coast
Insect: Balsam woolly aphid

Insecticide	Active ingredient	Application rate
Baygon		
Sevin		
Oleate		
Permethrin		

Aircraft:
Application system:

Province: **British Columbia**
Area:
Insect: Cone and seed insects

Insecticide	Active ingredient	Application rate
Orthene		
Dimethoate		

Aircraft: helicopter (Dimethoate)
ground (Orthene)
Application system: hand sprayer (ground)

1979

Province: **Newfoundland (corrected)**
Area: 544 acres (220 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 24BA	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)
Thuricide 24BC	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)
Novabac 45B	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)

Aircraft: 4 Cessna AgTrucks
Application system: Boom and Nozzle

1979

Province: **New Brunswick**
Area: 890 acres (361 ha)
CANUSA
Insect:

Insecticide	Active ingredient	Application rate
Thuricide 16B	8 BIU/ac (19.8 BIU/ha)	1 gal/ac (9.35 L/ha)
Dipel ABG-6103 (32B)	-	
Dipel 45B	-	

Aircraft:
Application system:

Province: **New Brunswick**
Area: Canadian Forces Base Georgetown
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Reldan	70 - 84 g/ha (1 - 1.2 oz/ac)	1.46 L/ha(20 fl oz/ac)
Alfacron	18 g/ha (0.26 oz/ac)	1.46 L/ha (20 fl oz/ac)
	35 g/ha (0.5 oz/ac)	1.46 L/ha (20 fl oz/ac)
	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
Aircraft:	Piper Pawnee	
Application system:	Micronair AU3000	

Province: **New Brunswick**
Area: 500 acres (203 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	8 BIU/ac (19.8 BIU/ha)	
Aircraft:	Grumman AgCat	
Application system:	Boom and Nozzle	

Province: **Nova Scotia (corrected)**
Area: 3 520 ha (8 698 acres) Mainland
2 036 ha (5 031 acres) Cape Breton Highlands
5 556 ha (13 729 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	10 BIU/ha (4.1 BIU/ac)	4.7 L/ha (0.5 gal/ac)
	20 BIU/ha (8.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	1 Stearman 1 Cessna AgTruck 4 Grumman AgCats	
Application system:	Boom and Nozzle - Tee Jet - Flat Fan 8006	

Province: Quebec
Area: 14 339 ha (35 432 acres)
CANUSA
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel ABG-6103 Novabac-3 Thuricide 32B	20 BIU/ha (8.1 BIU/ac)	9.34 L/ha (1.01 gal/ac)
Aircraft:		
Application system:		

Province: Quebec
Area: 16 024 ha (39 595 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide	29.65 BIU/ha (12 BIU/ac)	7 L/ha (96 fl oz/ac)
	19.77 BIU/ha (8 BIU/ac)	4.68 L/ha (64 fl oz/ac)
Dipel ABG-6103	19.77 BIU/ha (8 BIU/ac)	5.8 L/ha (79 fl oz/ac)
Novabac-3	29.77 BIU/ha (12.1 BIU/ac)	7 L/ha (96 fl oz/ac)
Aircraft:	Constellation L-749	
Application system:	Boom and Nozzle	

Province: Quebec
Area: -
Insect: Eastern spruce budworm

1979

Insecticide	Active ingredient	Application rate
Thuricide 16B	9.9 BIU/ha (4 BIU/ac)	4.7 L/ha (0.5 gal/ac)
	19.8 BIU/ha (8 BIU/ac)	4.7 L/ha (0.5 gal/ac)
	22 - 27 BIU/ha (8 - 11 BIU/ac)	2.35 - 2.95 L/ha (32.1 - 40.4 fl oz/ac)
	2.5, 0.25, 0.025 and 0.0002 BIU/ha (1, 0.1, 0.01 and 0.0001 BIU/ac)	4.7 L/ha (0.5 gal/ac)
Novabac 32B	19.8 BIU/ha (8 BIU/ac)	4.7 L/ha (0.5 gal/ac)
Thuricide 32B	19.8 BIU/ha (8 BIU/ac)	4.7 L/ha (0.5 gal/ac)
Novabac 45B	19.8 BIU/ha (8 BIU/ac)	4.7 L/ha (0.5 gal/ac)
Dipel ABG-6103	19.8 BIU/ha (8 BIU/ac)	4.7 L/ha (0.5 gal/ac)
Aircraft:	Grumman AgCat	
Application system:	Boom and Nozzle	

Province: **Quebec**
Area: 1 237 ha (3 057 acres)
Mount Saint-Bruno Park
Domaine Gault, Mt. Saint-Hilaire
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Thuricide 25%	19.76 BIU/ha (8 BIU/ac)	9.36 L/ha (1 gal/ac)
Thuricide 50%	39.52 BIU/ha (16 BIU/ac)	9.36 L/ha (1 gal/ac)
Aircraft:	Grumman AgCat	
Application system:	Boom and Nozzle	

Province: **Quebec**
Area: 330 ha (815 acres)
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	5×10^9 PIB/ha (2.02×10^9 PIB/ac)	9.36 L/ha (1 gal/ac)
	10×10^9 PIB/ha (4.1×10^9 PIB/ac)	18.7 L/ha (2 gal/ac)
Aircraft:	Hughes 300 and 500 helicopters ground	
Application system:	Beecomist Boom and Nozzle Sthill SG17 Mistblower: ground	

Province: **Ontario**
Area: Wawa
Insect: -

Insecticide	Active ingredient	Application rate
EL-1215	1.72 g/tree (0.06 oz/tree)	25 ml/tree (0.85 fl oz/tree)
EL-7063	0.334 g/tree (0.01 oz/tree)	25 ml/tree (0.85 fl oz/tree)

Aircraft: ground
Application system: ULVA handsprayer

Province: **Ontario**
Area: Wawa
Insect:

Insecticide	Active ingredient	Application rate
BAY SIR 8514	1 - 4 oz/ac (70 - 280 g/ha)	0.5 gal/ac (4.68 L/ha)

Aircraft: Cessna AgTruck
Application system: Micronair

Province: **Ontario**
Area: 81 ha (200 acres)
Thessalon
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV	0.75×10^9 PIB/ha (0.304×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
	1.5×10^6 PIB/ha (0.61×10^6 PIB/ac)	9.4 L/ha (1.01 gal/ac)

Aircraft: Cessna 185E
Application system: Micronair AU3000

Province: **Ontario**
Area: 4 614 ha (11 401 acres)
CANUSA
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	10 BIU/ha (4.1 BIU/ac)	4.68 L/ha (0.5 gal/ac)
Novabac-3	40 BIU/ha (16.2 BIU/ac)	-

1979

Aircraft:
Application system:

Province: **Ontario**
Area: 100 acres (41 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Orthene 85SP + NPV	8 oz + 300 × 10^{12} PIB/ac (560 g + 741 × 10^{12} PIB/ha)	0.5 gal/ac (4.68 L/ha)
	8 oz + 300 × 10^{12} PIB/ac (560 g + 741 × 10^{12} PIB/ha)	1 gal/ac (9.35 L/ha)
Aircraft:	1 Piper Pawnee	
Application system:	Micronair	

Province: **Ontario**
Area: 33.6 ha (83 acres)
Pembroke district
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	5 × 10^{9} PIB/ha (2.02 × 10^{9} PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Cessna 185E	
Application system:	Micronair AU3000	

Province: **British Columbia**
Area: 24 acres (10 ha)
Insect: Spiral spruce-cone borer

Insecticide	Active ingredient	Application rate
Cygon 4E	0.2 gal/ac (1.87 L/ha)	10 gal/ac (93.5 L/ha)
	0.0008 gal/tree (0.003 L/tree)	1 gal/tree (3.79 L/tree)
	0.022 gal/tree (0.08 L/tree)	2.7 gal/tree (10.22 L/tree)
Aircraft:	helicopter	
Application system:	Boom and Nozzle	

1980

Province: **Newfoundland (corrected)**
Area: 4 320 ha (10 675 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 24B	20 BIU/ha (8.1 BIU/ac)	4.67 L/ha (64 fl oz/ac)
Thuricide 32B	20 BIU/ha (8.1 BIU/ac)	2.34 L/ha (32 fl oz/ac)
Novabac 45B	20 BIU/ha (8.1 BIU/ac)	4.67 L/ha (64 fl oz/ac)
Novabac-3	20 BIU/ha (8.1 BIU/ac)	4.67 L/ha (64 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	4.67 L/ha (64 fl oz/ac)

Aircraft: 4 Piper Pawnees
Application system: Boom and Nozzle

Province: **New Brunswick**
Area: 1 201 acres (486 ha)
Insect: -

Insecticide	Active ingredient	Application rate
Fenitrothion	4 oz/ha (1.6 oz/ac)	

Aircraft: -
Application system: Micronair
Boom and Nozzle

Province: **New Brunswick**
Area: 1 400 ha (3 459 acres)
McCallum Brook
Middle Brook
McKenzie Brook
North Brook
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Ambush	17.5 g/ha (0.25 oz/ac)	
Sevin-2-oil	80 g/ha (4 oz/ac)	
Reldan	70 g/ha (1 oz/ac)	

Aircraft: Cessna AgTruck
Application system: Micronair

1980

Province: **New Brunswick**
Area: 10 000 ha (24 710 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bt	8 BIU/ha (3.2 BIU/ac)	
Aircraft:	fixed-wing helicopter	
Application system:	Micronair Boom and Nozzle	

Province: **Quebec**
Area: 600 ha (1 483 acres)
Rivière-du-Loup
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)
Thuricide 24B	20 BIU/ha (8.1 BIU/ac)	4.7 L/ha (0.5 gal/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU3000	

Province: **Quebec**
Area: 3 616 ha (8 935 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Ambush	17.5 g/ha (0.25 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
Dipel 88	19.54 BIU/ha (7.9 BIU/ac)	7.015 L/ha (96 fl oz/ac)
Aircraft:	Piper Pawnee Constellation L-749	
Application system:	Boom and Nozzle	

Province: **Quebec**
Area: 147 ha (363 acres)
special program
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	87.5 g/ha (1.25 oz/ac)	2.34 L/ha (32 fl oz/ac)
Thuricide	39.54 BIU/ha (16 BIU/ac)	9.36 L/ha (1 gal/ac)
Aircraft:	Piper Supercub (PA18)	
Application system:	Beecomist	

Province: Quebec
Area: 320 ha (791 acres)
Shipshaw River
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)
Thuricide 32B	40 BIU/ha (16.2 BIU/ac)	4.7 L/ha (0.5 gal/ac)
Aircraft:	Grumman AgCat	
Application system:	Boom and Nozzle	

Province: Quebec
Area: 163 ha (403 acres)
Beauce-Sud
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Bt	14.83 BIU/ha (6 BIU/ac)	4.68 L/ha (64 fl oz/ac)
	7.41 BIU/ha (3 BIU/ac)	4.68 L/ha (64 fl oz/ac)
	9.88 BIU/ha (4 BIU/ac)	4.68 L/ha (64 fl oz/ac)
	4.94 BIU/ha (2 BIU/ac)	4.68 L/ha (64 fl oz/ac)
Aircraft:	Grumman AgCat	
Application system:	Boom and Nozzle	

Province: Quebec
Area: Outaouais
Insect: Leconte sawfly

Insecticide	Active ingredient	Application rate
NPV	5×10^9 PIB/ha (2.03×10^9 PIB/ac)	18.7 L/ha (2 gal/ac)
	5×10^9 PIB/ha (2.03×10^9 PIB/ha)	93.6 L/ha (10 gal/ac)

1980

Aircraft: ground
Application system: Sthill SG17 atomizer

Province: **Ontario**
Area: 52 ha (129 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV/CPV	75×10^{12} PIB/ha (30.4×10^{12} PIB/ac)	9.4 L/ha (1.01 gal/ac)
Granulosis virus	0.016×10^{12} PIB/ha (0.0065×10^{12} PIB/ac)	9.4 L/ha (1.01 gal/ac)

Aircraft: Cessna 185E
Application system: Micronair AU3000

Province: **Ontario**
Area: Grundy Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
UC-62644	35 g/ha (0.5 oz/ac)	4.7 L/ha (0.5 gal/ac)
	70 g/ha (1 oz/ac)	4.7 L/ha (0.5 gal/ac)
Dipel 88	3.24 BIU/ha (1.31 BIU/ac)	4.7 L/ha (0.5 gal/ac)

Aircraft: Cessna AgTruck
Application system: Micronair AU3000

Province: **Ontario**
Area: Grundy Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
BAY SIR 8514	210 g/ha (3 oz/ac)	
	140 g/ha (2 oz/ac)	

Aircraft:
Application system:

Province: **Ontario**
Area: 125 ha (309 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil 1.8 OSC	86 g/ha (1.23 oz/ac)	4.7 L/ha (64.3 fl oz/ac)
Aircraft:	Grumman AgCat	
Application system:	Micronair	

Province: **Ontario**
Area: 690 acres (280 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Permethrin	0.25 oz/ac (17.5 g/ha)	20 fl oz/ac (1.46 L/ha)
Aircraft:	Grumman AgCat	
Application system:	Micronair	

Province: **Ontario**
Area: 2 100 acres (851 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 88	8 BIU/ac (19.8 BIU/ha)	1 gal/ac (9.35 L/ha)
Thuricide 16B	8 BIU/ac (19.8 BIU/ha)	1 gal/ac (9.35 L/ha)
Aircraft:	Grumman AgCat Piper Pawnee	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: 35 ha (87 acres)
Iron Bridge
Insect: White pine weevil (adult)

Insecticide	Active ingredient	Application rate
ZR-515	280 g/ha (4 oz/ac)	9.6 L/ha (1.03 gal/ac)
Aircraft:		
Application system:		

1980

Province: **Ontario**
Area: 33 ha (82 acres)
Minden District
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	5×10^9 PIB/ha (2.03×10^9 PIB/ac)	2.4 L/ha (0.26 gal/ac)
	5×10^9 PIB/ha (2.03×10^9 PIB/ac)	4.7 L/ha (0.5 gal/ac)
	5×10^9 PIB/ha (2.03×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Cessna 185E	
Application system:	Micronair AU3000	

Province: **Ontario**
Area: 70 ha (173 acres)
Bancroft (semi-operational)
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	5×10^9 PIB/ha (2.03×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Cessna 185E	
Application system:	Micronair AU3000	

Province: **Ontario**
Area: 436.8 ha (1 079 acres)
Algonquin
Parry Sound
Bancroft
Pembroke
Bracebridge
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	6.25×10^9 PIB/ha (2.53×10^9 PIB/ac)	23.5 L/ha (2.51 gal/ac)
	5×10^9 PIB/ha (2.03×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
	5×10^9 PIB/ha (2.03×10^9 PIB/ac)	18.8 L/ha (2.01 gal/ac)
	2×10^9 PIB/ha (0.81×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
	1×10^9 PIB/ha (0.41×10^9 PIB/ac)	37.6 L/ha (4.02 gal/ac)
Aircraft:	ground	
Application system:	Mistblowers	
	pressure sprayers	

1980

Province: **Ontario**
Area: Petawawa
Sault Ste Marie
Insect: Spruce seedworm
Oak leaf shredder

Insecticide	Active ingredient	Application rate
Sex pheromones:		
(E)-7-dodecanol		
(E)-11-tetradecanol		
(Z)-11-tetradecanol		
Aircraft:	ground	
Application system:	traps	

Province: **Ontario**
Area: Petawawa
Insect: Seed and cone insects

Insecticide	Active ingredient	Application rate
Cygon	0.5 - 1.5 %	
Lannate	0.5 - 1.5 %	
Orthene	0.5 - 1.5 %	
Oxydemeton-methyl		
Carbofuran		
Ammonium nitrate		
Entomopathogenic fungi		
Aircraft:	ground	
Application system:	hydraulic sprayers	
	foliar application	
	stem application	
	soil application	
	dusting or soil inoculation	

1981

Province: **New Brunswick**
Area: 150 ha (371 acres)
Bathurst
Insect: Eastern spruce budworm

1981

Insecticide	Active ingredient	Application rate
Matacil (1.8F)	70 g/ha (1 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU3000	

Province: **Quebec**
Area: 1 175 ha (2 903 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura 32B	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)
	18.8 BIU/ha (7.6 BIU/ac)	2.35 L/ha (32.2 fl oz/ac)
Aircraft:	Grumman Constellation L-749	
Application system:		

Province: **Quebec**
Area: 2 813 ha (6 951 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 32B	19.76 BIU/ha (8 BIU/ac)	5.85 L/ha (80 fl oz/ac)
Futura 64B	19.76 BIU/ha (8 BIU/ac)	2.34 L/ha (32 fl oz/ac)
Aircraft:	fixed-wing	
Application system:		

Province: **Ontario**
Area: Sault Ste. Marie
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
UC-62644	70 g/ha (1 oz/ac)	4.68 L/ha (0.5 gal/ac)
UC-70680	70 g/ha (1 oz/ac)	4.68 L/ha (0.5 gal/ac)
	140 g/ha (2 oz/ac)	4.68 L/ha (0.5 gal/ac)
UC-70676	70 g/ha (1 oz/ac)	4.68 L/ha (0.5 gal/ac)
	140 g/ha (2 oz/ac)	4.68 L/ha (0.5 gal/ac)
PH-60-44	140 g/ha (2 oz/ac)	4.68 L/ha (0.5 gal/ac)
	280 g/ha (4 oz/ac)	4.68 L/ha (0.5 gal/ac)

PH-60-43	140 g/ha (2 oz/ac)	4.68 L/ha (0.5 gal/ac)
	280 g/ha (4 oz/ac)	4.68 L/ha (0.5 gal/ac)
EL-413	70 g/ha (1 oz/ac)	4.68 L/ha (0.5 gal/ac)

Aircraft: ground
Application system: Mistblower

Province: **Ontario**
Area: 125 ha (309 acres)
Highway 11 between Atikokan and Mine Centre
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Dipel 88	10 BIU/ha (4.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)
	20 BIU/ha (8.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)
	40 BIU/ha (16.2 BIU/ac)	9.4 L/ha (1.01 gal/ac)
	80 BIU/ha (32.4 BIu/ac)	9.4 L/ha (1.01 gal/ac)
Thuricide 32B	10 BIU/ha (4.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)
	20 BIU/ha (8.1 BIU/ac)	9.4 L/ha (1.01 gal/ac)
	40 BIU/ha (16.2 BIU/ac)	9.4 L/ha (1.01 gal/ac)
	80 BIU/ha (32.4 BIU/ac)	9.4 L/ha (1.01 gal/ac)

Aircraft: Cessna 185 Skywagon
Application system: Micronair AU3000

Province: **Ontario**
Area: 103 ha (255 acres)
Hearst
Chapleau
Kapuskasing
Insect: Eastern spruce budworm

Insecticide	**Active ingredient**	**Application rate**
NPV	1.1×10^{12} PIB/ha (0.45×10^{12} PIB/ac)	9.4 L/ha (1.01 gal/ac)
	3.4×10^{12} PIB/ha (1.38×10^{12} PIB/ac)	18.8 L/ha (2.01 gal/ac)
	95×10^{12} PIB/ha (38.5×10^{12} PIB/ac)	9.4 L/ha (1.01 gal/ac)

Aircraft: fixed-wing
helicopters
Application system: Micronair
Boom and Nozzle

1981

Province: **Ontario**
Area: Sault Ste. Marie
Insect: Oak leaf shredder

Insecticide	Active ingredient	Application rate
Dimilin		
BAY SIR 8514		

Aircraft: ground
Application system: Mistblower

Province: **Ontario**
Area: Sault Ste. Marie
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Dimilin	11.2 g/ha (0.16 oz/ac)	18.75 L/ha (2.01 gal/ac)
BAY SIR 8514	11.2 g/ha (0.16 oz/ac)	18.75 L/ha (2.01 gal/ac)

Aircraft: ground
Application system: Mistblower

Province: **Ontario**
Area: 65 Red pine plantations
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	3.7 - 62 × 10^9 PIB/ha (1.5 - 25.1 × 10^9 PIB/ac)	0.9 - 50 L/ha (0.1 - 5.4 gal/ac)

Aircraft: ground
Application system: Mistblower
hand sprayer

Province: **Ontario**
Area: 3 ha (7 acres)
Thessalon
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
NPV	0.1 × 10^9 PIB/ha (0.041 × 10^9 PIB/ac)	30 L/ha (3.21 gal/ac)

Aircraft:
Application system:

Province: **Ontario**
Area: 19.2 ha (47 acres)
Haldimand Township
Insect: European pine sawfly

Insecticide	**Active ingredient**	**Application rate**
NPV	3.9×10^{11} PIB/ha (1.6×10^{11} PIB/ac)	9.4 L/ha (1.01 gal/ac)

Aircraft: Piper Supercub (PA18)
Application system: Boom and Nozzle

Province: **Manitoba**
Area: -
Insect: Birch leaf miner

Insecticide	**Active ingredient**	**Application rate**
Orthene	15.8 %	1 L/5 cm DBH
Cygon 2E	0.875 g	

Aircraft: ground
Application system: trunk injection
acecap implants
Cygon banding

Province: **British Columbia**
Area: South-central B.C.
Insect: Douglas-fir tussock moth

Insecticide	**Active ingredient**	**Application rate**
NPV	0.022×10^9 PIB/ha * (0.009×10^9 PIB/ac) 0.24×10^9 PIB/ha ** (0.097×10^9 PIB/ac)	

Aircraft: helicopter *
ground **
Application system: -

1981

Province: **British Columbia**
Area: Kamloops
Insect: Douglas-fir tussock moth

Insecticide	Active ingredient	Application rate
Pheromone (conrel fibers)	24.7 g/ha (0.35 oz/ac) 7.4 g/ha (0.11 oz/ac)	

Aircraft:
Application system:

1982

Province: **New Brunswick**
Area: Charlo
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Matacil	70 g/ha (1 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Sunspray 6N oil (diluent)	-	1.5 L/ha (20.5 fl oz/ac)

Aircraft: Cessna AgTruck 188C
Application system: Micronair

Province: **New Brunswick**
Area: 4 000 ha (9 884 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 88	30 BIU/ha (12.2 BIU/ac)	1.5 L/ha (20.5 fl oz/ac)
Bactospeine	15 BIU/ha (6.1 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	4.7 L/ha (64.3 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	7 L/ha (95.8 fl oz/ac)
Novabac-3	30 BIU/ha (12.2 BIU/ac)	7 L/ha (95.8 fl oz/ac)

Aircraft: fixed-wing
Application system: Micronair

Province: **New Brunswick**
Area: >1 000 ha (>2 471 acres)
emergency test program
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil (F)	70 g/ha (1 oz/ac)	1.46 L/ha (20 fl oz/ac)
Fenitrothion	210 g/ha (3 oz/ac)	1.46 L/ha (20 fl oz/ac)

Aircraft: Cessna 188
Grumman AgCat
Application system: Micronair

Province: **Quebec**
Area: 3 574 ha (8 831 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)

Aircraft: DC-4
Application system:

Province: **Quebec**
Area: 240 ha (593 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)

Aircraft: Grumman AgCat
Application system: Boom and Nozzle

Province: **Quebec**
Area: 14 219 ha (35 135 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	52 g/ha (0.75 oz/ac)	1.4 L/ha (19.2 fl oz/ac)
Futura II	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)

1982

Aircraft: DC-4G
Piper Pawnee

Application system:

Province: **Ontario**
Area: Marathon area
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bt	30 BIU/ha (12.2 BIU/ac)	2.34 L/ha (32 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	4.67 L/ha (64 fl oz/ac)
	30 BIU/ac (12.2 BIU/ac)	9.35 L/ha (1 gal/ac)

Aircraft:
Application system:

Province: **Ontario**
Area: 25 ha (62 acres)
Frost Township
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 48B	30 BIU/ha (12.2 BIU/ac)	2.36 L/ha (32.3 fl oz/ac)

Aircraft: Piper Pawnee
Application system: Micronair

Province: **Ontario** 1982
Area: 11 000 ha (27 181 acres)
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Fenitrothion	210 g/ha (3 oz/ac)	

Aircraft: Thrush
Application system: Micronair

Province: **Ontario**
Area: 40 ha (99 acres)
Simcoe County Forest
Insect: Oak leaf shredder

Insecticide	Active ingredient	Application rate
Dimilin WP25	70 -140 g/ha (1 - 2 oz/ac)	4.7 L/ha (0.5 gal/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU3000	

Province: **Ontario**
Area: 374 ha (924 acres)
Algonquin Park
Parry Sound
Bancroft
Pembroke
Bracebridge
Tweed
North Bay
Blind River
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
Lecontvirus	0.15 - 65 × 10^9 PIB/ha (0.06 - 26.3 × 10^9 PIB/ac)	0.3 - 130 L/ha (0.03 - 13.9 gal/ac)
Aircraft:	ground	
Application system:	handsprayers Mistblowers	

Province: **British Columbia**
Area: 352 ha (870 acres)
Ashcroft
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
NPV	54 × 10^{12} PIB/ha (21.87 × 10^{12} PIB/ac)	9.4 L/ha (1.01 gal/ac)
Granulosis virus	0.017 × 10^{12} PIB/ha (0.0069 × 10^{12} PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Cessna AgWagon	
Application system:	Boom and Nozzle	

Province: **British Columbia**
Area: 40 ha (99 acres)
Veasy Lake

1982

Insect: Douglas-fir tussock moth

Insecticide	Active ingredient	Application rate
NPV	0.025×10^9 PIB/ha (0.01×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
	0.83×10^9 PIB/ha (0.34×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
	0.16×10^9 PIB/ha (0.07×10^9 PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	fixed-wing	
Application system:	Boom and Nozzle	

Province: **British Columbia**
Area: Greater Victoria
Insect: Winter moth

Insecticide	Active ingredient	Application rate
Parasites		
Aircraft:		
Application system:		

1983

Province: **Quebec**
Area: 40 ha (99 acres)
Saint-Eugène
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
NPV	1.15×10^{12} PIB/ha (0.47×10^{12} PIB/ac)	4.5 L/ha (61.6 fl oz/ac)
	3.44×10^{12} PIB/ha (1.39×10^{12} PIB/ac)	4.5 L/ha (61.6 fl oz/ac)
	2.3×10^{12} PIB/ha (0.93×10^{12} PIB/ac)	4.5 L/ha (61.6 fl oz/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU 3000	

Province: **Quebec**
Area: 3 500 ha (8 649 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)
	17 BIU/ha (6.9 BIU/ac)	2.14 L/ha (29.3 fl oz/ac)
	16.3 BIU/ha (6.6 BIU/ac)	1.43 L/ha (19.6 fl oz/ac)
	8 BIU/ha (3.2 BIU/ac)	0.71 L/ha (9.7 fl oz/ac)
Aircraft:	DC-4G	
Application system:	-	

Province: **Quebec**
Area: 67 501 ha (166 795 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	210 g/ha (3 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
Dipel 88	20 BIU/ha (8.1 BIU/ac)	5.85 L/ha (80 fl oz/ac)
Futura II	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)
Novabac	20 BIU/ha (8.1 BIU/ac)	6.6 L/ha (90.3 fl oz/ac)
Matacil	52 g/ha (0.75 oz/ac)	1.403 L/ha (19.2 fl oz/ac)
Aircraft:		
Application system:		

Province: **Ontario**
Area: Forest Pest Management Institute, Sault Ste. Marie (study on spray deposits)
Insect: -

Insecticide	Active ingredient	Application rate
Ambush 500 EC	33.1 g/ha (0.47 oz/ac)	25 L/ha (2.68 gal/ac)
Aircraft:	ground	
Application system:	Soloport 423 Mistblower	

Province: **Ontario**
Area: Lake Superior Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Entomogenous fungi		

1983

Aircraft: ground
Application system: -

Province: **Ontario**
Area: Forest Pest Management Institute, Sault Ste. Marie (bioassay test)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
N. fumiferanae	5 000 000 spores	
	50 000 000 spores	

Aircraft:
Application system:

Province: **Ontario**
Area: Sault Ste. Marie
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	280 g/ha (4 oz/ac)	
	210 g/ha (3 oz/ac)	
Orthene	1.12 kg/ha (1 lb/ac)	
	0.56 kg/ha (8 oz/ac)	
Permethrin	70 g/ha (1 oz/ac)	
	35 g/ha (0.5 oz/ac)	

Aircraft: ground
Application system: ULV sprayer

Province: **Ontario**
Area: Aubrey Falls
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion (F20)	210 g/ha (3 oz/ac)	1 L/ha (13.7 fl oz/ac)
	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
	210 g/ha (3 oz/ac)	4.7 L/ha (64.3 fl oz/ac)

Aircraft: Cessna AgTruck
Application system: Micronair AU3000

Province: **Ontario**
Area: 280 ha (692 acres)
Rogers Township
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 88	30 BIU/ha (12.2 BIU/ac)	1.75, 2.3, 3.5, 4.7 and 7 L/ha (23.9, 31.5, 47.9, 64.3 and 95.8 fl oz/ac)
Dipel 6L	30 BIU/ha (12.2 BIU/ac)	
Dipel 8L	30 BIU/ha (12.2 BIU/ac)	

Aircraft:
Application system:

Province: **Ontario**
Area: 123 ha (304 acres)
Nagagamisis Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bactospeine	30 BIU/ha (12.2 BIU/ac)	4.7 L/ha (64.3 fl oz/ac)

Aircraft:
Application system:

Province: **Ontario**
Area: Hearst
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
T. minutum		

Aircraft:
Application system:

Province: **British Columbia**
Area: 40 ha (99 acres)
Veasy Lake
Insect: Douglas-fir tussock moth

1983

Insecticide	Active ingredient	Application rate
NPV		

Aircraft:
Application system:

1984

Province: **New Brunswick**
Area: 250 ha (618 acres)
Bathurst
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran (DB)	70 g/ha (1 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Sumithion (F20)	140 g/ha (2 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU3000	

Province: **New Brunswick**
Area: Northwestern region
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Ambush + Matacil	70 g + 90 g/ha (1 oz + 1.3 oz/ac)	5 L/ha (68.4 fl oz/ac)
	35 g + 90 g/ha (0.5 oz + 1.3 oz/ac)	5 L/ha (68.4 fl oz/ac)
Aircraft:	Thrush Commanders	
Application system:	Micronair	

Province: **New Brunswick**
Area: 1 ha (2.5 acres)
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
T. minutum	20 000 000/ha (8 100 000/ac)	

Aircraft:
Application system:

Province: **Quebec**
Area: Kamouraska
Chicoutimi
Rivière-du-Loup
Saint-Ambrose
Lac Bouchette
Saint-David-de-Falardeau
Lac Clair
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	20 BIU/ha (8.1 BIU/ac)	50 L/ha (5.35 gal/ac)
	20 BIU/ha (8.1 BIU/ac)	100 L/ha (10.7 gal/ac)
	20 BIU/ha (8.1 BIU/ac)	150 L/ha (16.05 gal/ac)

Aircraft: ground
Application system:

Province: **Quebec**
Area: 240 ha (593 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)

Aircraft: Grumman AgCat
Application system: -

Province: **Quebec**
Area: 3 800 ha (9 390 acres)
Gaspé Peninsula
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)

Aircraft: Grumman AgCat
Application system: -

1984

Province: **Quebec**
Area: 86 441 ha (213 596 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide	20 BIU/ha (8.1 BIU/ac)	2.58 L/ha (35.3 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Dipel 132	20 BIU/ha (8.1 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Dipel 176	30 BIU/ha (12.2 BIU/ac)	1.77 L/ha (24.2 fl oz/ac)
Thuricide 64B	30 BIU/ha (12.2 BIU/ac)	1.77 L/ha (24.2 fl oz/ac)
Matacil	52 g/ha (0.75 oz/ac)	1.4 L/ha (19.2 fl oz/ac)
SAN 415	20 BIU/ha (8.1 BIU/ac)	2.37 L/ha(32.4 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	3.55 L/ha (48.6 fl oz/ac)

Aircraft: Piper Pawnee
Piper Supercub (PA18)
Application system: Micronair

Province: **Ontario**
Area: Hearst
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
T. minutum	12 000 000 females/ha (4 900 000 females/ac)	

Aircraft:
Application system:

1985

Province: **Newfoundland**
Area: 210 ha (519 acres)
Bay d'Espoir
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Thuricide 64B	30 BIU/ha (12.2 BIU/ac)	1.78 L/ha (24.4 fl oz/ac)
Thuricide 48LV	30 BIU/ha (12.2 BIU/ac)	2.36 L/ha (32.3 fl oz/ac)
Futura 48LV	20 BIU/ha (8.1 BIU/ac)	1.4 L/ha (19.2 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	2.1 L/ha (28.7 fl oz/ac)

Dimilin	30 g/ha (0.43 oz/ac)	2.0 L/ha (27.4 fl oz/ac)
	35 g/ha (0.5 oz/ac)	4.7 L/ha (64.3 fl oz/ac)
	70 g/ha (1 oz/ac)	4.7 L/ha (64.3 fl oz/ac)
Matacil (180F)	90 g/ha (1.3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
	135 g/ha (1.9 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
	180 g/ha (2.6 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Sumithion	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
	140 g/ha (2 oz/ac)	1.5 L/ha (20.5 fl oz/ac)

Aircraft: Piper Pawnee
Application system: Micronair AU5000

Province: **Newfoundland (corrected)**
Area: 300 ha (741 acres)
Insect: White-marked tussock moth

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	5.9 L/ha (80.7 floz/ac)

Aircraft: 1 AgCat
Application system: Micronair AU5000

Province: **New Brunswick**
Area: -
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sumithion (F20)	140 g/ha (2 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Matacil (180F)	70 g/ha (1 oz/ac)	0.4 L/ha (5.5 fl oz/ac)

Aircraft: Cessna 188
Application system: Micronair AU3000

Province: **New Brunswick**
Area: -
(semi-operational)
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Futura XLV	20 BIU/ha (8.1 BIU/ac)	
	30 BIU/ha (12.2 BIU/ac)	

1985

Aircraft: Cessna 188
Application system: Micronair AU3000

Province: **New Brunswick**
Area: -
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Dipel 132/176	20 BIU/ha (8.1 BIU/ac)	
	30 BIU/ha (12.2 BIU/ac)	
Thuricide 32LV,	20 BIU/ha (8.1 BIU/ac)	
48LV and 64B	30 BIU/ha (12.2 BIU/ac)	
Futura XLV	20 BIU/ha (8.1 BIU/ac)	
	30 BIU/ha (12.2 BIU/ac)	
SAN 415	20 BIU/ha (8.1 BIU/ac)	
	30 BIU/ha (12.2 BIU/ac)	

Aircraft: Cessna 188
Application system: Micronair AU3000

Province: **New Brunswick**
Area: -
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Zectran		

Aircraft:
Application system:

Province: **New Brunswick**
Area: 0.5 ha (1.2 acres)
Northern area
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
T. minutum	10 000 000/ha (4 050 000/ac)	

Aircraft:
Application system:

Province: Nova Scotia
Area: 85 - 510 ha (210 - 1 260 acres)
Lunenburg County
Insect: Balsam gall midge

Insecticide	Active ingredient	Application rate
Diazinon 50EC	0.5, 1.0 and 1.5 L/ha (6.9, 13.7 and 20.5 fl oz/ac)	33.7 and 16.8 L/ha (3.6 and 1.8 gal/ac)
	0.7 L/ha (9.6 fl oz/ac)	22.4 L/ha (2.4 gal/ac)
Aircraft:	Piper Pawnee	
Application system:	Boom and Nozzle Micronair AU5000	

Province: Quebec
Area: 593 acres (240 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	16.6 BIU/ha (6.7 BIU/ac)	2 L/ha (27.4 fl oz/ac)
	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)
	22 BIU/ha (8.9 BIU/ac)	2 L/ha (27.4 fl oz/ac)
Aircraft:	Grumman AgCat	
Application system:	Boom and Nozzle	

Province: Quebec
Area: Saguenay - Lac Saint-Jean
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura	20 BIU/ha (8.1 BIU/ac)	50 - 100 L/ha (5.35 - 10.7 gal/ac)
Aircraft:	ground	
Application system:	Mistblower	

Province: Quebec
Area: 2 971 ha (7 341 acres)
(semi-operational)
Insect: Eastern spruce budworm

1985

Insecticide	Active ingredient	Application rate
Futura XLV	20 BIU/ha (8.1 BIU/ac)	2.5 L/ha (34.2 fl oz/ac)
Aircraft:	Piper Pawnee	
Application system:	Micronair AU5000	

Province: **Quebec**
Area: 767 ha (1 895 acres)
Port-Neuf
Laurentides
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 48LV	20 BIU/ha (8.1 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
Dipel 176	20 BIU/ha (8.1 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
Thuricide 64B	20 BIU/ha (8.1 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
Biobit 64	20 BIU/ha (8.1 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
SAN 415	20 BIU/ha (8.1 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	1.77, 2.37 and 3.55 L/ha (24.2, 32.4 and 48.6 fl oz/ac)
Aircraft:	Piper Pawnee	
Application system:	Micronair AU5000	

Province: **Ontario**
Area: 100 ha (247 acres)
Garvey Township
Gogama District
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
NPV	75×10^{12} PIB/ha (30.38×10^{12} PIB/ac)	9.5 L/ha (1.02 gal/ac)
Aircraft:	Cessna 188 AgWagon	
Application system:	Micronair AU3000	

Province: **Ontario**
Area: Gogama District
Insect: Jack-pine budworm

Insecticide	Active ingredient	Application rate
Futura XLV	20 BIU/ha (8.1 BIU/ac)	1.389 L/ha (19 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	2.003 L/ha (28.5 fl oz/ac)
Sumithion (F20)	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Matacil (180F)	70 g/ha (1 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
Aircraft:	Cessna 188 AgWagon	
Application system:	Micronair AU3000	

Province: **Ontario**
Area: 161 ha (398 acres)
Insect: Red-headed pine sawfly

Insecticide	Active ingredient	Application rate
Lecontvirus		
Aircraft:		
Application system:		

Province: **British Columbia**
Area: Greater Victoria
Insect: Winter moth

Insecticide	Active ingredient	Application rate
C. albians		
A. flaveolatum		
Aircraft:		
Application system:		

1985

Province: **British Columbia**
Area: Okanagan Valley
Insect: Douglas-fir cone moth

Insecticide	Active ingredient	Application rate
Pyrethrins		

Aircraft:
Application system:

Province: **British Columbia**
Area: Vancouver Island
Insect: Douglas-fir cone gall midge

Insecticide	Active ingredient	Application rate
Pyrethrins		

Aircraft:
Application system:

1986

Province: **Newfoundland**
Area: Gallants
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Dimilin	70 g/ha (1 oz/ac)	4.7 L/ha (64.3 fl oz/ac)
	70 g/ha (1 oz/ac)	2.5 L/ha (34.2 fl oz/ac)
Sumithion	210 g/ha (3 oz/ac)	1.5 L/ha (20.5 fl oz/ac)
	180 g/ha (2.6 oz/ac)	0.9 L/ha (12.3 fl oz/ac)
Aircraft:	Grumman AgCat	
Application system:	Micronair AU5000	

Province: **Quebec**
Area: 5 plots (5 × 10m)
Matapédia
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Growth regulators:		
Diflubenzuron 25 WP	200 g/ha (2.9 oz/ac)	10 L/ha (1.07 gal/ac)
BASF 153-100-50 WP	400 g/ha (5.7 oz/ac)	10 L/ha (1.07 gal/ac)
HOE-00522-20	200 g/ha (2.9 oz/ac)	10 L/ha (1.07 L/ha)
Aircraft:	ground	
Application system:	backpack sprayer	

Province: **Ontario**
Area: Hearst
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
T. minutum	3 000 000/ha (1 215 000/ac)	
	6 000 000/ha (2 430 000/ac)	
	18 000 000/ha (7 290 000/ac)	
Aircraft:	ground	
Application system:	hand-held leaf blower	

Province: **Ontario**
Area: -
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
NPV	27×10^{12} PIB/ha (10.94×10^{12} PIB/ac)	9.4 L/ha (1.01 gal/ac)
	2.2×10^{12} PIB/ha (0.89×10^{12} PIB/ac)	9.4 L/ha (1.01 gal/ac)
SAN 415	30 BIU/ha (12.2 BIU/ac)	6 L/ha (82.1 fl oz/ac)
Aircraft:		
Application system:		

Province: **Ontario**
Area: 97.5 ha (241 acres)
Olden Township
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Gypchek	25×10^{12} PIB/ha (10.13×10^{12} PIB/ac)	9.5 L/ha (1.02 gal/ac)

1986

Aircraft: helicopter
Application system: Micronair

Province: **Ontario**
Area: <242 ha (<598 acres)
Insect: Douglas-fir tussock moth

Insecticide	Active ingredient	Application rate
NPV	25×10^{12} PIB/ha (10.13×10^{12} PIB/ac)	20 L/ha (2.14 gal/ac)

Aircraft: ground
Application system: Mistblower

1987

Province: **Newfoundland**
Area:
Insect:

Insecticide	Active ingredient	Application rate
Diflubenzuron	30 g/ha (0.43 oz/ac)	2 L/ha (27.4 fl oz/ac)
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.1 L/ha (28.7 fl oz/ac)
Thuricide 48LV	30 BIU/ha (12.2 BIU/ac)	2.36 L/ha (32.3 fl oz/ac)

Aircraft: Piper Pawnee
Application system: Micronair AU5000

Province: **Newfoundland (corrected)**
Area: 390 ha (964 acres)
Hawke's Bay
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Dipel 132	30 BIU/ha (12.2 BIU/ac)	2.36 L/ha (32.3 fl oz/ac)
Dipel 176	30 BIU/ha (12.2 BIU/ac)	1.78 L/ha (24.4 fl oz/ac)
	40 BIU/ha (16.2 BIU/ac)	2.36 L/ha (32.3 fl oz/ac)
Dipel 264	30 BIU/ha (12.2 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)
	40 BIU/ha (16.2 BIU/ac)	1.58 L/ha (21.6 fl oz/ac)
Dimilin *	70 g/ha (1 oz/ac)	5.0 L/ha (68.4 fl oz/ac)
	70 g/ha (1 oz/ac)	2.5 L/ha (34.2 fl oz/ac)

Fenitrothion	210 g/ha (3 oz/ac) 210 g/ha (3 oz/ac)	0.4 L/ha (5.5 fl oz/ac) 1.5 L/ha (20.5 fl oz/ac)
Aircraft:	Piper Pawnee	
Application system:	Micronair AU4000	

Province: **Newfoundland**
Area: 25 ha (62 acres)
Bottom Brook
Insect: Whitemarked tussock moth

Insecticide	**Active ingredient**	**Application rate**
Virtuss	2.5×10^{11} PIB/ha (1.01×10^{11} PIB/ac)	9.4 L/ha (1.01 gal/ac)
Aircraft:	Piper Pawnee	
Application system:	Micronair AU4000	

Province: **Quebec (corrected)**
Area: 15 ha (37 acres)
Insect: Eastern spruce budmoth

Insecticide	**Active ingredient**	**Application rate**
Diflubenzuron	70 g/ha (1 oz/ac)	10 L/ha (1.07 gal/ac)
Teflubenzuron	140 g/ha (2 oz/ac)	10 L/ha (1.07 gal/ac)
Aircraft:	Hughes 269C helicopter	
Application system:	Boom and Nozzle	

Province: **Ontario**
Area: 60 ha (148 acres)
Northern Ontario
Insect:

Insecticide	**Active ingredient**	**Application rate**
Thuricide 48LV	30 BIU/ha (12.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)
Aircraft:	Bell 206 helicopter	
Application system:	Micronair AU5000	

1987

Province: **Ontario**
Area: 130 ha (321 acres)
Sandbar Provincial Park
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 176	30 BIU/ha (12.2 BIU/ac)	1.6 L/ha (21.9 fl oz/ac)

Aircraft: Bell 206 helicopter
Application system:

Province: **Ontario**
Area: 350 ha (865 acres)
Nipigon
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 8L	30 BIU/ha (12.2 BIU/ac)	1.78 L/ha (24.4 fl oz/ac)
Dipel 8AF	30 BIU/ha (12.2 BIU/ac)	1.78 L/ha (24.4 fl oz/ac)
	20 BIU/ha (8.1 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)
Dipel 12L	30 BIU/ha (12.2 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.08 L/ha (28.5 fl oz/ac)

Aircraft: -
Application system: Micronair AU3000

Province: **Ontario**
Area: 90 ha (222 acres)
Tweed
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dimilin WP25	70 g/ha (1 oz/ac)	2.5 L/ha (34.2 fl oz/ac)
	70 g/ha (1 oz/ac)	5.0 L/ha (68.4 fl oz/ac)
Dimilin 48%	70 g/ha (1 oz/ac)	5.0 L/ha (68.4 fl oz/ac)

Aircraft:
Application system:

Province: **Ontario (corrected)**
Area: 224 ha (554 acres)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dipel 176	30 BIU/ha (12.2 BIU/ac)	4.4 L/ha (60.2 fl oz/ac)
	50 BIU/ha (20.2 BIU/ac)	3.0 L/ha (41 fl oz/ac)
Aircraft:	Bell 206 helicopter	
Application system:	-	

Province: **Ontario**
Area: Thessalon
Tweed
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Diflubenzuron	250 g/ha (3.6 oz/ac)	10 L/ha (1.07 gal/ac)
Aircraft:	ground	
Application system:	backpack sprayer	

1988

Province: **Newfoundland**
Area: 30 ha (74 acres)
Hawke's Bay
Insect: Eastern hemlock looper

Insecticide	Active ingredient	Application rate
Dipel 176	30 BIU/ha (12.2 BIU/ac)	1.8 L/ha (24.6 fl oz/ac)
	40 BIU/ha (16.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)
Dipel 264	30 BIU/ha (12.2 BIU/ac)	1.2 L/ha (16.4 fl oz/ac)
	40 BIU/ha (16.2 BIU/ac)	1.6 L/ha (21.9 fl oz/ac)
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.1 L/ha (28.7 fl oz/ac)
Dimilin ODC-45 *	70 g/ha (1 oz/ac)	2.5 L/ha (34.2 fl oz/ac)
	120 g/ha (1.7 oz/ac)	2.5 L/ha (34.2 fl oz/ac)
Aircraft:	Grumman AgCat	
Application system:	Micronair AU4000	

Province: **New Brunswick**
Area: 400 ha (988 acres)
Bathurst
Insect: Eastern spruce budworm

1988

Insecticide	Active ingredient	Application rate
Dipel 12L	30 BIU/ha (12.2 BIU/ac)	1.1 L/ha (15.1 fl oz/ac)
	15 BIU/ha (6.1 BIU/ac)	0.55 L/ha (7.5 fl oz/ac)
Aircraft:	2 Cessna 188s	
Application system:	Micronair AU4000	

Province: **Quebec (corrected)**
Area: 35.1 ha (86.7 acres)
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Dimilin	140 g/ha (2 oz/ac)	-
	280 g/ha (4 oz/ac)	-
Pounce	35 g/ha (0.5 oz/ac)	5 L/ha (68.4 fl oz/ac)
	70 g/ha (1 oz/ac)	5 L/ha (68.4 fl oz/ac)
	35 g/ha (0.5 oz/ac) *	20 L/ha (2.14 gal/ac)
	70 g/ha (1 oz/ac) *	20 L/ha (2.14 gal/ac)
Aircraft:	Hughes 269C helicopter	
	ground *	
Application system:	Boom and Nozzle	

Province: **Quebec (corrected)**
Area: 0.8 ha (2 acres)
Beauceville
Saint-Narcisse
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Dimilin WP25	250 g/ha (3.6 oz/ac)	200 L/ha (21.4 gal/ac)
Dimilin ODC-45	800 g/ha (11.4 oz/ac)	100 L/ha (10.7 gal/ac)
Aircraft:	ground	
Application system:	Solo Mistblower	

Province: **Ontario**
Area: 350 ha (865 acres)
Vermilion Bay
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Futura XLV	30 BIU/ha (12.2 BIU/ac)	2.08 L/ha (28.5 fl oz/ac)
Futura XLV-HP	30 BIU/ha (12.2 BIU/ac)	1.14 L/ha (15.6 fl oz/ac)
Dipel 8AF	30 BIU/ha (12.2 BIU/ac)	1.78 L/ha (24.4 fl oz/ac)
Dipel 12L	30 BIU/ha (12.2 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)
Dipel 16L	30 BIU/ha (12.2 BIU/ac)	0.89 L/ha (12.2 fl oz/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU4000	

Province: **Ontario (corrected)**
Area: 64 ha (158 acres)
Lindsay District
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Disparvirus	1.25×10^{12} PIB/ha (0.51×10^{12} PIB/ac)	10 L/ha (1.07 gal/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU4000	

Province: **Ontario (corrected)**
Area:
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dipel 64AF	15 BIU/ha (6.1 BIU/ac)	0.9 L/ha (12.3 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	1.8 L/ha (24.6 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	6.0 L/ha (82.1 fl oz/ac)
Aircraft:	Piper Brave	
Application system:	Micronair AU4000	

Province: **Ontario**
Area: 7.5 ha (18.5 acres)
Madoc
Kirkwood
Insect: White pine weevil

1988

Insecticide	Active ingredient	Application rate
Dimilin WP25	375 g/ha (5.4 oz/ac)	150 L/ha (16.05 gal/ac)
Dimilin ODC-45	500 g/ha (7.1 oz/ac)	500 L/ha (53.5 gal/ac)
	500 g/ha (7.1 oz/ac)	40 L/ha (4.28 gal/ac)
Dimilin SC-48	500 g/ha (7.1 oz/ac)	40 L/ha (4.28 gal/ac)
Aircraft:	ground	
Application system:		

1989

Province: **Quebec (corrected)**
Area: 144 ha (356 acres)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
C.I.L. E2492	30 BIU/ha (12.2 BIU/ac)	1.77 L/ha (24.2 fl oz/ac)
Condor AF	30 BIU/ha (12.2 BIU/ac)	1.17 L/ha (16 fl oz/ac)
Foray 48B	30 BIU/ha (12.2 BIU/ac)	2.37 L/ha (32.4 fl oz/ac)
Dipel 96AF	30 BIU/ha (12.2 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)
Dipel 264	30 BIU/ha (12.2 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)
Dipel 352	30 BIU/ha (12.2 BIU/ac)	0.88 L/ha (12 fl oz/ac)
Aircraft:	Piper Pawnee	
Application system:	Micronair AU5000	

Province: **Quebec**
Area: Matapédia
Insect: Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Pounce EC	70 g/ha (1 oz/ac)	20 L/ha (2.14 gal/ac)
	70 g/ha (1 oz/ac)	1.2 L/ha (16.4 fl oz/ac)
	70 g/ha (1 oz/ac)	50 L/ha (5.35 gal/ac)
Ambush 500 EC	70 g/ha (1 oz/ac)	1.33 L/ha (18.2 fl oz/ac)
Aircraft:	ground	
Application system:	Soloport Mistblower	
	Electrodyne sprayer	

Province: **Ontario**
Area: 350 ha (865 acres)
Cedar Lake
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 96AF	30 BIU/ha (12.2 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)
Dipel 352	30 BIU/ha (12.2 BIU/ac)	0.89 L/ha (12.2 fl oz/ac)
Condor OF	126 g/ha (1.8 oz/ac)	1.68 L/ha (23 fl oz/ac)
Condor AF	126 g/ha (1.8 oz/ac)	1.68 L/ha (23 fl oz/ac)
Futura HP	30 BIU/ha (12.2 BIU/ac)	0.91 L/ha (12.5 fl oz/ac)
Futura "O"	30 BIU/ha (12.2 BIU/ac)	0.5 L/ha (6.8 fl oz/ac)
C.I.L. E2492	30 BIU/ha (12.2 BIU/ac)	1.77 L/ha (24.2 fl oz/ac)

Aircraft: Cessna 188 AgTruck
Application system: Micronair AU4000

Province: **Ontario (corrected)**
Area: 90 ha (222 acres)
Lindsay District
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Disparvirus	5×10^{11} PIB/ha (2.02×10^{11} PIB/ac)	10 L/ha (1.07 gal/ac)
	5×10^{11} PIB/ha (2.02×10^{11} PIB/ac)	5 L/ha (68.4 fl oz/ac)

Aircraft: Cessna AgTruck
Piper Pawnee
Application system: Micronair AU4000 and AU5000

Province: **Ontario**
Area: 1.91 ha (4.72 acres)
Sault Ste. Marie
Insect: White pine weevil
Eastern spruce budmoth

Insecticide	Active ingredient	Application rate
Dimilin ODC-45	250 g/ha (3.6 oz/ac)	10 L/ha (1.07 gal/ac)
	125 g/ha (1.8 oz/ac)	10 L/ha (1.07 gal/ac)
	125.99 g/ha (1.8 oz/ac)	5 L/ha (68.4 fl oz/ac)
	62.50 g/ha (0.9 oz/ac)	5 L/ha (68.4 fl oz/ac)
	31.25 g/ha (0.45 oz/ac)	5 L/ha (68.4 fl oz/ac)
Dimilin WP25	250 g/ha (2.6 oz/ac)	10 L/ha (1.07 gal/ac)
	125 g/ha (1.8 oz/ac)	10 L/ha (1.07 gal/ac)

	62.50 g/ha (0.9 oz/ac)	5 L/ha (68.4 fl oz/ac)
	31.25 g/ha (0.45 oz/ac)	5 L/ha (68.4 fl oz/ac)
Aircraft:	ground	
Application system:	-	

Province: **Ontario (corrected)**
Area: 14 ha (35 acres)
Collingwood
Insect: European pine sawfly

Insecticide	**Active ingredient**	**Application rate**
Sertifervirus	5×10^9 PIB/ha (2.02×10^9 PIB/ha)	20 L/ha (2.14 gal/ac)
Aircraft:	ground	
Application system:	backpack Mistblower	

Province: **British Columbia**
Area: 150 ha (371 acres)
Glenrosa
Insect: Western spruce budworm

Insecticide	**Active ingredient**	**Application rate**
Dipel 264	30 BIU/ha (12.2 BIU/ac)	1.19 L/ha (16.3 fl oz/ac)
Aircraft:	fixed-wing	
Application system:	Micronair AU4000	

Province: **British Columbia**
Area: 108 ha (267 acres)
Holberg
Insect: Western blackheaded budworm

Insecticide	**Active ingredient**	**Application rate**
Dipel 176	30 BIU/ha (12.2 BIU/ac)	1.8 L/ha (24.6 fl oz/ac)
Aircraft:	fixed-wing	
Application system:	Micronair AU4000	

1990

Province: **Newfoundland (corrected)**
Area: 2 602 ha (6 430 acres)
Round Lake
Insect: Eastern blackheaded budworm

Insecticide	Active ingredient	Application rate
Futura XLV	30 BIU/ha (12.1 BIU/ac)	2.03 L/ha (27.8 fl oz/ac)
Dipel 176	30 BIU/ha (12.1 BIU/ac)	1.8 L/ha (24.6 fl oz/ac)

Aircraft: 4 AgCats
Application system: Micronair AU4000 and AU5000

Province: **Quebec (corrected)**
Area: 180 ha (445 acres)
Matapédia Valley
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 352	30 BIU/ha (12.2 BIU/ac)	0.9 L/ha (12.3 fl oz/ac)
Foray 75B	30 BIU/ha (12.2 BIU/ac)	1.18 L/ha (16.1 fl oz/ac)

Aircraft: Piper Pawnee
Application system: Micronair AU5000

Province: **Quebec (corrected)**
Area: 1 ha (2.5 acres)
Matapédia
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Dimilin	80 g/ha (1.14 oz.ac) 140 g/ha (2 oz/ac)	

Aircraft: ground
Application system: backpack sprayer

Province: **Ontario**
Area: 60 ha (148 acres)
Simcoe District
Insect: Gypsy moth

1990

Insecticide	Active ingredient	Application rate
Disparvirus	5×10^{11} PIB/ha (2.02×10^{11} PIB/ac)	5 L/ha (68.4 fl oz/ac)
	5×10^{11} PIB/ha (2.02×10^{11} PIB/ac)	2.5 L/ha (34.2 fl oz/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU4000	

Province: **Ontario**
Area: 30 ha (74 acres)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Gypchek	5×10^{11} PIB/ha (2.02×10^{11} PIB/ac)	5 L/ha (68.4 fl oz/ac)
Aircraft:	Cessna AgTruck	
Application system:	Micronair AU4000	

Province: **Ontario**
Area: 800 ha (1 976 acres)
Sault Ste. Marie
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Permethrin	70 g/ha (1 oz/ac)	
	140 g/ha (2 oz/ac)	
Methoxychlor	1 kg/ha (14 oz/ac)	
Aircraft:	ground	
Application system:	Solo backpack sprayer	

Province: **Ontario**
Area: -
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Dimilin		
Aircraft:	ground	
Application system:	backpack sprayer	

Province: **British Columbia**
Area: ~ 90 ha (222 acres)
Holberg
Insect: Western blackheaded budworm

Insecticide	Active ingredient	Application rate
Futura XLV-HP	40 BIU/ha (16.2 BIU/ac)	1.2 L/ha (16.4 fl oz/ac)
Dipel 176	40 BIU/ha (16.2 BIU/ac)	2.4 L/ha (32.8 fl oz/ac)
Foray 48B	50 BIU/ha (20.2 BIU/ac)	3.9 L/ha (53.4 fl oz/ac)

Aircraft: fixed-wing
Application system: Micronair AU 4000

Province: **British Columbia**
Area: Lower Fraser Valley
Insect: Winter moth

Insecticide	Active ingredient	Application rate
Deltamethrin (Decis)		
Bt		

Aircraft:
Application system:

APPENDIXES

A. Aerial spray applications in the United States

NOTE: The data in Appendix A are the preliminary estimates of areas sprayed. More complete data may be found in the annual pest condition reports of the United States Forest Service (USFS; please see p. 265).

I. Operational applications

Maine

Year: **1970**
Area: 210 000 acres (85 050 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Fenitrothion	0.125 lb/ac (140 g/ha)	0.15 gal/ac (1.4 L/ha)
	0.188 lb/ac (210 g/ha)	0.15 gal/ac (1.4 L/ha)
Formulation:	emulsion	
Aircraft:	3 Stearmans	
Guidance:	-	
Application system:	Boom and Nozzle	

Year: **1972**
Area: 500 000 acres (202 500 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran	2.4 oz/ac (168 g/ha)	1 gal/ac (9.35 L/ha)
Formulation:	-	
Aircraft:	10 PV-2s	
	3 TBMs	
Guidance:		
Application system:		

Maine

Year: **1973**
Area: 470 000 acres (190 350 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran	1.2 oz/ac (84 g/ha)	32 fl oz/ac (2.34 L/ha)
	2.4 oz/ac (168 g/ha)	32 fl oz/ac (2.34 L/ha)
	2.4 oz/ac (168 g/ha)	64 fl oz/ac (4.67 L/ha)
Bt		

Formulation:
Aircraft: PV-2s
TBMs
helicopters
Guidance:
Application system:

Year: **1975**
Area: 2 250 000 acres (911 250 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Zectran	2.2 oz/ac (154 g/ha)	19.2 fl oz/ac (1.4 L/ha)
Sevin-4-oil	1 lb/ac (1.12 kg/ha)	32 fl oz/ac (2.34 L/ha)
Sumithion	2 oz/ac (140 g/ha)	20 fl oz/ac (1.46 L/ha)

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1976**
Area: 3 500 000 acres (1 417 500 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sevin-4-oil	0.75 lb/ac (840 g/ha)	

Formulation: -
Aircraft: 4-engine aircraft
Guidance: -
Application system:

Maine

Year: **1977**
Area: 922 190 acres (373 487 ha)
Eastport
Danforth
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sevin-4-oil	12 oz/ac (840 g/ha)	
Dylox	12 oz/ac (840 g/ha)	
Orthene	8 oz/ac (560 g/ha)	

Formulation:
Aircraft: 2 C-54s
5 TBMs
5 PV-2s
7 Bell G-5 helicopters
Guidance: -
Application system:

Year: **1978**
Area: 1 130 000 acres (457 650 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sevin-4-oil	0.75 lb/ac (840 g/ha)	30 fl oz/ac (2.19 L/ha)
	0.31 lb/ac (347 g/ha)	20 fl oz/ac (1.46 L/ha)
	0.50 lb/ac (560 g/ha)	20 fl oz/ac (1.46 L/ha)
	0.69 lb/ac (773 g/ha)	27 fl oz/ac (1.97 L/ha)
	0.62 lb/ac (694 g/ha)	25 fl oz/ac (1.83 L/ha)
Dylox	0.75 lb/ac (840 g/ha)	32 fl oz/ac (2.34 L/ha)
Orthene	0.50 lb/ac (560 g/ha)	64 fl oz/ac (4.67 L/ha)
	0.375 lb/ac (420 g/ha)	64 fl oz/ac (4.67 L/ha)
Bt	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)

Formulation: wettable powder
Aircraft: 6 C-54s
1 Thrush
4 PV-2s
6 Bell 47 helicopters
2 TBMs
Guidance:
Application system:

Maine

Year: **1979**
Area: 2 200 000 acres (891 000 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sevin-4-oil	24 oz/ac (1.68 kg/ha)	30 fl oz/ac (2.19 L/ha)
Dylox	24 oz/ac (1.68 kg/ha)	24 fl oz/ac (1.75 L/ha)
Orthene	0.67 lb/ac (750 g/ha)	64 fl oz/ac (4.67 L/ha)
Formulation:	oil solution	
	wettable powder	
Aircraft:	Constellation	
	PV-2s	
	DC-4s	
	TBMs	
	B-17s	
	Thrushes	
Guidance:		
Application system:	Boom and Nozzle	

Year: **1979**
Area: 490 000 acres (198 450 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sevin-4-oil	16 oz/ac (1.12 kg/ha)	20 fl oz/ac (1.46 L/ha)
	15 oz/ac (1.05 kg/ha)	30 fl oz/ac (2.19 L/ha)
Thuricide 16B	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)
Thuricide 32B	8 BIU/ac (19.8 BIU/ha)	64 fl oz/ac (4.67 L/ha)
Formulation:	-	
Aircraft:	DC-4s	
	B-17s	
	PV-2s	
	TBMs	
	helicopters	
Guidance:		
Application system:	Boom and Nozzle	

Year: **1980**
Area: 1 012 971 acres (409 944 ha)
Insect: Eastern spruce budworm

Maine

Insecticide	Active ingredient	Application rate
Sevin-4-oil	16 oz/ac (1.12 kg/ha)	30 fl oz/ac (2.19 L/ha)
	12 oz/ac (840 g/ha)	20 fl oz/ac (1.46 L/ha)
Formulation:	oil solution	
Aircraft:	6 C-54s (DC-4s)	
	15 Thrushes	
	3 PV-2s	
	6 Bell 205, 212 helicopters	
Guidance:	-	
Application system:	Boom and Nozzle	

Year: **1981**
Area: 1 192 600 acres (483 003 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Sevin-4-oil	0.75 lb/ac (840 g/ha)	30 fl oz/ac (2.19 L/ha)
	0.46 lb/ac (520 g/ha)	30 fl oz/ac (2.19 L/ha)
Dipel 4L	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)
	12 BIU/ac (29.7 BIU/ha)	120 fl oz/ac (8.76 L/ha)
Thuricide 16B	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)
Thuricide 24B	12 BIU/ac (29.7 BIU/ha)	96 fl oz/ac (7.01 L/ha)
Orthene	0.50 lb/ac (560 g/ha)	64 fl oz/ac (4.67 L/ha)
Formulation:	oil solution	
	wettable powder	
Aircraft:	Bell 47 helicopters	
	TBMs	
	Bell 205, 206B, 212 helicopters	
	PV-2s	
	DC-4s	
	AgCats	
	B-17s	
	Turbo Thrushes	
	Constellation L-749s	
Guidance:		
Application system:	Boom and Nozzle	

Year: **1982**
Area: 823 411 acres (333 239 ha)
Insect: Eastern spruce budworm

Maine

Insecticide	Active ingredient	Application rate
Sevin-4-oil	0.46 lb/ac (515 g/ha)	30 fl oz/ac (2.19 L/ha)
	0.375 lb/ac (420 g/ha)	24 fl oz/ac (1.75 L/ha)
	0.75 lb/ac (840 g/ha)	30 fl oz/ac (2.19 L/ha)
Sevin FR	0.375 lb/ac (420 g/ha)	24 fl oz/ac (1.75 L/ha)
	0.75 lb/ac (840 g/ha)	30 fl oz/ac (2.19 L/ha)
Orthene	0.50 lb/ac (560 g/ha)	64 fl oz/ac (4.67 L/ha)
Dipel	12 BIU/ac (29.7 BIU/ha)	120 fl oz/ac (8.76 L/ha)
	12 BIU/ac (29.7 BIU/ha)	96 fl oz/ac (7.01 L/ha)
Thuricide 32LV	12 BIU ac (29.7 BIU/ha)	96 fl oz/ac (7.01 L/ha)
Thuricide 24B	12 BIU/ac (29.7 BIU/ha)	96 fl oz/ac (7.01 L/ha)
Bactospeine	12 BIU/ac (29.7 BIU/ha)	96 fl oz/ac (7.01 L/ha)
Formulation:	oil solution	
	wettable powder	
Aircraft:	C-54s	
	Thrushes	
	helicopters	
Guidance:		
Application system:	Micronair	

Year: **1983**
Area: 846 624 acres (342 883 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil (180F)	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)
Sevin-4-oil	6 oz/ac (420 g/ha)	24 fl oz/ac (1.75 L/ha)
Orthene	8 oz/ac (560 g/ha)	64 fl oz/ac (4.67 L/ha)
Dipel 6L	12 BIU/ac (29.7 BIU/ha)	64 fl oz/ac (4.67 L/ha)
	12 BIU/ac (29.7 BIU/ha)	32 fl oz/ac (2.34 L/ha)
Dipel 4L	12 BIU/ac (29.7 BIU/ha)	48 fl oz/ac (3.5 L/ha)
Thuricide 32LV	12 BIU/ac (29.7 BIU/ha)	64 fl oz/ac (4.67 L/ha)
	12 BIU/ac (29.7 BIU/ha)	48 fl oz/ac (3.5 L/ha)
Thuricide 24B	12 BIU/ac (29.7 BIU/ha)	96 fl oz/ac (7 L/ha)
Bactospeine	12 BIU/ac (29.7 BIU/ha)	64 fl oz/ac (4.67 L/ha)
Formulation:	oil solution	
	wettable powder	
Aircraft:	C-54s	
	Thrushes	
	M-18s	
	Air Tractors	
Guidance:		
Application system:	Micronair	
	Boom and Nozzle	

Maine

Year: **1984**
Area: 668 026 acres (270 551 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Matacil	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)
Zectran	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)
Dipel 8L *	12 BIU/ac (29.7 BIU/ha)	24 fl oz/ac (1.75 L/ha)
Thuricide 32LV *	12 BIU/ac (29.7 BIU/ha)	48 fl oz/ac (3.5 L/ha)

Formulation: undiluted *
Aircraft: 4 C-54s
9 Air Tractors
4 M-18s
3 Thrushes
Guidance: -
Application system: Micronair

Year: **1985**
Area: Presque Isle
Old Town
Ragmuff
Estcourt
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 8L	12 BIU/ac (29.7 BIU/ha)	24 fl oz/ac (1.75 L/ha)
Thuricide 48LV	12 BIU/ac (29.7 BIU/ha)	32 fl oz/ac (2.34 L/ha)
Zectran (DB)	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)
Matacil (180F)	1 oz/ac (70 g/ha)	20 fl oz/ac (1.46 L/ha)

Formulation:
Aircraft: 9 M-18
1 Turbo Thrush
Guidance:
Application system: Micronair

Year: **1985**
Area: 2 728 ha (6 741 acres)
sprayed by Passamaquoddy tribe
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 6L	30 BIU/ha (12.2 BIU/ac)	

Maine

Formulation: undiluted
Aircraft:
Guidance:
Application system:

Year: **1990**
Area: 2 000 acres (810 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

Other States

Year: **1976**
Area: 360 000 acres (145 800 ha)
Washington
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Malathion		

Formulation:
Aircraft: helicopters
Guidance:
Application system:

Year: **1982**
Area: 292 988.3 ha (723 974 acres)
Vermont
Pennsylvania
Rhode Island
Maryland
New Jersey
Maine
New York
Massachusetts

Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dylox		
Sevin-4-oil		
Bt	30 BIU/ha (12.2 BIU/ac)	
Dimilin	-	

Formulation:
Aircraft:
Guidance:
Application system:

Year: 1983
Area: 1 411 acres (572 ha)
Vermont
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

Year: 1983
Area: 37 142 acres (15 043 ha)
Carson National Forest, New Mexico
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Sevin		
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

Other States

Year: **1983**
Area: 591 461 acres (239 542 ha)
Delaware
Pennsylvania
Massachusetts
Rhode Island
Maryland
West Virginia
New Jersey
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt	12 BIU/ac (29.7 BIU/ha)	
Dimilin		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1984**
Area: 96 440 ha (238 304 acres)
Lincoln National Forest/Mescalero Apache Reserve
New Mexico
14 000 ha (35 594 acres)
Carson National Forest, New Mexico
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Sevin		
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1985**
Area: 801 ha (1 979 acres)
Michigan
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 8L		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1985**
Area: 10 352 ha (25 580 acres)
Carson National Forest, New Mexico
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 48LV		
Dipel 8L		
Dipel 4L		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1985**
Area: 36 000 ha (88 956 acres)
Pacific Southwest Region (private landowners)
North California
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Bactospeine		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1985**
Area: 4 000 ha (9 884 acres)
Rocky Mountains (private landowners)
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Sevin		
Bt		

Other States

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1985**
Area: 207 006 ha (511 512 acres)
Delaware
Pennsylvania
Maryland
Rhode Island
New Jersey
West Virginia
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dimilin		
Sevin		
Bt	30 BIU/ha (12.2 BIU/ac)	
	40 BIU/ha (16.2 BIU/ac)	
	50 BIU/ha (20.3 BIU/ac)	

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1985**
Area: 111 350 ha (275 146 acres)
Indiana
Oregon
Illinois
Tennessee
Minnesota
Washington
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dimilin		
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1986**
Area: 283 ha (699 acres)
Gallatin National Park, Montana
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Bt	30 BIU/ha (12.2 BIU/ac)	

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1986**
Area: 1 133 ha (2 800 acres)
Carson National Forest, New Mexico
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1986**
Area: 3 238 ha (8 001 acres)
La Grande, Oregon
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Sevin		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1986**
Area: 233 982 ha (578 170 acres)
Delaware

Other States

New Jersey
Maryland
Pennsylvania
Massachusetts
Rhode Island
Michigan
West Virginia

Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt		
Dimilin		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1987**
Area: 13 400 acres (5 425 ha)
Carson National Forest, New Mexico
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 6L		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1987**
Area: 43 983 acres (17 807 ha)
Washington
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Bt		

Formulation:
Aircraft:
Guidna:
Application system:

Year: **1987**
Area: 94 470 acres (38 247 ha)
Oregon
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1987**
Area: 641 521 acres (259 725 ha)
Delaware
Maryland
Michigan
New Jersey
Pennsylvania
Virginia
West Virginia
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dimilin		
Bt		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1988**
Area: 598 031 acres (242 118 ha)
Oregon
Washington
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Bt		

Formulation:
Aircraft:

Other States

Guidance:
Application system:

Year: **1988**
Area: 792 820 acres (320 908 ha)
Delaware
Maryland
Michigan
New Jersey
New York
Pennsylvania
Vermont
Virginia
West Virginia
District of Columbia
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt		
Dimilin		
Gypchek		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1988**
Area: 43 183 acres (17 483 ha)
North Carolina
Virginia
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt		
Dimilin		

Formulation:
Aircraft:
Guidance:
Application system:

Other States

Year: **1989**
Area: 7 454 acres (3 018 ha)
Mount Hood National Forest, Oregon
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 6L	16 BIU/ac (40 BIU/ha)	0.33 gal/ac (3.09 L/ha)

Formulation:
Aircraft: helicopter
Guidance: -
Application system:

Year: **1989**
Area: 754 095 acres (305 302 ha)
Pennsylvania
Vermont
Madison
West Virginia
District of Columbia
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt		
Dimilin		
Gypchek		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1989**
Area: 37 405 acres (15 144 ha)
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt		
Dimilin		

Formulation:
Aircraft:
Guidance:
Application system:

Other States

Year: **1989**
Area: 21 151 acres (8 563 ha)
Idaho
Virginia
North Carolina
Utah
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Bt		
Dimilin		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1989**
Area: 27 500 acres (11 134 ha)
Menominee Indian Reservation, Wisconsin
Insect: Forest tent caterpillar

Insecticide	Active ingredient	Application rate
Dipel 8L		
Dimilin		

Formulation:
Aircraft:
Guidance:
Application system:

Year: **1990**
Area: 71 000 acres (28 745 ha)
Yakima Indian Reservation, Oregon
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 48LV	16 BIU/ac (40 BIU/ha)	

Formulation:
Aircraft:
Guidance:
Application system:

Other States

Year: **1990**
Area: 13 232 acres (5 357 ha)
Vermont
New York
Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Foray	24 BIU/ac (60 BIU/ha)	64 fl oz/ac (4.67 L/ha)
Dipel 8AF	16 BIU/ac (40 BIU/ha)	32 fl oz/ac (2.34 L/ha)

Formulation: undiluted
Aircraft: -
Guidance: -
Application system: -

Year: **1990**
Area:

57 718 acres	(23 368 ha)	Delaware
1 060 acres	(429 ha)	Idaho
212 600 acres	(86 073 ha)	Maryland
144 024 acres	(58 309 ha)	Michigan
101 402 acres	(41 053 ha)	New Jersey
4 200 acres	(1 700 ha)	North Carolina
393 627 acres	(159 364 ha)	Pennsylvania
200 acres	(81 ha)	Tennessee
20 064 acres	(8 123 ha)	Utah
229 703 acres	(92 997 ha)	Virginia
448 acres	(181 ha)	Washington
367 064 acres	(148 609 ha)	West Virginia
1 532 110 acres	(620 287 ha)	

Insect: Gypsy moth

Insecticide	Active ingredient	Application rate
Dimilin		
Bt		
Gypchek		
Disparlure		

Formulation:
Aircraft:
Guidance:
Application system:

II. Research applications

Maine

Year: **1979**
Area: 800 ha (1 977 acres)
University of Maine
Insect: -

Insecticide	Active ingredient	Application rate
Thuricide		
Thuricide/Orthene		

Aircraft: helicopter
Application system: Beecomist

Year: **1979**
Area: 10 000 ha (24 710 acres)
Insect: Eastern spruce budworm
CANUSA

Insecticide	Active ingredient	Application rate
Dipel ABG	-	-
Thuricide 16B	20 BIU/ha (8.1 BIU/ac)	9.34 L/ha (1 gal/ac)

Aircraft:
Application system:

Year: **1980**
Area: 197 321 acres (79 915 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Thuricide 16B	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)
	8 BIU/ac (19.8 BIU/ha)	128 fl oz/ac (9.34 L/ha)
Dipel 4L	8 BIU/ac (19.8 BIU/ha)	80 fl oz/ac (5.84 L/ha)

Aircraft:
Application system:

Maine

Year: **1986**
Area: 2 800 acres (1 134 ha)
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Dipel 8L	12 BIU/ac (29.7 BIU/ha)	24, 16, 32 fl oz/ac (1.75, 1.17, 2.34 L/ha)
Dipel 8AF	8 BIU/ac (19.8 BIU/ha)	24, 16, 32 fl oz/ac (1.75, 1.17, 2.34 L/ha)
Dipel 12L	12 BIU/ac (29.7 BIU/ha)	24, 16, 32 fl oz/ac (1.75, 1.17, 2.34 L/ha)
Thuricide 32LV	8 BIU/ac (19.8 BIU/ha)	24, 16, 32 fl.oz/ac (1.75, 1.17, 2.34 L/ha)
Thuricide 64LV	12 BIU/ac (29.7 BIU/ha)	24, 16, 32 fl oz/ac (1.75, 1.17, 2.34 L/ha)
SAN 415	8 BIU/ac (19.8 BIU/ha)	24, 16, 32 fl oz/ac (1.75, 1.17, 2.34 L/ha)

Aircraft: Thrush
Application system: Micronair

Year: **1989**
Area: 4 ha (10 acres)
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Dimilin W-25	280 g/ha (4 oz/ac)	28 L/ha (3 gal/ac)

Aircraft: Bell 47 helicopter
Application system: Boom and Nozzle

Year: **1990**
Area: -
Insect: White pine weevil

Insecticide	Active ingredient	Application rate
Dimilin		

Aircraft: ground + aerial
Application system: -

Other States

Year: **1982**
Area: 405 ha (1 001 acres)
Michigan
Insect: Eastern spruce budworm

Insecticide	Active ingredient	Application rate
Bt	30 BIU/ha (12.2 BIU/ac)	5.6 L/ha (76.61 fl oz/ac)
	30 BIU/ha (12.2 BIU/ac)	11.2 L/ha (1.2 gal/ac)

Aircraft:
Application system:

Year: **1984**
Area: 800 acres (324 ha)
Pacific Northwest Region
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Bt		

Aircraft:
Application system:

Year: **1989**
Area: Wallowa-Whitman National Forest
Oregon
Insect: Western spruce budworm

Insecticide	Active ingredient	Application rate
Foray 48B	16 BIU/ac (40 BIU/ha)	0.33 gal/ac (3.09 L/ha)
	16 BIU/ac (40 BIU/ha)	0.5 gal/ac (4.68 L/ha)
Aircraft:	helicopter	
Application system:		

Year: **1989**
Area: 400 acres (162 ha)
Vermont
Insect: Pear thrip

Insecticide	Active ingredient	Application rate
Sevin-4-oil		
Aircraft:	AgCat	
Application system:	-	

B. Insects

I. Operational applications

Ambrosia beetle
Black army cutworm
Black-headed budworm
Douglas-fir tussock moth
Eastern hemlock looper
Eastern spruce budworm
European pine sawfly
Fall cankerworm
False hemlock looper
Forest tent caterpillar
Gypsy moth
Jack-pine budworm
Larch sawfly
Mosquito
Oak leaf shredder
Phantom hemlock looper
Pine butterfly
Red-headed pine sawfly
Saddle-back looper
Saratoga spittlebug
Swaine jack-pine sawfly
Western hemlock looper
Western spruce budworm
White pine weevil

II. Research applications

Ambrosia beetle
Balsam gall midge
Balsam woolly aphid
Birch leaf miner
Cone and seed insects
Cone moth
Douglas-fir cone gall midge
Douglas-fir cone moth
Douglas-fir tussock moth
Eastern black-headed budworm
Eastern hemlock looper
Eastern spruce budmoth
Eastern spruce budworm
European pine sawfly
Fall cankerworm
Forest tent caterpillar
Gall midge
Green-striped forest looper
Gypsy moth (larvae)
Gypsy moth
Hemlock needle miner
Jack-pine budworm
Leconte sawfly
Lodgepole needle miner
Mountain pine beetle
Oak leaf shredder
Oak looper
Pear thrip
Pine needle midge
Red-headed pine sawfly
Saddle-back looper
Spiral spruce-cone borer
Spruce seedworm
Swaine jack-pine sawfly
Western black-headed budworm
Western false hemlock looper
Western hemlock looper
Western spruce budworm
White pine weevil
White pine weevil (adult)
White-marked tussock moth
Winter moth

C. Insecticides used

I. Operational applications

NOTE: The following list contains common names for chemical and biological insecticides as well as trade names. Lower-case initial letters are used for common names and upper case for trade names. (For the latter, the common name is provided in parentheses whenever possible.)

ABG-6103	(bacteria)
Accothion	(fenitrothion)
Ambush 500 EC	(permethrin)
Bacillus thuringiensis	
Bactospeine	(Bt)
benzene hexachloride	
Biodart	(Bt)
Cygon 4E	(dimethoate)
DDT	
Dimecron	(phosphamidon)
Dimecron 90	
Dimecron 110	
dimethoate	
Dimilin	(diflubenzuron)
Dimilin 25%	
Dimilin 25% (WP)	
Dipel	(Bt)
Dipel WP	
Dipel 4L	
Dipel 6L	
Dipel 8AF	
Dipel 8L	
Dipel 36B	
Dipel 48AF	
Dipel 88	
Dipel 132	
Dipel 176	
Disparlure	(NPV)
Dylox	(trichlorfon)
fenitrothion	
Folithion	(fenitrothion)
Foray 48B	(Bt)
Futura	(Bt)
Futura (FC)	
Futura "O"	
Futura (XLV)	
Futura XLV-HP	
Gypchek	(NPV)
Lecontvirus	
malathion	
malathion 50% EC	
Matacil	(aminocarb)
Matacil (1.8D)	
Matacil (1.8F)	
Matacil (180D)	
Matacil (180F)	
methoxychlor	
methyl Trithion	
Novabac-3	(Bt)
Novabac 32B	
nuclear polyhedrosis virus	(NPV)
Orthene	(acephate)
Orthene 75	
Orthene 85	
Orthene 85SP	
Orthene 97SP	
phosphamidon	
Sertifervirus	
Sevin	(carbaryl)
Sevin FR	
Sevin 80S	
Sevin 85P	
Sevin-4-oil	
Sumithion	(fenitrothion)
Thuricide	(Bt var. *kurstaki*)
Thuricide 16B	
Thuricide 24B	
Thuricide 26B	
Thuricide 32B	
Thuricide 32LV	
Thuricide 36B	
Thuricide 48B	
Thuricide 48LV	
Thuricide HPC	
Zectran	(mexacarbate)
Zectran (DB)	

II. Research applications

NOTE: The following list contains common names for chemical and biological insecticides as well as trade names. Lower-case initial letters are used for common names, while trade names are capitalized. (The common name of trade names is provided in parentheses whenever possible.) For trade names marked with an asterisk (*), confirmation was not possible.

#47470 *	
#47772 *	
Abate	(temephos)
Accothion	(fenitrothion)
aldicarb	
Alfacron	(azamethiphos)
Altosid	(methoprene)
Ambush	(permethrin)
Ambush 500 EC	
ammonium nitrate	
Aramite	(aramite)
Bacillus thuringiensis	
Bactospeine	(Bt)
Bactospeine 22.5B	
BASF 153-100-50	(growth regulator)
BAY SIR 8514	(propoxur)
Bay 37289	(trichloronat)
Baygon	(propoxur)
Baytex	(fenthion)
benzene hexachloride	
Bidrin	(dicrotophos)
Biobit 64	(Bt Berliner ssp. *kurstaki*)
C 9643 *	
C 10015 *	
C.I.L. E2492	(Bt)
C. militaris	(parasite)
carbaryl	
carbofuran	
chlorpyrifosmethyl	
CGA 13353	(insect growth regulator)
CIBA 9491 *	
CIBA 17974 *	
Condor AF	(delta-endotoxin)
Condor OF	
Cygon	(dimethoate)
Cygon (4E)	
Cygon (2E)	
cytoplasmic polyhedrosis virus (CPV)	
DDD	
DDT	
Deltamethrin/Decis	(pyrethroid)
diazinon	
diazinon 50EC	
Dibrom	(naled)
diflubenzuron	(growth regulator)
Dimecron	(phosphamidon)
dimethoate	
dimethoate (EC)	
Dimilin	(diflubenzuron)
Dimilin ODC-45	
Dimilin SC-48	
Dimilin WP25	
Dipel	(Bt)
Dipel (WP)	
Dipel ABG	
Dipel ABG-6103 (32B)	
Dipel SC 36B	
Dipel 4L	
Dipel 6L	
Dipel 8AF	
Dipel 8L	
Dipel 12L	
Dipel 16L	
Dipel 36B	
Dipel 45B	
Dipel 88	
Dipel 96AF	
Dipel 132	
Dipel 176	
Dipel 264	
Dipel 352	
Disparvirus	(NPV)
Dursban	(chlorpyrifos)
Dylox	(trichlorfon)
EL-1215	(growth regulator)
EL-413 *	
EL-494	(growth regulator)
EL-7063 *	
Entomogenous fungi	
Entomopathogenic fungi	
Entomopox virus (EPV)	

Experimental Insecticide 1642
Experimental Insecticide 447470
fenitrothion
FMC 33297 (synthetic pyrethroid)
Foray 48B (Bt)
Fundal (chlordimeform)
Furadan (carbofuran)
Futura (Bt)
Futura II
Futura HP
Futura "O"
Futura XLV
Futura XLV-HP
Futura 32B
Futura 48LV
Futura 64B
Gardona (tetrachlorvinphos)
granulosis virus
GS 42710 (insect growth regulator)
Gypchek (NPV)
Hercules 134462 *
HOE-00522-20 (growth regulator)
Imidan (phosmet)
Invadine *
Lannate (methomyl)
Lannate 20L
Lecontvirus (NPV)
Lindane
malathion
Matacil (aminocarb)
Matacil (WP)
Matacil (F)
Matacil 1.8 OSC
Matacil (1.8F)
Matacil (180F)
Merck's Bacterial Insecticide
Meta Systox-R (oxydemeton-methyl)
methomyl
methoxychlor
methyl Trithion
N. fumiferanae (microsporidia)
Nellite *
NIA-10242
Novabac (Bt)
Novabac 32B
Novabac 45B
Novabac-3
Novathion (fenitrothion)
NRDC 143 (permethrin)
NRDC 143 (A)
NRDC 143 (B)
nuclear polyhedrosis virus (NPV)
Oleate *
Orthene (acephate)
Orthene 75S
Orthene 85SP
Orthene 90
Ortho
oxydemeton-methyl
P. shubergi (microspordian)
Panasol *
parasitoid - *A. flaveolatum*
parasitoid - *C. albians*
permethrin
PH 60-40 (Dimilin)
PH 60-40 (WP)
PH 60-41 (growth regulator)
PH-60-43
PH-60-44
pheromone
phosphamidon
Phosvel *
phoxim
Pounce (permethrin)
poxvirus
PP062
PP511
pyrethrin
pyrethrin (7014)
pyrethroid
Pyrethrum (pyrethroid)
RE-5305
RE-5353
RE-5655
RH-5992 (ecdysonoid: molt inhibitor)
Reldan (chlorpyrifos-methyl)
RO-10-3108 (juvenile hormone)
Rothane * (DDD)
S-71639 (insect growth regulator)
SAN 239 I (24B) (Bt)
SAN 239 I (32B)
SAN 415
Sayfos (menazon)
SBP 1382 (resmethrin)
Sertifervirus
Sevin (carbaryl)
Sevin FR
Sevin 80S
Sevin-2-oil
Sevin-4-oil
sex attractant (trans-11-tetra-decanal)
sex pheromone (E)-7-dodecanol

sex pheromone (E)-11-tetradecanol
sex pheromone (Z)-11-tetradecanol
Silvisar 510
Silvisar 550
Sumithion (fenitrothion)
Sumithion (F20)
Sunspray 6N oil
Synthetic Attractant
Teflubeuzuron
T. minutum
TH-60/40 *
Thimet (phorate)
Thiocron *
Thiodan (endosulfan)
Thuricide (Bt var. *kurstaki*)
Thuricide 16B
Thuricide 24B
Thuricide 24BA
Thuricide 24BC
Thuricide 26B
Thuricide 32B
Thuricide 32LV
Thuricide 48LV
Thuricide 48B
Thuricide 64B
Thuricide 64LV
Thuricide 90TS
Thuricide HPC
Thuricide SO75
trichlorforon
tussock moth virus
UC 62644 (molt inhibitor)
UC 70676
UC 70680
vamidothion
Virtuss (NPV)
Volaton 47SC (phoxim)
Zectran (mexacarbate)
Zectran (2E)
Zectran (DB)
Zoecon 515 (methoprene)
ZR-515 (methoprene)

D. Insecticides used, by year and province or State

I. Operational applications

Year	Province/State	Insecticide
1945	Ontario	DDT
1946	Ontario	DDT
	British Columbia	DDT
1948	British Columbia	DDT
1950	Ontario	DDT
1951	Ontario	DDT
1952	New Brunswick	DDT
	Quebec	DDT
	Ontario	DDT
1953	New Brunswick	DDT
	Quebec	DDT
1954	New Brunswick	DDT
	Quebec	DDT
	Saskatchewan	Malathion
1955	New Brunswick	DDT
	Quebec	DDT
	Saskatchewan	Malathion
1956	New Brunswick	DDT
	Quebec	DDT
	British Columbia	DDT
1957	New Brunswick	DDT
	Quebec	DDT
	Ontario	DDT
	British Columbia	DDT
1958	New Brunswick	DDT
1959	British Columbia	DDT
1960	New Brunswick	DDT
	Quebec	DDT
	British Columbia	DDT
1961	New Brunswick	DDT
	Quebec	DDT Sevin 85P
	Ontario	DDT
	British Columbia	benzene hexachloride DDT
1962	New Brunswick	DDT
	Quebec	DDT Sevin 80S
	Ontario	DDT
	British Columbia	benzene hexachloride
1963	New Brunswick	DDT phosphamidon
	Quebec	Sevin 80S

Year	Province/State	Insecticide
	Ontario	DDT
	British Columbia	benzene hexachloride
1964	New Brunswick	DDT phosphamidon
	Quebec	NPV Sevin 80S
	Ontario	DDT
	Manitoba	DDT
	British Columbia	benzene hexachloride
1965	New Brunswick	DDT phosphamidon
	Quebec	Dimecron 90 Sevin 80S
	Ontario	DDT
	British Columbia	benzene hexachloride
1966	New Brunswick	DDT phosphamidon
	Quebec	Sevin 80S
	Ontario	DDT phosphamidon
	British Columbia	benzene hexachloride
1967	New Brunswick	DDT
	Quebec	fenitrothion phosphamidon Sevin 80S
	Manitoba	DDT
	British Columbia	benzene hexachloride
1968	Newfoundland	phosphamidon Sumithion
	New Brunswick	DDT
	Quebec	phosphamidon Sevin 80S
	Ontario	fenitrothion methoxychlor phosphamidon Sumithion
	British Columbia	methyl Trithion
1969	Newfoundland	phosphamidon Sumithion
	New Brunswick	fenitrothion
	Quebec	NPV Sevin 80S
	Ontario	methoxychlor phosphamidon Sumithion
	British Columbia	methyl Trithion
1970	New Brunswick	Dimecron 110 fenitrothion
	Quebec	fenitrothion Sevin 80S
	Ontario	fenitrothion methoxychlor Sevin 80S
	British Columbia	methyl Trithion
	Maine	fenitrothion
1971	New Brunswick	fenitrothion

Year	Province/State	Insecticide
	Quebec	fenitrothion
	Ontario	fenitrothion methoxychlor Sevin-4-oil
1972	New Brunswick	fenitrothion
	Quebec	fenitrothion
	Ontario	fenitrothion methoxychlor Sevin-4-oil Zectran
	Maine	Zectran
1973	New Brunswick	fenitrothion
	Quebec	Dimecron fenitrothion Matacil phosphamidon
	Ontario	fenitrothion methoxychlor Zectran
	Manitoba	fenitrothion Sevin-4-oil
	British Columbia	Sumithion
1974	New Brunswick	Dimecron Dylox fenitrothion
	Quebec	Bt Dylox fenitrothion Matacil Zectran
	Ontario	Bt Sevin-4-oil Zectran
	Manitoba	fenitrothion
1975	New Brunswick	Dimecron Dylox fenitrothion Matacil
	Quebec	fenitrothion Matacil phosphamidon Sevin-4-oil Thuricide 16B Thuricide 26B Thuricide 36B Zectran
	Ontario	Dylox fenitrothion NPV Sevin-4-oil Thuricide 16B
	Manitoba	fenitrothion malathion malathion 50% EC Sumithion
	British Columbia	Dipel 36B Dylox Thuricide 16B
	Maine	Sevin-4-oil Sumithion Zectran
1976	New Brunswick	Dimecron Dylox fenitrothion Matacil
	Quebec	Dimethoate fenitrothion Matacil Sevin-4-oil
	Ontario	fenitrothion malathion 50% EC Matacil

Year	Province/State	Insecticide
		Orthene
		Thuricide 16B
	Manitoba	malathion
	British Columbia	Orthene 75
		Thuricide HPC
	Maine	Sevin-4-oil
	Other States	malathion
1977	New Brunswick	Dylox
		fenitrothion
		Matacil
	Quebec	fenitrothion
		Matacil
		phosphamidon
	Ontario	Bt
		Dimilin
		Matacil
		Orthene
		Sevin-4-oil
		Thuricide 16B
	Manitoba	fenitrothion
		malathion
	Maine	Dylox
		Orthene
		Sevin-4-oil
1978	Newfoundland	Matacil
	New Brunswick	fenitrothion
		Matacil
	Quebec	Dimilin
		25% (WP)
		Matacil
		Sumithion
	Ontario	Dimilin 25%
		Dipel WP
		Matacil
		Orthene
		Orthene 85
		Thuricide 16B
	Manitoba	malathion
	Maine	Bt
		Dylox
		Orthene
		Sevin-4-oil
1979	Newfoundland	Thuricide 16B
	New Brunswick	fenitrothion
		Matacil
	Quebec	ABG-6103
		fenitrothion
		Matacil
		Novabac-3
		Thuricide
	Ontario	Matacil
		Novabac 32B
		Orthene
		Orthene 85SP
		Thuricide 16B
	Maine	Dylox
		Orthene
		Sevin-4-oil
		Thuricide 16B
		Thuricide 32B
1980	Newfoundland	Thuricide 16B
	New Brunswick	fenitrothion
		Matacil
	Nova Scotia	Thuricide 16B
	Quebec	Matacil
		Sevin 80S
		Sumithion
		Thuricide 32B
	Ontario	Cygon 4E
		Lecontvirus
		Matacil

Year	Province/State	Insecticide
		Novabac-3
		Orthene 85SP
		Orthene 97SP
		Sevin-4-oil
		Thuricide 16B
	Manitoba	fenitrothion
	Saskatchewan	Dipel
		malathion
	Alberta	Dipel
		malathion
	Maine	Sevin-4-oil
1981	Newfoundland	Dipel 88
		Matacil (1.8D)
		Thuricide 16B
	New Brunswick	fenitrothion
	Nova Scotia	Dipel 88
		Thuricide 16B
	Quebec	Dipel 88
		fenitrothion
		Matacil
	Ontario	Dipel 88
		Lecontvirus
		Matacil
		NPV
		Thuricide 16B
		Thuricide 32B
	Manitoba	Dipel 88
	Alberta	Dipel
		malathion
	Maine	Dipel 4L
		Orthene
		Sevin-4-oil
		Thuricide 16B
		Thuricide 24B
1982	Newfoundland	Matacil (1.8D)
		Thuricide 16B
	New Brunswick	Bt
		fenitrothion
		Matacil
	Nova Scotia	Dipel 88
		Thuricide 16B
		Thuricide 32LV
	Quebec	Dipel 88
		fenitrothion
		Matacil
		Thuricide 32LV
	Ontario	Dipel 88
		Gypchek
		Lecontvirus
		Matacil (1.8D)
		Novabac-3
		Orthene 85SP
		Sevin-4-oil
		Thuricide 32B
		Thuricide 48B
	Alberta	Dipel
		malathion
	Maine	Bactospeine
		Dipel
		Orthene
		Sevin-4-oil
		Sevin FR
		Thuricide 24B
		Thuricide 32LV
	Other States	Bt
		Dimilin
		Dylox
		Sevin-4-oil
1983	Newfoundland	Matacil (1.8D)
		Matacil (180F)
	New Brunswick	Dipel 88
		fenitrothion
		Matacil (180F)

Year	Province/State	Insecticide
		Novabac-3
	Nova Scotia	Dipel 88
		Novabac-3
		Thuricide 32LV
	Quebec	Dipel 88
		fenitrothion
		Matacil
		Novabac-3
	Ontario	Dipel 88
		Lecontvirus
		Matacil (1.8F)
		Novabac-3
		Orthene 97SP
		Sevin-4-oil
	British Columbia	Orthene
		Sevin
	Maine	Bactospeine
		Dipel 4L
		Dipel 6L
		Matacil (180F)
		Orthene
		Sevin-4-oil
		Thuricide 24B
		Thuricide 32LV
	Other States	Bt
		Dimilin
		Sevin
1984	Newfoundland	Dipel 132
		Matacil (1.8D)
		Thuricide 16B
	New Brunswick	fenitrothion
		Matacil
		Thuricide 48LV
	Nova Scotia	Dipel 132
		Dipel 176
		Thuricide 32LV
	Quebec	Dipel 132
		fenitrothion
		Futura
		Matacil (180D)
		Matacil (180F)
		Thuricide 32LV
		Thuricide 48LV
	Ontario	Dipel 88
		Dipel 132
		Lecontvirus
		Matacil (1.8F)
		Sevin-4-oil
	Alberta	Dipel 88
	Maine	Dipel 8L
		Matacil
		Thuricide 32LV
		Zectran
	Other States	Bt
		Sevin
1985	Newfoundland	Dipel 132
		Folithion
	New Brunswick	Dipel 132
		Matacil (180F)
		Sumithion
		Thuricide 48LV
	Nova Scotia	Dipel 132
	Quebec	fenitrothion
		Futura
		Futura (FC)
		Futura XLV
		Novabac-3
		Thuricide 48LV
	Ontario	Dipel 88
		Dipel 132
		Lecontvirus
		Thuricide 48LV
	Maine	Dipel 6L
		Dipel 8L
		Matacil (180F)
		Thuricide 48LV

Year	Province/State	Insecticide
		Zectran (DB)
	Other States	Bactospeine Bt Dimilin Dipel 4L Dipel 8L Sevin Thuricide 48LV
1986	Newfoundland	Dipel fenitrothion
	New Brunswick	Dipel 132 Sumithion
	New Brunswick	Matacil
	Nova Scotia	Dipel 132
	Quebec	Futura Sumithion Thuricide 48LV
	Ontario	Dipel 132 Lecontvirus Thuricide 48LV
	Manitoba	Bt Thuricide 48LV
	Various States	Bt Dimilin Sevin
1987	Newfoundland	Dipel 132 Folithion
	New Brunswick	Dipel Futura Matacil Sumithion
	Nova Scotia	Dipel 132
	Quebec	Dipel 132 Dipel 176 Futura
	Ontario	Dipel 132 Futura XLV Thuricide 48LV
	Manitoba	Thuricide 48LV
	Various States	Bt Dimilin Dipel 6L
1988	Newfoundland	Dipel 176 fenitrothion Futura XLV
	New Brunswick	Bt Dipel 132 Futura XLV Sumithion
	Quebec	Dipel 132 Futura FC Futura XLV
	Ontario	Dipel 132 Futura FC Lecontvirus
	Manitoba	Dipel 132
	British Columbia	Bt
	Various States	Bt Dimilin Gypchek
1989	Newfoundland	Futura XLV
	New Brunswick	Dipel 176 Futura XLV Sumithion
	Quebec	Dipel 132 Dipel 48AF Dipel 176 Futura XLV
	Ontario	Futura XLV Lecontvirus

Year	Province/State	Insecticide
		Sertifervirus
	Manitoba	Dipel 8L
	Alberta	Bt
		Dipel 176
	Various States	Bt
		Dimilin
		Dipel 6L
		Dipel 8L
		Gypchek
1990	Newfoundland	Foray 48B
		Futura XLV
	New Brunswick	Biodart
		fenitrothion
		Futura XLV
		Futura XLV-HP
		Sumithion
	Quebec	Bt
		Biodart

Year	Province/State	Insecticide
		Dipel 176
		Foray 48B
		Futura XLV-HP
	Ontario	Dipel 132
		Dipel 176
		Futura XLV
		Lecontvirus
	Manitoba	Futura XLV
	Alberta	Futura "O"
		Futura XLV-HP
	British Columbia	Bt
	Maine	Bt
	Other States	Bt
		Dimilin
		Dipel 8AF
		Disparlure
		Foray
		Gypchek

II. Research applications

Year	Province/State	Insecticide
1951	Ontario	DDT
1952	Ontario	DDT NPV
1955	Ontario	DDT
1956	British Columbia	DDT
1958	New Brunswick	DDD (Rothane) DDT Korlan Sevin
1959	New Brunswick	DDT malathion
	Ontario	Merck's Bacterial Insecticide
	British Columbia	benzene hexachloride Merck's Bacterial Insecticide
1960	New Brunswick	Thuricide SO75
	Quebec	NPV
	British Columbia	Thuricide SO75
1961	New Brunswick	DDT
	British Columbia	DDT Dibrom phosphamidon Thuricide
1962	New Brunswick	Thuricide SO75
	British Columbia	benzene hexachloride DDT malathion Thiodan
1963	Ontario	NPV
	British Columbia	phosphamidon
1964	Newfoundland	diazinon dimethoate Nellite phosphamidon Sumithion Thiocron vamidothion Zectran #47470 #47772
	Alberta	dimethoate
	British Columbia	phosphamidon
1965	Newfoundland	Aramite Bay 37289 Baygon Cygon diazinon Meta Systox-R Sayfos Sumithion
	New Brunswick	Cygon (4E) DDT dimethoate malathion phosphamidon Sumithion Zectran (2E)
1965	Manitoba	DDT Dylox Matacil

Year	Province/State	Insecticide
	British Columbia	benzene hexachloride
		dimethoate
		phosphamidon
1966	New Brunswick	Baygon
		Bidrin
		DDT
		Dibrom
		dimethoate
		Dylox
		malathion
		Matacil
		Meta Systox-R
		NIA-10242
		phosphamidon
		Sumithion
		Zectran
	British Columbia	Abate
		Baygon
		Baytex
		methyl Trithion
1967	Newfoundland	Baygon
		diazinon
		Dursban
	New Brunswick	Abate
		Baygon
		Baytex
		malathion
		Matacil
		Novathion
		phosphamidon
		Sumithion
		Zectran
	Manitoba	Accothion
		DDT
		Dylox
		Matacil
		phosphamidon
		Thimet
	British Columbia	Baygon
		C 9643
		C 10015
		Invadine
		Matacil
		methyl Trithion
		NIA-10242
		Ortho
		RE-5305
		RE-5353
		RE-5655
1968	Newfoundland	Baygon
		diazinon
		Dursban
		Furadan
	New Brunswick	Baygon
		CIBA 9491
		DDT
		fenitrothion
		malathion
		Matacil
		phosphamidon
		Sumithion
1968	Ontario	Sumithion
	British Columbia	benzene hexachloride
		methyl Trithion
1969	Newfoundland	Baygon
		Dursban
		Experimental Insecticide 447470
		Experimental Insecticide 1642
		Hercules 134462
		Lannate
		NPV
		PP062
		PP511
	New Brunswick	Bt
		DDT
		Lannate
		Matacil
		phosphamidon

Year	Province/State	Insecticide
		Sumithion
		Thuricide 90TS
		Zectran
	Ontario	NPV
	British Columbia	Baygon
		diazinon
		Dursban
		Lannate
		Matacil
		NIA-10242
		RE-5305
		Zectran
1970	Newfoundland	NPV
	New Brunswick	Accothion
		CIBA 17974
		CPV
		Dylox
		Lannate
		Matacil
		NPV
		Panasol
		phosphamidon
		Pyrethrin (7014)
		Zectran
	Quebec	NPV
	Ontario	Dipel
		Thuricide 90TS
1971	New Brunswick	Matacil
		Matacil (WP)
		pyrethroid
		Sumithion
		Zectran
	Quebec	Thuricide HPC
	Ontario	Bt
		Dipel
		Dursban
		EPV
		Gardona
		Lindane
		methoxychlor
		NPV
		poxvirus
		Thuricide
	British Columbia	dimethoate (EC)
		fenitrothion
		methyl Trithion
1972	New Brunswick	fenitrothion
		phosphamidon
	Quebec	aldicarb
		carbaryl
		dimethoate
		Dipel
		Dursban
		fenitrothion
		Gardona
		Imidan
		malathion
		matacil
		methomyl
		methoxychlor
		Thuricide HPC
		Zectran
	Ontario	aldicarb
		Carbaryl
		dimethoate
		Dipel (WP)
		Dursban
		EPV
		fenitrothion
		Gardona
		Imidan
		malathion
		methomyl
		methoxychlor
		NPV
		phosphamidon
		Thuricide HPC
1973	New Brunswick	CGA 13353
		Dimecron
		Dylox
		GS 42710
		Pyrethrum

Year	Province/State	Insecticide
	Quebec	Altosid
		Bt
	Ontario	Dipel
		Dipel (WP)
		fenitrothion
		Gardona
		methoxychlor
		NPV
		Sevin-4-oil
		Thuricide
		Thuricide 16B
	Manitoba	Dipel
	British Columbia	Dipel
	Maine	Bt
		Zectran
1974	New Brunswick	CGA 13353
		phosphamidon
	Quebec	Bt
		Dipel
		fenitrothion
		Fundal
		Lannate 20L
		methomyl
		Orthene
		Orthene 90
		phoxim
		Sevin 80S
		Thuricide 16B
		Volaton 47 SC
	Ontario	Bt
		Dipel
		methoxychlor
		NPV
		Orthene
		PH 60-40 (WP)
		RO-10-3108
		Sevin-4-oil
		Thuricide 16B
		ZR-515
	British Columbia	*C. militaris*
		diazinon
		Dipel
		Dylox
		juvenile hormone
		NPV
		Zoecon 515
1975	New Brunswick	Dimecron
		Dipel
		fenitrothion
		Thuricide
	Quebec	Cygon
		DDT
		Dimecron
		Dipel
		Dylox
		fenitrothion
		FMC 33297
		methomyl
		Orthene
		Phosvel
		phoxim
		Thuricide
		Thuricide 16B
		Thuricide 26B
		TH-60/40
		trichlorforon
	Ontario	Dipel
		methoxychlor
		N. fumiferanae
		NPV
		Orthene
		PH 60-40
		RO-10-3108
		SAN 239 I (24B)
		SAN 239 I (32B)
		sex attractant (trans-11-tetra-decanal)
		Thuricide 16B
	British Columbia	Dipel
		Orthene
		Thuricide
		Thuricide 16B

Year	Province/State	Insecticide
		tussock moth virus
1976	New Brunswick	Dimecron
		Futura
		Lannate
		Matacil
		Orthene
		Sevin-4-oil
	Quebec	Bt
		dimethoate
		fenitrothion
		FMC 33297
		Matacil
		NRDC-143
		NRDC-143 (A)
		NRDC 143 (B)
		Orthene
		Orthene 75S
		phosphamidon
		Reldan
		Sumithion
	Ontario	Dimilin
		fenitrothion
		N. fumiferanae
		NPV
		NRDC 143
		P. shubergi
		R0-10-3108
	British Columbia	Dimilin
		Orthene
1977	Newfoundland	Bt
		fenitrothion
		Matacil
		Orthene
	New Brunswick	Dimecron
	Quebec	Bactospeine 22.5B
		chlorpyrifos-methyl
		Dimilin WP 25
		Dipel SC 36B
		fenitrothion
		Matacil
		permethrin
		phosphamidon
		Thuricide 32B
	Ontario	Dimilin
		Dipel 36B
		Dylox
		EL-494
		NPV
		Orthene
		PH 60-41
		Thuricide 16B
1978	Quebec	diazinon
		Dipel
		fenitrothion
		Matacil
		Novabac
		NPV
		permethrin
		Thuricide 32B
	Ontario	BAY SIR 8514
		Dimilin
		Dipel (WP)
		EL-494
		Novabac-3
		NPV
		Orthene
		Thuricide 16B
	British Columbia	Baygon
		dimethoate
		Lindane
		NPV
		Oleate
		Orthene
		permethrin
		Reldan
		Sevin
		Silvisar 510
		Silvisar 550
		Thuricide 16B
1979	Newfoundland	Novabac 45B
		Thuricide 24BA

Year	Province/State	Insecticide
		Thuricide 24BC
	New Brunswick	Alfacron
		Dipel ABG-6103 (32B)
		Dipel 45B
		Reldan
		Thuricide 16B
	Nova Scotia	Thuricide 16B
	Quebec	Dipel ABG-6103
		Novabac-3
		Novabac 32B
		Novabac 45B
		NPV
		Thuricide
		Thuricide 16B
		Thuricide 32B
	Ontario	BAY SIR 8514
		EL-1215
		EL-7063
		Novabac-3
		NPV
		Orthene 85SP
		Thuricide 16B
	British Columbia	Cygon 4E
	Maine	Dipel ABG
		Orthene
		Sevin-4-oil
		Thuricide
		Thuricide 16B
		Thuricide 32B
1980	Newfoundland	Dipel 88
		Novabac-3
		Novabac 45B
		Thuricide 24B
		Thuricide 32B
	New Brunswick	Ambush
		Bt
		fenitrothion
		Reldan
		Sevin-2-oil
	Quebec	Ambush
		Bt
		Dipel 88
		Futura
		Matacil
		NPV
		Thuricide
		Thuricide 16B
		Thuricide 24B
		Thuricide 32B
	Ontario	ammonium nitrate
		BAY SIR 8514
		carbofuran
		CPV
		Cygon
		Dipel 88
		Entomopathogenic fungi
		granulosis virus
		Lannate
		Matacil 1.8 OSC
		NPV
		Orthene
		oxydemeton-methyl
		permethrin
		sex pheromone (E)-7-dodecanol
		sex pheromone (E)-11-tetradecanol
		sex pheromone (Z)-11-tetradecanol
		Thuricide 16B
		UC-62644
		ZR-515
	Maine	Dipel 4L
		Thuricide 16B
1981	New Brunswick	Matacil (1.8F)
	Quebec	Futura 32B
		Futura 64B

Year	Province/State	Insecticide
		Thuricide 32B
	Ontario	BAY SIR 8514
		Dimilin
		Dipel 88
		EL-413
		NPV
		PH-60-43
		PH-60-44
		Thuricide 32B
		UC-62644
		UC-70676
		UC-70680
	Manitoba	Cygon 2E
		Orthene
	British Columbia	NPV
		pheromone
1982	New Brunswick	Bactospeine
		Dipel 88
		fenitrothion
		Matacil
		Matacil (F)
		Novabac-3
		Sunspray 6N oil
	Quebec	Futura
		Futura II
		Matacil
	Ontario	Bt
		Dimilin WP25
		fenitrothion
		Lecontvirus
		Thuricide 48B
	British Columbia	granulosis virus
		NPV
		parasites
	Michigan	Bt
1983	Quebec	Dipel 88
		fenitrothion
		Futura
		Futura II
		Matacil
		Novabac
		NPV
	Ontario	Ambush 500 EC
		Bactospeine
		Dipel 6L
		Dipel 8L
		Dipel 88
		Entomogenous fungi
		fenitrothion
		N. fumiferanae
		Orthene
		permethrin
		Sumithion (F20)
		T. minutum
	British Columbia	NPV
1984	New Brunswick	Ambush
		Matacil
		Sumithion (F20)
		T. minutum
		Zectran (DB)
	Quebec	Dipel 132
		Dipel 176
		Futura
		Matacil
		SAN 415
		Thuricide
		Thuricide 64B
	Ontario	*T. minutum*
	Pacific Northwest (U.S.)	Bt
1985	Newfoundland	Dimilin
		Dipel 132
		Futura 48LV
		Matacil (180F)
		Sumithion
		Thuricide 48LV
		Thuricide 64B
	New Brunswick	Dipel 132
		Dipel 176

Year	Province/State	Insecticide
		Futura XLV
		Matacil (180F)
		SAN 415
		Sumithion (F20)
		Thuricide 32LV
		Thuricide 48LV
		Thuricide 64B
		T. minutum
		Zectran
	Nova Scotia	diazinon 50EC
	Quebec	Biobit 64
		Dipel 176
		Futura
		Futura XLV
		SAN 415
		Thuricide 48LV
		Thuricide 64B
	Ontario	Futura XLV
		Lecontvirus
		Matacil (180F)
		NPV
		Sumithion (F20)
	British Columbia	*A. flaveolatum*
		C. albians
		pyrethrin
1986	Newfoundland	Dimilin
		Sumithion
	Quebec	BASF 153-100-50 WP
		diflubenzuron 25WP
		HOE-00522-20
	Ontario	Gypchek
		NPV
		SAN 415
		T. minutum
	Maine	Dipel 8L
		Dipel 8AF
		Dipel 12L
		Thuricide 32LV
		Thuricide 64LV
		SAN 415
1987	Newfoundland	diflubenzuron
		Dimilin
		Dipel 132
		Dipel 176
		Dipel 264
		fenitrothion
		Futura XLV
		Thuricide 48LV
		Virtuss
	Quebec	diflubenzuron
		Teflubenzuron
	Ontario	diflubenzuron
		Dimilin
		Dimilin WP25
		Dipel 8AF
		Dipel 8L
		Dipel 12L
		Dipel 176
		Futura XLV
		Thuricide 48LV
1988	Newfoundland	Dimilin ODC-45
		Dipel 176
		Dipel 264
		Futura XLV
	New Brunswick	Dipel 12L
	Quebec	Dimilin
		Dimilin ODC-45
		Dimilin WP25
		Pounce
	Ontario	Dimilin ODC-45
		Dimilin SC-48
		Dimilin WP25
		Dipel 8AF
		Dipel 12L
		Dipel 16L
		Dipel 64AF
		Disparvirus
		Futura XLV
		Futura XLV-HP

Year	Province/State	Insecticide
1989	Quebec	Ambush 500 EC
		C.I.L. E2492
		Condor AF
		Dipel 96AF
		Dipel 264
		Dipel 352
		Foray 48B
		Pounce EC
	Ontario	C.I.L. E2492
		Condor AF
		Condor OF
		Dimilin ODC-45
		Dimilin WP25
		Dipel 96AF
		Dipel 352
		Disparvirus
		Futura HP
		Futura "O"
		Sertifervirus
	British Columbia	Dipel 176
		Dipel 264
	Maine	Dimilin W-25
	Other States	Foray 48B
		Sevin 4-oil
1990	Newfoundland	Dipel 176
		Futura XLV
	Quebec	Dimilin
		Dipel 352
		Foray 75B
	Ontario	Dimilin
		Disparvirus
		Gypchek
		methoxychlor
		permethrin
	British Columbia	Bt
		Deltamethrin
		Dipel 176
		Foray 48B
		Futura XLV-HP
	Maine	Dimilin

E. Aircraft used

I. Operational applications

Fixed-wing

AgCat (450 h.p.)
AgCat (600 h.p.)
Air Tractor
Aerostar
Ayres Bull Thrush
Ayres Turbo Thrush
B-17
Baron Beechcraft
Beaver
Boeing Stearman
Brave
Bull Thrush
C-46
C-54
Canso Model A
Cessna
Cessna 31
Cessna 172
Cessna 180
Cessna 182
Cessna 185
Cessna 188
Cessna 188D
Cessna 310
Cessna 336
Cessna 337
Cessna T50
Cessna Cardinal
Cessna Skymaster
CL-215
Commander 690A
Constellation
Constellation L-749
Dakota
DC-3
DC-4
DC-4G
DC-6
DC-6B
DC-7B
Douglas DC-4
Douglas DC-6
Dromadier
Dromadier M-18
Grumman AgCat
Grumman Avenger
M-18
Pilatus Porter
Piper Aerostar 601P
Piper Cub
Piper J3
Piper Pawnee
Piper Pawnee 235B
Piper Seneca
Piper Supercub
PV-2
Piston Thrush
Republic Seabee
Shrike Commander
S-2-D Snow Commander
Standard Thrush
Stearman
Stearman Avenger
Super AgCat
Super Constellation L-1049
TBM
TBM-3
Thrush 800
Thrush Commander
Turbo Commander
Turbo Thrush

Rotary-wing

A-Star
Bell G2
Bell G4
Bell G5
Bell 47
Bell 47G-2
Bell 47G-5
Bell 64A
Bell 205
Bell 206
Bell Jet Ranger 206B
Bell Jet Ranger 212
Hiller 12E
Hughes 300
Hughes 300C
Hughes 500
Hughes 500C
Hughes 500S
Sikorsky S55

II. Research applications

Fixed-wing

AgCat
Ayres Thrush
Ayres Turbo Thrush
B-17
Balanca Scout
Beaver
Brave
C-46
Cessna 180
Cessna 185
Cessna 185E
Cessna 185 Skywagon
Cessna A188
Cessna 188C
Cessna AgTruck
Cessna 188 (AgWagon)
Cessna Pawnee
Cessna T50
CL-215
Constellation L-749
Constellation L-1049
Dakota
DC-4
DC-4G
DC-6
DC-6B
DC-7
DC-7B
4-engine
Grumman AgCat
Grumman Avenger
M-18
Piper Brave
Piper Cub
Piper Pawnee
Piper Pawnee 235
Piper Pawnee 235B
Piper Supercub (PA18)
PV-2
S-2-D Snow Commander
Stearman
TBM
TBM-3
Thrush
Thrush Commander

Rotary-wing

Bell
Bell 47
Bell 47G
Bell 47G-5
Bell 206
Bell G2-A
Hiller 12E
Hughes 269C
Hughes 300
Hughes 500

F. Contacts

I. Federal establishments

FIDS Head
Newfoundland and Labrador Region
Forestry Canada
Building 304, Pleasantville
St. John's, Newfoundland
A1C 5X8

Tel: (709) 772-4683
Fax: (709) 772-2576

FIDS Head
Maritimes Region
Forestry Canada
P.O. Box 4000, College Hill
Hugh John Flemming Forestry Centre
Fredericton, New Brunswick
E3B 5P7

Tel: (506) 452-3500
Fax: (506) 452-3525

FIDS Head
Quebec Region
Forestry Canada
P.O. Box 3800, 1055 rue du P.E.P.S.
Ste-Foy, Quebec
G1V 4C7

Tel: (418) 648-3957
Fax: (418) 648-5849

FIDS Head
Ontario Region
Forestry Canada
P.O. Box 149, 1215 Queen St. East
Sault Ste. Marie, Ontario
P6A 5M7

Tel: (705) 949-9461
Fax: (705) 759-5700

FIDS Head
Northwest Region
Forestry Canada
5320-122nd Street
Edmonton, Alberta
T6H 3S5

Tel: (403) 435-7210
Fax: (403) 435-7359

FIDS Head
Pacific and Yukon Region
Forestry Canada
506 West Burnside Road
Victoria, British Columbia
V8Z 1M5

Tel: (604) 363-0600
Fax: (604) 363-0775

II. Provincial establishments

Department of Forestry and Agriculture
P.O. Box 2006, Herald Building
Corner Brook, Newfoundland
A2H 6J8

Tel: (709) 637-2424
Fax: (709) 637-2403

Entomological Services
N.S. Department of Natural Resources
P.O. Box 68
Truro, Nova Scotia
B2N 5B8

Tel: (902) 893-5660
Fax: (902) 893-6102

Forest Pest Management
Department of Natural Resources
P.O. Box 6000, Hugh John Flemming Centre
Fredericton, New Brunswick
E3B 5H1

Tel: (506) 453-2516
Fax: (506) 453-6689

Ministère des Forêts
Service de la protection contre
les insectes et les maladies
Édifice de l'Atrium - 5700, 4e avenue Ouest
Charlesbourg (QC)
G1H 6R1

Tel: (418) 643-4670
Fax: (418) 643-2368

Forest Health Protection
Ontario Ministry of Natural Resources
1235 Queen Street East - Box 969
Sault Ste. Marie, Ontario
P6A 5N5

Tel: (705) 946-2981
Fax: (705) 946-2112

Forest Protection
Manitoba Natural Resources
300-530 Kenaston Blvd.
Winnipeg, Manitoba
R3N 1Z4

Tel: (204) 945-7989
Fax: (204) 489-1360

Forestry Division
Saskatchewan Parks and Renewable
Resources
Box 3003, 1288 Central Avenue
Prince Albert, Saskatchewan
S6V 6G1

Tel: (306) 953-2437

Insect and Disease Program
Provincial Forest Fire Centre
10725-120th Avenue
P.O. Box 7040 - Station M
Edmonton, Alberta
T5G 0S8

Tel: (403) 427-6807
Fax: (403) 479-2270

III. U.S. establishments

Director of Operations Budworm
Maine Forest Service
State House Station No. 22
Augusta, Maine 04333
USA

Tel: (207) 289-2791

U.S. Forest Service
State and Private Forestry
5 Radnor Corporate Center
100 Matsonford Road, Suite 200
P.O. Box 6775
Radnor, Pennsylvannia 19087
USA

G. Conversion tables and glossary

I. Area

1 acre = 0.405 hectares
1 square mile = 640 acres

1 hectare = 2.471 acres
1 square kilometre = 0.39 square miles

II. Dry and fluid measure

1 oz/ac = 70 g/ha
1 lb/ac = 1.12 kg/ha
1 fl oz/ac (U.K.) = 0.073 L/ha
1 fl oz/ac (U.S.) = 0.07 L/ha
1 gallon/ac (U.K.) = 11.23 L/ha
1 gallon/ac (U.S.) = 9.35 L/ha

1 L/ha = 14.25 fl oz/ac (U.K.)
1 L/ha = 13.68 fl oz/ac (U.S.)
1 L/ha = 0.107 gal/ac (U.S.)

1 g/ha = 0.0143 oz/ac
1 kg/ha = 0.89 lb/ac = 14.3 oz/ac

1 BIU/ac = 2.471 BIU/ha
1 BIU/ha = 0.405 BIU/ac

Sources: *Metric Practice Guide.* Canadian Standards Association. 1973. *Measure for Measure.* P.J. Rennie. Canada Department of Forestry and Rural Development. Publication no. 1195. 1967.

III. Glossary

BIU	billion international units
CPV	cytoplasmic polyhedrosis virus
EPV	entomopox virus
NPV	nuclear polyhedrosis virus
PIB	polyhedral inclusion bodies
WP	wettable powder
(I) or (U.K.)	Imperial measure