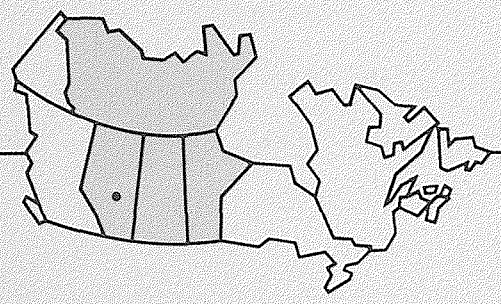
Environment Canada
Canadian Forestry Service

Environnement Canada
Service canadien des forêts

Silviculture statistics for Canada, 1975-80

L.G. Brace and P.J. Golec
Northern Forest Research Centre



NOR-X-245

FORSTATS

Canada

SILVICULTURE STATISTICS FOR CANADA

1975-80

L.G. BRACE AND P.J. GOLEC

INFORMATION REPORT NOR-X-245

NORTHERN FOREST RESEARCH CENTRE
CANADIAN FORESTRY SERVICE
ENVIRONMENT CANADA
1982

Catalogue No. FO46-12/245E
ISBN 0-662-12249-6
ISSN 0704-7673

This publication is available at no charge from:

Northern Forest Research Centre
Canadian Forestry Service
Environment Canada
5320 - 122 Street
Edmonton, Alberta, Canada
T6H 3S5

Brace, L.G. and P.J. Golec. 1982. Silviculture statistics for Canada, 1975-80. Environ. Can., Can. For. Serv., North For. Res. Cent. Edmonton, Alberta. Inf. Rep. NOR-X-245.

ABSTRACT

Silviculture activities including site preparation, planting, seeding, stand tending, and pest control are summarized for each province and territory and for Canada for 1975-80. The level of silvicultural activity is discussed in relation to the harvesting rate and the productive forest land base. It is concluded that the levels of site preparation, planting, and seeding in Canada are inadequate if a policy of sustained yield management is assumed and that the practice of stand tending is still minimal in Canada as a whole.

RÉSUMÉ

Le présent ouvrage donne un résumé des activités de sylviculture pour chaque province et territoire ainsi que pour le Canada, notamment en ce qui concerne l'aménagement des sites, la plantation, l'ensemencement, l'entretien des peuplements et la lutte contre les ravageurs, pour la période allant de 1975 à 1980. On y étudie le niveau d'activités de sylviculture par rapport au taux de récolte et à la superficie forestière productive. On en conclut que l'aménagement des sites, la plantation et l'ensemencement sont insuffisants au Canada, surtout si l'on adopte une politique d'aménagement avec production soutenue, et que l'entretien des peuplements est, dans l'ensemble, une pratique encore peu répandue au Canada.

FOREWORD

The FORSTATS (FORestry STATisticS) program provides current statistical information on Canada's forest resources, including periodic descriptions and analyses of forest inventory and growth; insect, disease, and fire losses; nursery production and silvicultural practice; and social and economic conditions.

FORSTATS involves the direct participation of the Canadian Forestry Service Headquarters in Ottawa, the Forestry Statistics and Systems Branch located at Petawawa, Ont., Pacific Forest Research Centre in Victoria, B.C., Northern Forest Research Centre in Edmonton, Alberta, Great Lakes Forest Research Centre in Sault Ste. Marie, Ont., Laurentian Forest Research Centre in Ste. Foy, Quebec, Maritimes Forest Research Centre in Fredericton, N.B., Newfoundland Forest Research Centre in St. John's, Nfld., Petawawa National Forestry Institute in Petawawa, Ont., and Forest Pest Management Institute in Sault Ste. Marie, Ont. Provincial forestry agencies, other provincial and federal agencies, and the forest industry cooperate in providing data for the program.

CONTENTS

FIGURE

TABLES

INTRODUCTION

Timber shortages have recently been cited as a major issue facing forestry in Canada (Forest Sector Strategy Committee 1981). Information on timber depletion presented to the Canadian Forestry Congress in 1980 (Canadian Pulp and Paper Association) indicated that inadequate regeneration, fire, insects, diseases, restrictive guidelines on forest harvesting, and zoning of timber land for other uses were resulting in a 15% reduction in the annual allowable softwood cut for Canada. There is now a consensus among governmental, industrial, and labor segments of the forestry community that a greater effort is needed to renew and protect Canada's forest resources (Canadian Forestry Association 1977; Canadian Pulp and Paper Association 1980; Reed 1978; Thompson 1981).

Silviculture can play a key role in forest management initiatives aimed at increasing timber supplies, particularly through site preparation, reforestation, and stand tending programs such as thinning and fertilization. The potential gain from such practices is estimated to be 50-100% of current timber supplies (Forest Sector Strategy Committee 1981).

The practice of silviculture in Canada is a provincial responsibility. The federal role, coordinated by the Canadian Forestry Service (CFS), is supportive through silviculture research, financial assistance for reforestation, stand tending, and pest control programs under specific federal-provincial agreements and through the collection and reporting of national statistics under the CFS FORSTATS (FORestry STATisticS) program.

This is the first CFS report of silviculture statistics on a national basis. It covers all silviculture practiced in Canada by governments and industry during 1975-80. The main objective is to provide a broad perspective on silvicultural practice, a key determinant of the status of Canada's forest resources. The data should be particularly useful in formulating policies and planning priorities for silviculture at all levels of forest administration in Canada. Information collected has been stored on a computer system at the Northern Forest Research Centre (NoFRC).

METHODS

Data Collection

The silviculture data survey was initiated in the fall of 1981 using a questionnaire designed by members of the CFS Regional Committee on Forestry Statistics. The committee is composed of members from CFS Headquarters, the Forestry Statistics and Systems Branch, each of the six regional research centers, and the Petawawa National Forestry Institute. The questions were designed to obtain data at a level of detail that is not currently available in every province or territory but is expected to be available during future surveys, when there will be more silviculture data collected by resource managing agencies and when such data are more accessible through automated record systems. The questionnaire (Appendix 1) was distributed to each provincial agency in Canada, completed, and returned to NoFRC.

Data Analysis

The data were initially reviewed for completeness and consistency of reporting. This revealed a need for further standardization of definitions to accommodate local terms such as site reclamation. There were also many data gaps

because of a lack of silvicultural activity and the inaccessibility of records. Estimates were made by each province or territory to fill data gaps where possible, and inconsistencies or unusual data were identified. Standardized summaries were prepared by province and territory, and national overview summaries were made. A draft report was reviewed by each province and territory. The data were then revised, and analysis was completed.

Analysis focused on Canada-wide summary tables with detailed reference to individual provinces or territories where data warranted. Data from government agencies and industry were grouped for analysis. Detailed data for each province and territory are provided in Appendix 2.

RESULTS AND DISCUSSION

Most of the productive forest land in Canada is found from Quebec westward, with Quebec, British Columbia, and Ontario having the most (Fig. 1). In terms of productive forest land as a percentage of total land area, New Brunswick ranks highest with 86% and is followed by Quebec with 63% and British Columbia and Nova Scotia each with 55%.

Harvesting

The harvesting methods reported include clear-cutting and seed tree, shelterwood, and selection cutting. Clear-cutting accounted for 84.3% of all harvesting reported. Significant amounts of cutting by other methods occurred in Ontario (where 40.7% was shelterwood, seed tree, and selection cutting), Quebec (where 22.5% of cutting was by other means not specified), and British Columbia (where there was 18.1% selection cutting). The total area harvested in Canada over the reporting period gradually increased from 678 886 to 871 728 ha, an increase of 28% (Table 1). The average yearly harvest was 759 438 ha. Quebec, Ontario, British Columbia, and New Brunswick were highest in average area harvested. The most rapid relative rate of harvest took place in New Brunswick and Nova Scotia, where 1.49% and 1.02% of the productive forest land was being cut over each year. These two provinces, along with Prince Edward Island and Newfoundland, are currently reporting timber supply deficits, partly due to spruce budworm infestations. Other provinces such as Quebec, Ontario, and British Columbia foresee or are experiencing local supply problems (Forest Sector Strategy Committee 1981).

Site Preparation

Site preparation is practiced to obtain natural regeneration or to improve the survival and growth of planted seedlings. Methods of preparation reported in the survey indicate 61.4% scarification (which was the most common technique reported across Canada), 29.9% prescribed burning (mainly in British Columbia), and 8.7% other treatments (which include lop and scatter, crushing, windrowing, and herbicide application). There was no consistent trend in area of site preparation in Canada during 1976-80 (Table 2). The relatively large average increase in 1979-80 was due primarily to the increase in British Columbia. In terms of total area treated, British Columbia, Ontario, Alberta, New Brunswick, and Quebec were most active. In the reporting period, an average of 165 916 ha was treated in Canada, 21.8% of the average harvest area.

In terms of site preparation as a percentage of area harvested, Alberta, British Columbia, Manitoba, Ontario, Saskatchewan, and New Brunswick were most active, with Alberta reaching a high of 88% in 1977-78 (Table 3).

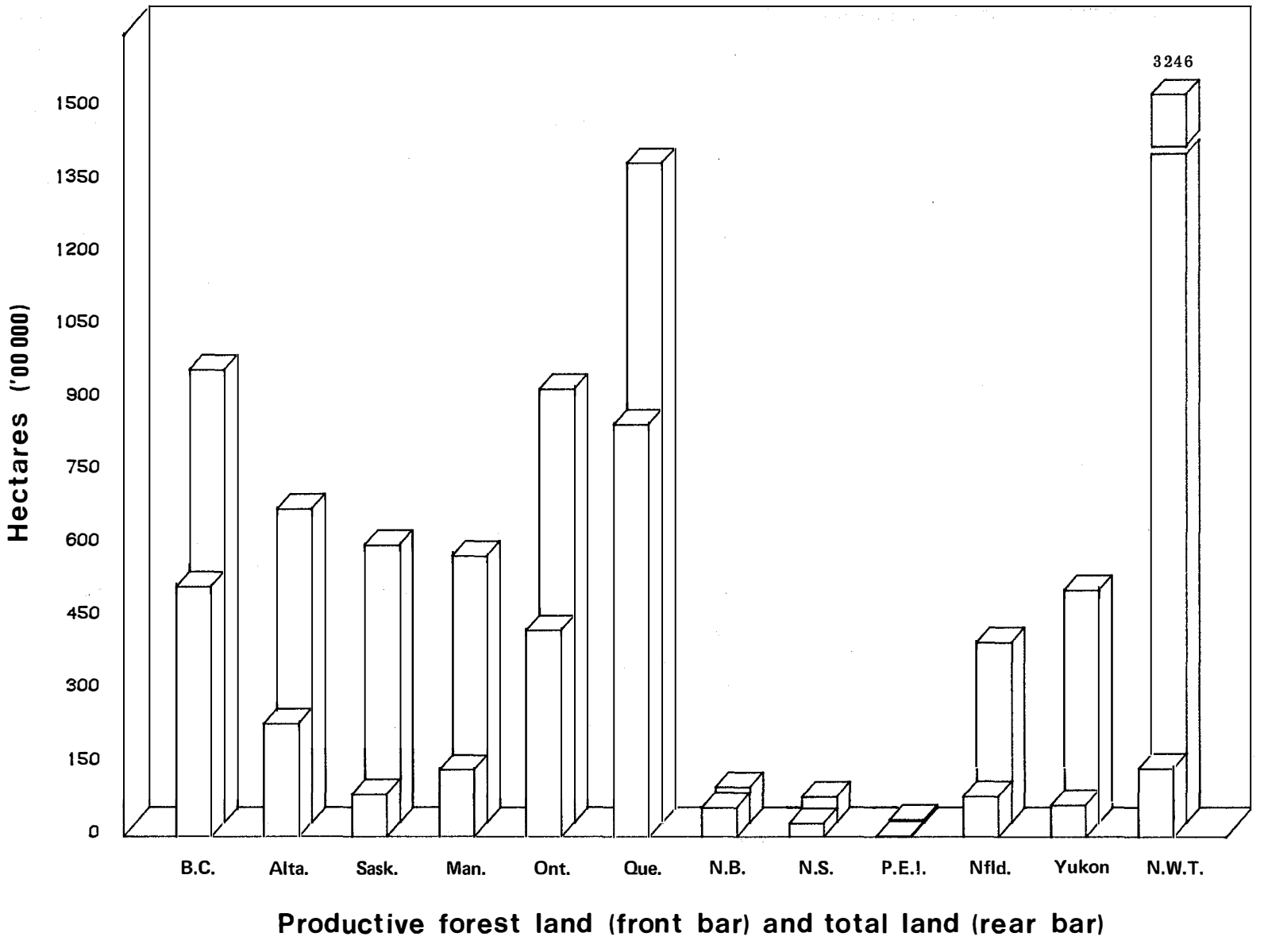


Figure 1. Total and productive forest land by province and territory

Table 1. Area harvested

Province	Area harvested (ha)						Area of productive forest land[1] ('000 ha)
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average	
British Columbia	156 976	175 952	166 081	196 533	187 547	176 618	51 500
Alberta	20 256	19 060	21 450	22 103	24 689	21 512	23 400
Saskatchewan	13 814	9 727	14 231	14 909	20 396	14 615	8 900
Manitoba	(15 700)[2]	(17 000)	(18 000)	(20 000)	(24 600)	(19 060)	13 900
Ontario	196 760	156 721	187 993	194 998	218 578	191 010	42 600
Quebec	135 094	181 737	193 295	226 127	241 826	195 616	84 900
New Brunswick	(94 400)	(92 800)	(86 500)	(89 200)	(100 000)	(92 580)	6 200
Nova Scotia	27 260	26 285	28 335	32 120	33 703	29 541	2 900
Prince Edward Island	1 600	1 600	1 600	1 600	1 780	1 636	300
Newfoundland	(15 700)	(14 700)	(14 300)	(17 600)	(17 700)	(16 000)	8 500
Yukon Territory	620	560	747	935	280	628	6 700
Northwest Territories	706	396	688	693	629	622	14 200
Canada	678 886	696 538	733 220	816 818	871 728	759 438	264 000

[1] From Bonnor (1982).
[2] Numbers in brackets are estimates.

Table 2. Area of site preparation

Province	Area of site preparation (ha)					
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average
British Columbia	77 749	80 406	52 652	57 297	81 544	69 930
Alberta	15 822	14 944	18 905	18 635	14 536	16 568
Saskatchewan	2 267	5 717	3 905	6 334	6 951	5 035
Manitoba	3 965	4 038	4 080	4 443	4 356	4 176
Ontario	45 231	39 157	47 962	48 707	53 390	46 889
Quebec	3 008	2 570	7 555	9 539	14 769	7 488
New Brunswick	10 100	11 000	13 900	16 000	18 500	13 900
Nova Scotia	595	634	850	2 608	2 255	1 388
Prince Edward Island	0	48	0	16	566	126
Newfoundland	0	0	28	320	1 508	371
Yukon Territory	0	0	0	0	224	45
Northwest Territories	0	0	0	0	0	0
Canada	158 737	158 514	149 837	163 899	198 599	165 916

Table 3. Area of site preparation as a percentage of area harvested

Province	% site preparation					
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average
British Columbia	49.5	45.7	31.7	29.2	43.5	39.6
Alberta	78.1	78.4	88.1	84.3	58.9	77.0
Saskatchewan	16.4	58.8	27.4	42.5	34.1	34.5
Manitoba	(25.2)[1]	(23.8)	(22.7)	(22.2)	(17.7)	(21.9)
Ontario	23.0	25.0	25.5	25.0	24.4	24.5
Quebec	2.2	1.4	3.9	4.2	6.1	3.8
New Brunswick	(10.7)	(11.9)	(16.1)	(17.9)	(18.5)	(15.0)
Nova Scotia	2.2	2.4	3.0	8.1	6.7	4.7
Prince Edward Island	0.0	3.0	0.0	1.0	31.8	7.7
Newfoundland	0.0	0.0	(0.2)	(1.8)	(8.5)	(2.3)
Yukon Territory	0.0	0.0	0.0	0.0	80.0	7.2
Northwest Territories	0.0	0.0	0.0	0.0	0.0	0.0
Canada	23.4	22.8	20.4	20.0	22.8	21.8

[1] Numbers in brackets are estimates.

Planting, Seeding, and Natural Regeneration

Over 90% of the reported forest tree planting in Canada was done manually in the period surveyed. Machine planting was reported only by Saskatchewan, with a 5-year total of 3 116 ha, and by Manitoba, which reported 80 ha in 5 years.

Bare-root planting was predominant in the reporting period, averaging 73.7% of area planted and 76.9% of number of seedlings planted. Containers accounted for the rest. Both types of planting increased substantially (10.8%) over the reporting period, but the total was variable from year to year for most reporting agencies (Table 4). New Brunswick showed the most consistent upward trend. The major planting activity occurred in British Columbia, Ontario, Quebec, and New Brunswick.

Area planted as a percentage of area harvested was highest in the three western provinces (Table 5). The average total area planted in Canada was 128 662 ha, 16.9% of the average total harvest area for 1975-80. No definitive data on actual survival and growth performance of forest plantations in Canada were available.

Direct seeding in Canada has been reviewed for 1900-72 by Waldron (1973), who found that the method had proved unreliable except for jack pine (*Pinus banksiana* Lamb.), and he suggested that there was a need for improved operational techniques to increase success. In 1973, approximately 17 000 ha were direct-seeded in Canada, about 1.4% of the area planted that year. During 1975-80, direct seeding averaged 37 434 ha, about 29.1% of the average area planted in the same period (Table 6), so there was a substantial increase in both amount and percentage of direct seeding over 1973. The technique was practiced mainly in Ontario, Alberta, and Quebec, which reported an average of 25 435, 6 400, and 4 665 ha, respectively, during 1975-80; minor amounts were reported for Manitoba and New Brunwick. No clear trend in area seeded was evident. On the average, direct seeding accounted for 4.9% of the area harvested in Canada in 1975-80 (Table 7). There was no statistical evidence of the current reliability of direct seeding as a reforestation technique.

Natural regeneration is still relied upon to provide a large percentage of the regeneration in Canada. Only two provinces provided data on natural regeneration. Manitoba reported 21% and Ontario 28% of harvested area naturally regenerated. Alberta estimated 20% and Saskatchewan estimated 30%. Estimates reported in 1970 (Canadian Pulp and Paper Association 1970) were Manitoba 50%, Ontario 50%, Alberta 70%, and Saskatchewan 45%, with a 67% average for Canada. A downward revision of natural regeneration figures is evident, and a 30% average for Canada may currently be realistic.

Stand Tending

Stand tending practices such as fertilizing, thinning, pruning, and weeding provide opportunities to increase wood production or wood quality over relatively short periods. Stand tending was reported by nine provinces, with Ontario and British Columbia accounting for an average of 91.7% of the activity during 1975-80 (Table 8). The most significant operations reported were thinning, fertilizing, and mechanical weeding in British Columbia and thinning, chemical cleaning, and manual cleaning in Ontario. There appears to be a trend to increased stand tending, particularly in British Columbia and Nova Scotia. The area of stand tending as a percentage of total productive forest land area (Table 9) illustrates the relatively minor role of these intensive forestry practices during 1975-80. If the potential of stand tending to relieve wood shortages is to be realized, there must be a significant increase in area treated, and the results must be documented so that actual allowable cut effects can be determined.

Table 4. Area planted

Province	Area planted (ha)					
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average
British Columbia	63 038	60 161	55 741	58 269	63 676	60 177
Alberta	6 016	4 799	5 484	7 145	8 264	6 342
Saskatchewan	3 554	4 439	6 231	6 591	5 683	5 300
Manitoba	1 116	1 046	832	1 220	570	957
Ontario	30 050	26 170	26 507	27 549	30 830	28 221
Quebec	15 905	15 329	16 544	14 079	14 062	15 184
New Brunswick	6 675	8 050	9 607	10 700	15 700	10 146
Nova Scotia	1 425	1 230	2 331	3 290	2 676	2 190
Prince Edward Island	120	120	120	94	84	108
Newfoundland	0	0	0	0	184	37
Yukon Territory	0	0	0	0	0	0
Northwest Territories	0	0	0	0	0	0
Canada	127 899	121 344	123 397	128 937	141 729	128 662

Table 5. Area planted as a percentage of area harvested

Province	% area planted					
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average
British Columbia	40.2	34.2	33.6	29.6	34.0	34.1
Alberta	29.7	25.2	25.6	32.3	33.5	29.5
Saskatchewan	25.7	45.6	43.8	44.2	27.9	36.3
Manitoba	(7.1)[1]	(6.2)	(4.6)	(6.1)	(2.3)	(5.0)
Ontario	15.3	16.7	14.1	14.1	14.1	14.8
Quebec	11.8	8.4	8.6	6.2	5.8	7.8
New Brunswick	(7.1)	(8.7)	(11.1)	(12.0)	(15.7)	(11.0)
Nova Scotia	5.2	4.7	8.2	10.2	7.9	7.4
Prince Edward Island	7.5	7.5	7.5	5.9	4.7	6.6
Newfoundland	0.0	0.0	0.0	0.0	(1.0)	(0.2)
Yukon Territory	0.0	0.0	0.0	0.0	0.0	0.0
Northwest Territories	0.0	0.0	0.0	0.0	0.0	0.0
Canada	18.8	17.4	16.8	15.8	16.3	16.9

[1] Numbers in brackets are estimates.

Table 6. Area of direct seeding

Province	Area of direct seeding (ha)					
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average
British Columbia	0	0	0	0	0	0
Alberta	7 906	6 470	7 668	5 416	4 539	6 400
Saskatchewan	0	0	0	0	0	0
Manitoba	223	199	61	126	2 774	677
Ontario	23 510	27 039	28 791	23 582	24 251	25 435
Quebec	5 693	1 810	3 373	5 703	6 744	4 665
New Brunswick	125	550	393	0	0	214
Nova Scotia	0	10	1	127	77	43
Prince Edward Island	0	0	0	0	0	0
Newfoundland	0	0	0	0	0	0
Yukon Territory	0	0	0	0	0	0
Northwest Territories	0	0	0	0	0	0
Canada	37 457	36 078	40 287	34 954	38 385	37 434

Table 7. Area of direct seeding as a percentage of area harvested

Province	% area direct seeded					
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average
British Columbia	0.0	0.0	0.0	0.0	0.0	0.0
Alberta	39.0	33.9	35.7	24.5	18.4	29.8
Saskatchewan	0.0	0.0	0.0	0.0	0.0	0.0
Manitoba	(0.1)[1]	(1.2)	(0.0)	(0.6)	(11.3)	(3.6)
Ontario	11.9	17.3	15.3	12.1	11.1	13.3
Quebec	4.2	1.0	1.7	2.5	2.8	2.4
New Brunswick	(0.1)	(0.6)	(0.5)	0.0	0.0	(0.2)
Nova Scotia	0.0	0.0	0.0	0.4	0.2	0.1
Prince Edward Island	0.0	0.0	0.0	0.0	0.0	0.0
Newfoundland	0.0	0.0	0.0	0.0	0.0	0.0
Yukon Territory	0.0	0.0	0.0	0.0	0.0	0.0
Northwest Territories	0.0	0.0	0.0	0.0	0.0	0.0
Canada	5.5	5.2	5.5	4.3	4.4	4.9

[1] Numbers in brackets are estimates.

Table 8. Area of all methods of stand tending [1]

Province	Area stand tending (ha)					
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average
British Columbia	1 841	9 733	23 435	26 586	33 279	18 975
Alberta [2]	143	906	123	152	272	319
Saskatchewan [3]	0	0	0	0	142	28
Manitoba	562	377	558	624	220	468
Ontario	33 277	38 324	52 850	48 269	39 228	42 390
Quebec [4]	-	-	-	-	-	-
New Brunswick	0	0	0	0	3 322	664
Nova Scotia	1 334	1 625	2 146	2 504	4 551	2 432
Prince Edward Island [2]	0	0	0	0	20	4
Newfoundland	251	236	2 340	2 327	2 790	1 589
Yukon Territory	0	0	0	0	0	0
Northwest Territories	0	0	0	0	0	0
Canada	37 408	51 201	81 452	80 462	83 824	66 869

[1] Detailed information in Appendix 2.
[2] Thinning only.
[3] Mechanical weeding only.
[4] Information not available.

Table 9. Area of stand tending as a percentage of productive forest area

Province	% area stand tending					
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average
British Columbia	0.00	0.02	0.05	0.05	0.06	0.04
Alberta	0.00	0.00	0.00	0.00	0.00	0.00
Saskatchewan	0.00	0.00	0.00	0.00	0.00	0.00
Manitoba	0.00	0.00	0.00	0.00	0.00	0.00
Ontario	0.08	0.09	0.12	0.11	0.09	0.10
Quebec [1]	-	-	-	-	-	-
New Brunswick	0.00	0.00	0.00	0.00	0.05	0.01
Nova Scotia	0.05	0.06	0.07	0.09	0.16	0.08
Prince Edward Island	0.00	0.00	0.00	0.00	0.00	0.00
Newfoundland	0.00	0.00	0.03	0.03	0.03	0.02
Yukon Territory	0.00	0.00	0.00	0.00	0.00	0.00
Northwest Territories	0.00	0.00	0.00	0.00	0.00	0.00
Canada	0.01	0.02	0.03	0.03	0.03	0.03

[1] Information not available.

Pest Control

Pest control is summarized separately from other stand tending operations (Table 10). Pest control activities were reported by six provinces: British Columbia reported mainly mistletoe control and Ontario, Quebec, New Brunswick, Nova Scotia, and Newfoundland reported mainly spruce budworm control. The New Brunswick and Quebec figures are by far the most significant in terms of area treated. In New Brunswick an average of 36.8% of the productive forest land was treated each year. Pest control statistics reflect response to pest buildup and persistence and can be expected to vary accordingly. New outbreaks, such as the recent mountain pine beetle infestation in western Canada, can be expected to cause major changes in statistics in the future.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The data presented in this report, however preliminary, are particularly clear regarding the degree to which current harvest areas are being reforested. On the average, area harvested increased 28%, area of site preparation increased 25%, area planted increased 10.8%, and area seeded increased 2.5% during 1975-80. During this time, the area of site preparation averaged 21.8%, the area planted averaged 16.9%, and the area seeded averaged 4.9% of the area harvested. Areas with stand tending as a percentage increased by 124% during 1975-80, indicating a movement toward more intensive management; however, such treatments are still of minor significance in Canada as a whole. The most notable pest control activity was spruce budworm spraying, particularly in New Brunswick and Quebec.

The adequacy of any forest management practice, including silviculture, must be judged by the responsible management agencies in each province and territory in Canada. If a policy of sustained yield management is assumed, with a goal of prompt regeneration of current cutover lands, even ignoring all other sources of depletion such as fire, insects, and diseases, the current reforestation effort in Canada is inadequate. Areas planted and seeded together account for 21.8% of average area cut over. If these are assumed to be 100% successful and 30% is added to allow for natural regeneration, just over 50% of the current harvest area is being regenerated, and the already considerable nonsatisfactorily restocked (NSR) backlog (Bonnor 1982) continues to grow.

Silviculture data for Canada should be collected on an annual basis. As contributing agencies modernize their record-keeping systems, the amount of data estimation will decline and the data on record will increase to a point where more meaningful analysis is possible. Definitions used in silviculture reporting should be further refined. More detailed recording is needed to determine the extent to which site preparation is done for purposes of natural regeneration, seeding, and planting, to separate out the effects of repeated treatments, and to document in more detail the survival and growth performance of planted and seeded areas and the success of all stand tending and pest control practices. Detailed information should be collected by species or major species groups. A major assessment of silviculture data in Canada should be undertaken when 10 years of records are available, at which time trends of significance to the analysis of silvicultural practices should be more evident.

Table 10. Area of pest control

Province	Area pest control (ha)					
	1975-76	1976-77	1977-78	1978-79	1979-80	5-year average
British Columbia[1]	1 785	2 667	2 384	2 908	2 287	2 406
Alberta	0	0	0	0	0	0
Saskatchewan	0	0	0	0	0	0
Manitoba	0	0	0	0	0	0
Ontario	14 167	41 060	10 522	4 085	22 702	18 507
Quebec	(2 800 000)[2]	(2 900 000)	(1 400 000)	(1 200 000)	(600 000)	(1 780 000)
New Brunswick	2 695 000	3 881 000	1 682 000	1 554 000	1 598 000	2 282 000
Nova Scotia	0	0	556	25 670	30 752	11 396
Prince Edward Island	0	0	0	0	0	0
Newfoundland	0	0	76 910	376 600	5 870	91 876
Yukon Territory	0	0	0	0	0	0
Northwest Territories	0	0	0	0	0	0
Canada	5 510 952	6 824 727	3 172 372	3 163 263	2 259 611	4 186 185

[1] Mechanical control.
[2] Numbers in brackets are estimates.

ACKNOWLEDGMENTS

The authors wish to thank staff members of each of the provincial and territorial agencies in Canada for their cooperation in providing statistical data used in this report. Our thanks and appreciation are also expressed to each member of the Regional Committee on Forestry Statistics for assistance in obtaining data and reviewing the statistical summaries used in this report.

REFERENCES

Bonnor, G.M. 1982. Canada's forest inventory--1981. Environ. Can., Can. For. Serv., For. Stat. Syst. Branch, Petawawa, Ontario.

Canadian Forestry Association. 1977. Proceedings, National Forest Regeneration Conference, Quebec City, Oct. 19-21, 1977. Canadian Forestry Association, Toronto, Ontario.

Canadian Pulp and Paper Association. 1970. Tree improvement and multiple use task force, 1970. Woodlands Section, Canadian Pulp and Paper Association, Montreal, Quebec.

Canadian Pulp and Paper Association. 1980. Proceedings, Canadian Forestry Congress, Ontario Science Centre, Toronto, Sept. 22-23, 1980. Canadian Pulp and Paper Association, Montreal, Quebec.

Forest Sector Strategy Committee. 1981. A forest sector strategy for Canada. Discussion paper. Environ. Can., Ottawa, Ontario.

Reed, F.L.C. and Associates Ltd. 1978. Forest management in Canada. Vol. 1. A study to improve the basis for policy formulation, planning and practice in intensive forest management. Environ. Can., Can. For. Serv., For. Manage. Inst., Petawawa, Ont. Inf. Rep. FMR-X-102.

Thompson, K.M. (ed.). 1981. An industrial assessment of forestry research in Canada. Vol. I. Forestry research needs of the Canadian industry; Vol. II. Present status and needs of Canadian forest research; Vol. III. Corporate silvicultural activity in Canada. Pulp and Paper Research Institute of Canada, Montreal, Quebec.

Waldron, R.M. 1973. Direct seeding in Canada 1900-1972. Pages 11-27 in Direct seeding symposium, Timmins, Ont., Sept. 11-13, 1973. Environ. Can., Can. For. Serv., Ottawa, Ont. Publ. 1339.

APPENDIXES

The following pages contain additional, detailed information for those who may be interested in more-specific data than were presented in the main part of the report.

1. Silviculture questionnaire 1981

2. Provincial and territorial data, Tables A-O

APPENDIX 1

SILVICULTURE QUESTIONNAIRE 1981

INTRODUCTION

A biennial report on silviculture has been scheduled by the Forestry Statistics and Systems Branch as one element of the Canadian Forest Resource Data Program. The Northern Forest Research Centre has been given the responsibility of coordinating data collection and preparing the silviculture report for 1981.

During the January 20-21 meeting of the Regional Committee on FORSTATS, it was decided that a questionnaire would be used to collect data and one was subsequently prepared at the Northern Forest Research Centre. It was reviewed in detail during and following the May 27-29 meeting of the Regional Committee. Attached is the final amended questionnaire which is now being sent to all Regional Committee members for completion.

Data is being collected for the period from 1975/76 to 1979/80 to provide some historical background. The results will be published in early 1982 and will show short-term trends, and regional differences in silvicultural practices. In order to remain on schedule, it is requested that members return the completed questionnaire no later than October 15, 1981.

GUIDE

I. Site Preparation

A. Administrative unit* - use the appropriate code

B. Year - fill in the last two digits of the year in which the fiscal year ended, ex. for the 1979/80 fiscal year, write "80".

Data is being collected for the past 5 years (1975/76 to 1979/80), if available.

C. Harvesting method - number of hectares in the administrative unit which were cut in various patterns during the fiscal year

1. clearcut
   a) strip
   b) block - regular or irregular shapes
2. shelterwood
   a) strip
   b) uniform
3. seed tree
   a) single
   b) group
4. selection

D. Treatment - number of hectares in the administrative unit which received treatment during the fiscal year.

Fill in areas of single treatment only. Where combination of treatments is common, make a note of the areas, and their treatments at the bottom of the page.

1. prescribed burning - as a means of site preparation only, does not include hazard abatement
2. lop and scatter
3. crushing
4. windrowing
5. scarification
6. herbicide
7. no treatment - area that was harvested during the fiscal year and will not be treated

II. Natural Seeding

A. Administrative unit - use appropriate code

B. Year - end of fiscal year

C. Species - fill in the name of the appropriate species and enter the number of hectares left to regenerate naturally. Include only those areas which are expected to be satisfactorily stocked without supplemental planting or seeding.

III. Direct Seeding

A. Administrative unit - use appropriate code

B. Year - end of fiscal year

C. Pattern - number of hectares in the administrative unit which were seeded during the fiscal year

1. broadcast
2. partial

---

* Throughout this questionnaire, "administrative unit" refers to a general management area within a province. In some cases, an entire province will be treated as one unit. A list of the codes, and the areas they represent, is attached.

D. Method - percentage of area seeded using various types of equipment

1. Manual - seed distributed without the use of motor driven machinery, ex. cyclone seeder is manual

2. Mechanical ground - seed distributed using motor driven machinery on the ground

3. Mechanical aerial - seed distributed by airborne equipment

E. Species - fill in the blank with the name of appropriate species

1. Area - total number of hectares in the administrative unit that was seeded with the species during the fiscal year

2. Application - average application of that species of seed within the area of the administrative unit during the fiscal year

IV. Planting Bareroot

A. Administrative unit - use appropriate code

B. Year - end of fiscal year

C. Planting method

1. Manual - percentage of hectares within the administrative unit which were planted without the use of motor driven planting machinery

2. Mechanical - percentage of hectares within the administrative unit which were planted using motor driven planting machinery

D. Species - fill in blank with appropriate species name

1. Area - number of hectares within the administrative unit which were planted with each species during the year

- includes manual and mechanical planting

2. number of seedlings

3. Age - average age of each species of seedling planted (years in seedbed and transplant bed)

V. Planting Container

A. Administrative unit - use appropriate code

B. Year - end of fiscal year

C. Planting method

1. Manual - percentage of hectares within the administrative unit that were planted without the use of motor driven planting machinery.

2. Mechanical - percentage of hectares within the administrative unit which were planted using motor driven planting machinery.

D. Species - fill in blank with appropriate species name

1. Area - number of hectares within the administrative unit which were planted with each species during the year
- includes manual and mechanical planting

2. Number of seedlings

3. Age - average age of each species of seedling planted (in weeks)

VI. Stand Treatments

Fill in areas of single treatments only. Where combination of treatments is common, make a note of the areas and their treatments at the bottom of the page.

A. Administrative unit - use appropriate code

B. Year - end of fiscal year

C. Major species - fill in the name of each species for which an area within the administrative unit was managed (plantation species, or the most common species in a natural stand)

D. Fertilizing

1. Area - the number of hectares of each species within the administrative unit which were treated with fertilizers

2. Treatment schedule - the age(s) of the major species at the time(s) of treatment (in years)

E. Thinning

1. Area - the number of hectares of each species within the administrative unit which were thinned

2. Treatment schedule - the age(s) of the major species at the time(s) of treatment

F. Pruning

1. Area - the number of hectares of each species within the administrative unit which were pruned

2. Treatment schedule - the age(s) of the major species at the time(s) of treatment

G. Weeding - Mechanical

1. Area - the number of hectares of each species within the administrative unit which were mechanically weeded

2. Treatment schedule - the age(s) of the major species at the time(s) of treatment

H. Weeding - Chemical

1. Area - the number of hectares of each species within the administrative unit which were chemically weeded

2. Treatment schedule - the age(s) of the major species at the time(s) of treatment

I. Pest Control

1. Area - the number of hectares of each species within the administrative unit which were treated for pests

2. Treatment schedule - the age(s) of the major species at the time(s) of treatment

Definitions

Administrative unit - see guide

Broadcast seeding* - the scattering of seed more or less evenly over a whole area on which a forest stand is to be raised

Clear cut* - a silvicultural system in which the old crop is cleared over a considerable area at one time

Crushing - the compacting of slash with heavy machinery ex. Marden, Letourneaux

Direct seeding - the artificial sowing of seeds in an area by manual or mechanical means

Fertilizing - the addition of nutrients to the soil (in organic or inorganic form)

Herbicide* - any chemical preparation used to kill or inhibit the growth of forbs, grasses, and woody plants, and their seeds

Lopping and scattering* - chopping the branches, tops and small trees left on a site after logging and spreading this residue more or less evenly over the ground without burning

Natural seeding - the seeding of an area by natural means, i.e. from slash borne seeds or from standing, seed-producing trees

Partial seeding* - seeding confined to limited areas e.g. drills, strips, patches (spots), nests, generally according to a regular spatial pattern

Pest control - reduction or elimination of harmful insect or disease populations by chemical, biological, or mechanical means

Prescribed burning* - controlled application of fire to wild-land fuels in either their natural or modified state, under such conditions of weather fuel moisture, soil moisture etc. as allow the fire to be confined to a predetermined area and at the same time to produce the intensity of heat and rate of spread required to further certain planned objectives of silviculture, wildlife management, grazing, fire-hazard reduction, etc.

Pruning - the removal of live or dead branches from the bole of a tree for a variety of reasons ex. to improve access or the quality of lumber sawn from the bole

Scarification* - loosening the top soil of open areas, or breaking up the forest floor, in preparation for artificial or natural regeneration

Seed-tree cutting method* - removal in one cut of the mature timber from an area, save for a small number of seed bearers left singly or in small groups

Selection cutting* - an uneven-aged silvicultural system in which trees are removed individually or in groups, here and there, from a large area each year

Shelterwood cutting* - any regeneration cutting in a more or less regular and mature crop, designed to establish a new crop under the protection (overhead or side) of the old

---

* from: Ford-Robertson, F.C. (ed.), 1971. Terminology of forest science, technology practice and products. SAF, Washington, D.C.

Thinning* - a felling made in an immature crop or stand in order primarily to accelerate diameter increment but also, by suitable selection to improve the average form of the trees that remain

Weeding* - generally, a cultural operation eliminating or suppressing undesireable vegetation, mainly herbaceous, during the seedling stage of a forest crop and therefore before the first cleaning, so as to reduce competition with the seedling stand. If it is done with chemicals, it is termed chemical weeding.

Windrow* - slash, brushwood, etc. concentrated along a line, so as to clear the intervening ground between the two of them

---

* from: Ford-Robertson, F.C. (ed.). 1971. Terminology of forest science, technology practice and products. SAF, Washington, D.C.

Administrative Units

Province	Code
British Columbia	
Prince Rupert	101
Prince George	102
Caribou	103
Vancouver	104
Kamloops	105
Nelson	106
Alberta	
Footner Lake	201
Peace River	202
Athabasca	203
Slave Lake	204
Lac La Biche	205
Grande Prairie	206
Whitecourt	207
Edson	208
Rocky Clearwater	209
Bow Crow	210
Saskatchewan	
Department of Northern Saskatchewan	301
Meadow Lake	302
Prince Albert	303
Hudson Bay	304
Saskatoon	305
Swift Current	306
Regina	307
Melville	308
Manitoba	
Northern	401
Western	402
Eastern	403
Southern	404
Parks	405
Ontario	
Northwestern	501
North Central	502
Northern	503
Northeastern	504
Algonquin	505
Eastern	506
Central	507
Southwestern	508
Quebec	
Nouveau-Québec	601
Nord-Quest	602
Saguenay-Lac-St.-Jean	603
Côte-Nord	604
Outaouais	605
Trois-Rivières	606
Bas-Saint-Laurent-Gaspésie	607
Québec	608
Montréal	609
Cantons-de-l'Est	610
New Brunswick	
entire province	700
Prince Edward Island	
entire province	800
Nova Scotia	
entire province	900
Newfoundland	
island	150
Labrador	151
Northwest Territories	250
Yukon Territory	350

S I T E P R E P A R A T I O N

Administrative Unit	Year	HARVESTING METHOD							TREATMENT						
		Clearcut		Shelterwood		Seed Tree									
		Strip (ha)	Block (ha)	Strip cut (ha)	Uniform cut (ha)	Single Tree (ha)	Group (ha)	Selection (ha)	Prescribed Burning (ha)	Lop and Scatter (ha)	Crushing (ha)	Windrow (ha)	Scarification (ha)	Herbicide (ha)	No Treatment (ha)

NATURAL SEEDING

Administrative Unit	Year	SPECIES											
		(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)

DIRECT SEEDING

Administrative Unit	Year	PATTERN		METHOD			SPECIES							
		Broadcast (ha)	Partial (ha)	Manual (% of total)	Mechanical Ground (% of total)	Mechanical Aerial (% of total)	Area (ha)	Application (kg/ha)	Area (ha)	Application (kg/ha)	Area (ha)	Application (kg/ha)	Area (ha)	Application (kg/ha)

PLANTING BAREROOT

Administrative Unit	Year	PLANTING METHOD		SPECIES											
		Manual total)	Mechanical total)	Area (ha)	Number of Seedlings	Age	Area (ha)	Number of Seedlings	Age	Area (ha)	Number of Seedlings	Age	Area (ha)	Number of Seedlings	Age

PLANTING CONTAINER

Administrative Unit	Year	PLANTING METHOD		SPECIES											
		Manual (% of total)	Mechanical (% of total)	Area (ha)	Number of Seedlings	Age	Area (ha)	Number of Seedlings	Age	Area (ha)	Number of Seedlings	Age	Area (ha)	Number of Seedlings	Age

STAND TREATMENTS

Administrative Unit	Year	Major Species	Fertilizing		Thinning		Pruning		Weeding Mechanical		Weeding Chemical		Pest Control		Total Area (ha)
			Area (ha)	Treatment Schedule (years)	Area (ha)	Treatment Schedule (years)	Area (ha)	Treatment Schedule (years)	Area (ha)	Treatment Schedule (years)	Area (ha)	Treatment Schedule (years)	Area (ha)	Treatment Schedule (years)	

APPENDIX 2

PROVINCIAL AND TERRITORIAL DATA

A. Harvesting, site preparation, and planting and seeding data for British Columbia

B. Harvesting, site preparation, and planting and seeding data for Alberta

C. Harvesting, site preparation, and planting and seeding data for Saskatchewan

D. Harvesting, site preparation, and planting and seeding data for Manitoba

E. Harvesting, site preparation, and planting and seeding data for Ontario

F. Harvesting, site preparation, and planting and seeding data for Quebec

G. Harvesting, site preparation, and planting and seeding data for New Brunswick

H. Harvesting, site preparation, and planting and seeding data for Nova Scotia

I. Harvesting, site preparation, and planting and seeding data for Prince Edward Island

J. Harvesting, site preparation, and planting and seeding data for Newfoundland

K. Harvesting, site preparation, and planting and seeding data for the Yukon Territory

L. Harvesting, site preparation, and planting and seeding data for the Northwest Territories

M. Stand treatments in British Columbia

N. Stand treatments in Ontario

O. Stand treatments in Newfoundland

Table A. Harvesting, site preparation, and planting and seeding data for British Columbia

Year	Harvesting		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76	133 277	23 699	60 615	13 194	3 940	(50 440)[1]	(58 257)	(12 638)	(14 564)	63 038	72 821	0
1976-77	147 897	28 055	61 759	15 490	3 157	(44 171)	(48 334)	(15 990)	(17 498)	60 161	65 832	0
1977-78	140 169	25 912	29 942	18 227	4 483	(32 012)	(34 317)	(23 729)	(25 438)	55 741	59 755	0
1978-79	168 820	27 713	33 460	17 948	5 889	(34 740)	(38 122)	(23 529)	(25 211)	58 269	63 333	0
1979-80	157 395	30 152	47 468	19 827	14 249	(40 534)	(48 040)	(23 143)	(26 932)	63 676	74 971	0
Total	747 558	135 531	233 244	84 686	31 718	(201 897)	(227 070)	(99 029)	(109 643)	300 885	336 712	0
5-year Average	149 512	27 106	46 649	16 937	6 344	(40 379)	(45 414)	(19 806)	(21 929)	60 177	67 342	0

[1] Numbers in brackets are estimates.

Table B. Harvesting, site preparation, and planting and seeding data for Alberta

Year	Harvesting		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76	20 256	0	0	15 822	0	1 818	2 273	4 198	5 247	6 016	7 520	7 906
1976-77	19 060	0	0	14 944	0	761	952	4 038	5 045	4 799	5 997	6 470
1977-78	21 450	0	0	18 905	0	180	234	5 304	6 633	5 484	6 867	7 668
1978-79	22 103	0	0	18 635	0	110	129	7 035	8 218	7 145	8 347	5 416
1979-80	24 689	0	0	14 536	0	0	0	8 264	10 329	8 264	10 329	4 539
Total	107 558	0	0	82 842	0	2 869	3 588	28 839	35 472	31 708	39 060	31 999
5-year average	21 512	0	0	16 568	0	574	718	5 768	7 094	6 342	7 812	6 400

Table C. Harvesting, site preparation, and planting and seeding data for Saskatchewan

Year	Harvesting		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76	13 814	0	0	1 322	945	3 402	4 598	152	153	3 554	4 751	0
1976-77	9 727	0	0	2 820	2 897	3 928	5 378	511	759	4 439	6 137	0
1977-78	14 231	0	0	1 883	2 022	6 063	8 191	168	322	6 231	8 513	0
1978-79	14 909	0	0	4 530	1 804	6 004	9 841	587	1 174	6 591	11 015	0
1979-80	20 396	0	0	5 501	1 450	4 943	9 195	740	1 209	5 683	10 404	0
Total	73 077	0	0	16 056	9 118	24 340	37 203	2 158	3 617	26 498	40 820	0
5-year average	14 615	0	0	3 211	1 824	4 868	7 441	432	723	5 300	8 164	0

Table D. Harvesting, site preparation, and planting and seeding data for Manitoba

Year	Harvesting		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76	(15 700)[1]	0	0	3 965	0	(573)	1 335	(543)	1 266	1 116	2 601	223
1976-77	(17 000)	0	0	4 038	0	(743)	2 068	(303)	842	1 046	2 910	199
1977-78	(18 000)	0	0	4 080	0	(738)	1 406	(94)	180	832	1 586	61
1978-79	(20 000)	0	0	4 342	101	(917)	1 217	(303)	402	1 220	1 619	126
1979-80	(24 600)	0	0	3 823	533	(470)	1 293	(100)	275	570	1 568	2 774
Total	(95 300)	0	0	20 248	634	(3 441)	7 319	(1 343)	2 965	4 784	10 284	3 383
5-year average	(19 060)	0	0	4 050	127	(688)	1 464	(269)	593	957	2 057	677

[1] Numbers in brackets are estimates.

Table E. Harvesting, site preparation, and planting and seeding data for Ontario

Year	Harvesting		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other [1] (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76	140 896	55 864	0	40 431	4 800	27 284	(45 984) [2]	2 766	(4 791)	30 050	50 775	23 510
1976-77	114 171	42 550	0	35 873	3 284	24 165	(41 927)	2 005	(3 589)	26 170	45 516	27 039
1977-78	121 930	66 063	2 949	37 639	7 374	24 101	(43 343)	2 406	(4 381)	26 507	47 724	28 791
1978-79	141 381	53 617	4 247	36 291	8 169	25 189	52 928	2 360	5 487	27 549	58 415	23 582
1979-80	160 147	58 431	4 163	43 340	5 887	26 693	61 453	4 137	7 945	30 830	69 398	24 251
Total	678 525	276 525	11 359	193 574	29 514	127 432	(245 635)	13 674	(26 193)	141 106	271 828	127 173
5-Year Average	135 705	55 305	2 272	38 715	5 903	25 486	(49 127)	2 735	(5 239)	28 221	54 366	25 435

[1] Chemical site preparation and mechanical cone scattering.
[2] Numbers in brackets are estimates.

Table F. Harvesting, site preparation, and planting and seeding data for Quebec

Year	Harvesting[1]		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76	104 609	30 485	0	3 008	0	(15 905)[2]	36 582	0	0	15 905	36 582	5 693
1976-77	140 106	41 631	0	2 570	0	(15 271)	35 124	(58)	132	15 329	35 256	1 810
1977-78	159 045	34 250	0	7 555	0	(16 348)	37 601	(196)	450	16 544	38 051	3 373
1978-79	185 908	40 219	0	(8 478)	1 061	(14 026)	32 259	(53)	122	14 079	32 381	5 703
1979-80	208 498	33 328	0	14 217	552	(14 039)	32 289	(23)	54	14 062	32 343	6 744
Total	798 166	179 913	0	35 828	1 613	(75 589)	173 855	(330)	758	75 919	174 613	23 323
5-year Average	159 633	35 983	0	7 166	323	(15 118)	34 771	(66)	152	15 184	34 923	4 665

[1] Crown land only.
[2] Numbers in brackets are estimates.

Table G. Harvesting, site preparation, and planting and seeding data for New Brunswick

Year	Harvesting		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76	(94 400)[1]	0	300	9 800	0	5 300	13 096	1 375	3 398	6 675	16 494	125
1976-77	(92 800)	0	500	10 500	0	5 450	13 467	2 600	6 425	8 050	19 892	550
1977-78	(86 500)	0	400	13 500	0	5 200	12 849	4 407	10 890	9 607	23 739	393
1978-79	(89 200)	0	1 000	15 000	0	8 100	20 015	2 600	6 425	10 700	26 440	0
1979-80	(100 000)	0	1 500	16 802	198	8 500	21 004	7 200	17 791	15 700	38 795	0
Total	(462 900)	0	3 700	65 602	198	32 550	80 431	18 182	44 929	50 732	125 360	1 068
5-year average	(92 580)	0	740	13 120	40	6 510	16 086	3 636	8 986	10 146	25 072	214

[1] Numbers in brackets are estimates.

Table H. Harvesting, site preparation, and planting and seeding data for Nova Scotia

Year	Harvesting		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76[1]	27 260	0	0	595	0	980	2 495	445	1 100	1 425	3 595	0
1976-77	26 285	0	0	634	0	777	1 925	453	1 120	1 230	3 045	10
1977-78	28 335	0	0	850	0	1 359	3 125	972	2 401	2 331	5 526	1
1978-79	32 120	0	0	2 608	0	1 907	3 045	1 383	3 416	3 290	6 461	127
1979-80	33 703	0	0	2 255	0	888	2 910	1 788	4 416	2 676	6 814	77
Total	147 703	0	0	6 942	0	5 911	13 500	5 041	12 453	10 952	25 441	215
5-year average	29 540	0	0	1 388	0	1 182	2 700	1 008	2 491	2 190	5 088	43

Table I. Harvesting, site preparation, and planting and seeding data for Prince Edward Island

Year	Harvesting		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76	1 600	0	0	0	0	40	100	80	200	120	300	0
1976-77	1 600	0	0	48	0	40	100	80	200	120	300	0
1977-78	1 600	0	0	0	0	40	100	80	200	120	300	0
1978-79	1 600	0	0	16	0	54	135	40	100	94	235	0
1979-80	1 780	0	0	566	0	44	110	40	100	84	210	0
Total	8 180	0	0	630	0	218	545	320	800	538	1 345	0
5-year average	1 636	0	0	126	0	44	109	64	160	108	269	0

Table J. Harvesting, site preparation, and planting and seeding data for Newfoundland

Year	Harvesting		Site preparation			Planting and seeding						
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	Bare-root area (ha)	Bare-root seedlings ('000)	Container area (ha)	Container seedlings ('000)	Total area planted (ha)	Total seedlings ('000)	Area seeded (ha)
1975-76	(15 700)[1]	0	0	0	0	0	0	0	0	0	0	0
1976-77	(14 700)	0	0	0	0	0	0	0	0	0	0	0
1977-78	(14 300)	0	0	28	0	0	0	0	0	0	0	0
1978-79	(17 600)	0	0	320	0	0	0	0	0	0	0	0
1979-80	(17 700)	0	0	1 508	0	0	0	184	460	184	460	0
Total	(80 000)	0	0	1 856	0	0	0	184	460	184	460	0
5-year average	(16 000)	0	0	371	0	0	0	37	92	37	92	0

[1] Numbers in brackets are estimates.

Table K. Harvesting, site preparation, and planting and seeding data for the Yukon Territory

Year	Harvesting		Site preparation			Planting and seeding (ha)
	Clearcut (ha)	Other (ha)	Prescribed burning (ha)	Scarification (ha)	Other (ha)	
1975-76	112	508	0	0	0	0
1976-77	104	456	0	0	0	0
1977-78	250	497	0	0	0	0
1978-79	299	636	0	0	0	0
1979-80	0	280	0	224	0	0
Total	765	2 377	0	224	0	0
5-Year Average	153	475	0	45	0	0

Table L. Harvesting, site preparation, and planting and seeding data for the Northwest Territories

Year	Harvesting		Site preparation (ha)	Planting and seeding (ha)
	Clearcut (ha)	Other (ha)		
1975-76	706	0	0	0
1976-77	396	0	0	0
1977-78	688	0	0	0
1978-79	693	0	0	0
1979-80	629	0	0	0
Total	3 112	0	0	0
5-year average	622	0	0	0

Table M. Stand treatments in British Columbia

Year	Area of stand treatment (ha)			
	Fertilizing	Thinning	Mechanical weeding	Total
1975-76	0	1 244	597	1 841
1976-77	0	6 906	2 827	9 733
1977-78	7 449	12 432	3 554	23 435
1978-79	9 017	15 102	2 467	26 586
1979-80	6 202	22 629	4 448	33 279
Total	22 668	58 313	13 893	94 874
5-year average	4 534	11 663	2 779	18 975

Table N. Stand treatments in Ontario

Year	Area of stand treatments (ha)						
	Fertilizing[1]	Thinning	Pruning	Manual cleaning	Mechanical cleaning	Chemical[2] cleaning	Total
1975-76	844	19 857	1 221	4 805	0	6 550	33 277
1976-77	673	20 119	1 029	5 963	0	10 540	38 324
1977-78	547	24 349	1 823	8 780	23	17 328	52 850
1978-79	697	19 424	1 563	5 872	44	20 669	48 269
1979-80	366	13 617	1 632	6 665	16	16 932	39 228
Total	3 127	97 366	7 268	32 085	83	72 019	211 948
5-year average	625	19 473	1 454	6 417	17	14 404	42 390

[1] Includes drainage.
[2] Ground and aerial.

Table O. Stand treatments in Newfoundland

Year	Area of stand treatment (ha)			
	Fertilizing	Thinning	Stand reclamation	Total
1975-76	57	194	0	251
1976-77	0	236	0	236
1977-78	16	1 909	415	2 340
1978-79	0	1 672	655	2 327
1979-80	41	1 705	1 044	2 790
Total	114	5 716	2 114	7 944
5-year average	23	1 143	423	1 589