

FOREST BIOLOGY RANGER REPORTS

WINNIPEG, MANITOBA

1952

R. C. TIDSBURY

**REPORT ON FOREST INSECT CONDITIONS
IN THE FORESTED AREAS OF MANITOBA AND SASKATCHEWAN
1952**

Forest Biology Laboratory

Winnipeg, Man.

CANADA DEPARTMENT OF AGRICULTURE

SCIENCE SERVICE

FOREST BIOLOGY DIVISION

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INTRODUCTION

Most important activities within the survey during the year were (a) the continuation of forest tent caterpillar field studies, (b) the continuation of larch sawfly parasite studies, and (c) the initiation of a full scale tree disease survey in Manitoba and Saskatchewan by the Forest Biology Rangers.

Field studies on the forest tent caterpillar were carried out primarily to determine the importance of natural control agents in outbreak areas. The studies were carried out at two points, one in the outbreak area in southeastern Manitoba and the other in central Saskatchewan. Egg surveys were also conducted in the fall of 1952 in order to predict the probable distribution and severity of outbreaks in 1953. Larch sawfly parasite studies were continued in Manitoba and Saskatchewan. Mesoleius leuthredinis Morley and Bessa harveyi T.T. were again the principal parasites recovered. Tritoneptis klugii (Ratz.) was present in some areas but was less abundant than in 1951. Field surveys to determine the distribution and occurrence of major diseases infecting forest trees were carried out in conjunction with forest insect surveys.

Several important changes occurred in the distribution and status of major insect pests in 1952. An unusual spruce budworm infestation appeared on white spruce and regeneration balsam fir at the northern tip of Namew Lake on the Manitoba-Saskatchewan boundary. A survey conducted in the summer revealed new growth on white spruce and balsam fir in approximately 5,500 acres was severely defoliated. The forest tent caterpillar outbreaks increased in size and intensity as was predicted. An egg survey carried out in the fall indicated that further extensions of the outbreaks are probable in 1953. Larch sawfly infestations increased in extent and intensity in Saskatchewan. Severe defoliation was recorded for the first time as far west as Big River and Dore Lake.

Populations of the American poplar leaf beetle and large aspen tortrix increased in Saskatchewan, while the grey willow-leaf beetle, birch tubemaker, striped alder sawfly, and spotless fall webworm became more abundant in Manitoba. The black-headed budworm increased greatly in abundance in both Manitoba and Saskatchewan.

BIOLOGY RANGER REPORTS

1. SOUTHERN AND INTERLAKE DISTRICTS OF MANITOBA

by
L.L. McDowall

1.1. INTRODUCTION

On April 29 and 30 a preliminary survey for the prevalence of forest tent caterpillar larvae was conducted in south-eastern Manitoba. Relatively high populations of first and second instar larvae were observed. Approximately one week, May 5 to May 10, was spent with M. Pratt and E. Campbell, making branch counts on tamarack trees. This work was done to provide preliminary information, in preparation for a study of larch sawfly populations planned for the summer of 1952.

From May 13 to May 17 a spruce budworm survey was carried out in the Spruce Woods Forest Reserve. Defoliation was negligible at this time and budworm larvae were still in the buds.

Considerable leaf roller damage was noted on white poplar throughout the Spruce Woods Forest Reserve. This insect has been tentatively identified as Pseudexentera oregonana (Wlshn.)

During the period May 19 to May 24, a forest tent caterpillar survey was carried out in the southern part of Manitoba. Two days of this time were spent on a special survey of poplar stands along the Greater Winnipeg Water District railroad and in the vicinity of Waugh.

From May 26 to May 31, a general insect survey was carried out in the Interlake District. Insect populations appeared very light at that time. Field work between June 2 and June 21 was continued in the Southern District. Forest tent caterpillar damage was mapped and mass larval and pupal collections were made in the south-eastern portion of the Province. One day, June 18, was spent on an aerial survey of poplar stands in the south-east corner of the Province. Several collections of the yellow-headed spruce sawfly were made, but in all instances defoliation was light and confined to small isolated spruce. Six days, June 9 to June 14, were spent mapping current spruce budworm defoliation in the Spruce Woods Forest Reserve. From June 23 to June 28 a survey for the detection of jack-pine and spruce budworm, as well as a preliminary larch sawfly survey was conducted in the Interlake District.

A larch sawfly and general survey was carried out in the Southern District during the first two weeks of July. From July 14 to July 19 a survey was carried out in the Spruce Woods Forest Reserve. During the period July 20 to July 26 spruce stands in the Interlake District were examined for the prevalence of black-headed budworm. A larch sawfly and grey willow leaf beetle survey was also undertaken at this time. From July 28 to August 16 a combined forest tent caterpillar egg and larch sawfly survey was conducted in the Southern District.

Insect survey field work between August 18 and September 27 was as follows: conducting a forest tent caterpillar egg survey, establishing permanent sample plots in white poplar stands infested by the forest tent caterpillar, making mass collections of larch sawfly cocoons, checking and recording defoliation of tagged trees in all permanent tamarack plots, and obtaining reports on tamarack stands infested by the larch sawfly. This work was carried out in both the Southern and Interlake districts.

Three days, October 1, 2 and 3 were spent on a forest tent caterpillar egg survey in south-western Manitoba.

On December 16, in company of V. Hildahl, a trip was made to Harrison Creek in south-eastern Manitoba, for the purpose of completing the forest tent caterpillar egg survey for 1952.

Details of the summer work and reports of insect conditions are given in the following pages.

1.2 INSECT CONDITIONS

1.2.1 - Larch Sawfly, Pristiphora erichsonii (Htg.)

Tamarack stands in the Southern and Interlake districts of Manitoba were again subjected to attack by the larch sawfly in 1952. In the extreme south-east corner of Manitoba, between Middlebro and the United States Boundary (tp. 1, rge. 16, E.P. mer.), severe defoliation was recorded. A number of trees in this area were completely defoliated during the season, but by the latter part of August had put forth a new crop of needles. West of Middlebro to Sprague and north to Moose Lake, moderate to heavy defoliation occurred. Tamarack stands west of Sprague to South Junction suffered light to moderate defoliation. The most severe

defoliation in this area was recorded in a large swamp located in sec. 15, tp. 1, rge. 13, E.P. mer. one quarter of a mile north-west of South Junction. Complete defoliation was common throughout this stand and needle growth was quite retarded. Light to moderate defoliation was recorded in tamarack stands from Vassar north to Whitemouth Lake. Tamarack from Vassar west to Piney and Menisino suffered light to moderate defoliation. North of Piney to Badger, Garrick, and Woodridge tamarack is very scattered and sawfly populations were light in all areas examined. Larch sawfly continued to defoliate tamarack stands between the Sandilands Forest Reserve headquarters and the town of Marchand. Defoliation ranged from moderate to heavy and a small percentage of trees with dead or dying tops were noted in tp. 5, rge. 9, E.P. mer.

Light to moderate defoliation prevailed in the northern part of the Sandilands Forest Reserve. A few scattered areas of heavy defoliation occurred between Dawson Cabin and the town of Madashville. Tamarack stands from Madashville east to McKinn and East Braintree showed light to moderate defoliation. Heavy defoliation was recorded in a large stand of tamarack west of Madashville at Mile 53 along the Greater Winnipeg Water District railroad. Tamarack stands in the immediate vicinity of East Braintree, located in tp. 7, rge. 14, E.P. mer. suffered moderate to heavy defoliation. Moderate to heavy defoliation occurred in all tamarack stands examined from East Braintree east along the Greater Winnipeg Water District railroad to Waugh. Moderate to heavy defoliation was recorded in tamarack stands from East Braintree north-east along the Falcon Lake Road. An increase in tree mortality since 1951 was observed in the above mentioned area. A tree count was made in the area and it was estimated that approximately five per cent tree mortality had occurred. It was impossible to determine the cause of mortality. However there are several factors that may have attributed to it, such as severe defoliation by the larch sawfly, high water levels and mechanical injury due to logging operations.

In the Spruce Woods Forest Reserve larch sawfly populations appeared light and little or no defoliation was recorded.

Although the larch sawfly was widely distributed throughout the Interlake District, it caused very little defoliation in areas where encountered. The heavy infestation of 1951, two miles north of Riverton, located in sec. 29, tp. 23, rge. 4, E.P. mer. had subsided. Light defoliation was observed in this area, with a few

patches of moderate. Light tree mortality (about 1.3 per cent) occurred here and of three dead trees examined all were infested with bark beetles. Light to moderate defoliation occurred in tamarack stands north of Riverton to Sugar Creek along the west side of Washow Bay. West of Riverton to Arborg and north into the Rosenberg area, tamarack is very scattered and only light defoliation was recorded. Light defoliation occurred in tamarack stands around Broad Valley north to Hodgson and Red Rose. In the vicinity of Ashern and north to Moosehorn, larch sawfly populations were very light and defoliation was almost negligible. Moderate defoliation was recorded in a small stand, one mile north of Moosehorn, located in sec. 1, tp. 27, rge. 8, W.P. mer. North of Moosehorn to Grahamdale, Fairford, and Gypsumville, light defoliation was recorded. Light to moderate defoliation still prevailed in a small tamarack stand north-east of Gypsumville located in sec. 25, tp. 32, rge. 9, W.P. mer.

1.2.2. - Forest Tent Caterpillar, Malacosoma disstria Hbn.

The 1952 outbreak of the forest tent caterpillar in the southeastern part of Manitoba has been the most serious to date. Increased populations, as well as a more widespread distribution of this insect, were recorded. Large areas of white poplar and birch and its understorey suffered complete and partial defoliation. Early larval feeding aided by hot dry weather in early April, apparently contributed to the severe and widespread defoliation.

Several collections of first and second instar larvae were made on April 29 in the Madashville and East Braintree areas. Poplar foliage was well advanced and light feeding damage was observed at that time. On May 19 a trip was made from Winnipeg east along the Greater Winnipeg Water District railroad as far as Waugh. Severe defoliation to poplar and birch occurred at Waugh and along the west and south shores of Indian Bay. Poplar trees in some instances were completely defoliated and large clusters of larvae were observed on the trunks and branches. Light feeding damage was observed on fruit trees and small ornamentals in an orchard nearby. This condition existed from Waugh west to Haute, with a gradual lessening of defoliation in and around East Braintree. However, later on in the season heavy defoliation was recorded in the East Braintree area. Large stands of white poplar and birch were completely defoliated in the area surrounding Moose Lake, located in tp. 3, rge. 16, E.P. mer. From Moose Lake west

to Twin Lakes, Whitemouth Lake, and south to the United States boundary, moderate to severe defoliation occurred. The heaviest defoliation was recorded in stands around Whitemouth Lake, along the United States boundary, and in the vicinity of Middlebro. Complete defoliation was common in the above mentioned areas. South of Whitemouth Lake to Vassar moderate defoliation was recorded. East of Vassar to South Junction, Sprague, and north into tp. 3, moderate defoliation occurred with several patches of heavy defoliation recorded. Moderate defoliation occurred west of Vassar to Piney and Menisino. Small bluffs of white poplar growing on farm lands between Menisino and Stuartburn suffered light defoliation. From Piney north to Badger, Garrick, and Woodridge light defoliation prevailed, with a few small areas of moderate defoliation. Light to moderate defoliation occurred north-east along the St. Labre Road to Whitemouth Lake. Light defoliation was recorded throughout the Sandilands Forest Reserve, with the exception of one area in the north-east corner, where defoliation was moderate. Heavy defoliation was recorded in the vicinity of Hadashville and east to McKean and East Braintree. Severe defoliation was recorded from East Braintree north-east along the Falcon Lake Road to Falcon Lake. In the above mentioned area complete defoliation of white poplar and its undergrowth was quite common.

1.2.3 - Jack-pine Budworm, Choristoneura sp.

A general decline in populations of the jack-pine budworm was observed in both the Southern and Interlake districts of Manitoba in 1952. In the Sandilands Forest Reserve only two collections, each containing one budworm larva, were made. No defoliation was recorded in both instances. Elsewhere through the Southern District negative results were obtained. The severe infestation at Rosenburg, sixteen miles north of Arborg, had completely subsided in 1952. Although this area was thoroughly sampled no larva of the jack-pine budworm was collected. Very few staminate flowered trees were recorded in this area. No collections of this insect were made at any point sampled in the Interlake District during the survey.

1.2.4 - Spruce Budworm, Choristoneura fumiferana (Glen.)

Populations of the spruce budworm in the Spruce Woods Forest Reserve showed a slight decline in 1952. Although defoliation was quite widespread throughout the Reserve, only one area of heavy defoliation was recorded. This area, located in sec. 17, tp. 9, rge. 13, W.P. mer. is in the east block of the Spruce Woods Forest Reserve.

Several small collections of this insect were made at Arborg, Camper and Gypsumville in the Interlake District. Very light defoliation was recorded in the above mentioned areas.

1.2.5 - Spruce Needleworm, Dioryctria reniculella (Grt.)

The only appreciable damage recorded by this insect was in the Spruce Woods Forest Reserve. Because of its close association with the spruce budworm no accurate estimate of the damage to white spruce by this species could be made. However, collections revealed that populations were lighter than in 1951. In the Interlake District, one collection was made from a small stand of isolated spruce, in the vicinity of Riverton.

1.2.6 - Yellow-headed Spruce Sawfly, Pikenema alaskensis (Beh.)

This species, although quite widespread in both the Southern and Interlake districts of Manitoba, caused only light to moderate damage in the areas where collected. In the Sandilands Forest Reserve, located in sec. 16, tp. 6, rge. 10, E.P. mer. small isolated white spruce suffered light to moderate defoliation. Light defoliation was recorded at several points in the Spruce Woods Forest Reserve. Other collections of this species were made at Pinesy, South Junction, Vassar, Sprague, Middlebro and Moose Lake, all in the Southern District. In all instances only a few larvae were found and defoliation was light. Populations of this insect were relatively light at the following places in the Interlake District: Arborg, Hodgson, Spearhill, Fairford and Gypsumville. Only light feeding damage was recorded.

1.2.7 - Green-headed Spruce Sawfly, Pikonema dimockii (Cress.)

This species was found closely associated with the yellow-headed spruce sawfly, but in much lower populations. Very little defoliation occurred in the areas where collected. The yellow-headed and green-headed spruce sawflies were feeding on both white and black spruce.

1.2.8 - Balsam-fir Sawfly, Neodiprion abietis (Harr.)

One collection of this insect, containing one larva, was made from white spruce in the St. Labre area in the Southern District.

1.2.9 - Black-headed Budworm, Acleria varians (Fern.)

Increased populations of this insect occurred in both the Southern and Interlake districts of Manitoba in 1952. The most notable increase was recorded in the Interlake District. Early feeding damage to white spruce buds was noted in the vicinity of Riverton and Arborg. Collections were also made at Hnausa, Hodgson, Ashern, Camper, Meechorn, Spearhill, Fairford, Davis Point, McRae Lake, and Gypsumville. Defoliation ranged from light to moderate in all but a few areas. Three collections, containing from one to two larvae were made in the Southern District. One collection was in the Spruce Woods Forest Reserve, another in the Sandilands Forest Reserve, and a third near Vassar.

1.2.10 - White-pine Weevil, Pissodes strobi (Peck).

Scattered collections of this insect were made from white spruce and jack-pine in the Southern and Interlake districts of Manitoba; Light damage was observed and only one or two trees in each area were affected.

1.2.11 - Pitch Nodule Maker, Petrova albicapitana (Busck).

Several collections of this insect were made in the Sandilands Forest Reserve, but in all instances the areas affected were quite small and the damage was confined to jack-pine regeneration. Elsewhere in the Southern and Interlake districts small collections were made at widely scattered points.

1.2.12 - Grey Willow Leaf Beetle, Galerucella decora (Say).

Willow stands in both the Interlake and Southern Districts suffered moderate to heavy damage by this insect in 1952. The heaviest outbreak was recorded in a large area of willow ten miles west of Arborg in sec. 17, tp. 22, rge. 1, E.P. mer. Heavy skeletonizing was common on small balsam poplar as well as willow in this area. Moderate to heavy patches of skeletonizing occurred east to Arborg and Hnausa. Light to moderate skeletonizing of foliage was observed from Hnausa north to Riverton and Sugar Creek. Light skeletonizing prevailed, for the most part, from Poplarfield north to Hodgson. North of Hodgson to Dallas and Red Rose very little damage was recorded. From Poplarfield west to Brikadale and north to Ashern, Moosehorn, Spearhill, Fairford and Cypsumville light skeletonizing occurred. In the Southern District, moderate to heavy skeletonizing of willow foliage occurred in the Sandilands Forest Reserve. The most severe damage was recorded from the Forest Reserve headquarters six miles north along the Dawson Road. Elsewhere in the Southern District light to moderate skeletonizing was recorded. Collections were made at the following points: La Broquerie, Marchand, South Junction, Middlebro and Moose Lake.

1.2.13 - American Poplar Beetle, Phytodecta americana Schffr.

No serious outbreak of this insect was encountered in either the Southern or Interlake districts in 1952. Light defoliation was recorded in a small area of second growth poplar in the Spruce Woods Forest Reserve. Collections were also made at South Junction, Sprague and in the Sandilands Forest Reserve. In all instances only a few larvae were found and little or no defoliation was observed.

1.2.14 - Large Aspen Tortrix, Archips conflictans (Wlk.)

Several small collections of this insect were made along the west side of Lake Winnipeg in the area between Camp Morton and Hnaua. Poplar in this area is very scattered and only light defoliation was recorded. One collection, containing one larva, was made in the Spruce Woods Forest Reserve.

1.2.15 - Spiny Elm Caterpillar, Hymobalis antione L.

Three collections of this insect were made in the vicinity of Arborg. Defoliation ranged from light to moderate but was confined mainly to small second growth poplar.

1.2.16 - Ugly-nest Caterpillar, Archips cerasivorana (Fitch).

Scattered collections of this insect were made in both the Southern and Interlake districts, but very little defoliation was noted.

1.2.17 - A Tent Caterpillar, Malacosoma lutescens (N. & D.)

This insect was collected from only two locations in the Southern District in 1952. Light defoliation occurred in both the Sandilands and Spruce Woods Forest Reserves.

1.2.18 - Eastern Tent Caterpillar, Malacosoma americanum (F.)

One collection of this insect, found on chokecherry in the Sandilands Forest Reserve was the only one recorded throughout the Southern and Interlake districts in 1952.

1.2.19 - Birch Tube Maker, Acrobasis betulella (Hbst.)

Collections of this insect were made at several points in the Southern and Interlake districts in 1952. Populations appeared light and very little damage was recorded.

1.2.20 - Aspen Betch Minor, Lithocolletis tremuloidella (Braun).

This insect, although quite widespread throughout the Southern and Interlake districts, was causing very little damage to white poplar stands.

1.2.21 - Red-pine Sawfly, Neodiprion ramulus Schedl.

Two collections of this insect, both in the Sandilands Forest Reserve, were made, but only very light defoliation was observed.

1.2.22 - Swaine's Jack-pine Sawfly, Neodiprion swaini, Mdd.

Populations of this insect appeared very light in areas where collected in the southern part of the Sandilands Forest Reserve. In all instances only a few trees were affected and defoliation was light.

1.2.23 - Cedar Sawfly, Monactes juniperinus (MacD.)

This sawfly was commonly found on cedar throughout the Southern District in 1952. Collections were made at the following places:- Moose Lake, Sprague, Middlebro, South Junction, Piney and in the north end of the Sandilands Forest Reserve. Although populations appeared relatively high, no severe defoliation was encountered.

1.2.24 - A Pine Scale, Toumeyella sp.

An overall increase in scale activity was noted in the Sandilands Forest Reserve. The moderate to heavy infestation south-east of Forest Reserve headquarters located in sec. 17 and 20, tp. 5, rge. 10, E.P. mer. continued to flourish. Trees in this area were quite black and covered with a sooty fungus. Several new but small areas of infestation were recorded in the northern part of Sandilands Forest Reserve, but activity was light. A small localised infestation occurred in jack-pine stands five miles east of Piney. Several collections of this insect were made at the following points in the Interlake District: Rosenburg, Ashern and Gypsumville. Populations were light and no damage was noted.

1.2.25 - A Webworm on Jack-pine, Tetralopha sp.

Increased populations of this insect on young jack-pine regeneration was recorded from south-eastern Manitoba in 1952. Collections made were centered around South Junction and five miles east of Piney.

1.2.26 - A Leaf Roller poss., Pseudexentera oregonans Wlshn.

A leaf roller, tentatively identified as Pseudexentera oregonans, was causing severe defoliation to white poplar stands in the Spruce Woods Forest Reserve in 1952. The most severe defoliation occurred in the west block of the Reserve. Here defoliation ranged from 60 to 80 per cent. Another area of heavy defoliation occurred in poplar stands between Camp Shile and the Criddle farm. Elsewhere throughout the Reserve light to moderate defoliation was recorded. Refoliation was exceptionally slow in all areas of heavy defoliation.

1.3 SPECIAL PROJECTS

1.3.1 - Larch Sawfly Cocoons.

Mass collections of larch sawfly cocoons were made from twelve areas in the Southern and Interlake districts in 1952. These cocoons were packed in moss and placed in cold storage at the Laboratory. They will be dissected during the winter to determine the distribution and incidence of parasites. The mass collections were made from the areas shown in Table A.

TABLE A

Larch Sawfly Cocoon Collections

District	Place	Sec.	Tp.	Rge.	Mer.	Plot No.	No. of Cocoons
Southern	Falcon Lake	19	8	16	E.P.	37-S	250
Southern	East Braintree	33	7	14	E.P.	6-A-S	250
Southern	Hadashville	9	8	12	E.P.	-	250
Southern	Sandilands F.R.	2	8	11	E.P.	22-S	250
Southern	Sandilands F.R.	32	7	11	E.P.	6-S	250
Southern	Sandilands F.R.	5	8	10	E.P.	18-S	250
Southern	Sandilands F.R.	34	5	9	E.P.	-	250
Southern	Sprague	16	11	114	E.P.	5-A-S	250
Southern	Middlebro	8	1	16	E.P.	10-A-S	200
Southern	Piney	3	2	11	E.P.	-	200
Interlake	Riverton	32	23	4	E.P.	23-I	125
Interlake	Gypseuville	26	32	9	W.P.	33-I	250

1.3.2 - Forest Tent Caterpillar Egg Survey.

A forest tent caterpillar egg survey was carried out in the Southern and Interlake districts of Manitoba during September and October of 1952. All available white poplar stands were examined at five mile intervals. Three trees were felled at each examining point and the total number of egg bands were recorded. Five egg bands from each tree were placed in storage and will be reared during the winter months for the purpose of determining parasitism and fertility. The additional information gained from these rearings will be used to determine the intensity of the outbreak in 1953.

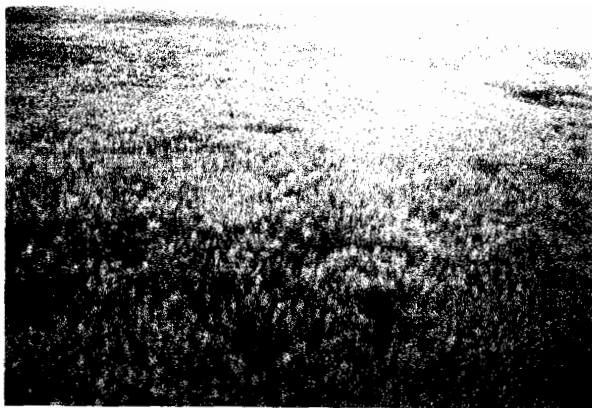


Fig. 1. Aerial view of Forest Tent Caterpillar Defoliation, Moose Lake, Man., June 15, 1952



Fig. 2. Aerial View of Forest Tent Caterpillar Defoliation, North West Angle, Man., June 15, 1952



Fig. 3. Aerial View of Forest Tent Caterpillar Defoliation, Whitemouth Lake, Man. June 15, 1952



Fig. 4. Forest Tent Caterpillar Defoliation
Moose Lake, Minn., June 5, 1952



Fig. 5. Forest Tent Caterpillar Defoliation on
Birch, Moose Lake, Minn., June 5, 1952.



Fig. 6. Forest Tent Caterpillar Defoliation,
Middlebro, Minn., June 2, 1952

1.3.3 - Permanent Sampling Stations.

The following table gives the locations of the permanent sampling stations established in the Southern and Interlake districts of Manitoba in 1952.

TABLE B
Permanent Sample Stations

Station No.	Tree Species	Location
1-A-S	Jack-pine	1 $\frac{1}{4}$ miles south-west of S.F.R., H.Q., sec. 26, tp. 5 rge. 9, E.P. mer.
2-A-S	Birch	1/2 mile west of S.F.R., H.Q. along fire guard, sec. 27, tp. 5, rge. 9, E.P. mer.
3-A-S	W. Spruce	1/4 mile north-west of S.F.R., H.Q., sec. 35, tp. 5, rge. 9, E.P. mer.
4-A-S	Tamarack	10 miles north of Sprague, sec. 24, tp. 2, rge. 14, E.P. mer.
5-A-S	Tamarack	1 mile west of Sprague, sec. 16, tp. 1, rge. 14, E.P. mer.
6-A-S	Tamarack	1/4 mile south of East Braintree, sec. 23, tp. 7, rge. 11, E.P. mer.
7-A-S	Jack-pine	S.F.R., H.Q., sec. 35, tp. 5, rge. 9, E.P. mer.
8-A-S	Jack-pine	2 $\frac{1}{4}$ miles north-east of S.F.R., H.Q., sec. 7, tp. 6, rge. 13, E.P. mer.
9-A-S	Tamarack	1/4 mile west of South Junction, sec. 16, tp. 1, rge. 13, E.P. mer.
10-A-S	Tamarack	2 miles east of Middlebro, sec. 8, tp. 1, rge. 15, E.P. mer.
21 - I	W. Poplar	Rosenburg Fire Tower, N.W. sec. 1, tp. 25, rge. 1, E.P. mer.
22 - I	Jack-pine	Rosenburg Fire Tower, 1/4 mile north sec. 1, tp. 25, rge. 1, E.P. mer.
23 - I	Tamarack	2 miles north of Riverton, sec. 32, tp. 23, rge. 4, E.P. mer.
24 - I	W. Spruce	1/4 mile north of Moosehorn, sec. 31, tp. 26, rge. 7, E.P. mer.
25 - I	Tamarack	10 miles north-west of Dallas, sec. 35, tp. 28, rge. 1, E.P. mer.

1.3.4 - Permanent Sample Plots.

Nine permanent sample plots were established in the Southern District of Manitoba in 1952. These plots were established in white poplar stands infested by the forest tent caterpillar to determine if tree mortality accompanies a forest tent caterpillar outbreak.

TABLE C
Permanent Sample Plots

Date	Plot No.	Species	District	Location
20/9/52	S-1	W.Poplar	Southern	Falcon Lake Rd. sec. 10, tp. 8 rge. 15, E.P. mer.
24/9/52	S-2	"	"	Sandilands F.R., sec. 1, tp. 6, rge. 9, E.P. mer.
24/9/52	S-5	"	"	Whitemouth Lake, sec. 4, tp. 3, rge. 13, E.P. mer.
25/9/52	S-6	"	"	Sprague, sec. 20, tp. 2, rge. 15, E.P. mer.
25/9/52	S-7	"	"	Moose Lake, sec. 12, tp. 3, rge. 16, E.P. mer.
26/9/52	S-8	"	"	Sprague, sec. 11, tp. 1, rge. 13, E.P. mer.
26/9/52	S-9	"	"	Middlebro, sec. 18, tp. 1, rge. 16, E.P. mer.
27/9/52	S-10	"	"	Piney, sec. 30, tp. 1, rge. 12, E.P. mer.
29/9/52	S-11	"	"	Hadashville Tower, sec. 8, tp. 8, rge. 12, E.P. mer.

1.4 PERSONNEL CONTACTED

<u>Name</u>	<u>Address</u>	<u>Title</u>	<u>No. of Contacts</u>	<u>Demonstration of Sampling</u>
W. Webster	Winnipeg	Dist. Forester	12	yes
D. Cooper	Marchand	Sr. Forest Ranger	10	yes
W. Meseman	Piney	Forest Ranger	6	yes
E. Harrison	Sprague	Sr. Forest Ranger	10	yes
W. Trowsdale	Sprague	Forest Ranger	10	yes
C. Clark	Sprague	R.C.M.P.	1	no
G. Hodgins	Richer	Forest Ranger	5	yes
R. McIntosh	Steinbach	Game Guardian	3	no
C. Smith	Winnipeg	Forester	4	yes
W. Ruth	E.Braintree	Forest Ranger	6	yes
H.C. Terschman	E.Braintree	Forest Ranger	3	yes
Mrs. V. Slusar	E. Braintree	P.O. Employee	1	no
E. Pokowski	W.Hawk Lake	Forest Ranger	2	yes
C. Beiber	E.Braintree	Fire Ranger	4	yes
H. Johnson	Winnipeg	Forester	1	no
J.J. Wright	Carberry	Sr. Forest Ranger	6	yes
F. de Belley	Douglas	Forest Ranger	2	yes
A. Shannon	Riverton	Forest Ranger	5	yes
S. Thompson	Arborg	Fire Ranger	4	yes
J. Thompson	Hodgson	Forest Ranger	3	yes
H. Clee	Ashern	Forest Ranger	5	yes
Mr. Tinline	Boissevain	Supt. International Peace Gardens	1	yes
A. MacDonald	Hodgson	Fire Ranger	2	yes

2. EASTERN DISTRICT OF MANITOBA

by

J.A. Dronin

2.1 INTRODUCTION

Forest Insect and Disease survey investigations and observations were conducted in the Eastern District of Manitoba from May 26 to September 30, 1952.

Field work commenced on May 26. An extensive forest tent caterpillar survey and general forest insect survey were carried out in the Eastern District. Forest tent caterpillar populations had increased considerably, ranging from light to medium in the Lac du Bonnet, Sedden's Corner, Beausejour and Stead areas, and from medium to heavy east and south to the Manitoba-Ontario boundary. The outbreak merged in the south-east corner of the Whiteshell Forest Reserve with the heavy infestation in the vicinity of Moose Lake. Mass collections of the forest tent caterpillar larvae were made in the heavily defoliated areas of Telford and Big Whiteshell Lake. Results of mass rearings indicated that both parasites and disease organisms of the forest tent caterpillar were more abundant this year. Light populations of the American poplar leaf beetle and leaf roller were recorded during the survey.

In the latter part of May the writer made the first collections of spruce and jack-pine budworm larvae. These were made between Lac du Bonnet and Sedden's Corner and contained mainly 2nd, 3rd and 4th instar larvae.

On June 10 the writer proceeded to the Stead Belair areas on forest tent caterpillar and jack-pine budworm surveys.

Budworm defoliation in the heavily infested areas of 1951 had decreased to light with scattered pockets of moderate defoliation. The scale infestation in the Belair area had declined slightly. The infestation of mistletoe remained much the same, except for an increase in mortality. This was particularly noticeable on young growth. By June 20 larvae of the forest tent caterpillar had pupated and mass collections of pupae were made at Mile 97 on the Trans-Canada highway (Telford) and at the Big Whiteshell Crow-Duck Portage. On the Crow-Duck Portage large parasite populations were recorded. A random examination of 25 forest tent

caterpillar pupae showed five sound. At Telford there were fewer parasitised larvae and pupae.

By the latter part of June severely defoliated poplar stands were re-leafing. Forest tent caterpillar adults and egg bands were observed in many of the areas sampled. During the latter part of June and the first two weeks of July field work consisted mainly of making 18" branch counts to determine jack-pine budworm populations in jack-pine stands from Lac du Bonnet south to Seddon's Corner and along the No. 1 highway. Jack-pine budworm populations had decreased considerably in 1952. No increase was noted in parasite populations in the field, although Glypta sp. appeared more common during the time when mass collections of larvae and pupa were made. The remainder of July was devoted mainly to ground and aerial surveys for jack-pine and black-headed budworm.

From July 7 to 9 a three day aerial survey, consisting of 13 hours flying time, was carried out in Eastern Manitoba. The survey included nineteen lakes in the area extending from Lac du Bonnet north along the Manitoba-Ontario boundary, north to God's Lake. Records and observations showed increased populations of the black-headed budworm and widespread distribution of the forest tent caterpillar.

In the latter part of July and the first part of August jack-pine budworm mapping was carried out in the Stead, Belair and Seddon's Corner areas. The balance of August was spent on larch sawfly surveys and permanent sample plot work in the Eastern District. During this time an aerial survey was made of the northerly areas to Sasaginnigak Lake to determine distribution and extent of larch sawfly defoliation. In the latter part of August some time was spent on a survey of tree diseases in the Eastern District with R. Thomas, Forest Pathology Laboratory at Saskatoon.

Field activities continued until September 30. Fall work included making mass collections of larch sawfly cocoons, disease survey, and establishing permanent sample plots in white poplar stands defoliated by the forest tent caterpillar. Mass collections of 250 larch sawfly cocoons were made in 16 widely separated tamarack stands. These collections were stored in the cold room at the laboratory for dissection and examination purposes to determine the incidence of parasites and disease.

An extensive ground survey covering the Eastern District was made during this period to determine the distribution of forest tent caterpillar egg bands. Data obtained from the survey will be used to determine the populations and distributions of the forest tent caterpillar in 1953.

2.2 INSECT CONDITIONS

2.2.1 - Larch Sawfly, *Pristiphora erichsonii* (Htg.)

The status of the larch sawfly in the Eastern District changed somewhat during the 1952 season. Defoliation in the southern sections increased from generally light to moderate in 1951 to medium to severe in 1952, while in the northern sections it remained much the same as in 1951; in the medium to heavy class. The northern section is comprised of the areas bounded on the west by Lake Winnipeg, on the east by the Manitoba-Ontario boundary, and on the south by the Manigotagan River. Owing to the lack of air transportation during the latter part of the season defoliation surveys for this region are not complete. At the time when most of the aerial surveys were conducted, larval feeding was not complete. South of the Manigotagan River tamarack stands suffered only light to moderate defoliation.

Following is a complete breakdown of larch sawfly defoliation by areas. The first larch sawfly adults were observed during the latter part of May south of Lac du Bonnet and the first larvae were collected on June 24 along the Pointe du Bois Road. By July 3 larval development was well advanced and defoliation to tamarack stands was quite noticeable. Numerous aerial surveys, supplemented by a limited number of ground checks, were made during July to determine degree of infestation in the Eastern District. By the first week of August larval feeding was generally completed.

West of Lac du Bonnet in the agricultural areas, defoliation in tamarack stands varied from medium to heavy. The heaviest defoliation was recorded at Brightstone, 7 miles west of Lac du Bonnet, where defoliation ranged from 80 to 95 per cent. North of Lac du Bonnet along the Pointe du Bois Road defoliation was generally light to medium. Heavy defoliation was recorded in sec. 30, tp. 15, rgs. 12, E.P. mer. (sample plot E-19), and in a small stand east of Lac du Bois Creek. All stands examined in the Bird River area and north to Cat Lake suffered light defoliation. North-west of Lac du Bonnet to Great Falls and Pine

Falls defoliation remained light to medium.

The areas north of Stead to Pine Falls and south to Libau and Scanterbury were examined by railroad. The construction of a road east of Stead to the French Settlement and north to Murray Hill facilitated the survey of large stands of tamarack in the lowlands extending along the east side of the railroad north to Traverse Bay. All tamarack stands examined throughout this area were lightly defoliated. Water levels in the area had receded, due mainly to drainage and road building for land reclamation in the district. Growth in the area was generally good and low sawfly populations recorded. However, as water levels recede it is probable that larch sawfly populations will increase. Light to medium damage was recorded west of Stead and Beaconsia and nil to light south of Beaconsia to Scanterbury and Libau. South of Libau along the highway in the agricultural area damage was medium to heavy.

In the large stands of tamarack along the shore of Lake Winnipeg between Beaconsia and Scanterbury, conditions were the same as 1951. Defoliation was light, few curled tips were observed, and surface water was present in most swamps examined. Growth conditions appeared good, but some stands consistently flooded had scanty foliage and heavy cone crops.

Although information on the area north of the Winnipeg River and east of Lake Winnipeg was incomplete, the status of the larch sawfly appeared to be the same as in 1951. Aerial surveys made in the latter part of July showed light to medium defoliation north to Manigotagan Lake in the Bear Lake area, and south of Long Lake. North of Bissett on the Gunnar Road in township 24 medium to heavy defoliation was observed. Light to medium patches were recorded to the Gannon River, with medium to heavy defoliation occurring at an unnamed lake in secs. 36, 35 and 34, tp. 27, rge. 13, R.P. mer. and through secs. 12, 13, 24, 25 to 36, tp. 28, rge. 13, B.P. mer. to the edge of a large burn south of the Bloodvein River. In the Sasaginnigak Lake area stands suffered light to medium defoliation.

Defoliation along the Trans-Canada Highway increased in 1952. Defoliation varied from medium to heavy in the Beausejour and Whitemouth area to generally heavy in the Whiteshell Forest Reserve. At all the permanent plots examined in the Darwin, Rennie, Telford and West Hawk Lake areas, stands suffered 80 to 95 per cent defoliation. South of West Hawk Lake to Falcon Lake and to the Whiteshell Forest Reserve boundary, defoliation

was also heavy. In the central portion of the Whiteshell Forest Reserve defoliation remained much the same as in 1951. It was generally light with scattered patches of medium defoliation along the Whiteshell Road to Big Whiteshell Lake, along the Betula Lake Road, and along the Meditation Lake Trail.

In the large tamarack stands south of Dorothy and Eleanor Lakes, defoliation remained light to medium with heavy patches occurring immediately south of Dorothy Lake and at Picket Creek.

Larch sawfly reports showing degree of defoliation and mortality were completed for all tamarack stands examined in the Eastern District. The defoliation and mortality of tagged trees in the permanent sample plots were also recorded during the latter part of August. There was an increase in mortality in some of the permanent sample plots, but it was impossible to determine the exact cause.

Collections of diseased larvae were obtained in the Lac du Bonnet, Whitemouth and Falcon Lake areas. The diseased organisms were identified at the Winnipeg Laboratory as Bemisia, Bemisa and Fusarium Spp.

The new Tray sampling technique introduced in 1951 for sampling high populations of the larch sawfly was used in most of the areas surveyed; the only exceptions were in areas where populations were low.

2.2.2 - Green Larch Lopper, Semiothisa sexmaculata (Pack.)
Marlatt's Larch Sawfly, Anaploxyx laticis (Marl.)

These two species were found in most tamarack stands examined during 1952. The amount of defoliation caused directly by them was not determined, but as populations were comparatively low it was probably negligible.

2.2.3 - Jack-pine Budworm, Choristoneura Sp.

Defoliation caused by the jack-pine budworm decreased considerably in the Eastern District of Manitoba during 1952. Light populations were general on jack-pine stands throughout the whole district. The first larvae of the jack-pine budworm were collected at Milner Ridge and on the jack-pine ridge east of Seddon's Corner on May 27.

In the Lac du Bonnet area jack-pine budworm was general and was found in most stands examined. The same conditions existed in the areas sampled along the Pointe du Bois Road and in the Pinawa, Bird River and Great Falls areas. Distribution was general in the vicinity of Seven Sisters and along the Winnipeg River to Nutimik Lake on Picket Creek. Along the Trans-Canada Highway, in the Whiteshell Forest Reserve and at Betula, Falcon, Crow-Duck Lakes to the Manitoba-Ontario boundary conditions were much the same. The somewhat higher populations recorded at Betula Lake in 1951 had declined in 1952.

A jack-pine budworm survey was made again in the Seddon's Corner, Milner Ridge area in 1952. This area, located on an elevated ridge (altitude 975') supporting a dense jack-pine stand, was severely defoliated in 1951, but suffered only light defoliation in 1952. Two small patches of heavy defoliation were encountered while surveying the area, but damage was limited to only a few trees. These were open-growing, mature, male flowering trees. The high populations were discovered while making 18" tip counts and mass collections. Most of the areas of heavy defoliation during 1951 showed nil to light traces of budworm in 1952 (see map). On the Milner Ridge, populations were generally very low. Observations during the survey showed some defoliation to regeneration. Damage was most conspicuous on the main leaders which were found to be drying out (see photographs).

Jack-pine budworm defoliation in the Stead area had decreased considerably during 1952. The infestation was confined to secs. 21 and 20, and extending into secs. 28, 29, tp. 17, rge. 8, E.P. mer. At the forestry tower defoliation was confined to a small pocket of open-growing, male-flowering trees and in secs. 28 and 21 defoliation was limited to a small strip along a ridge top. There was a marked decrease in the number of male-flowering trees. In areas where they were abundant, defoliation was somewhat heavier. Damage to regeneration was observed in areas that had been heavily defoliated in 1951. Main leaders were damaged through defoliation and scoring of the bark and cambium. In a number of

cases the leaders were drying out (see photographs).

Jack-pine budworm defoliation in the Belair District decreased in 1952. The heavy defoliation in secs. 4, 5, 9, tp. 19, rge. 7, E.P. mer. had receded to a small pocket in sec. 33, tp. 18, rge. 7, E.P. mer. This pocket of medium defoliation was patchy and varied in intensity, but the outlines were somewhat similar to 1951. Near the Belair Townsite, budworm defoliation was nil to light and tree growth was good. In the Albert Beach area defoliation had also decreased to light. Defoliation was patchy and concentrated on the more open-growing, male-flowering trees. One noticeable feature was the absence of male flowers throughout most of the area.

Information on the area east of Lake Winnipeg was obtained through aerial surveys supplemented by ground checks. Budworm populations were general and were found in both the larval or pupal stages at Oiseau, Garner, Obukowin, Aikens, Manigotagan, Saaginnigak, Dogskin, Family and Mear lakes.

Medium defoliation was recorded at Flintstone Lake, along the east shore line to Carlson's Camps at Aikens Lake, and at the point examined on Manigotagan Lake.

Twenty four jack-pine budworm population counts were made in 1952. The counts consisted of two 18" branches from each of 5 trees. These were carefully examined and the number of larvae recorded. Supplementary five tree beating samples were made to assess the value of the 18" tip counts. Table A shows the results of 18" branch counts and the supplementary beating collection.

TABLE A
Jack-pine Population Counts

Date	Place	Sec.	Tp.	Rge.	Mer.	18" Branch Count	Beating Count.
June 25	Nelson	29	12	9	E.P.	9	5
June 25	Julius	25	12	9	E.P.	43	52
June 26	Seddon's Corner	4	13	10	E.P.	7	7
June 24	Pointe du Bois	3	16	14	E.P.	2	4
June 23	Milner Ridge	16	14	10	E.P.	0	1
June 23	Milner Ridge	16	14	10	E.P.	7	0
June 23	Seddon's Corner	3	13	9	E.P.	58	120
June 30	Boggy River	1	11	13	E.P.	1	0
June 30	Rennie	28	10	14	E.P.	3	2
July 3	Stead	9	17	8	E.P.	63	113
July 2	Stead	27	17	8	E.P.	85	26
July 7	Stead	28	17	8	E.P.	46	119

Some parasitism was recorded in several areas. Of these, Seddon's Corner and Stead seemed to support the most noticeable increase in parasitism. Glypta sp. appeared most common, with Apanteles sp. also recorded at Stead, Seddon's Corner, and in the Julius areas.

Diseased larvae were located at Stead and Seddon's Corner. The disease organisms obtained from jack-pine larvae collected at Stead were identified as Beauveria bassiana (Oleb.), Fusarium sp., and Capaulos (disease not identified). From Seddon's Corner the disease organism was identified as Polyhedra.

2.2.4 - Spruce Budworm, Choristoneura fumiferana (Clem.)

Spruce budworm populations increased in 1952 in the area north of the Winnipeg River in Eastern Manitoba. The first larvae were collected in the latter part of May on white spruce and balsam fir at McArthur Falls. Aerial surveys of the northern section revealed that spruce budworm was general and several light infestations occurred throughout the area. Ground checks were made at Wallace and Garner lakes where defoliation was noticeable from the air. At the time of survey spruce budworm feeding was complete. Defoliation estimates were made from visual examination and the abundance of pupae in the area. The black-headed budworm was found closely associated with the spruce budworm and was still feeding at time of examination. In all probability the black-headed budworm was responsible for a large part of the defoliation.

Spruce budworm was found on white and black spruce and balsam fir at Oiseau, Flintstone, Garner, Wallace, Aikens, Sasaginnigak and Dogskin lakes. Areas of medium defoliation were recorded at Garner Lake in sec. 36, tp. 21, rge. 17, E.P. mer., and at Wallace Lake in sec. 1, tp. 24, rge. 15, E.P. mer. In both these areas it was difficult to establish whether the spruce budworm or black-headed budworm was causing the most defoliation. At Garner Lake the infestation of medium intensity covered approximately 100 acres. Spruce budworm in all stages, larvae, pupae and adult, were collected in this area. Parasites were also common in this area.

Populations were general but light at Maskwa Lake, at Lake St. George and in the Lac du Bennet area. The same conditions applied to areas around Seven Sisters, Pointe du Bois, Seddon's



Main leader damage on jack pine at
Milner Ridge
sec. 30, tp. 12, rge. 10, E.P. mer.



Main leader damage on jack pine at
Milner Ridge
sec. 1, tp. 13, rge. 9, E.P. mer.



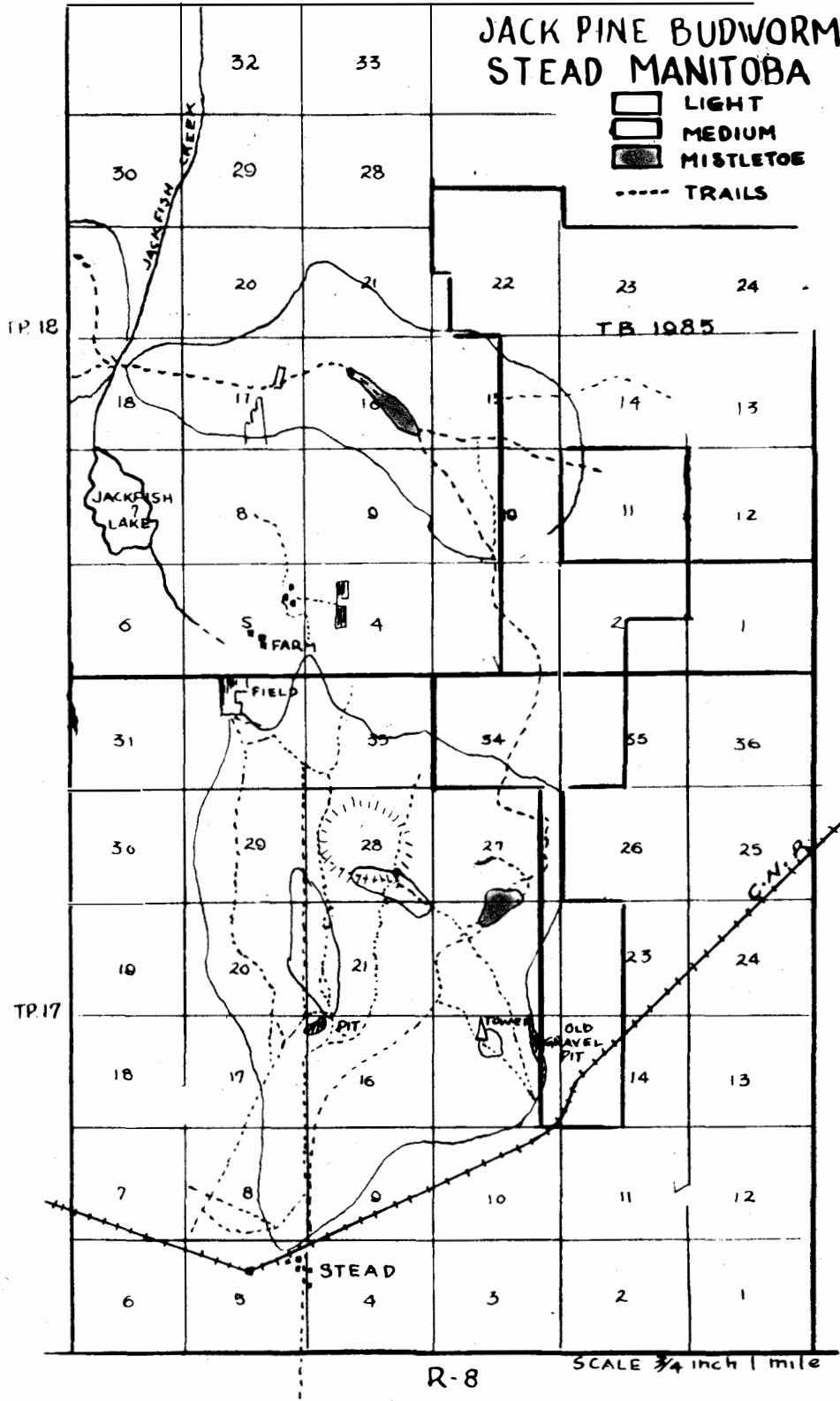
Leader damage on jack pine - Stead
sec. 21, tp. 17, rge. 8, E. P. mer.



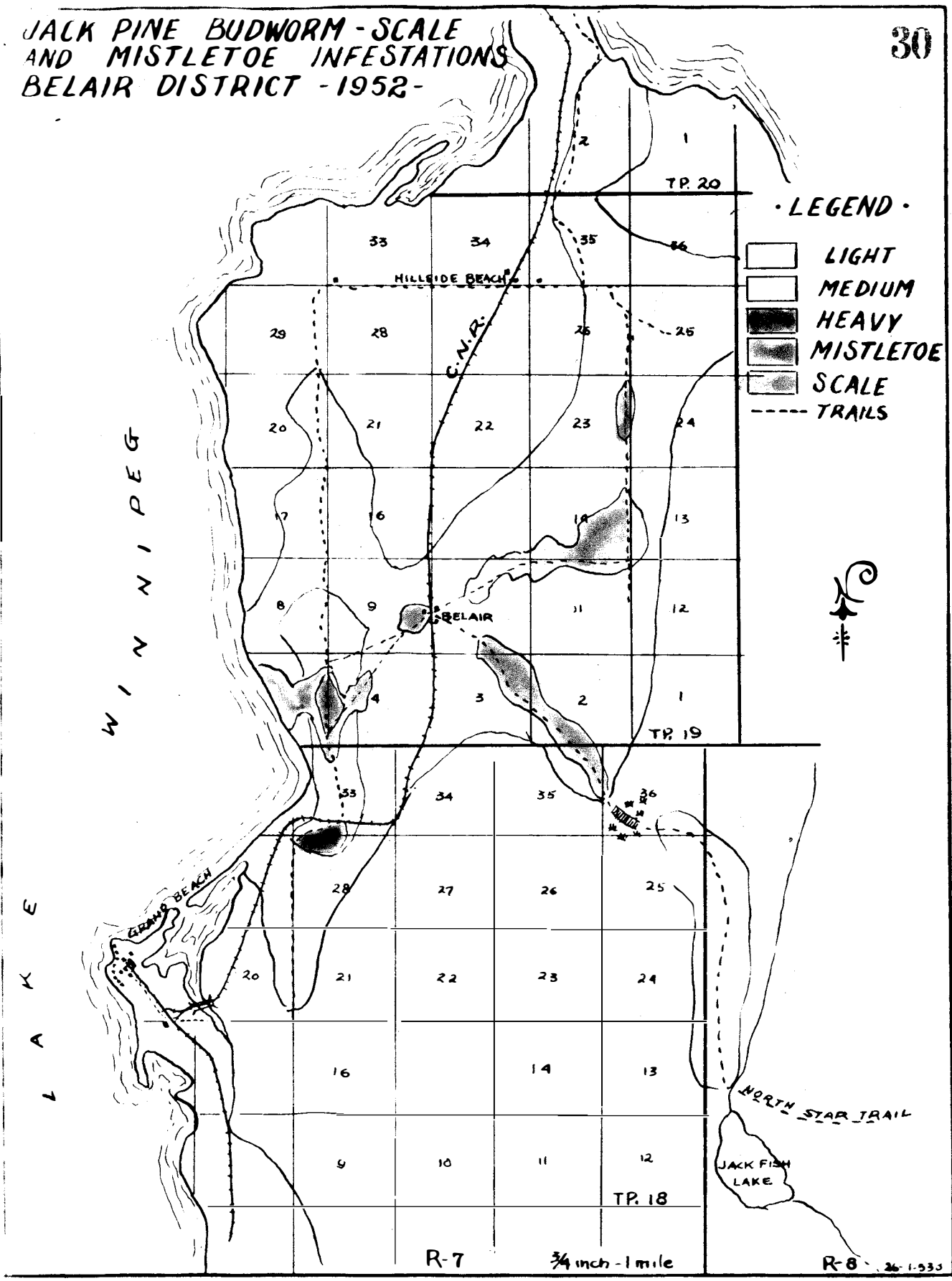
Leader damage on jack pine - Stead
sec. 22, tp. 17, rge. 8, E. P. mer.

JACK PINE BUDWORM INFESTATION STEAD MANITOBA - 1952

-  LIGHT
-  MEDIUM
-  MISTLETOE
-  TRAILS



**JACK PINE BUDWORM - SCALE
AND MISTLETOE INFESTATIONS
BELAIR DISTRICT - 1952-**



• LEGEND •

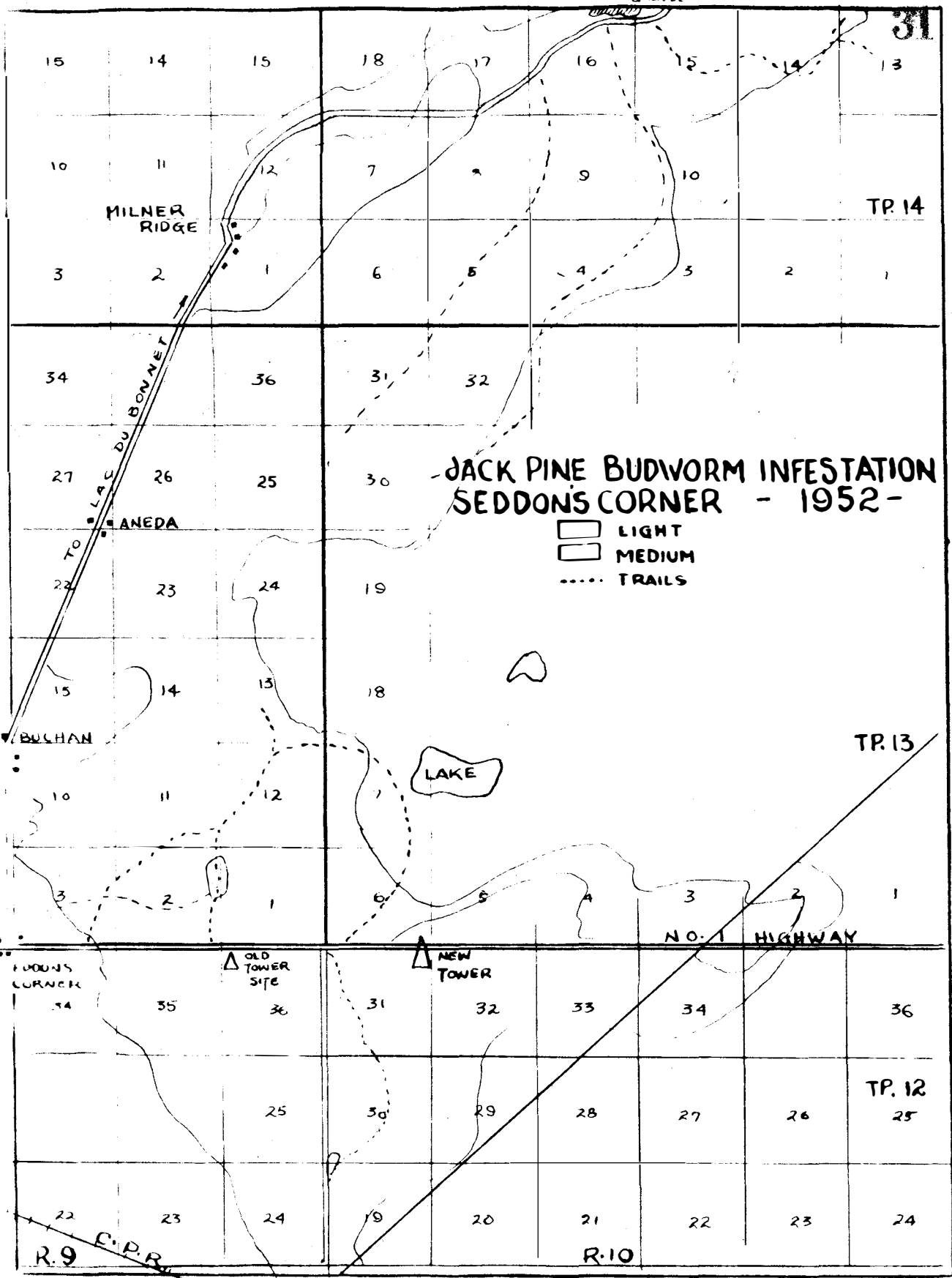
- LIGHT
- MEDIUM
- HEAVY
- MISTLETOE
- SCALE
- TRAILS



R-7

3/4 inch = 1 mile

R-8 26-1-535



Corner, Rennie and in the northern part of the Whiteshell Forest Reserve.

One diseased larva was collected at Stead and the organism identified as Fusarium sp.

2.2.5 - Spruce Needleworm, Dioryctria reniculella (Grt.)

The spruce needleworm was common throughout the Eastern District in 1952, but caused only very light damage.

2.2.6 - Grey Willow Leaf Beetle, Galerucella decora (Say.)

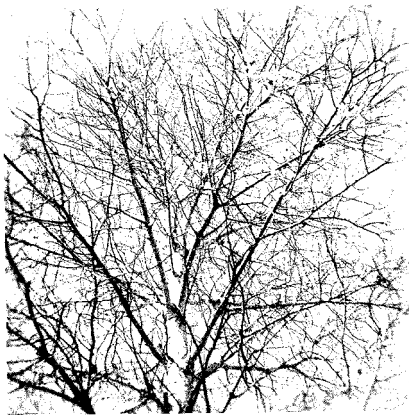
This insect was general in the Eastern District in 1952. Skeletonizing of willow foliage was light in the areas north of the Winnipeg River to Sasaginnigak Lake, Moar Lake and God's Lake, and along the east shoreline of Lake Winnipeg to Berens River. Light with occasional patches of moderate skeletonizing was evident in the Lac du Bonnet and Pointe du Bois areas. The same conditions existed at Seven Sisters, south to Whitemouth and east to Rennie, and including the Whiteshell Forest Reserve. In the area around Stead, Belair and Brightstones skeletonizing was also light.

2.2.7 - Forest Tent Caterpillar, Malacosoma disstria (Hbn)

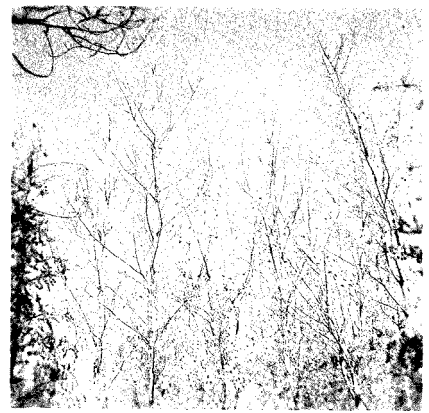
In Eastern Manitoba populations of the forest tent caterpillar continued to increase in 1952. The large infestation in the south-eastern corner of Manitoba had spread north and west and was causing complete defoliation around Falcon Lake in the southern part of the Whiteshell Forest Reserve. Pockets of heavy defoliation occurred also west of Falcon Lake along the Trans-Canada Highway to Rennie. The infestation at Big Whiteshell Crow-Duck Portage had expanded to twice the area that was infested in 1951. The large island located in Big Whiteshell Lake, which had supported heavy populations of forest tent caterpillars in the past, was completely defoliated. Two smaller islands to the south were also completely defoliated. Pockets of heavy defoliation were recorded along the Trans-Canada Highway at the overhead bridge west of Rennie, on the east shore of Lac du Bonnet and at Pointe du Bois. An extensive defoliation survey

was carried out in early June to determine the amount of defoliation and the incidence of parasitism and disease. Severe defoliation at Falcon Lake extended south to the boundary of the Whiteshell Forest Reserve and along the south shore line. At Falcon Lake, as in the other heavily defoliated areas, white poplar and its understory, including oak, birch, ash, pin and chokecherries, saskatoon, hazel, alder and willow, suffered 90 to 100 per cent defoliation. It was also noted that pupation was heaviest on grasses, ferns and shrubs, along the tree trunks and bark, and on conifers which had also been lightly attacked in the feeding period.

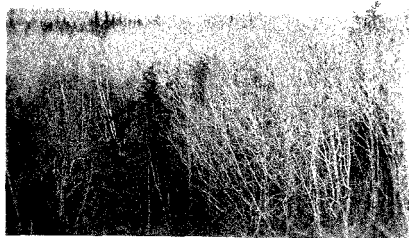
North of Falcon Lake defoliation gradually lessened to moderate at West Hawk Lake. In the Gaddy Lake area defoliation was medium. South of Bear Lake to the Telford area the infestation was heavy. The heaviest defoliation was recorded between mi. 97 and mi. 98 along the Trans-Canada Highway. West of Telford the defoliation varied between medium and heavy from Rennie to Darwin, and then decreasing to medium in the agricultural district of Whitemouth. In the central portion of the Whiteshell Forest Reserve along the Whiteshell Road to White Lake, poplar stands suffered medium defoliation. From White Lake to the infestation at Big Whiteshell defoliation was light. East of Seven Sisters along the south side of the Winnipeg River populations were light. From Seig's Corner to Seven Sisters defoliation was heavy. North of Seven Sisters and along the west side of the river to Lac du Bonnet it was moderate. North of Lac du Bonnet to Great Falls and into the agricultural areas at St. George and Pine Falls defoliation was light with occasional pockets of medium. Small pockets of heavy defoliation were recorded along the Brookfield Road, and on the east shore of Lac du Bonnet. Along the Pointe du Bois Road defoliation was light, with the exception of a heavy pocket at eight foot falls. Heavy defoliation was also observed in the shelterbelts and woodlots in the agricultural areas of Brightstone and Landerville. At Beausejour and north to Stead defoliation in general was light to medium. At Stead populations were low and scattered. The same conditions applied to Gull Lake and north to Grand Beach, Belair, Hillside and Albert Beach.



Forest Tent Caterpillar Defoliation
Telford Mi. 96



Forest Tent Caterpillar Defoliation
Telford Mi. 96



Forest Tent Caterpillar Infestation
Big-Whiteshell - Crow-Duck lakes
portage



Forest Tent Caterpillar Infestation
Falcon lake - Whiteshell Forest
Reserve



Forest Tent Caterpillar
Infestation - Mi. 97
Telford

Information on the area north of the Winnipeg River was obtained through aerial surveys and ground checks. At the time of survey the tent caterpillars were in the pupal stage and few adults had emerged. Large outbreaks were recorded as far north as the Touchwood and Joint Lakes area. Medium defoliation was encountered at Black Lake in tp. 19, rge. 16, E.P. mer., and at Gem, Wallace, Aikens, Sasaginnigak, Moar, Charron, Island and Bolton lakes. Parasitized and diseased larvae were observed at most of the points examined. At the Big Whiteshell Portage infestation, parasite populations (especially Sarcophaga sp) had increased considerably. The same conditions were observed in the newer infestation at Telford. Two mass collections of larvae and pupae, each consisting of 500, were made at the Big Whiteshell-Crow-Duck Portage, and at Telford for parasite and disease studies.

Diseased larvae were collected at Whiteshell, Crow-Duck Lake, Telford, Silver Falls, Seddon's Corner and Pointe du Bois; the disease in all cases was identified as Polyhedra.

In order to predict the probable area and intensity of the forest tent caterpillar in the Eastern District in 1953, an egg survey was carried out in the fall of 1952. The survey indicated a more widespread distribution of forest tent caterpillar may occur in the district in 1953.

In late September ten permanent sample plots were established in white poplar stands throughout the district. Twenty five trees in each plot were marked and all pertinent data recorded to serve as a future check on forest tent caterpillar defoliation.

2.2.8 - Black-headed Budworm, Acleria varians (Fern.)

Populations of the black-headed budworm increased considerably in 1952. The most conspicuous defoliation by this insect occurred north of the Winnipeg River. Aerial surveys were conducted in this region during July, and at that time black-headed budworm larvae were still feeding. In several areas surveyed the black-headed budworm was closely associated with the spruce budworm and a large percentage of the defoliation was attributed to the black-headed budworm. This species was collected in varying numbers from black and white spruce and balsam fir at the 19 examination points during the aerial survey.

Medium to heavy defoliation on black spruce was recorded on the north shore of Garner Lake in secs. 33, 34, tp. 21, rge. 19, E.P. mer., along the east shore of Beresford Lake and north along Moore Creek to the south-east end of Moore Lake. Medium to heavy defoliation was also mapped at the north-east end of Wallace Lake, east to Siderock Lake, and extending north to the creek joining Siderock and Wallace Lake. Another infestation was recorded in the north-east corner of tp. 27, rge. 14, E.P. mer. along the north-west shore of an unnamed lake. Light to medium defoliation on black and white spruce and balsam fir was also recorded at Flintstone, Oisema, Garner, Obukowin, Aikens, Manigotagan, Sasaginnigak, Dogskin, Mear, Charron, Elliot, Island, Red Sucker, God's, Belton, Bigstone and Carr Harris lakes. To the south in the Lac du Bonnet area, Seven Sisters, Whitemouth, Rennie, Whiteshell Forest Reserve to the Manitoba-Ontario boundary black-headed budworm populations were general, but caused only light defoliation.

2.2.9 - American Poplar Beetle, Phytodecta americana, Schffr.

Populations of the american poplar beetle were heavier in 1952 than they were in 1951. Small localized infestations were located at McArthur Falls, south of Lac du Bonnet at the gravel pit, at Darwin and Telford in the Whiteshell Forest Reserve, Falcon Lake and Big Whiteshell Lake, but in all cases defoliation was light.

2.2. 10 - Ugly Nest Caterpillar, Archips cerasivorana (Vitch).

The old active infestation along the Lac du Bonnet Highway, at Milner Ridge, in the Stead and Belair areas and along the jack-pine ridge east of Seddon's Corner had abated in 1952, and tents were uncommon. In the remainder of the district very few tents were encountered and damage was quite light.

The majority of the larvae obtained were affected by a disease which was identified as Beauveria bassiana (globulifera).

2.2.11 - Aspen Blotch Miner, Lithocolletia tremuloidiella (Braun.)

Damage caused by this species remained somewhat the same as in 1951, the degree of attacks ranging from moderate to severe. It was recorded in most of the areas sampled during the 1952 season.

2.2.12 - A Pine Scale, Toumeyella sp.

The old infestations of pine scale located west of Belair in secs. 4 and 5, tp. 19, rge. 17, E.P. mer. were still active, but the boundaries remained much the same as in 1951 (see map). Light scale damage was observed at various points in the Stead area, but attack was limited to a few trees. Of these the most active was located on the North Star Trail in sec. 16, tp. 17, rge. 8, E.P. mer. Other spot damage was recorded at points north of the Winnipeg River, at Seddon's Corner and at Falcon Lake in the Whiteshell Forest Reserve.

2.2.13 - Yellow-headed Spruce Sawfly, Pikonema alaskensis (Reh.)

This sawfly caused light defoliation of white and black spruce in the Eastern District. North of the Winnipeg River yellow-headed spruce sawfly caused light defoliation to black spruce at Aikens, Mear, Flintstone, Wallace, Garner and Elliot lakes, and as far north as God's Lake.

South of the Winnipeg River light populations and defoliation was recorded at Lac du Bennet, Seven Sisters, in the Whiteshell Forest Reserve, and in the West Hawk Lake area. Samples of the green-headed spruce sawfly Pikonema dimockii (Cress.) usually closely associated with the yellow-headed spruce sawfly, were collected from black and white spruce in the same areas. Both sawflies occurred on white spruce at Letonia, along the Brockfield Road, south of Lac du Bennet, and at Dogskin Lake.

2.2.14 - A Tent Caterpillar, Malacosoma lutescens (N. & D.)

One sample of this species was obtained at Aikens Lake in 1952. Damage was negligible and was found on pincherry.

2.2.15 - Spotless Fall Webworm, Hyphantria textor (Harr.)

A few samples of this insect were collected in 1952 on elm regeneration along the Brockfield Road north of Seven Sisters but defoliation was light.

2.2.16 - White-pine Weevil, Pissodes strobi (Peck.)

Light infestations on jack-pine regeneration and pole growth were more numerous in 1952. Damage was recorded at Milner Ridge in sec. 30, tp. 13, rge. 10, E.P. mer., at Belair, and south of Falcon Lake in sec. 27, tp. 8, rge. 15, E.P. mer. Occasional damage was observed at Seddon's Corner, Telford, Darwin and along the Pointe du Bois Road.

2.2.17 - Pitch Nodule Maker, Petrova albicapitana (Busck.)

This nodule maker was common on jack-pine regeneration. Nodules were recorded in most areas examined, but damage was light. An increase in nodules was noticeable in the heavier jack-pine stands of Stead, Belair, and Seddon's Corner.

2.2.18 - Dark Beetles.

The status of bark beetles in the Eastern District remained much the same as in 1951. Attacks were confined to fire burns, windfalls, skidways, and dying balsam fir.

2.3. SPECIAL PROJECTS

2.3.1 - Jack-pine Budworm Survey at Stead, Belair, Seddon's Corner.

The annual jack-pine budworm survey at Stead, Belair and Seddon's Corner was continued in 1952.

Survey procedure entailed half mile stops on all accessible roads and trails through the infested area. At each location the following data were recorded; defoliation by diameter class, percentage of dead tops by diameter class, number of dead trees,

average d.b.h., number of staminate-flowering trees and remarks. Budworm populations had decreased and the severe infestations recorded in all three areas in 1951 were reduced to small scattered pockets. A detailed analysis of the data obtained in these areas will be found in the jack-pine budworm report, number 2.2.3.

2.3.2 - Mistletoe, Arceuthobium americanum Nutt.

Little change was noted in the status of mistletoe, except for a slight increase in tree mortality in the Belair District (see map). East of Belair in secs. 23 and 24, tp. 19, rge. 7, E.P. mer. some areas were cut selectively, thereby reducing the amount of mistletoe damage. To the south in secs. 15 and 10, 3 and 2, tp. 19, rge. 7, E.P. mer. mistletoe damage is spreading slowly and was recorded on all tree sizes. A small pocket of mistletoe reported near Lac du Bonnet in 1950 has now spread to about ten trees.

An infestation of mistletoe on black spruce in the Falcon Lake area was surveyed and mapped for the Forest Pathology Laboratory, Saskatoon.

2.3.3 - Larch Sawfly Cocoon Collections.

Mass collections of larch sawfly cocoons were made from sixteen scattered tamarack swamps in Eastern Manitoba. The locations are shown in the following table. These cocoons were stored at the Winnipeg Laboratory for dissection and examination to determine the distribution and incidence of parasites.

TABLE A
Larch Sawfly Cocoon Collections.

Date	Location	Sec.	Tp.	Rge.	Mer.	Plot #	No. of Cocoons
Aug. 22	Landerville	35	15	10	E.P.		250
" 21	Brightstone	23	15	9	E.P.		250
" 13	Murray Hill	14	17	8	E.P.		200
" 15	Pointe du Bois	30	15	12	E.P.	E.19	200
" 20	" "	10	16	13	E.P.	E.	200
" 20	" "	35	15	14	E.P.		200
" 13	" "	24	15	11	E.P.	E.18	250
" 11	Jack Pine Ridge	1	13	9	E.P.	E.52	250
" 19	§Seddon's Corner	3	13	9	E.P.	E.36	200
" 18	Darwin	24	11	12	E.P.		250
" 18	" "	18	11	13	E.P.		250
" 26	Telford	17	10	16	E.P.		250
" 26	" "	16	10	15	E.P.	E.10	250
" 25	Bear Lake	14	10	16	E.P.		250
Sept. 2	Red Rock Lake	8	12	15	E.P.		250
Aug. 18	Hector	10	11	13	E.P.	E.9	250

§ Parasite release area 1948, 1,400 tripunctis klugii

2.3.4 - Forest Tent Caterpillar Defoliation and Egg Survey.

Extensive surveys to determine the distribution of the forest tent caterpillar were conducted during the 1952 season. Ground and aerial surveys covering most of the Eastern District were also made in June to map defoliation (see map).

In September an egg survey was made of the infested and adjacent areas to determine the areas most likely to be infested in 1953. Survey procedure was as follows:- Three trees ranging from 2" to 6" d.b.h. were examined at five mile intervals in the infested and adjoining areas. The trees were felled and thoroughly examined for egg bands, the total number of egg bands per tree was recorded as well as d.b.h., height, location and any data pertinent to the survey, such as old egg bands, structure and stand type. These egg bands will later be reared at room temperature in separate vials. Emergence records will be kept and finally all egg bands will be dissected for parasite and total egg counts. These data will be used to forecast the population trends for 1953.

The following negative reports were obtained during the forest tent caterpillar egg survey.

Date	Host	Location
Sept. 12	White Poplar	Seddon's Corner, sec. 1, tp. 13, rgs. 9, E.P. mer.
Sept. 12	White Poplar	Tyndall, sec. 13, tp. 13, rgs. 6, E.P. mer.
Sept. 12	White Poplar	Beaussejour, sec. 33, tp. 12, rgs. 8, E.P. mer.

2.3.5 - Permanent Sample Plots.

Seven permanent sample plots were established in 1952 in white poplar stands infested by the forest tent caterpillar in Eastern Manitoba. The locations of these plots are shown in the following table.

TABLE B
Permanent Sample Plots

Date	Place	Sec.	Tp.	Rgs.	Mer.	No.	Stand Type
Sept. 15	Lake Brereton Road	20	10	15	E.P.	E.61	White Poplar
" 16	Rennie	11	11	13	E.P.	E.62	White Poplar
" 24	West of Darwin	23	11	12	E.P.	E.63	White Poplar
" 24	Betula Road	33	22	15	E.P.	E.64	White Poplar
" 25	Seven Sisters	27	13	12	E.P.	E.65	White Poplar
" 26	Pointe du Bois Road	27	15	12	E.P.	E.66	White Poplar
" 27	Milner Ridge	7	14	10	E.P.	E.67	White Poplar

2.3.6 - Permanent Sample Stations.

Sixteen permanent sampling stations were established in the Eastern District in 1952. They are located as follows:

TABLE C
Permanent Sample Stations

Date	Location	Sec.	Tn.	Rgs.	Mer.	Station No.	Tree Species
July 12	Mi. 80 Darwin	1	11	13	E.P.	E.45	White poplar
" 29	West Hawk Lake	34	9	17	E.P.	E.46	Jack-pine
" 31	Mi. 94 Rennie	22	10	15	E.P.	E.47	White Poplar
" 28	Falcon Lake	17	9	17	E.P.	E.48	Jack-pine
Aug. 1	Green Lake	17	13	16	E.P.	E.49	Jack-pine
" 2	White Lake	33	12	15	E.P.	E.50	White Poplar
" 12	Mi. 51 Seddon's Corner	6	13	10	E.P.	E.51	White Poplar
" 11	Seddon's Corner	1	13	9	E.P.	E.52	Tamarack
" 12	Stead	20	17	8	E.P.	E.53	White Poplar
" 13	Murray Hill	14	17	8	E.P.	E.54	Tamarack
" 13	Stead	20	17	8	E.P.	E.55	White Poplar
" 14	Gull Lake	36	16	7	E.P.	E.56	White Poplar
" 16	Las du Bonnet	30	15	11	E.P.	E.57	Black Spruce
" 18	Darwin	24	11	12	E.P.	E.58	Tamarack
" 18	Darwin	29	11	12	E.P.	E.59	White Poplar
Sept. 2	Jessica Lake	20	12	15	E.P.	E.60	Jack-pine

2.4 - PERSONNEL CONTACTED

EASTERN DISTRICT OF MANITOBA

Name	Rank	Address	Time Contacted
T.B. Verailyea	District Forester	Winnipeg	8
J.G. Sommers	Provincial Forester	"	2
A.W. Brain	Chief of Fire Protection	"	2
W. Danyluk	Forest Management	"	#
C.J. Ritchie	Sr. Forest Ranger	Rennie	#
G. Emberley	Forest Ranger	"	#
J. Nespor	Forest Ranger	Las du Bonnet	#
D. Wardrop	" "	"	#
J.D. McCarrol	" "	"	#
O. Meier	Stockman	"	#
S. Maltman	Trainee	"	#
D. Gretsinger	"	"	#
S. Sveinson	Forest Ranger	Stead	#
E. Greer	F.S. Mechanic	Rennie	#
F. Gilbert	Game Branch	Las du Bonnet	#
E. Folkowski	Forest Ranger	West Hawk Lake	#

2.4 - Personnel Contacted (completed)

Name	Rank	Address	Time Contacted
S. Olecka	Fire Ranger	Stead	#
B. Enns	Forest Ranger	Seven Sisters	#
B. Coens	Foreman	"	#
W. Tucker	Fire Ranger	Pointe du Bois	#
R. Taggeson	"	Bird River	#
B. Davies	"	Lac du Bonnet	5
G. King	"	"	5
R. Tate	Surveys	Winnipeg	6
O. Kelba	"	"	6
A. Jardine	"	"	6
J. Baldwin	Fire Ranger	Berens River	1
J. Inkster	Forest Ranger	Pine Falls	3
E. Hood	"	Whitemouth	7
E. Buchan	Biology Ranger	Sault St. Marie	3
R. Carlson	Tourist Camp Operator	Aikens Lake	1
T. HUMANAKI	"	God's Lake	1
B. Everett	Fire Ranger	Little Grand Rapids	1
A. Raven	"	Hole River	4
G. Barker	"	Berens River	#
B. Morse	"	"	1
A. Shannon	Forest Ranger	Riverton	1
D. Williams	Meteorological Branch	Toronto	#
M. Wheaton	Dem. Forest Service	Winnipeg	#
J. Russell	Fire Ranger	Bissett	2
H. Wells	Game & Fisheries	Lac du Bonnet	#
T. Coats	C.F.A. Unit	Winnipeg	1
J.C. Uhlman	Director M.G.A.S.	Lac du Bonnet	#
H. Smith	Dispatcher M.G.A.S.	"	#
G. Donaldson	Radio Div. M.G.A.S.	"	#
C. McGuire	"	"	#
F. Hanton	Pilot M.G.A.S.	"	#
R. Rice	"	"	#
N. McCoy	"	"	1
R. Hunter	"	"	#
R. Percy	"	"	#
R. Paquin	"	"	5
<u>Manitoba Pulp & Paper Co.</u>			
C. Farmer	Cruiser	Pine Falls	1
G. Baily	Cruiser	"	1

- indicates everyday contact for a week or more during season.

3 WESTERN DISTRICT OF MANITOBA

by
A.R. Campbell

3.1 INTRODUCTION

Forest insect survey, sampling and observations were conducted in the Western District of Manitoba from May 14 to September 20, 1952.

From May 7 to May 10 the writer assisted L.L. McDowall and M. Pratt counting branches on tamarack trees to provide information on sawfly populations by the number of curled tips. This work was carried out in the Birds Hill area.

Field work commenced in the Riding Mountain National Park on May 15, where general sampling and observations were carried out. This survey was made to detect and determine the damage caused by the spruce budworm, Choristoneura fumiferana (Clem.), the jack-pine budworm, Choristoneura sp., and the black-headed budworm, Acleris varians (Fern.). The results from this survey indicated that the black-headed budworm populations had increased from previous years, but defoliation of white and black spruce was still negligible.

From June 1 to June 29 a survey was made of the Duck Mountain and the Porcupine Forest reserves, and north along Highway No. 10 to the Overflowing River. White poplar stands in the Duck Mountain Forest Reserve were examined. Several collections of the large aspen tortrix were obtained, but no noticeable defoliation was observed. In addition, jack-pine stands in the Cowan area were examined; one larva of the jack-pine budworm was found. Near the Overflowing River, several collections of the spruce budworm were made, but no appreciable defoliation was observed. The survey was continued along the western slopes of the Duck Mountain Forest Reserve, where white poplar stands were examined for the large aspen tortrix, however no evidence of this insect was found.

During period July 2 to 15, forested areas south and north of Grandview, Gilbert Plains, Onanole, and in the Riding Mountain National Park were re-examined. Special attention was given to tamarack stands during this survey. Several collections of the larch sawfly were made and special reports prepared on most stands

examined. Although defoliation at this time was very light, many small larvae were observed feeding on all tamaracks examined.

From July 16 to July 31 a survey was made of all accessible tamarack stands in the Duck Mountain Forest Reserve, the Porcupine Forest Reserve, and north along Highway No. 10 to the Overflowing River. During this period several permanent sampling station sites were located in white spruce and poplar stands along the Singoosh Lake Road in the Duck Mountain Forest Reserve.

From August 1 to August 31, forest stands in Riding Mountain National Park were re-examined. On August 17, 18 and 19 the writer assisted Mr. R.W. Thomas of the Forest Pathology Laboratory, Saskatoon, Saskatchewan, on a preliminary survey for the occurrence of tree diseases in the Western District. Several specimens were collected and forwarded to the Saskatoon Laboratory for identification. Mr. Thomas also instructed on the procedure to be followed when collecting diseased material. During the remainder of the month general sampling was continued, permanent sample plots were examined, and special infestation reports prepared.

The period September 1 to September 20 was spent making mass collections of larch sawfly cocoons. In addition, random sampling was carried out through the Riding Mountain National Park and north to the Overflowing River.

Field work in the Western District was completed on September 20 and the writer returned to the Winnipeg Laboratory on September 21.

From September 23 to September 30 the writer assisted Mr. J.A. Drenin, establishing permanent sample plots in white poplar stands in the Whiteshell Forest Reserve and in the Lac du Bonnet area of eastern Manitoba.

3.2 INSECT CONDITIONS

3.2.1 - Larch Sawfly, *Pristiphora erichsonii* (Htg.)

The larch sawfly was less abundant in the Western District of Manitoba in 1952. Defoliation was recorded as light or very light throughout the district, except along No. 10 Highway north of Dauphin to Minniconas, south of Minniconas to Wellman Lake, and

along the eastern slope of the Porcupine Forest Reserve to the Overflowing River. In these sections defoliation varied from light to moderate. The first larch sawfly larvae were collected on June 26. These were obtained from tamarack along the Norgate and Rolling River roads in Riding Mountain National Park. Small mammals were active predators and destroyed many larch sawfly cocoons in most tamarack stands examined throughout the district in 1952.

In Riding Mountain National Park defoliation, for the most part, varied from very light to light. Very light defoliation occurred along the Rolling River, Whirlpool Lake, and Katherine Lake roads. Traces of defoliation were noted also in the vicinity of sec. 34, tp. 19, rge. 17, W.P. mer. and in sec. 5, tp. 20, rge. 17, W.P. mer. Light defoliation occurred in scattered stands of tamarack along No. 10 Highway in the central portion of the Park. Very light defoliation was recorded in a tamarack stand south of Moon Lake in sec. 4, tp. 22, rge. 19, W.P. mer. Other stands examined in this area suffered light defoliation. Light defoliation was observed on tamarack along the Lake Audy, P.O.W., and Gunn Lake roads. Only a trace of defoliation was recorded in a tamarack stand in sec. 14, tp. 21, rge. 21, W.P. mer. north of Elphinstone, in the western portion of the Riding Mountain National Park. Several tamarack stands were examined north of Elphinstone and in the Crawford Park and Rossburn areas. Defoliation was generally very light throughout these areas. Light sawfly defoliation occurred in a tamarack stand in sec. 11, tp. 22, rge. 25, W.P. mer. In other tamarack swamps along the Wilson Lake and Deep Lake roads larch sawfly caused no appreciable defoliation.

In the south section of the Duck Mountain Forest Reserve, light defoliation occurred from Grandview north to Mink Creek and Baldy Mountain. Very light defoliation was observed along the Baldy Mountain road in sec. 28, tp. 28, rge. 24, W.P. mer. In two additional stands nearby this insect was present, but was causing very light defoliation. North of Gilbert Plains several stands of tamarack located on private lands were examined. Light sawfly defoliation was noted in these stands.

In the Bield Ranger district, and north to San Clara, Shell River, Boggy Creek and along highway No. 31, defoliation varied from light to moderate. Light defoliation also occurred in a small swamp in sec. 15, tp. 30, rge. 29, W.P. mer. Light to moderate defoliation occurred in scattered tamarack stands from Dauphin

north through Garland, Ethelbert, Singoosh Lake, Solater, Cowan, Kenner, and south to Wellman Lake. West of Garland, along the Singoosh Lake road, moderate defoliation occurred in a small stand of tamarack in sec. 10, tp. 30, rge. 23, W.P. mer. Two additional stands in this area suffered light defoliation. These stands were located in sec. 16, tp. 30, rge. 25, W.P. mer. and sec. 33, tp. 30, rge. 24, W.P. mer. East of Solater very light defoliation was reported on tamarack in sec. 28, tp. 34, rge. 22, W.P. mer. Moderate defoliation occurred in a large tamarack swamp south of Cowan in sec. 11, tp. 35, rge. 23, W.P. mer. and light to moderate defoliation in sec. 15, tp. 36, rge. 23, W.P. mer. north of Cowan.

In the Wellman Lake area light to moderate defoliation occurred in a small tamarack stand in sec. 20, tp. 33, rge. 25, W.P. mer. Light to moderate defoliation occurred in most tamarack examined from Swan River north along highway No. 10 to Mafeking and the Overflowing River. Light defoliation was reported in a small tamarack stand south of Birch River in sec. 23, tp. 39, rge. 26, W.P. mer. North of Mafeking moderate defoliation occurred on tamarack in sec. 16, tp. 46, rge. 25, W.P. mer. and in sec. 19, tp. 44, rge. 25, W.P. mer.

3.2.2 - Black-Headed Budworm, Aglia varians (Fern.)

This budworm was found on most white and black spruce examined throughout the Western District during 1952, but it was most abundant in the western portion of the Riding Mountain National Park. Very light defoliation occurred on young spruce north of Rosburn in sec. 11, tp. 22, rge. 25, W.P. mer. and in sec. 2, tp. 23, rge. 25, W.P. mer. Light damage was also reported from Dauphin north along highway No. 10 to the Duck Mountain Forest Reserve, Porcupine Forest Reserve and the Overflowing River. Ninety seven samples were collected during the survey, but defoliation was generally negligible.

3.2.3 - Striped Alder Sawfly, Hemichrea crossea (Fourc.)

This insect was observed on most alder examined in the Western District in 1952, but caused severe defoliation in only one area. This severely defoliated stand of alder was located north of Rossburn in sec. 33, tp. 22, rge. 25, W.P. mer. In other sections of the district only a trace of defoliation was observed. This sawfly is becoming more abundant and may cause more severe defoliation of alder next year.

3.2.4 - White-Pine weevil, Pissodes strabi (Peck)

The white pine weevil was generally light through the Western District of Manitoba in 1952. It was most abundant in the eastern and western portions of the Riding Mountain National Park. Along the Gunn Lake Road, dead leaders were common on young white and black spruce. Several collections of this insect were made also along the eastern slopes of the Duck Mountain and the Porcupine Forest reserves and north to the Overflowing River. However it caused no serious damage to young spruce in these areas.

3.2.5 - American Poplar Beetle, Phytodecta americana Schffr.

This insect was again common throughout the Western District but did not cause extensive defoliation. In the Duck Mountain Forest Reserve patches of poplar were moderately defoliated, being slightly more extensive along the Singoosh Lake road in sec. 16, tp. 31, rge. 23, W.P. mer. Traces of defoliation were observed in the Riding Mountain National Park, the Porcupine Forest Reserve and north to the overflowing River.

3.2.6.- Grey Willow Leaf Beetle, Galerucella decora (Say).

The grey willow leaf beetle was generally distributed throughout the Western District in 1952. However, damage caused by this insect in the district was negligible. Light skeletonizing occurred south of Durban in sec. 22, tp. 33, rge. 28, W.P. mer.

3.2.7 - Balsam-fir Sawfly, Neodiprion abietis (Harr.)

A decrease in the distribution of this sawfly was evident in the Western District in 1952. It caused only very light defoliation to white spruce where it was present. Very light defoliation occurred on mature white spruce in the Riding Mountain National Park in sec. 21, tp. 22, rge. 19, W.P. mer. and sec. 23, tp. 19, rge. 17, W.P. mer. This insect was also present in the Duck Mountain and the Porcupine Forest reserves, but generally it caused no appreciable defoliation.

3.2.8 - Large Aspen Tortrix, Archips conflictana (Wlk.)

The large aspen tortrix was widely distributed throughout the Western District in 1952, but caused only a trace of defoliation on most poplar examined. It was slightly more abundant along the southern and eastern slopes of the Duck Mountain Forest Reserve. Several collections were made west of Garland in sec. 15, tp. 31, rge. 22, W.P. mer. and north of Shortdale.

3.2.9 - Ugly Nest Caterpillar, Archips cerasiverana (Fitch).

The heaviest concentrations of this insect occurred north of San Clara in the Duck Mountain Forest Reserve, but no appreciable damage was reported. It was also observed south of Ethelbert in sec. 5, tp. 30, rge. 22, W.P. mer. and south of Bowman in sec. 33, tp. 38, rge. 27, W.P. mer. The remainder of the district was comparatively free of attack, and defoliation was negligible.

3.2.10 - Yellow-headed Spruce Sawfly, Pikonema alaskensis (Reh.).

This sawfly was observed on most white spruce examined in the Western District in 1952. It was most abundant in the Riding Mountain National Park. Light defoliation occurred along the Whirlpool Lake, Norgate and Katherine lake roads. It was also present in sec. 27, tp. 19, rge. 13, W.P. mer. and sec. 5, tp. 20, rge. 17, W.P. mer. From Dauphin north along highway No. 10 and the Duck Mountain and Porcupine Forest reserves to the Overflowing River it was found on most white spruce sampled, but was causing no appreciable damage.

3.2.11 - Green-headed Spruce Sawfly, Pikonema dimockii (Gress.).

The green headed spruce sawfly was generally distributed throughout the Western District in Manitoba in 1952, but it caused no serious damage. Several samples of this insect were taken from white spruce along the Helling River and Hergate roads. Other collections were obtained from sec. 5, tp. 20, rge. 17, W.P. mer. and sec. 17, tp. 20, rge. 19, W.P. mer. in the Riding Mountain National Park. A trace of defoliation was observed in scattered spruce stands from Dauphin north along highway No. 10 to the Duck Mountain and Porcupine Mountain reserves and the Overflowing River.

3.2.12 - Forest Tent Caterpillar, Malacosoma disstria (Hbn.).

Only one larva of this insect was found during the survey. This collection was taken from birch north of Mafeking in sec. 5, tp. 47, rge. 25, W.P. mer.

3.2.13 - Spruce Budworm, Choristoneura fumiferana (Glen.).

The spruce budworm was found on white spruce in four different areas of the Western District, but was causing no noticeable damage. Three samples were taken from white spruce north of Mafeking at the following points: sec. 3, tp. 46, rge. 25, W.P. mer., sec. 5, tp. 47, rge. 25, W.P. mer. and sec. 21, tp. 47, rge. 25, W.P. mer. One larva was collected from white spruce in sec. 14, tp. 20, rge. 19, W.P. mer. in the Riding Mountain National Park.

3.2.14 - Jack-pine Budworm, Choristoneura sp.

One larva and one pupa of this insect were found in the Western District in 1952. This collection was taken north of Cowan in sec. 35, tp. 35, rge. 23, W.P. mer. and sec. 2, tp. 36, rge. 23, W.P. mer. No signs of this insect were observed on other stands of jack-pine examined.

3.2.15 - Sawflies, Neodiprion sp.

Samples of the red-headed jack-pine sawfly, Neodiprion virginiana Roh. were collected from jack-pine north of Grandview in sec. 13, tp. 27, rge. 24, W.P. mer. and north of Mafeking in

sec. 4, tp. 46, rge. 25, W.P. mer. Twelve larvae of Swaine's jack-pine sawfly, Neodiprion Swainii, Midd. was found on jack-pine north of Grandview, in sec. 13, tp. 27, rge. 24, W.P. mer. Defoliation in these areas for the most part was negligible.

3.2.16 - Pitch Nodule Maker, Petrova albicanitana (Busck).

The pitch nodule maker was again generally distributed throughout the Western District in 1952. In the central portion of the Duck Mountain Forest Reserve, and near Cowan, nodules were observed on young jack-pine, but they caused little damage.

3.2.17 - A Pine Scale, Toumeyella sp.

This pine scale was not detected on the jack-pine examined in the Western District of Manitoba in 1952.

3.2.18 - Aspen Blotch Miner, Lithocolletia tremuloidella (Braun).

The aspen blotch miner was again found on most poplar examined, but was causing no appreciable damage.

3.2.19 - Birch Sawfly, Arge borealis (Leach).

No signs of this sawfly were observed on birch examined in the Western District in 1952.

3.3 SPECIAL PROJECTS

3.3.1 - Larch Sawfly Cocoon Collections.

Several mass collections of larch sawfly cocoons were made from widely separated points in the Western District in 1952. The cocoons were stored in the cold room at the Winnipeg Laboratory and will be dissected during the winter to determine the dispersal and distribution of larch sawfly parasites. Results of the dissections appear under "Special Reports" in the section titled "Larch Sawfly". A table showing the origin of the mass collections is appended hereto.

Larch Sawfly Coccin Collections

Place	sec.	tp.	rge.	mer.	Parasite Check or release point	No. of Coccens
Riding Mountain Nat. Park Whirlpool Road	5	20	17	W.P.	check	160
Riding Mountain Na. Park Lake Andy Road	16	20	19	W.P.	"	250
Riding Mountain Nat. Park Dom. Forestry Camp	25	20	19	W.P.	"	170
Riding Mountain Nat. Park No. 10 Highway	23	21	19	W.P.	"	130
Riding Mountain Nat. Park P.O.W. Road	14	21	21	W.P.	release	206
Riding Mountain Nat. Park Norgate Road	36	19	17	W.P.	check	100
Riding Mountain Nat. Park Moon Lake	4	22	19	W.P.	"	150
Cowan	11	35	23	W.P.	"	60
Renver	15	36	23	W.P.	release	121
Mafeking	16	46	25	W.P.	check	150
Mafeking	19	44	25	W.P.	"	250
Bield	22	26	26	W.P.	"	100
Solater	28	34	22	W.P.	"	100
Duck Mountain Forest Res. Madge Lake	15	30	29	W.P.	"	100
Duck Mountain Forest Res. Singosh Lake	10	31	23	W.P.	"	90

3.3.2 - Permanent Sampling Stations.

The following Table shows the locations of the sampling stations established in the Western District in 1952.

TABLE B
Permanent Sampling Stations.

Place	sec.	tp.	rge.	mer.	Host
Riding Mountain Nat. Park Rolling River Road	2	19	19	W.P.	white poplar
Riding Mountain Nat. Park Rolling River Road	26	19	17	W.P.	jack-pine
Riding Mountain Nat. Park Daphin Trail	22	21	21	W.P.	white spruce
Riding Mountain Nat. Park Rossburn	2	23	25	W.P.	black spruce & tamarack
Riding Mountain Nat. Park. Rossburn	33	22	25	W.P.	white poplar
Riding Mountain Nat. Park Rossburn	33	22	25	W.P.	black poplar
Riding Mountain Nat. Park Gilbert Plains	28	23	22	W.P.	white poplar

3.4 PERSONNEL CONTACTED

TABLE C

<u>Name and Title</u>	<u>No. of contacts</u>	<u>Sampling demonstration</u>
E.A. Keens, District Forester, Dauphin	7	no
J. Koke Chief Ranger "	8	yes
B. Balchen Forest Engineer "	1	no
J. Allan Chief Warden, Wasagamung	5	no
J.E. Goodison, Forest Engineer "	4	yes
W. Armstrong, Park Warden "	2	no
E. Pike Forest Engineer "	4	no
S. Rowe " " "	3	yes
J. Hyska Park Warden Rossburn	4	yes
R. McKinnon " " Grandview	1	no
G. Bates Senior Ranger Swan River	4	no
C. Dowson Forest Ranger Minnitonas	4	yes
W. Presloski, " " Mafeking	3	no
M.T. Majure " " Durban	1	no
D. Sinclair " " Bield	3	yes
W. Mawdsley " " Grandview	2	yes
C. Lintett " " Winnipegosis	1	no
A. Machuk " " Garland	3	yes
F.W. McKelvey, Towerman Cowan	2	yes
R.W. Thomas, Forest Path.Ranger, Saskatoon, Sask.	1	yes
J. Heron Field Officer Madge Lake "	1	no
D. Binkley Park warden Elphinstone	1	no

4. NORTHERN DISTRICT OF MANITOBA

by

George T. Lalor

4.1 INTRODUCTION

Field work was carried out in the Northern District from April 16 to September 29. Between April 17 and May 4 work on the ranger cabin lot was continued. The road leading from the Clearwater Highway to the ranger cabin was levelled and brush and trees were cleared from the cabin site. The brush and trees from the cleaning were piled and burned under the supervision of Mr. R. Ross of the Manitoba Forest Service. During this period poplar plots previously established in the Wanless area were visited and examined. Fifty trees at each of the locations;- one at Wanless and another at Freshford were banded for the purpose of obtaining second instar larvae of the large aspen tortrix. These locations were each visited three times between April 17 and May 4.

On May 4, Mr. Hildahl arrived at The Pas, and between that date and May 16 work on the interior of the ranger cabin was continued. Mr. Lee and Mr. E. Kennedy of The Pas Lumber Company were contacted and the possibility of conducting a study on wood borers in logs on their skidways was discussed.

On May 17 the writer began a survey of the district. Between May 17 and June 18 general sampling was carried out in the Westray, Freshford, The Pas, Clearwater and Cranberry Portage areas. On June 10 the writer accompanied Mr. C. McLean of the Manitoba Forest Service by air to Panther Lake, where general sampling was carried out. During that period work was hampered somewhat by adverse weather. On June 19 the writer accompanied Mr. C. Patterson, District Forester, and Mr. R. Ross, Chief Ranger for the Northern District, by air to Wekusko, Herb Lake, Snow Lake and Sherridon, returning to The Pas on June 21. On May 12 a study was commenced on the occurrence of wood borers in logs piled on skidways at The Pas Lumber Company. These investigations are described in detail under "Special Projects".

On June 25 the writer, in company with Mr. Hildahl and Mr. McLean, travelled by air to Hamev Lake to investigate a spruce budworm infestation. Mass collections of larvae and pupae were made, and general sampling was carried out and the infested area was mapped

from the air. On June 26 a survey of the area between The Pas and Baker's Narrows was carried out. Special attention was given to the possible presence of spruce budworm. Forest Service personnel were contacted and plans laid for a future survey of the area. On June 28, 29, and 30 the writer, assisted Mr. R. Thomas and Mr. J. McKendry of the Forest Pathology Laboratory, Saskatoon, Saskatchewan. A survey was made of the area immediately surrounding The Pas. July 1, 2, 3 and 4 were spent assisting Mr. L. Warren of the Forest Biology Laboratory, Winnipeg, Manitoba, making a survey of the shorelines and islands of Simons Lake in connection with his project on H. piceus. During this survey boat transportation was provided by Mr. H. Gill, Forest Ranger at Cranberry Portage.

On July 18 and 19 the writer accompanied Mr. R. Lejeune to Sturgeon Landing to examine the budworm infestation. On July 10 the writer accompanied Mr. Shipley, Forest Ranger, to Moose Lake and general sampling was conducted at one point in that area.

From July 11 to July 13 inclusive, a survey was made of the area around Flin Flon and Amisk Lake. Personnel of the Saskatchewan Department of Natural Resources were contacted and arrangements were made for a later and more complete survey of the area. While awaiting the arrival of shipments of the larch sawfly parasite, Mesoleius tenthredinis, from the Dominion Parasite Laboratory, Belleville, Ontario, the writer sampled the Halcrow and Clearwater areas. On July 17 the larch sawfly parasites were released in the area known as "The Bog". Larch sawfly larval counts were made at several points at the same time.

On July 23 the writer left The Pas and surveyed the areas around Baker's Narrows, Athapapuskow Lake, Flin Flon, Amisk Lake and Kississing Lake. During the Athapapuskow and Baker's Narrows surveys, transportation was provided by the Manitoba Forest Service. At Amisk Lake transportation was provided by Mr. A. Fovle and Mr. C. Snell of the Saskatchewan Department of Natural Resources. During these surveys general sampling was carried out and special attention given to the presence of spruce budworm. At Kississing Lake boat transportation and assistance were provided by Mr. W. Erlendson and Mr. A. Tucker of the Manitoba Forest Service. On August 4, larch sawfly parasites were released in the area between The Pas and Cranberry Portage, and permanent sampling stations established to mark the release point.

On August 5 the writer returned to The Pas and made preparations for a survey of the areas along the Hudson Bay Railway between The Pas and Kettle Rapids. On August 7 the writer left The Pas and between that date and August 17 a survey was made of the areas around Gillam,

Thicket Portage, Wabowden, and Wekusko. At Gillam the writer was assisted by Mr. B. Gow, formerly with the Manitoba Forest Service but now employed with the Hudson Bay Railway Company, and at Thicket Portage by Mr. G. Evans with the Manitoba Forest Service. At Wabowden assistance was given by Mr. W. Hislop, and at Wekusko by Mr. E. Gray, both with the Manitoba Forest Service. Between August 18 and August 30 the areas surrounding "The Bog", The Pas, Clearwater Lake, and Cranberry Portage were examined.

On August 31, September 1 and 3, the writer accompanied Mr. Hildahl on a forest tent caterpillar egg survey of the Clearwater, Westray and Prospector areas. This survey, in conjunction with other work, was carried on until September 23. September 6 and September 8 were spent painting the interior of the ranger cabin. September 9, 10 and 11 were spent collecting larch sawfly cocoons and completing larch sawfly reports in the areas around The Pas, Freshford, Westray, Clearwater Lake and Wanless. On September 13 the writer, accompanied by Mr. F. Fenner, Fire Ranger with the Manitoba Forest Service, travelled to Cormorant by gas-car. On September 14 and 15 larch sawfly cocoons were collected and larch sawfly reports made in the area. On September 16 and 17 larch sawfly cocoons were collected in the Clearwater Lake area and on the 19, 20 and 21 in the Cranberry Portage and Flin Flon areas. On September 23, 24, 25 and 26 the writer assisted Mr. Hildahl and Mr. Warren to investigate further the spruce budworm infestation in the Nameow Lake area. September 27 and 28 were spent working on the ranger cabin at The Pas and closing it for the winter. Field work in the Northern District of Manitoba was concluded on September 29, and the writer returned to Headquarters at Winnipeg on September 30.

4.2. INSECT CONDITIONS

4.2.1 - Larch Sawfly, *Pristiphora erichsonii* (Htg.)

One sample of larch sawfly larvae was taken as early as June 20, two weeks earlier than the first taken in 1950 or 1951. A preliminary survey of the area was made immediately, but no other larvae were found. It was July 15 before larvae were observed in any numbers on tamarack foliage. The point at which the first sample was taken was in a well sheltered site and exposed to the sun. That was probably the reason for the exceptionally early emergence.

In previous years (1950-1951) larch sawfly was found present in all areas examined, but the area of severe defoliation was confined mainly to south of the Hudson Bay Railway, and as far north-east as Thicket Portage, sec. 15, tp. 73, rge. 2, W.P. mer. The most northerly point of severe defoliation in 1951 was 30 miles north of the 55th parallel of latitude. In 1952 the area of severe defoliation had extended north to Pikwitonei, 45 miles north of the 55th parallel. At Gillam, 30 miles north of the 56th parallel of latitude an increase over previous years in the number of larvae present on the foliage was observed. In the north-west part of the Northern District around Cranberry Portage, sec. 36, tp. 64, rge. 27, W.P. mer., Flin Flon, sec. 31, tp. 66, rge. 29, W.P. mer., and Sherriden, Grid 7.042.344, there was also a marked increase in the number of larvae and the amount of defoliation.

Although the writer was unable to obtain the flying necessary to observe the area personally, reports from Forest Service personnel would indicate that the area south from Thicket Portage, sec. 15, tp. 73, rge. 2, W.P. mer. to Norway House, sec. 34, tp. 57, rge. 3, E.P. mer. was again severely defoliated. In the south-westerly part of the Northern District between the Overflowing River, sec. 8, tp. 49, rge. 25, W.P. mer., and The Pas, sec. 9, tp. 56, rge. 26, W.P. mer., defoliation had dropped from severe in 1951 to moderate in 1952.

4.2.2 - Spruce Budworm, Choristoneura fumiferana (Clem.)

In August of 1951 empty pupae cases of spruce budworm were found at Sturgeon Landing, Saskatchewan, sec. 8, tp. 61, rge. 29, E.P. mer. During the spring and summer of 1952 the area was visited several times. On June 25 the area was examined from the air and an infestation covering approximately 5,500 acres was discovered. Larval and pupal collections were made at Namev Lake, sec. 8, tp. 61, rge. 29, W.P. mer., on June 25. The infested area was again visited on June 19 and more mass collections and observations were made. In the infested area defoliation ranged from moderate to severe. During the summer the area surrounding the infestation was carefully examined in order to determine the bounds of the infestation. Larvae were obtained at only two points outside the infested area:- one at Atik from black spruce, sec. 24, tp. 61, rge. 27, W.P. mer., and the other at The Pas from white spruce, sec. 10, tp. 56, rge. 26, W.P. mer. In each case only one larva was found and no damage was apparent.

4.2.3 - Green-headed Spruce Sawfly, Pikonema dimockii (Gross)
 Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh)

These two species were less abundant in 1952 than in previous years. A collection of the green-headed spruce sawfly was made in the Big Eddy Settlement north of The Pas, sec. 10, tp. 56, rge. 26, W.P. mer., but defoliation was very light. The yellow-headed spruce sawfly was found at two points, at Rocky Lake, sec. 15, tp. 60, rge. 27, W.P. mer., and at Mink Narrows at Lake Athapapatskow sec. 20, tp. 65, rge. 28, W.P. mer. At these points defoliation was also very light. Light defoliation probably caused by one or both species was observed at Sturgeon Landing in Saskatchewan, sec. 10, tp. 61, rge. 30, W.P. mer.

4.2.4 - Large Aspen Tortrix, Archips conflictana (Wlk.)

In 1950 an extensive area in the Northern District of Manitoba was severely defoliated by this insect. In that year the southern boundary of the infestation was at Westray, sec. 31, tp. 53, rge. 26, W.P. mer., the northern boundary at Lynn Lake, 48 miles north of the 56th parallel of latitude. Its most easterly point was Wabowden, sec. 6, tp. 65, rge. 26, W.P. mer., and western extremity at the Saskatchewan boundary line. The infestation covered approximately 12,000 square miles. In 1951 the infestation had spread somewhat, the eastern boundary was at the Principal Meridian and the southern boundary had extended eight miles, but there was a marked decrease in defoliation as well as in populations. Defoliation in the infested area in 1951 was generally light, with an occasional pocket of severe defoliation. By 1952 this insect had almost disappeared from the district. The areas surrounding Westray, sec. 31, tp. 53, rge. 26, W.P. mer., The Pas, sec. 10, tp. 56, rge. 27, W.P. mer., Wanless, sec. 14, tp. 60, rge. 37, W.P. mer., Cranberry Portage, sec. 20, tp. 64, rge. 26, W.P. mer., Sherriden, Grid 7-043-344, Cormorant, sec. 31, tp. 60, rge. 21, W.P. mer., Flin Flon, sec. 30, tp. 66, rge. 29, W.P. mer., Wabowden, sec. 6, tp. 65, rge. 26, W.P. mer., and Thicket Portage, sec. 11, tp. 73, rge. 2, W.P. mer. were sampled for large aspen tortrix, but only occasional samples at widely separated points were obtained. At no point of inspection did defoliation exceed negligible to light. Samples of large aspen tortrix were taken at the following points:-

Location	sec.	tp.	rgs.	Meridian
Clearwater Lake	36	57	25	W.P.
Vanless	14	60	27	W.P.
Carrot River Road	10	56	27	W.P.
Egg Lake	23	62	27	W.P.
Rauthier Lake	3	63	25	W.P.
Snow Lake	7	68	17	W.P.
Sherridon	Grid. 7 - 043 - 344			
Cranberry Portage	20	64	26	W.P.

4.2.5 - Forest Tent Caterpillar, Malacosoma disstria (Hbn.)

Although very few samples of this insect were taken in the district during 1952, there was an increase over previous years. At Sturgeon Landing, sec. 14, tp. 61, rgs. 30, W.P. mer. defoliation to white poplar was 50 per cent. This was the only heavily defoliated point in the district. Collections of larvae were made at Baker's Narrows, sec. 5, tp. 66, rgs. 28, W.P. mer., Big Eddy, sec. 3, tp. 57, rgs. 26, W.P. mer., Radio Range, sec. 13, tp. 57, rgs. 25, W.P. mer., and Egg Lake, sec. 14, tp. 62, rgs. 27, W.P. mer., but defoliation was light. During September an egg survey was conducted in the areas surrounding The Pass, Cormorant, and Flin Flon. The survey showed the insect to be present in an area bounded on the west by Sturgeon Landing, sec. 14, tp. 61, rgs. 30, W.P. mer., and on the east by Clearwater Siding, sec. 4, tp. 58, rgs. 24, W.P. mer. The most southerly point sampled for eggs was Freshford, sec. 21, tp. 59, rgs. 26, W.P. mer. and the most northerly was Atik, sec. 25, tp. 61, rgs. 32.

4.2.6 - Grey Willow Leaf Beetle, Gallerucella decora (Say.)

Although this insect was found at several widely separated points in the Northern District during 1952, it caused only light defoliation. Samples were taken at Freshford, sec. 21, tp. 54, rgs. 26, W.P. mer., Channing, sec. 31, tp. 66, rgs. 29, W.P. mer., Mistik Lake, sec. 8, tp. 66, rgs. 28, W.P. mer., Lanestone Narrows, sec. 32, tp. 64, rgs. 28, W.P. mer., Kissinging Grid 7-042-344, Big Eddy, sec. 19, tp. 56, rgs. 26, W.P. mer., and Wabowden, sec. 28, tp. 68, rgs. 8, W.P. mer.

4.2.7 - Red-headed Jack-pine Sawfly, Neodiprion virginiana (Roh.)

This insect, found in very small numbers at Amisk Lake in Saskatchewan, sec. 15, tp. 65, rge. 1, W.2nd mer., and Westray in Manitoba, sec. 28, tp. 53, rge. 27, W.P. mer. in 1951, was found at only one point in the Northern District during 1952. At Prospector, sec. 35, tp. 57, rge. 26, W.P. mer., two samples were taken during the season. Defoliation was negligible and larvae were present on only an occasional jack-pine tree.

4.2.8 - Pitch Nodule Maker, Petrova albicanitana (Buseck)

Although evidence of this insect was found in most jack-pine stands in the Northern District, new nodules were observed on occasional trees only. However, as a result of old nodules, light damage was apparent at most points. At Radie Range in the Clearwater Lake area, sec. 1A, tp. 57, rge. 26, W.P. mer., new nodules were numerous on jack-pine regeneration, but showed a decrease from the numbers found during 1950 and 1951. At Kississing, Grid. 7-042-344, nodules were found on occasional trees in a stand of scattered jack-pine regeneration, but no damage was apparent. This same condition existed at Lake Athapapuskov, sec. 21, tp. 64, rge. 28, W.P. mer.

4.2.9 - Balsam-fir Sawfly, Neodiprion abietis. (Harr.)

Only two samples of this insect were found in the Northern District during 1952. At Simonhouse Lake, sec. 35, tp. 64, rge. 25, W.P. mer., and Freshford, sec. 28, tp. 54, rge. 26, W.P. mer., a few larvae were found, but damage was negligible. This insect appeared to be on the decrease in Northern Manitoba.

4.2.10 - Black-headed Budworm, Acleris varians (Fern.)

This insect was found at three points in the Northern District during 1952. It caused light defoliation at Mink Narrows on Lake Athapapuskov, sec. 20, tp. 65, rge. 28, W.P. mer., The Pass, sec. 19, tp. 56, rge. 26, W.P. mer., and Kississing, Grid 7-042-344. As these are the first samples found during the past three years, it would indicate black-headed budworm may be on the increase.

4.2.11 - Birch Sawfly, Arge pectoralis (Leach)

Four samples of this insect were taken at widely separated points in the Northern District during 1952. Very light defoliation was caused by the birch sawfly at Halerow Lake, sec. 3, tp. 56, rge. 26, W.P. mer., Clearwater Lake, sec. 36, tp. 57, rge. 26, W.P. mer., and at Kississing, Grid 7-042-344. This insect showed no increase from previous years.

4.3 SPECIAL PROJECTS

4.3.1 - Large Aspen Tortrix Investigations.

In order to determine where the second instar larvae of the large aspen tortrix overwinter the following investigations were carried out:

On August 17 and 18 two locations, one at Freshford, sec. 20, tp. 54, rge. 26, W.P. mer., and one at Wanless, sec. 14, tp. 60, rge. 25 W.P. mer., were selected and at each location fifty white poplar trees of different diameters were banded with tanglefoot. Tanglefoot bands were placed at various levels on the trunks and branches. Bands were placed on the trunks three to six inches above the roots and at levels above gnarled or cracked bark, dividing points in the trunks or above any part of the trees where larvae could overwinter. Between April 18 and May 9 these locations were each checked three times, but during that period only three larvae were obtained. Unbanded trees were felled and the foliage examined, but only an occasional large aspen tortrix was found. As a result of these investigations and observations made during the summer, it was concluded that the large aspen tortrix infestation that had caused serious defoliation to white poplar over a large area during 1949 and 1950 had almost disappeared.

4.3.2 - Wood Borers, The Pas Lumber Co.

On May 5 the writer and Mr. Hildahl met with Mr. E. Kennedy and Mr. Lee of The Pas Lumber Co. to discuss the possibility of conducting a study of wood borers in sawlogs on their skidways. A stock pile of eight million board feet of saw logs was examined and it was found that approximately twenty five per cent of the

logs had been affected by wood borers before being cut. Twenty five white spruce logs free from borer activity were selected and one foot squares were painted on the bark on the butt, middle and small end of each log. The skidways were to be visited periodically and the space within the squares examined for egg scars on the bark. However, owing to a change in plan on the part of The Pas Lumber Company the experimental logs were used before observations could be made and the project was abandoned.

4.3.3.- Forest Tent Caterpillar Egg Survey.

In order to determine the present status of the forest tent caterpillar in the Northern District and probable area of infestation expected in 1953, an egg survey was conducted during the month of September. At each examination point three white poplar trees 4" d.b.h. were felled and the branches and twigs thoroughly examined for egg bands. The result of these counts will be dealt with in a separate report.

4.3.4 - Spruce Budworm Investigations, Namew Lake.

In August of 1951 empty pupae cases of the spruce budworm were found on white spruce and balsam-fir at Sturgeon Landing, Saskatchewan, sec. 8, tp. 61, rge. 29, W.P. mer. On June 25, 1952 the area was inspected from the air and an infestation covering 5,500 acres was discovered. In Manitoba 4,710 acres of that lie on the east shore of Namew Lake in tp. 60 and 61, rge. 29, W.P. mer. and 250 acres lie along the Manitoba-Saskatchewan border around Sturgeon Landing. In Saskatchewan the infestation was limited to 590 acres along the border around Sturgeon Landing. At that time, on the Manitoba side the new foliage of white spruce was from 50 to 100 per cent destroyed, and from 10 to 20 per cent of the old needles were eaten. Many small balsam-fir were completely defoliated. The infestation was lighter in mature white spruce around Sturgeon Landing, where about 50 per cent of the new growth was destroyed. In the younger 60 year old class spruce was severely defoliated, with about 75 per cent of the new growth destroyed. The area was at that time mapped from the air. On July 18 the area of infestation was again visited and mass pupal collections were made.

On September 23 the writer accompanied Mr. Warren and Mr. Hildahl to Sturgeon Landing to further investigate the budworm outbreak. During this survey air transportation was provided by the Manitoba Air Service and part of the equipment and manual assistance by the Manitoba Forest Service. The purpose of the survey was to determine what damage had occurred in infested stands during 1952, and to assess prospective budworm populations for 1953. Twenty white spruce trees in each of three sample areas were felled and cross sections of the base, mid-crown and crown were taken from each tree. Terminal counts and egg counts where possible were made.

A second party, consisting of one officer from the Saskatchewan Department of Natural Resources, and one from the Laboratory of Forest Biology, spent two weeks cruising the Amisk Lake area of Saskatchewan checking stands for budworm vulnerability and to determine if any egg laying occurred at any points outside of the 1952 infestation zone.

4.3.5 - Larch Sawfly Cocoons.

Mass collections of larch sawfly cocoons were made in 1952 in the areas listed below:

TABLE A

Location	Sq.	Tn.	Egs.	Mar.	Number Collected
Cormorant	31	60	21	W.P.	250
Clearwater	36	57	24	W.P.	250
Freshford	20	54	26	W.P.	200
Wanless	7	60	26	W.P.	150
Cranberry Portage	31	64	26	W.P.	150
Flin Flin	30	66	29	W.P.	100

4.3.6 - Permanent Sample Stations.

The following permanent sampling stations were established in tamarack stands at larch sawfly parasite release points in the Northern District in 1952:

TABLE B

Location	Sec.	Tp.	Age.	Mer.	Tree Species	Remarks
Wanless	2	60	27	W.P.	Tamarack	Parasite release point
Prospector	15	58	26	W.P.	Tamarack	" " "
Prospector	30	57	26	W.P.	Tamarack	" " "

4.4 PERSONNEL CONTACTED

4.4.1 - Personnel Contacted.

<u>Provincial Forest Service Personnel</u>				
<u>Name</u>	<u>Address</u>	<u>Title</u>	<u>Demonstration given</u>	<u>No. times Contacted</u>
C. Patterson	The Pas	District Forester	no	25
R. Ross	The Pas	Chief Ranger	no	25
W. Shipley	The Pas	Forest Ranger	yes	4
W. McLean	The Pas	District Engineer	no	10
H. Laws	The Pas	Asst. Dist. Engineer	yes	3
M. Lalor	Fredericton N.B.	Engineering Student	yes	5
S. Williamson	The Pas	Engineers Assistant	yes	10
E. Clarkson	The Pas	Fire Ranger	yes	10
H. Gill	Cranberry Ptg.	Forest Ranger	no	4
J. Dionne	Cranberry "	Fire Ranger	yes	2
R. Smith	Channing	Fire Ranger	yes	2
D. McKinnon	Channing	Forest Ranger	no	2
A. Towle	Flin Flon	Sr. Field Officer	yes	3
G. Snell	Flin Flon	Jr. Field Officer	yes	3
R. McDermot	Flin Flon	Fire Ranger	yes	2
W. Erlendson	Kississing	Forest Ranger	yes	3
A. Tucker	Kississing	Fire Ranger	yes	2
F. Fenner	Cormorant	Fire Ranger	yes	2
R. Sinclair	Cormorant	Fire Ranger	yes	1
R. Gray	Wekusko	Fire Ranger	no	1
C. Smith	Snow Lake	Fire Ranger	no	1
W. Hislop	Wabowden	Forest Ranger	yes	1
K. Hislop	Wabowden	Fire Ranger	yes	1
G. Evans	Thicket Ptg.	Fire Ranger	yes	1

Others Contacted

W. Krivda	The Pas	Student	yes	3
R. Cow	Gillam	Hudson Bay Railway	yes	1
J. Lee	The Pas	Manager, The Pas Lumber Co.	no	1
E. Kennedy	The Pas	The Pas Lumber Co.	no	1
R. Singleton	Swan River	Government Veterinarian	yes	3

5 HUDSON BAY DISTRICT OF SASKATCHEWAN

by M. Pratt

5.1 INTRODUCTION

Forest insect survey, sampling and observations were carried out in the Hudson Bay District from May 22 to September 21, 1952. Areas covered during the survey were the Nipawin Provincial Park, Torch River Provincial Forest, Fort a la Corne Provincial Forest, (east of rgs. 18, W.2nd mer.), Pasquia Provincial Forest, Porcupine Provincial Forest, and the Madge Lake area in the Duck Mountain Provincial Forest.

Field activities commenced on May 22 in the Madge Lake Provincial Park. General sampling and a survey for the presence of large aspen tortrix were carried out through this area. Collections and observations at that time showed little or no insect activity. The same conditions existed in the Pelly area of the Porcupine Provincial Forest where observations and sampling were carried out on May 27 and 28.

From May 29 to June 9 all accessible forest stands were sampled and examined in the Hudson Bay area of the Pasquia and Porcupine Provincial Forests. These areas were bounded by Usherville in the south, Armit in the east, Otonagon in the north, and Crooked River in the west. During this period large aspen tortrix defoliation was observed, but defoliation to white poplar was light. The area $2\frac{1}{2}$ miles north of Usherville, covering sec. 21, 28, 33 and 34, tp. 38, rge. 5 and sec. 3, 10 and 15, tp. 39, rge. 5, W.2nd mer., that was moderately to severely defoliated by the large aspen tortrix in 1951 was examined and sampled during this period. Defoliation was recorded as light this year.

From June 10 to June 21 general sampling and observations were carried out in the Carrot River, Fort a la Corne Provincial Forest (eastern half), Torch River Provincial Forest, Nipawin Provincial Forest areas. A survey of spruce and jack-pine was also made for the detection of budworm and all accessible poplar stands were examined for the presence of forest tent caterpillar.

From June 21 to June 28, general sampling and a preliminary larch sawfly survey were conducted in the Pasquia and Porcupine Provincial forests.

July 2 to 10 were spent on general sampling and larch sawfly survey work in the Hudson Bay area. During this period Mr. R. Thomas, Forest Pathology Laboratory, Saskatoon, was contacted and a survey was made for the occurrence of tree diseases in the Hudson Bay District. Several diseased samples were collected and sent to the Forest Pathology Laboratory, Saskatoon, Saskatchewan for identification.

Between July 10 and July 18, the larch sawfly survey was continued through the Torch River, Fort a la Corne and Nipawin areas and eastward to the Chelan, Crooked River, and Prairie River areas.

From July 19 to August 2 general sampling and the larch sawfly survey were continued from Otosquen in the Pasquia Provincial Forest to Pelly in the Porcupine Provincial Forest. Scattered samples of the larch sawfly were also obtained during this period in the Madge Lake area of the Duck Mountain Provincial Forest.

From August 5 to 15, larch sawfly survey, cocoon collecting, and general sampling were continued in the Hudson Bay area. Permanent sample stations were also established during this period. From the 16 to 26 of August general sampling, cocoon collecting, and the larch sawfly survey were continued in the western part of the Pasquia Provincial Forest and in the Nipawin and Fort a la Corne areas.

The period between August 26 and September 19 was devoted to a search for the occurrence of forest tent caterpillar egg bands in the Hudson Bay District. The larch sawfly survey and cocoon collections were completed during that time.

Field work in the Hudson Bay District was completed on September 20 and the writer returned to the Winnipeg Laboratory on September 21.

From September 22 to September 30 the writer assisted L.L. McDowall establishing permanent sample plots in the Southern District of Manitoba.

5.2 INSECT CONDITIONS.

5.2.1 - Larch Sawfly, *Pristiphora ericksonii* (Htg.)

All accessible tamarack stands throughout the Hudson Bay District were examined and sampled during the 1952 season to determine larch sawfly defoliation. The first larch sawfly samples were collected on June 14, three miles north of Grassy Lake fire tower in sec. 27, tp. 54, rge. 14, W.2nd mer.

Small tamarack stands in the Torch River Provincial Forest were examined during the season and moderate larch sawfly defoliation, ranging from 25 to 40 per cent, was observed. Tamarack swamps in the Nipawin Provincial Forest as far north as Fishing Lakes and the Narrow Hills tower were examined. Moderate defoliation was noted in most of the swamps in this area. A pocket of heavy defoliation was noted 11½ miles north of Snowden in sec. 8, tp. 54, rge. 18, W.2nd mer. In another swamp ¾ of a mile north in sec. 8, tp. 54, rge. 18, W.2nd mer. defoliation was moderate and did not exceed 35 per cent. Tamarack stands were examined along the Flin Flon highway as far as tp. 54, rge. 10, W.2nd mer. a distance of 35½ miles north-east of White Fox. In this area most scattered tamarack stands were moderately defoliated. Defoliation ranged from 25 to 35 per cent, with an occasional tree showing a little more defoliation. Throughout the Torch River area larch sawfly defoliation generally ranged from light to moderate.

Tamarack swamps east of range 18, W.2nd mer. in the Fort a la Corne Provincial Forest were examined. Defoliation in this area was light to moderate. On August 18 defoliation averaged 20 per cent in a swamp 10 miles south-west of Beaver House in sec. 20, tp. 50, rge. 17, W.2nd mer. Twenty to 25 per cent defoliation was noted also in a swamp in sec. 29, tp. 50, rge. 16, W.2nd mer. For the most part larch sawfly defoliation to tamarack stands in the Fort a la Corne Provincial Forest was light in 1952.

Defoliation was moderate through scattered tamarack in the Carrot River area except north-east of Carrot River along the old Battle Heights Trail, where in some small patches almost no defoliation was noted. Moderate defoliation was noted on tamarack trees along the trail leading to Summit Tower in tp. 49, rges. 9 and 10, W.2nd mer. Defoliation to tamarack in the Carrot River area during the 1952 season was classified as light to moderate and rarely exceeded 50 per cent.

All accessible swamps were examined from Crooked River east to Prairie River. Most of the tamarack in this area is scattered throughout black spruce swamps and comprises about 15 per cent of the stands. Tamarack in this area was moderately defoliated. In a large black spruce swamp south of Orley, defoliation ranged from 15 to 30 per cent. In the area between Mistatim and Bannock in tp. 45, rge. 9, W.2nd mer. small tamarack stands were surveyed during the middle of August. Moderate defoliation, ranging from 25 to 40 per cent, was observed at that time.

In scattered tamarack stands between Bannock and Prairie River, larch sawfly defoliation ranged from 35 to 40 per cent. Some curled tips were noted in this area. At the end of the season a survey was made for cocoons, but very few sound cocoons were found. Thirty-five per cent defoliation was recorded in a swamp north of Bjorkdale in tp. 43, rge. 12, W.2nd mer. This swamp is located on private land. West of Chelan, in sec. 9, tp. 42, rge. 10, W.2nd mer., defoliation averaged 60 per cent. This swamp is also on private land and was being cut.

East of Bertwell, a small swamp in sec. 33, tp. 41, rge. 4, W.2nd mer. was examined at the peak of the larch sawfly feeding period. Defoliation did not exceed 25 per cent at that time.

Tamarack swamps north of Hudson Bay to Turnberry in the Pasquia Provincial Forest were checked periodically throughout the 1952 season. A large black spruce swamp immediately north and east of Hudson Bay consisting of approximately 20 per cent tamarack was sampled and checked at various points. Defoliation was moderate and averaged 20 to 35 per cent at the end of the larch sawfly feeding period. Two small pure larch stands at the north and south extremities of Ruby Lake were checked. Defoliation ranged from 20 to 25 per cent at the end of the season. From Wachee to Turnberry along the C.N.R. right-of-way scattered tamarack stands were examined at the end of August for defoliation. Moderate defoliation ranging from 25 to 35 per cent was recorded at that time. Tamarack swamps north of Veillardville on the Spruce Products Trail were checked for larch sawfly defoliation. Moderate defoliation was noted in a tamarack swamp 1 1/2 miles north of the mile 15 fire tower, and 25 per cent defoliation was noted in a swamp in sec. 6, tp. 46, rge. 4, W.2nd mer. In tp. 48, rge. 5, W.2nd mer. several small swamps appeared to have no larch sawfly defoliation and very few larva were obtained from a five tree sample. Most of the

swamps in the above mentioned areas remained saturated by heavy rainfalls during the season. At times they were flooded to a depth of six or more inches. Tamarack stands west of Veillardville along the Greenbush Trail were checked and defoliation at the end of the season was 35 per cent.

From Hudson Bay east to Armit, all tamarack stands were sampled and surveyed for larch sawfly defoliation. Moderate defoliation was noted in sec. 12, tp. 44, rge. 2, W.2nd mer. Moderate to heavy defoliation was observed 21 miles east of Hudson Bay in sec. 11, tp. 44, rge. 32, W.P. mer. and moderate defoliation was recorded 27.5 miles east of Hudson Bay in tp. 44, rge. 31, W.P. mer. South of Hudson Bay in the Porcupine Provincial Forest small scattered larch stands were moderately defoliated. A few small islands of tamarack in this area were not defoliated.

East of Reserve, in the Eldridge and McBride Lake area, tamarack stands suffered 30 per cent defoliation. On September 12, a small swamp 1 1/2 miles south-east of Tall Pine was examined for a final defoliation. Light defoliation ranging from 5 to 10 per cent was recorded and very few larch sawfly larvae obtained at that time.

A small swamp 4 1/2 miles north of Pelly was defoliated 10 per cent by the end of the season.

In a swamp between Pelly and Nerquay, defoliation was also light and did not exceed 10 per cent. Scattered tamarack in the Madge Lake area of the Duck Mountain Provincial Forest was systematically sampled during the 1952 season, but defoliation did not exceed 10 per cent.

5.2.2 - Large Aspen Tortrix, Archips conflictana (Wlk.)

In the Madge Lake area, defoliation to white poplar stands by the large aspen tortrix was negligible. In all cases defoliation was observed at less than 5 per cent.

In the Porcupine Provincial Forest the large aspen tortrix population was generally very low and defoliation to white poplar foliage was very light. The 1951 infestation that extended north of Naherville along No. 9 highway for a distance of 5 miles was sampled, and surveyed during the large aspen tortrix feeding

season. Results of the survey indicated that this infestation had subsided in 1952. Defoliation during the peak of the 1952 feeding season was light and did not exceed 20 per cent. This area was examined again at the end of the survey season, and at that time evidence of previous defoliation was hardly noticeable.

An area of moderate defoliation, averaging about 35 per cent, was noted 2-1/4 miles north of Reserve in a narrow strip of white poplar along No. 9 highway. This infestation covered secs. 1, 12, 13, tp. 41, rge. 5, W.2nd mer. and sec. 19, tp. 41, rge. 4, W.2nd mer. A permanent sample station was established in the infestation to obtain continuous records of intensity and rate of spread of the large aspen tortrix in this area.

North of Hudson Bay in the Pasquia Provincial Forest the large aspen tortrix was present in small numbers. Very little defoliation was noticed on white poplar examined as far north as Turnberry on the C.N.R. right-of-way. White poplar stands north of Veillardville were checked and only light defoliation was recorded. West of Hudson Bay in the Pasquia Provincial Forest the large aspen tortrix was found in all white poplar stands, but populations were light and very little defoliation resulted.

White poplar stands in the Torch River, Hipawin and Fort a la Corne areas were examined during the season. Collections of the large aspen tortrix were obtained from these areas, but only light defoliation was observed.

5.2.3 - Jack-pine Budworm, Choristoneura sp.

One larva of the jack-pine budworm was found in the Hudson Bay district in 1952. It was found in the Fort a la Corne Provincial Forest, 3 1/2 miles south of Inland Store in sec. 14, tp. 51, rge. 19, W.2nd mer. A permanent sample station was established at the location where the larva was found to check future populations of the jack-pine budworm.

5.2.4 - Spruce Budworm, Choristoneura fumiferana (Clem.)

White spruce stands in the Hudson Bay District were extensively sampled for spruce budworm but no evidence of it was obtained.

5.2.5 - Forest Tent Caterpillar, Malacosoma disstria Hbn.

One adult of this insect was found in a small white poplar stand, 4 miles north of English Cabin, in the Fort a la Corne Provincial Forest. An intensive survey was conducted throughout the remainder of the Hudson Bay District for evidence of this insect, but no larva, adults, or egg bands were found.

5.2.6 - A Pine Scale, Toumeyella sp.

This scale was not found on jack-pine stands in the Hudson Bay District in 1952.

5.2.7 - Pitch Nodule Maker, Petrova albicanitana (Busck.)

Samples of this insect were found throughout all jack-pine stands in the Pasquia, Fort a la Corne, Nipawin and Torch River Provincial forests. However, very little damage to jack-pine was observed in these areas. Samples were found south of Hudson Bay in sec. 4, tp. 45, rge. 3, W.2nd mer. and at Nipawin in sec. 9, tp. 51, rge. 14, W.2nd mer. In the Fort a la Corne Provincial Forest, the pitch nodule maker was observed on most young jack-pine stands, but occurred in only limited numbers. Mature jack-pine stands were less susceptible to attack by the pitch nodule maker.

5.2.8 - American Poplar Beetle, Phytodecta americana, Schffr.

This insect was widely distributed throughout the Hudson Bay District in 1952. Defoliation was evident from Madge Lake to Hudson Bay and west to Greenwater Provincial Park. Samples of this insect were also collected north of Hudson Bay in the Pasquia Provincial Forest, and in the Nipawin and Torch River areas.

In the Madge Lake area, only light defoliation was observed, averaging about 5 per cent on immature and reproduction white poplar. Larva were also found on mature white poplar, but defoliation was also very light. In the area north of Pelly light defoliation was observed on regeneration and second growth white poplar. The mature poplar were less than 5 per cent defoliated. In the Uaherville, Reserve, Bertwell, and Hudson Bay areas regeneration and second growth white poplar were moderately defoliated. Between 35 and 40 per cent of the young white poplar leaves were eaten. The same condition existed along the trail leading to McBride Lake.

East of Hudson Bay to Armit in the Pasquia Provincial Forest, defoliation to young white poplar stands ranged from light to moderate. North of Veillardville along the Spruce Products Trail, scattered poplar stands suffered 20 to 35 per cent defoliation. In this area the defoliation to white poplar over $4\frac{1}{2}$ in. d.b.h. was negligible.

The American poplar beetle was lightly distributed west of Hudson Bay through Prairie River to Pessane and from Clemenceau to Greenwater Lake. North to Carrot River and Nipawin, light to moderate defoliation was observed. Defoliation through this area was mainly confined to regeneration and small white poplar growth. North of White Fox in the Torch River area, and in the eastern portion of the Fort a la Corne defoliation was generally light and did not exceed 20 per cent. The occasional small patch of white poplar regeneration was defoliated 40 to 50 per cent, but this was noticed only on rare occasions. These stands were checked again later in the season. At that time a dditional leaf growth was observed.

5.2.9 - Balsam-Fir Sawfly, Neodiprion abietis (Harr.)

Only three collections of the balsam-fir sawfly were obtained in the Hudson Bay District during the 1952 season. In all instances damage was negligible. One sample was found north of Birch Island in sec. 8, tp. 54, rge. 10. W.2nd mer. along the White Fox-Flin Flin highway. The other two samples were collected south of Chelani in the Greenwater Park area.

5.2.10 - Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

This insect was widely distributed on native white spruce stands throughout the Hudson Bay District, but populations were low and it caused very little defoliation. Heavy populations of the yellow-headed spruce sawfly were found on shelter belts in the Etomami settlement. This area is located in tp. 43, rges. 2 and 3, W.2nd mer. At Hedge Lake in the Duck Mountain Provincial Forest, a small patch of white spruce along the lake shore in sec. 27, tp. 30, rge. 30, W.P. mer. was defoliated 15 to 20 per cent by the yellow-headed spruce sawfly. The infestation was confined to a small number of trees and was brought to the attention of the Park superintendent.

5.2.11 - Green-headed Spruce Sawfly, Pikonema dimockii (Gress.)

Thirty-five samples of this insect were collected on white spruce stands throughout the Hudson Bay District in 1952. In all cases populations were low and defoliation to white spruce was negligible. During the peak of its feeding period only two or three larva were obtained per standard five tree sample.

5.2.12 - Black-headed Budworm, Acleris varians (Fern.)

Fourteen samples of this insect were collected in the Hudson Bay District in 1952. In all areas where it was collected, populations were low and defoliation to white spruce was not noticeable. Only one or two larvae were obtained per five tree sample. Six samples were obtained in the Porcupine Provincial Forest, two samples were found in the Torch River area and the other six samples were collected in the Pasquia Provincial Forest,

5.2.13 - Spruce Gall Aphid, Chermes abietis (L.)

Galls of this insect were commonly found on spruce in the Hudson Bay District, but they caused no serious damage.

5.2.14 - Ugly-nest Tortrix, Archips cerasivorana (Fitch)

This insect was commonly found throughout the Hudson Bay District, but was observed feeding mainly on chokecherry. Under natural forest conditions, defoliation to chokecherry and other shrubs was light and did not exceed 15 per cent. Damage was most evident to scattered chokecherry bushes which grew along roadsides and cultivated fields.

5.2.15 - White-pine Weevil, Pissodes strobi (Peck)

Throughout the Hudson Bay District second growth white spruce leaders were occasionally infested with larva and adults of the white pine weevil, but the damage to the stands was not serious.

5.2.16 - Aspen Blotch Miner, Lithocolletia tremuloidella (Braun)

This insect discolored some foliage in the Hudson Bay District. However, it caused no serious damage to white poplar stands on which it was found.

5.2.17 - Birch Sawfly, Arge nectoralis (Leach)

Two samples of the birch sawfly were collected in the Hudson Bay District in 1952. One sample was found two miles east of Pelly in sec. 30, tp. 32, rge. 33, W.P. mer. and the other sample was found south-west of Nipawin in sec. 26, tp. 50, rge. 14, W.2nd mer. In both cases very little defoliation was observed.

5.2.18 - Grey Willow Leaf Beetle, Galeryella decora (Say)

This insect was lightly distributed throughout the forested and agricultural areas of the Hudson Bay District. It was generally found on small soft-leaf willow. The glossy sharp-leaf willows were not skeletonized to any extent. The first adult of the grey willow leaf beetle was found on May 24 at Madge Lake in the Duck Mountain Provincial Forest. From that time on, willow was systematically sampled throughout the Hudson Bay District to determine the extent of skeletonizing.

In the area surrounding Madge Lake, skeletonizing by the grey willow leaf beetle was light. North to Pelly only very light skeletonizing was observed and did not exceed 10 per cent. Light to moderate skeletonizing (up to 15 per cent) was observed throughout the entire Porcupine Provincial Forest.

Only light skeletonizing occurred in the Pasquia Provincial Forest. Fewer larvae and adults were found this year in this area than in 1951 and skeletonizing was less conspicuous.

Willow foliage throughout the Fort a la Corne, Nipawin and Torch River areas was lightly skeletonized. Damage ranged from 5 to 10 per cent here. Damage was also somewhat lighter in this area in 1952 than it was in 1951.

5.2.19 - Poplar Vagabond Gall Aphid, Mordwilkoja vagabunda (Walsh)

Deformed poplar leaves caused by the poplar vagabond gall aphid were widely scattered on reproduction white poplar throughout the Hudson Bay District. In all cases little damage was caused to the trees.

5.2.20 - Willow Sawfly, Arge clavicornis (Fabr.)

This insect caused very little defoliation in the Hudson Bay District in 1952. Nine samples were collected, but each sample contained only one larva of the willow sawfly.

5.2.21 - Striped Alder Sawfly, Hemichroa crossea (Fourc.)

Five samples of this insect were found in the Hudson Bay District in 1952. These samples were obtained in the Madge Lake and Pelly areas and were all found on alder. Less than 15 per cent defoliation was observed where the larvae were found.

5.2.22 - Red-pine Sawfly, Neodiprion nanulus Schedl.

One sample of this insect was found in the Rivers End Settlement in the Torch River area. This sample was found in sec. 23, tp. 53, rge. 14, W.2nd mer. but no defoliation to the jack-pine was observed.

5.3 SPECIAL PROJECTS

5.3.1 - Permanent Sample Stations.

Fifteen permanent sample stations were established in the Hudson Bay District during the 1952 season. The following table gives their exact locations:-

TABLE A
Permanent Sample Stations - 1952

Date	Host	Place	Sec.	Tp.	Rge.	Mer.
Aug.17	W.Poplar	Fort a la Corne	22	40	17	W.2nd
Aug.17	Tamarack	Fort a la Corne	24	50	17	W.2nd
Aug.18	Tamarack	4 miles north of Grassy Lake Tower	34	54	15	W.2nd
Aug.19	Tamarack	24 miles north-east of White Fox	17	54	11	W.2nd
Aug.20	Tamarack	9.1 miles north of Snowden, Sask.	5	54	18	W.2nd
Aug.26	Tamarack	Spruce Product Trail north of Veillardville	7	46	4	W.2nd
Aug.28	Tamarack	1½ miles north of 15 mile tower	36	46	5	W.2nd
Aug.28	Tamarack	2 miles north-east of Greenbush	4	45	5	W.2nd
Sep. 5	W.Poplar	1/4 mile east of Bertwell	6	42	4	W.2nd
Sept.5	W.Poplar	2 miles north of Bertwell Jet.	5	42	4	W.2nd
Sept.5	W.Poplar	3 miles north of Bertwell Jet.	9	42	4	W.2nd

TABLE A (continued)
Permanent Sample Stations - 1952

Date	Host	Place	Sec.	Tp.	Rgs.	Mer.
Sep. 5	W. Spruce	7 miles north of Bertwell Jet.	24	42	4	W.2nd
Sep. 6	Tamarack	20 miles south-east of Hudson Bay along Armit Trail	16	44	1	W.2nd
Sep. 6	Tamarack	27 miles south-east of Hudson Bay via Armit Trail		44	32	W.P.
Sep. 7	W. Poplar	12½ miles north of Veillardville	2	47	5	W.2nd

5.3.2 - Larch Sawfly Cocoon Collection.

Mass collections of larch sawfly cocoons were made in 15 widely separated areas of the Hudson Bay District in 1952. These cocoons will be dissected during the winter to determine abundance and occurrence of parasites.

TABLE B
Larch Sawfly Cocoon Collections - 1952
Hudson Bay District, Saskatchewan

Date.	Place	Sec.	Tp.	Rgs.	Mer.	No. of Cocoons	Check or Release Point
Aug. 31	Pelly	10	15	2	W.2nd	100	check
Aug. 20	Grassy Lake	35	54	15	W.2nd	250	check
Aug. 18	Armit Road	17	44	1	W.2nd	250	check
Aug. 18	Hudson Bay	21	45	3	W.2nd	250	check
Sep. 2	Pasquia P. Forest	5	46	4	W.2nd	200	check
Aug. 11	Eldridge Lake	25	40	4	W.2nd	250	check
Aug. 25	Carrot River	3	50	11	W.2nd	175	check
Aug. 29	Veillardville	18	46	3	W.2nd	250	check
Aug. 24	Fort a la Corne	29	30	17	W.2nd	250	check
Sep. 12	Hudson Bay	6	47	3	W.2nd	157	check
Sep. 2	Greenbush Trail	23	45	5	W.2nd	200	check
Sep. 10	Pasquia P. Forest	16	46	3	W.2nd	112	check
Sep. 10	Hudson Bay	35	46	4	W.2nd	200	check
Aug. 22	Hipavin P. Forest	11	56	18	W.2nd	250	check
Aug. 18	Armit Road	14	44	31	W.P.	200	release

5.4 NEGATIVE REPORTS

Table C
 Negative Reports, Hudson Bay District 1952.

Date	Host	Location	Sec.	Tp.	Egs.	Mer.
May 25	White Spruce	Madge Lake	27	30	30	W.P.
June 9	White Spruce	Greenwater Park	3	41	11	W.2nd
June 10	White Spruce	Mistahm	12	45	10	W.2nd
June 13	Jack-pine	White Fox	3	54	12	W.2nd
June 14	Balsam	Torch River	27	54	14	W.2nd
June 16	Jack-pine	Nipawin P. Forest	9	55	18	W.2nd
June 16	Larch	Nipawin P. Forest	9	55	18	W.2nd
June 18	Larch	Nipawin	25	50	15	W.2nd
June 20	Black Poplar	Carrot River	6	50	10	W.2nd
June 23	Larch	Armit Road	13	44	1	W.2nd
June 23	White Poplar	Hudson Bay	31	44	3	W.2nd
June 24	White Poplar	Hudson Bay	3	46	3	W.2nd
July 12	Jack-pine	Nipawin	2	51	14	W.2nd
July 14	Jack-pine	Torch River	17	53	12	W.2nd
July 29	Balsam	Madge Lake	35	30	30	W.2nd
July 30	White Poplar	Greenbush Trail	28	45	5	W.2nd
July 30	Black Spruce	Greenbush Trail	33	45	5	W.2nd
July 31	White Spruce	Armit Road	21	44	31	W.P.
Aug. 25	White Poplar	Clemenceau	34	42	5	W.2nd
Aug. 25	White Spruce	Bertwell	4	42	4	W.2nd
Aug. 25	Jack-pine	Hudson Bay	16	44	3	W.2nd
Aug. 28	White Poplar	Greenbush Trail	18	45	4	W.2nd
Sept. 12	White Poplar	Porcupine P. Forest	14	38	5	W.2nd
Sept. 17	White Poplar	Madge Lake	35	30	30	W.P.

5.5 PERSONNEL CONTACTED

Name	Position	Address	Sampling Demonstration	No. of Contacts
G. Schell	District Superintendent	Hudson Bay	no	5
D.G. Pond	Forester	Hudson Bay	yes	7
F. Pierce	Equipment Officer	Hudson Bay	no	2
J.C. Cockwell	Field Officer	Hudson Bay	yes	6
H. Randall	Field Officer	Carrot River	no	3
G. Fergusson	Asst. Forester	Hudson Bay	no	4
J. Heron	Field Officer	Madge Lake	yes	6
F. Bryson	Field Officer	Usherville	no	4
F.J. Hawkes	Field Officer	Chelan	no	4
L. Beedle	Field Officer	Hudson Bay	yes	9
J.M. Bacon	Field Officer	Somme	yes	5
K.A. Smith	Asst. Forester	Carrot River	no	1
L. Reeschenko	Field Officer	Peesane	no	2
C. Otterbrian	Fire Control Officer	Nipawin	no	2
C.T. Bell	Towerman	White Fox	no	2
R.E. Brooker	Field Officer	Grassy Lake	yes	3
W.A. MacDonald	Field Officer	Beaver House	no	3
M. McInnes	Towerman	Beaver House	yes	4
R.D. Whitney	Technical Officer	Forest Pathology Lab. Saskatoon	no	2
R. Whitlock	Field Superintendent	Hudson Bay	no	5
J. Stewart	Pilot D.N.R.	Hudson Bay	no	3
G. Fladager	Game Warden	Hudson Bay	yes	7
H.R. Peacock	Forester	Hudson Bay	no	1
A. Roang	Patrolman	Snowden	yes	2
W. Bushman	Sask. Timber Board	Hudson Bay	no	4
G. Ross	Sask. Timber Board	Hudson Bay	yes	4
F. Priest	Construction Engineer D.N.R.	Hudson Bay	no	2
W. Stubbington	Field Officer	White Fox	no	2
Cliff Schell	Field Officer	Pelly	no	2
K. Lamb	Fur Rancher	Hudson Bay	yes	1
R. Thomas	Forest Pathology Ranger	Saskatoon	yes	3
K. Kirpatrick	Office Manager D.N.R.	Hudson Bay	no	4
T. Smith	Sask. Timber Board	Sturgis	no	1
M. Howland	Forest Inventory Officer	Prince Albert	yes	5
J. Hourie	Asst. Forest " "	Prince Albert	yes	6
B. Kipling	Towerman	Nipawin	no	1
J. Patterson	Forest Pathology Lab.	Saskatoon	no	2
K.O. Saunders	Field Officer	Danbury	no	1

6. PRINCE ALBERT, MEADOW LAKE AND NORTHERN
DISTRICTS OF SASKATCHEWAN

by

J.J. Lawrence and B.B. McLeod

6.1 INTRODUCTION

Field work was carried out from May 1 to October 9 in the Prince Albert, Meadow Lake and Northern Districts of Saskatchewan.

The period May 1 and May 18 was spent working on the ranger cabin at Prince Albert. Work consisted mainly of painting and fixing up the grounds. The last two weeks of May were spent contacting Department of Natural Resources personnel and in general sampling, with emphasis placed on determining the distribution of the forest tent caterpillar. The first three weeks of June were devoted to a ground survey for large aspen tortrix in the Lac La Ronge and Meadow Lake districts, as well as general sampling and a survey for jack-pine and spruce budworms. Mass collections of forest tent caterpillar larvae and pupae were made during this period throughout the areas infested in 1951. During the last week of June an aerial survey was made of the large aspen tortrix infestations in the Onion Lake and Lac La Ronge areas and the forest tent caterpillar infestations at Glaslyn, Sled Lake, and Bittern Creek. A special aerial survey was made south of Buffalo Narrows to determine the cause of reddening of jack-pine foliage. This proved to be hail damage.

The month of July was devoted to general sampling and a survey for jack-pine and spruce budworm and recording defoliation caused by the forest tent caterpillar to white poplar at the 1951 egg band collection points. Several days of this month were spent with personnel from the Forest Pathology Laboratory at Saskatoon on a survey for the detection of tree diseases and methods of handling diseased material.

The first two weeks of August were spent on general sampling and a larch sawfly survey. During the latter part of the month several colonies of larch sawfly parasites were released. General sampling was also continued, and a special survey made for the occurrence of forest tent caterpillar egg bands in the Meadow Lake District.

During September the forest tent caterpillar egg survey was completed and mass collections of larch sawfly cocoons were made. The latter part of the month was spent establishing additional sample plots in white poplar stands and rechecking the permanent sample plots that had been established in various forest stands in the Prince Albert District in 1947. During the first week of October preparations were made for the return to Headquarters. This consisted of cleaning and painting the ranger cabin.

Details of insect conditions in the Prince Albert, Meadow Lake, and Northern Districts of Saskatchewan for 1952 are found in the following pages.

6.2. INSECT CONDITIONS

6.2.1 - Larch Sawfly, Fristiphora erichsonii (Htg.)

While attack by this insect lessened somewhat in the southern portion of the Prince Albert District during 1952, in the northern part of the District larch sawfly populations increased to the extent that severe defoliation occurred in most of the tamarack stands examined. Defoliation, for the most part, in the Northern District was moderate to severe. In the Meadow Lake District larch sawfly appeared to be increasing in numbers, but defoliation was still light. The first larch sawfly larvae were collected on June 12. This was somewhat earlier than in previous years. An effort was made during 1952 to determine the cause of tree mortality in a tamarack swamp in the MacDowall Block of the Nisbet Provincial Forest. This condition was reported in 1951. With the aid of R. Thomas from the Pathology Laboratory at Saskatoon, it was found that this mortality was caused by a canker. The symptoms consist of sap seeping through the bark in several places on the trunk and branches. Larch sawfly caused only light defoliation in the affected area.

Defoliation in the Holbein and Home Blocks was light to moderate. Throughout the Round Lake, Steep Creek, and Red Rock Blocks, defoliation was moderate, except in a tamarack swamp in sec. 28, tp. 50, rge. 27, W.2nd mer. in the Round Lake Block, where severe defoliation was noted.

Defoliation by larch sawfly subsided somewhat in the Fort a la Corne Provincial Forest. In several stands examined between the western boundary and English Cabin, only moderate defoliation was recorded. In the Emma Lake and Candle Lake Provincial forests defoliation was severe with an occasional small area of moderate defoliation. Surface water was present during most of the season in many tamarack swamps in the Candle Lake Provincial Forest. Throughout the Prince Albert National Park, and as far north as Lac La Ronge, larch sawfly caused severe defoliation to tamarack. Numerous larvae that were collected in sec. 13, tp. 53, rge. 2, W.3rd mer. in the Prince Albert National Park were affected by the disease organism Beauveria bassiana.

Larch sawfly populations increased in the Big River Provincial Forest. Severe defoliation occurred in sec. 30, tp. 56, rge. 8, W.3rd mer. and throughout the southern portion of the Reserve, gradually tapering off from moderate to light toward the west boundary. North from Big River to Dore Lake defoliation was severe. This is the first year that complete defoliation was recorded in this area.

West of Dore Lake, through Green Lake to Meadow Lake larch sawfly defoliation gradually tapered off from severe at Dore Lake, moderate to light at Green Lake and from light to very light at Meadow Lake. Light defoliation was recorded through the area from Meadow Lake to Goodsoil, Pierceland, and the Alberta boundary. Throughout the Meadow Lake and Bronson Provincial forests defoliation ranged from very light to light. This is the first year that noticeable defoliation was recorded in this area.

6.2.2 - Forest Tent Caterpillar, Malacosma disstria Hbn.

This insect became more widespread in 1952 than it was in 1951. Many of the small infestations coalesced to form a general outbreak covering approximately 75 townships within an area 100 miles square in Central Saskatchewan (see Map). An aerial survey was made of the infestation and will be dealt with in more detail under Special Projects. During the season two collections of this insect were made in the Nisbet Provincial Forest. One was in sec. 28, tp. 48, rge. 23, W.2nd mer. in the Steep Creek Block, and the other in sec. 16, tp. 49, rge. 26, W.2nd mer. in the Home Block. One collection of larvae was made in the Fort a la Corne Provincial Forest, (sec. 28, tp. 50, rge. 19, W.2nd mer.) but no defoliation was observed. In a mixed

stand of poplar, white spruce, and birch about one mile wide, and running along the east shore of Torch Lake (about 5 miles) white poplar was moderately to severely defoliated. The infestation north of Bittern Creek continued to flourish, and had spread westward to Waskesiu Lake. Except for a small area at the south end, the infestation had completely surrounded the lake. White poplar was severely defoliated throughout this area. Collections of this insect were made as far north as Lac La Ronge, but defoliation was light. Larvae of this insect were collected in the area from Candle Lake south for 13 miles, and then west through Paddockwood to No. 2 highway. Collections were made every 5 miles, but no defoliation was noted. Only a trace of forest tent caterpillar was found south of the line described.

A small area of moderate defoliation was observed in sec. 27, tp. 58, rge. 9, W.3rd mer. north of Big River on No. 3 highway. From a point 32 miles north of Big River north-east to Dore Lake the forest tent caterpillar caused severe defoliation in most of the poplar stands examined (see figure 10 and 11). The same condition existed from Dore Lake to Green Lake in the Meadow Lake District (figures 8 and 9). Most of the poplar in this area is mature.

Forest tent caterpillar was quite widespread, but generally caused only light defoliation in the Meadow Lake District. Numerous collections were made north of Meadow Lake to Flotton Lake, sec. 36, tp. 63, rge. 18, W.3rd mer., and as far west as Pierceland, sec. 10, tp. 62, rge. 23, W.3rd mer. One collection was also made in the Bronson Provincial Forest in sec. 9, tp. 56, rge. 23, W.3rd mer. At all of these points defoliation was light. The old infestation south of Meadow Lake had spread to some extent, but was still confined to a fairly small area (tp. 54, rges. 16 and 17, W.3rd mer.) Defoliation remained severe throughout the area. Outside the infestation area, collections were made as far south as Glaslyn and east to Cater, but in all instances defoliation was very light.

6.2.3 - Pitch Nodule Maker, Petrova albicapitana (Busck)

This insect was again widespread throughout the Prince Albert District. The majority of collections this year were obtained in the Hisset Provincial Forest. Damage was very light in all areas where it was found, except in a plantation in sec. 12, tp. 49, rge. 28, W.3rd mer. where moderate damage was recorded. One

collection was made in the Fort a la Cernae Provincial Forest and another 22 miles south of Lac La Ronge, but in both cases damage was light. One collection was taken in the Brenson Provincial Forest, sec. 6, tp. 58, rge. 22, W.3rd mer. Only light damage was recorded at the collection point.

6.2.4 - Hemlock Looper, Lambdina fuscicollis (Guen.)

Four collections of the hemlock looper were collected in the Prince Albert and Meadow Lake Districts, but it caused no defoliation.

6.2.5 - Jack-pine Budworm, Choristoneura sp.

The jack-pine budworm infestation remained at a low level in 1952. Collections of this insect were recovered in the Nisbet Provincial Forest in secs. 5 and 6, tp. 49, rge. 23, W.2nd mer. in the Steep Creek Block. The jack-pine budworm was also collected in secs. 19, 20 and 26, tp. 49, rge. 25, W.2nd mer. in the Red Rock Block, and in sec. 14, tp. 49, rge. 28, W.2nd mer. and sec. 18, tp. 49, rge. 27, W.2nd mer. in the Home Block. Larvae of the jack-pine budworm were recovered for the first time in the Big River Provincial Forest. These collections were made in secs. 14 and 17, tp. 57, rge. 8, W.3rd mer. In all the above areas the populations were low and defoliation was not noticeable.

6.2.6 - Spruce Budworm, Choristoneura fumiferana (Olem.)

No specimens of this insect were found in the Prince Albert, Meadow Lake, or Northern districts of Saskatchewan in 1952.

6.2.7 - Large Aspen Tortrix, Archips conflictana (Wlk.)

In 1952 the large aspen tortrix caused severe defoliation in the Lac La Ronge area in the Northern District of Saskatchewan. The infestation area, starting 24 miles south of the town of

Lac La Ronge, runs north-east along the south shore of Wapawekka Lake, thence runs north to the eastern tip of Lac La Ronge, then north and west through townships 73 and 74 to Besnard Lake. The infestation boundary runs south along the east shore of Besnard Lake to Lynx Lakes and south to the starting point 24 miles south of Lac La Ronge. In the above area forest tent caterpillar was present also, but the populations were very low.

The large aspen tortrix was collected in the Nisbet Provincial Forest in secs. 6 and 7, tp. 49, rge. 23, W.2nd mer. in the Steep Creek Block, but defoliation was very light. An infestation of large aspen tortrix was causing light defoliation in the Candle Lake Provincial Forest. Collections were taken in sec. 23, tp. 55, rge. 23, W.2nd mer. and in sec. 16, tp. 56, rge. 24, W.2nd mer.

The large aspen tortrix infestation north of Glaslyn had abated in 1952. This year little or no defoliation was noticeable in areas that had been severely defoliated in previous years (see figures 1, 2, 3 and 4). The most severe infestation this year was centered in tps. 54 and 55, rges. 25, 26 and 27, and continued westward into Alberta. In tp. 54, rge. 27, W.3rd mer. the infestation was as severe that the host trees, shrubs, slash, and ground cover were enveloped with webbing (see figures 5, 6 and 7). Severe defoliation was noted in tp. 54, rge. 25, W.3rd mer. north of Frenchman Butte. Other additional collections in the Meadow Lake District were made at the following locations - one mile west of Cater in sec. 1, tp. 51, rge. 15, W.3rd mer. and 20 miles south of Goodsoil in sec. 27, tp. 59, rge. 22, W.3rd mer. Defoliation was light in these areas.

6.2.8 - Balsam-fir Sawfly, Neodiprion abietis (Harr.)

Scattered collections of this insect were recovered in the Prince Albert District. Larvae were collected in sec. 13, tp. 55, rge. 23, W.2nd mer. in the Candle Lake Provincial Forest, sec. 29, tp. 57, rge. 1, W.3rd mer. in the Prince Albert National Park, and in sec. 19, tp. 53, rge. 23, W.2nd mer. in the Emma Lake Provincial Forest. Collections were also taken 20 miles west of Shellbrooke in tp. 49, rge. 6, W.3rd mer. and 6 miles east of Canwood in tp. 50, rge. 5, W.3rd mer. A collection of this insect was recovered 42 miles north of Glaslyn in the Meadow Lake Provincial Forest in sec. 12, tp. 57, rge. 17, W.3rd mer.

In all the above locations balsam-fir sawfly populations were very low and defoliation was not noticeable.

6.2.9 - Birch Sawfly, Arge neotoralis (Leach)

Populations of the birch sawfly were very low in the Prince Albert District in 1952. Collections were again recovered in the Emma Lake Provincial Forest in secs. 13 and 25, tp. 53, rge. 27, W.2nd mer. One collection was taken in sec. 7, tp. 55, rge. 21, W.2nd mer. in the Candle Lake Provincial Forest, and also in sec. 22, tp. 46, rge. 1, W.3rd mer. in the MacDowall Block of the Nisbet Provincial Forest. Defoliation in these areas was negligible. An infestation of the birch sawfly, causing light defoliation, was noted in the Lac La Ronge area of the Northern District. Collections were taken in sec. 32, tp. 70, rge. 22, W.2nd mer. and in secs. 31 and 36, tp. 70, rge. 23, W.2nd mer.

6.2.10 - A Pine Scale, Toumeyella Sp.

This pine scale was recovered only in the Nisbet Provincial Forest of the Prince Albert District. Collections were made in secs. 5 and 23, tp. 49, rge. 26, W.2nd mer. in the Home Block. It was also collected in sec. 6, tp. 49, rge. 23, W.2nd mer. in the Steep Creek Block, and in sec. 26, tp. 49, rge. 25, W.2nd mer. in the Red Rock Block. Infestations were light in all cases.

6.2.11 - Ugly Nest Caterpillar, Archips cerasivorana (Fitch)

The ugly nest caterpillar remained at the same level in 1952 as it was in 1951. Small areas of severe infestations were present in the Nisbet Provincial Forest of the Prince Albert District. These infestations were located in sec. 21, tp. 49, rge. 25, W.2nd mer. in the Red Rock Block, in sec. 13, tp. 49, rge. 23, W.2nd mer. in the Steep Creek Block, and in sec. 21, tp. 49, rge. 26, W.2nd mer. in the Home Block. One collection was recovered in the Prince Albert National Park, but defoliation was very light. One collection was also taken in the Meadow Lake District in sec. 13, tp. 60, rge. 16, W.3rd mer. but again defoliation was very light.

6.2.12 - A Tent Caterpillar, Malacosoma lutescens (N. & D.)

In two small areas in the Prince Albert District, one in sec. 13, tp. 49, rge. 27, W.2nd mer. and the other in sec. 21, tp. 49, rge. 26, W.2nd. mer. of the Home Block, chokecherry was severely damaged by this insect. In sec. 26, tp. 49, rge. 1, W.3rd mer. of the Home Block moderate defoliation was noted. Moderate defoliation was also observed in the Steep Creek Block in sec. 13, tp. 49, rge. 23, W.2nd mer. and in sec. 11, tp. 46, rge. 1, W.3rd mer. in the MacDowall Block. A light infestation occurred in the Fort a la Corne Provincial Forest in sec. 4, tp. 50, rge. 19, W.2nd mer. In the Meadow Lake District this insect caused very little damage. Collections were taken in sec. 27, tp. 53, rge. 25, W.3rd mer. near Frenchman Butte and in tp. 47, rge. 17, W.3rd mer., near Cochin.

6.2.13 - Spruce Needleworm, Pterovytia reniculella, (Grt.)

Two collections of this insect were made in 1952. One collection was made in sec. 17, tp. 49, rge. 23, W.2nd mer. in the Steep Creek Block of the Nisbet Provincial Forest. The other collection was made in sec. 22, tp. 57, rge. 1, W.3rd mer. in the Prince Albert National Park. In both instances defoliation was nil.

6.2.14 - White Pine Weevil, Pissodes strobi (Peck)

Only two collections of this insect were recovered in 1952. Light damage to regeneration jack-pine was recorded in sec. 23, tp. 49, rge. 26, W.2nd mer. in the Home Block of the Nisbet Provincial Forest, and in sec. 4, tp. 54, rge. 1, W.3rd mer. in Prince Albert National Park.

6.2.15 - A Bud-moth, Petrova pallipennis (McD.)

Only one collection of this insect was made in 1952. This sample was recovered 1.5 miles north of Prince Albert in sec. 16, tp. 49, rge. 26, W.2nd mer. in the Home Block of the Nisbet Provincial Forest.

6.2.16 - Birch Tube-maker, Agrobasis betulella (Hbst.)

Two collections of this insect were made in 1952. One collection was made in the Red Rock Block in sec. 19, tp. 49, rge. 25, W.2nd mer. in the Nisbet Provincial Forest. The other collection was taken south-east of Green Lake in sec. 12, tp. 59, rge. 10, W.3rd mer. In both cases only one larva was found.

6.2.17 - Black-headed Budworm, Acleris varians (Fern.)

Populations of this insect increased in the Prince Albert and Meadow Lake Districts in 1952. In the Prince Albert District larvae were collected in secs. 16 and 21, tp. 49, rge. 26, W.2nd mer. in the Nisbet Provincial Forest, and secs. 9 and 29, tp. 57, rge. 1, W.3rd mer. in the Prince Albert National Park. Collections were also taken in secs. 13 and 25, tp. 53, rge. 27, W.2nd mer. in the Emma Lake Provincial Forest, and in sec. 3, tp. 56, rge. 23, W.2nd mer. in the Candle Lake Provincial Forest. This insect was widespread in the Meadow Lake District. Collections were made 14 miles north of Glaslyn in sec. 12, tp. 53, rge. 17, W.3rd mer. 11 miles north of Dorintosh in the Waterhen Provincial Forest (sec. 24, tp. 63, rge. 18, W.3rd mer.) Although black-headed budworm populations had increased in all areas, the increase was not significant enough to produce noticeable defoliation.

6.2.18 - Aspen Blotch Miner, Lithocolletis tremuleidella (Braun.)

Two small but severe infestations of aspen blotch miner occurred in the Prince Albert District in 1952. A small stand of white poplar in sec. 26, tp. 49, rge. 1, W.3rd mer. in the Home Block of the Nisbet Provincial Forest was severely infested. The other area occurred along the east shore of Dore Lake. Other infestations of moderate intensity occurred in sec. 12, tp. 56, rge. 24, W.2nd mer. in the Candle Lake Provincial Forest, 49 miles north-east of Waskegou in sec. 23, tp. 62, rge. 24, W.2nd mer. and ten miles north-west of Prince Albert in sec. 8, tp. 50, rge. 27, W.2nd mer. in the Round Lake Block of the Nisbet Provincial Forest. Poplar stands four miles north-west of Big River and 30 miles south-east of Green Lake were lightly infested. This insect was also recorded as lightly infesting poplar stands in the Meadow Lake Provincial Forest, and in the Waterhen Provincial Forest (sec. 24, tp. 63, rge. 18, W.3rd mer.).

6.2.19 - Red-pine Sawfly, Neodiprion nanulus Schedl.

This insect was recovered in only four places in 1952. These collections were made in the Nisbet Provincial Forest, and at no place was defoliation noticeable.

6.2.20 - American Poplar Beetle, Phytodecta americana Schffr.

The American poplar leaf beetle was active in white poplar stands in the Prince Albert, Meadow Lake and Northern districts in 1952. Regeneration poplar appeared to be the preferred host and suffered the most defoliation. In the Prince Albert District this insect defoliated two small areas severely. One area was in sec. 13, tp. 49, rgs. 27, W.2nd mer. in the Home Block of the Nisbet Provincial Forest, and the other was in sec. 19, tp. 49, rgs. 25, W.2nd mer. in the Red Rock Block. In sec. 14, tp. 49, rgs. 27, W.2nd mer. defoliation was moderate. Light defoliation of poplar occurred in Steep Creek Block in sec. 26, tp. 48, rgs. 23, W.2nd mer. and in sec. 32, tp. 47, rgs. 1, W.3rd mer. in the MacDowall Block. A small area in sec. 3, tp. 55, rgs. 27, W.2nd mer. in the Emma Lake Provincial Forest was moderately defoliated. White poplar stands were moderately defoliated in sec. 28, tp. 57, rgs. 2, W.3rd mer. in the Prince Albert National Park. White poplar in sec. 4, tp. 50, rgs. 19, W.2nd mer. in the Fort a la Corne Provincial Forest was severely defoliated. In the Meadow Lake Provincial Forest in sec. 1, tp. 57, rgs. 17, W.3rd mer. poplar was moderately defoliated. Another area, 20 miles south of Goodsoil in sec. 27, tp. 59, rgs. 22, W.3rd mer. was lightly defoliated.

6.2.21 - Green-headed Spruce Sawfly, Pikonema dimmockii (Cress.)
Yellow-headed Spruce Sawfly, Pikonema alaskensis (Roh.)

These two species were found closely associated on most spruce stands examined. Populations of the green-headed spruce sawfly were very low and caused little defoliation. On the other hand, the yellow-headed spruce sawfly was responsible for moderate defoliation in some areas. In sec. 13, tp. 50, rgs. 28, W.2nd mer. in the Round Lake Block, and sec. 9, tp. 50, rgs. 25, W.2nd mer. in the Red Rock Block, spruce was moderately defoliated. White spruce was moderately defoliated in sec. 31, tp. 57, rgs. 1, W.3rd mer. in the Prince Albert National Park. Collections of

these two species were made 21 miles north of Molanosa in sec. 11, tp. 67, rge. 23, W.2nd mer. but no defoliation was recorded. Very light defoliation was recorded in sec. 25, tp. 53, rge. 27, W.2nd mer. of Emma Lake Provincial Forest. Collections were made on the east shore of Dore Lake, but there was no defoliation. These insects were present, but caused little or no damage in the Meadow Lake District in 1952.

6.2.22 - Grey Willow Leaf Beetle, Galerucella decorata (Say)

This insect caused severe skeletonizing to willow along No. 2 highway at Molanosa in sec. 10, tp. 64, rge. 10, W.2nd mer. in 1952. The infestation was confined to the roadside as this area had been burned over. Moderate skeletonizing occurred to willow along the east shore of Dore Lake. The above two locations were the only places where the willow leaf beetle was recovered in 1952.

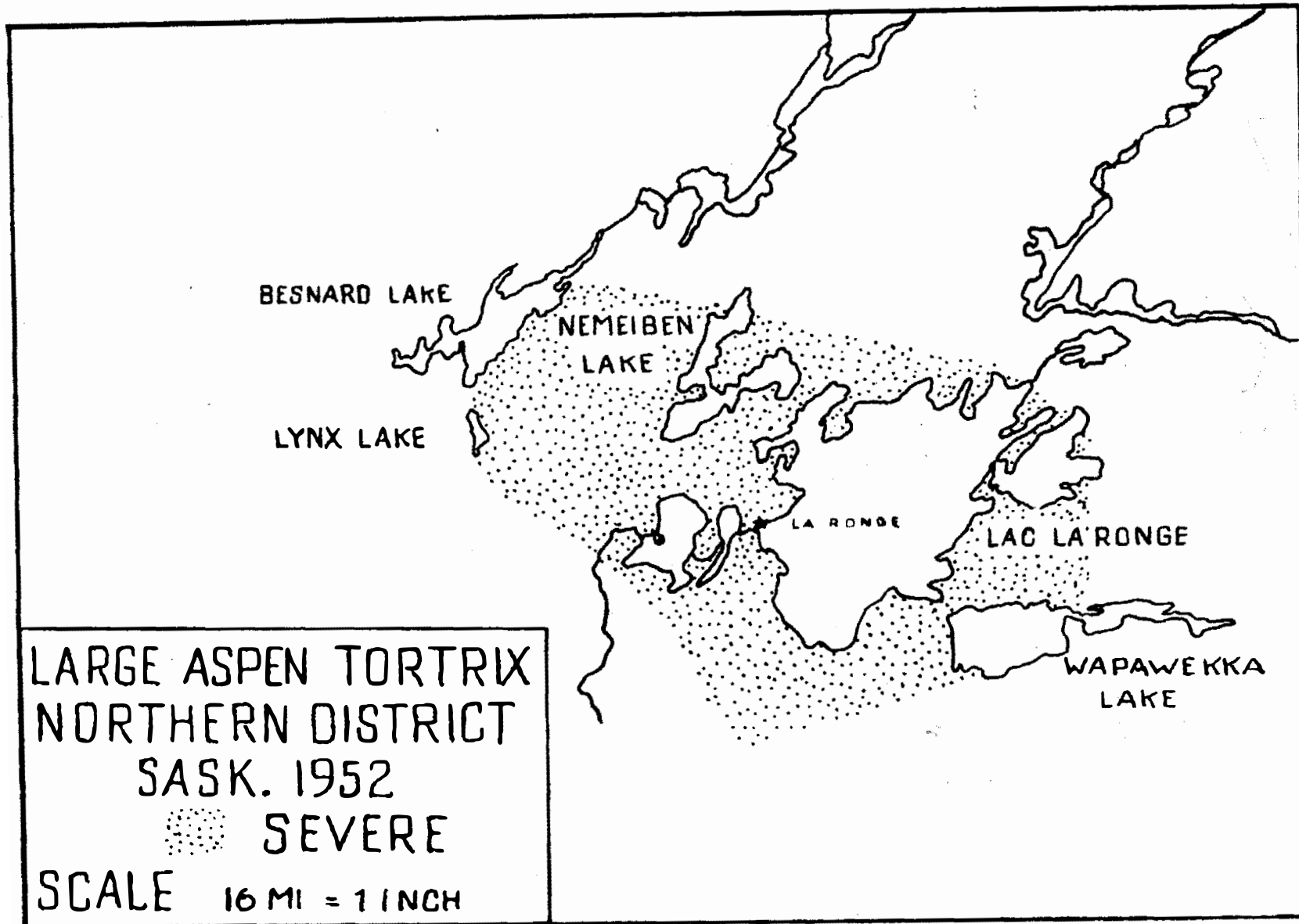
6.3 SPECIAL PROJECTS

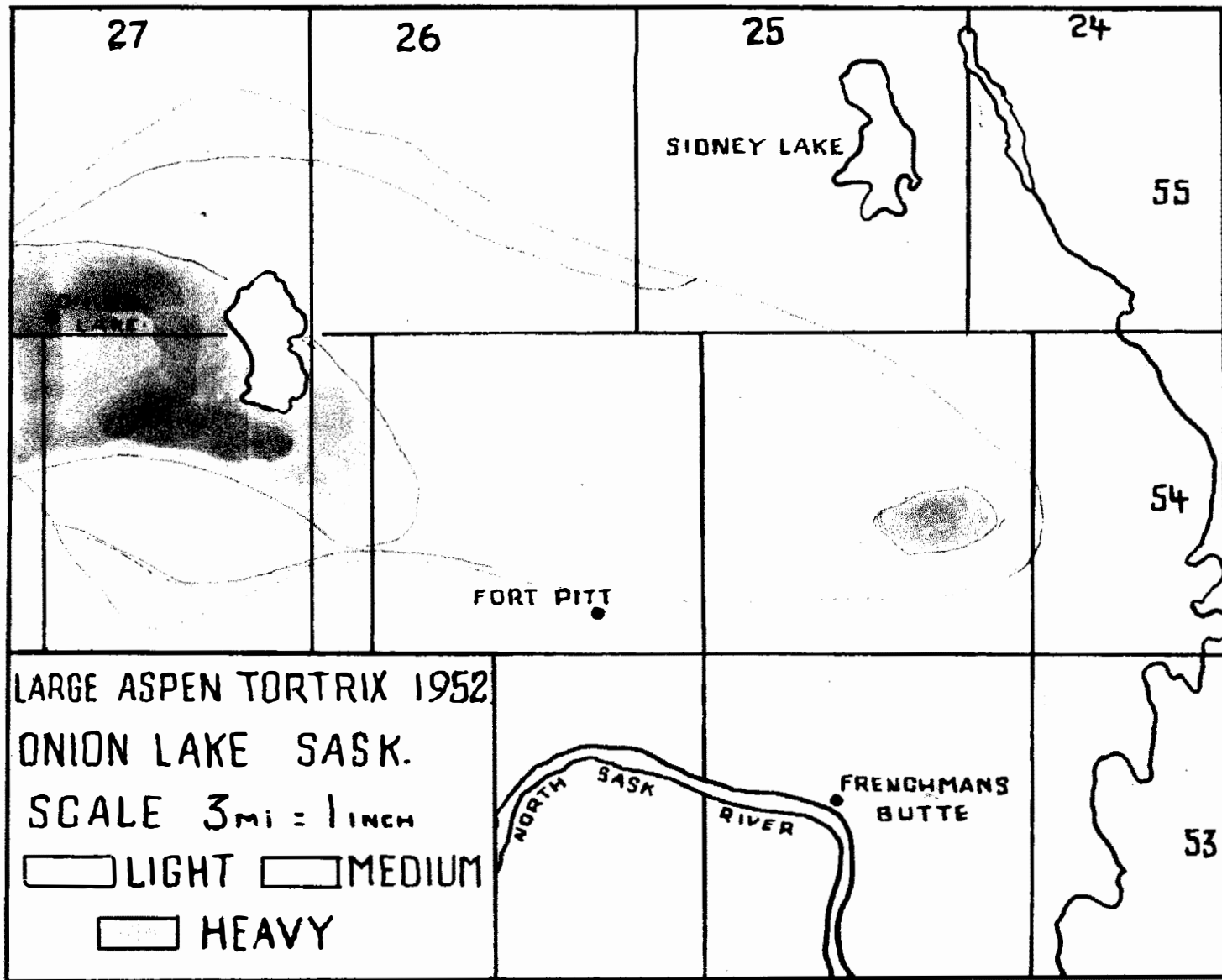
6.3.1 - Large Aspen Tortrix, Northern District.

On July 2 and 3, 1952, a special aerial survey was carried out from Lac la Ronge to determine the extent of the large aspen tortrix infestation in the Northern District. This infestation covered an area approximately 450 square miles and caused severe defoliation, (see Map). An aircraft for the survey was supplied by the Department of Natural Resources.

6.3.2 - Large Aspen Tortrix, Meadow Lake District.

On June 27 a special aerial survey was carried out to determine the boundaries of the large aspen tortrix infestation in the Onion Lake area. An aircraft used on the survey was supplied by the Saskatchewan Department of Natural Resources. The results of this survey are dealt with under "Insect Conditions" in this report.





6.3.3 - Forest Tent Caterpillar Surveys, Prince Albert,
Northern and Meadow Lake Districts.

An aerial survey was carried out on June 30, 1952 to determine the extent of defoliation to white poplar caused by the forest tent caterpillar in the Prince Albert and Northern Districts of Saskatchewan. The severe infestation now covers approximately 75 townships. Starting just west of Bittern Lake, the infestation boundary runs westward across the south end of Waskegan Lake, thence to Delaronde Lake and north-west to Green Lake. From Green Lake it runs north along the east bank of the Beaver River to Lac la Plonge, then south-east past Swan Lake to the Randall River, and on to Weyakwin Lake. From this lake it runs westward to Smoothstone Lake and then south past Listen Lake to within three miles of Delaronde Lake, thence north-east to include Kingsmere and Crean Lakes, and then back to the starting point near Bittern Lake. Within this area white poplar occurs only in scattered stands, but nevertheless wherever poplar was observed, defoliation ranged from moderate to severe.

Another aerial survey was made June 27 in the Meadow Lake District to determine the extent of forest tent caterpillar damage south of Meadow Lake. This infestation is in the same vicinity as last year's outbreak, but covers a much larger area. It is now causing severe defoliation in the southern half of tp. 54, rge. 17, V.3rd mer., most of tp. 54, rge. 16, W.3rd mer. and the south-west quarter of tp. 54, rge. 15, W.3rd mer. The southern boundary runs approximately one mile south of tp. 54 through tp. 53, rges. 16 and 17, W.3rd mer. The stand composition consists of poplar, jack-pine, and black spruce in the above order of abundance.

Light defoliation was observed earlier in the season south of the boundary given above, but it was not noticeable from the air.

6.3.4 - Forest Tent Caterpillar Egg Survey.

An egg survey was carried out in the fall of 1952 to determine the areas most likely to be attacked by the forest tent caterpillar in 1953. The following procedure was used. Three trees were cut every five miles in all possible directions from the centre of the 1952 infestation. All the branches and stems were examined and the number of egg bands recorded. A random sample, consisting of 15 bands, was saved for rearing to determine parasitism and hatchability of eggs. Samples were made in the same points as in 1951. Sampling was extended outward from the infestation until negative results were obtained. Results of the egg survey are included in a summary of the forest tent caterpillar under "Special Reports".

6.3.5 - Permanent Sample Plots.

The following table gives the locations of the permanent sample plots established in white poplar stands in the Prince Albert and Meadow Lake districts in 1952.

In addition, 15 permanent sample plots previously established in jack-pine, tamarack, and black spruce stands in the Prince Albert District were rechecked for diameter growth.

TABLE A.
Permanent Sample Plots

Date	Host	Place	Sec.	Tp.	Rge.	Mer.
Sept.15	W. Poplar	Prince Albert N.P.	21	57	2	W.3rd
Sept.16	W. Poplar	Montreal Lake	15	60	25	W.2nd
Sept.16	W. Poplar	Nolanosa	11	68	23	W.2nd
Sept.18	W. Poplar	Fort a la Corne P.F.	33	50	19	W.2nd
Sept.19	W. Poplar	Candle Lake P.F.	15	57	24	W.2nd
Sept.19	W. Poplar	Candle Lake P.F.	7	55	22	W.2nd
Sept.23	W. Poplar	Big River	14	58	9	W.3rd
Sept.23	W. Poplar	Big River	3	61	10	W.3rd
Sept.24	W. Poplar	Green Lake	35	62	13	W.3rd
Sept.24	W. Poplar	Green Lake	4	61	10	W.3rd

6.3.6 - Larch Sawfly Cocoon Collections.

Eighteen mass collections of larch sawfly cocoons were made in 1952. These cocoons will be subsequently dissected to determine the incidence and dispersal of larch sawfly parasites. The collecting points and number of cocoons obtained from each area are shown in the following table:-

TABLE B
Larch Sawfly Cocoon Collections

District	Place	Station or plot	Sec.	Tp.	Rge.	Mer.	No.
P.A.	Home Block		8	49	26	W. 2nd	250
P.A.	MacDowall Block		21	46	1	W. 3rd	150
P.A.	Home Block		22	49	1	W. 3rd	250
P.A.	Kelbein Block		13	49	2	W. 3rd	200
P.A.	Red Rock Block		19	49	25	W. 2nd	250
P.A.	Beaupre Creek		21	64	9	W. 3rd	250
P.A.	Skunk Creek		14	61	24	W. 2nd	250
P.A.	Fort a la Corne		33	50	19	W. 2nd	250
P.A.	Fort a la Corne		9	50	22	W. 2nd	250
P.A.	Steep Creek	28	28	48	23	W. 2nd	250
P.A.	Candle Lake		13	56	24	W. 2nd	250
P.A.	Eig River P.F.	Pl. 19	32	57	7	W. 3rd	250
P.A.	Ganwood		33	50	4	W. 3rd	250
P.A.N.P.	Mayview Swamp	29	24	53	2	W. 3rd	250
M.L.	Turtle Lake	Pl. 26	34	53	16	W. 3rd	1750
M.L.	Bronson P.F.		5	58	22	W. 3rd	250
M.L.	Pierceland	Pl. 36	14	62	26	W. 3rd	250
M.L.	Green Lake	Pl. 37	5	61	12	W. 3rd	250

6.3.7 - Larch Sawfly Parasite Releases.

Three colonies consisting of 10,689 adults of Mesoleius tenthredinis (Morley) and one colony consisting of 4,685 Tritneptis klugii (Ratz) adults were released during July and August 1952.

The following table shows the species and the points where they were released.

TABLE C
Larch Sawfly Parasite Releases - 1952

Date	Parasite	No. Released	Release Area
July 18	<u>Mesoleius tenthredinis</u> (Morley)	4,000	Sec. 22, tp. 49, rge. 1 W. 3rd mer, Crutwell, Sask.
Aug. 1	<u>Mesoleius tenthredinis</u> (Morley)	2,400	" " " "
Aug. 1	<u>Tritneptis klugii</u> (Ratz)	4,685	" " " "
Aug. 16	<u>Mesoleius tenthredinis</u> (Morley)	4,289	" " " "

6.4 - Negative Samples

The following negative samples were obtained from the Prince Albert District in 1952.

Negative Samples - 1952

Date	Host	Place	Sec.	Tp.	Egc.	Mer.
May 30	Jack-pine	MacDowall	4	47	1	W.3rd
May 30	Jack-pine	MacDowall	3	46	2	W.3rd
May 31	Jack-pine	Prince Albert	16	49	26	W.2nd
July 8	Jack-pine	Loon Lake	8	58	22	W.3rd
July 8	B. Spruce	Loon Lake	8	58	22	W.3rd
July 25	W. Spruce	Tweedsmuir	25	53	28	W.2nd
July 25	Jack-pine	Tweedsmuir	25	53	28	W.2nd
July 30	W. Spruce	Dore Lake	33	66	17	W.3rd
July 30	Balsam	Dore Lake	33	66	7	W.3rd
Aug. 4	Jack-pine	Waskesiu	22	55	1	W.3rd
Aug. 5	B. Spruce	Waskesiu	27	51	1	W.3rd
Aug. 6	Jack-pine	Melanesa	14	65	24	W.2nd
Aug. 7	B. Spruce	Lac La Ronge	32	70	22	W.2nd
Aug. 7	B. Spruce	Lac La Ronge	31	70	22	W.2nd
Aug. 12	Jack-pine	Candle Lake	21	55	22	W.2nd
Aug. 12	W. Spruce	Candle Lake	3	56	23	W.2nd
Aug. 12	B. Spruce	Candle Lake	12	56	24	W.2nd
Aug. 20	Jack-pine	Loon Lake	1	58	23	W.3rd
Aug. 23	B. Spruce	Meadow Lake	15	55	17	W.3rd

6.5 - Personnel Contacted.

Name	Position	Address	No. of Contacts
E.J. Marshall	Director of Forests	Prince Albert, Sask.	7
B.A. Matheson	Dist. Superintendent (P.A.)	" " "	8
A. Hansen	" "	(M.L.) Meadow Lake, Sask.	4
C. McLean	" "	(Northern, Pr. Albert, "	1
O.A. Ashen	" "	Pr. Albert, "	1
F. Warburton	Fire Control Officer	" " "	1
J. Johnson	Field Supervisor	" " "	6
H. Stav	" "	Meadow Lake "	3
E. Dodds	" "	(Northern) Pr. Albert "	2
G. Horncastle	Forester	" " "	2
W. MacNeill	"	Meadow Lake "	3
M. Laird	"	Lac La Ronge "	5
H. Rebelare	"	Pr. Albert "	1

Personnel Contacted (continued)

Name	Position	Address	No. of Contacts
R. Christie	Forester	Pr. Albert, Sask.	1
F. Hewitt	"	" "	1
F.J. Arnold	Field Officer	" "	3
G. Pederson	"	Christopher Lake	1
F. Clinton	"	Strong Pine	2
E. Over	"	Big River	2
T. Arseneault	"	Dore Lake	8
P. Masurak	"	Candle Lake	2
H. Knutsen	"	Glen Mary	1
L. Horne	"	Holbein	2
B. Shannon	"	Green Lake	4
W. Crothers	"	Glaslyn	1
D. Pegg	"	Loon Lake	3
H. Michaud	"	Goodsoil	3
E. Sharman	"	Pierceland	2
V. Henig	"	St. Walburg	1
W. Reise	"	Lac La Ronge	8
F. Bergman	"	" "	3
W. Forestberg	"	" "	4
A. Fremont	"	Melanosa	1
W.A. McDonald	"	"	1
G. Beck	"	Pelican Narrows	2
T. Leen	Asst. Forester	Meadow Lake	4
D. Eraser	Pilot	Pr. Albert	2
J. Cowie	In Charge of Nursery	Big River	6
C. Colby	Patrolman	Big River	2
B.I.M. Strong	Park Superintendent	Pr. Albert N.P.	5
C. Polcock	Park Warden	" "	4
F. Jarvis	"	" "	1
A. McDonald	Fisheries Branch	Pr. Albert	1
S. Mitchell	" "	"	1
O. Linton	" "	"	2
Dr. C. Riley	Officer in Charge Forest Pathology	Saskatoon	1
R. Thomas	Forest Pathology	"	6
J. Patterson	" "	"	1
R. Whitney	" "	"	2
S. Whitney	" "	"	2
C. Anastasiou	" "	"	2

aspen tortrix defoliation in the Cleslyn area in 1961.



Figure 1.



Figure 2.

Large aspen tortrix defoliation in aspen area in 1962.



Figure 3.



Figure 4.

Large sapsin tortrix defoliation in the Onion Lake area in 1862.



Figure 5.



Figure 6.



Figure 7.

Forest tent caterpillar defoliation in Plot lease
area in 1952.



Figure 10.



Figure 11.

Forest tent caterpillar defoliation 5 miles south
of Green Lake, Sask., 1952.



Figure 8.



Figure 9.

SPECIAL REPORTS

I. LARCH SAWFLY, Pristiphora erichsonii (Ntg.)

by V. Hildahl and L. McDowall

1.1. INTRODUCTION

This report contains information on the status and distribution of the larch sawfly in tamarack stands in Manitoba and Saskatchewan during 1952. It also contains a summary of the distribution and incidence of larch sawfly parasites. The data used in the report were derived mainly from ground and aerial surveys and special stand inspections. Special inspections were made of 106 individual tamarack stands, 62 in Manitoba and 44 in Saskatchewan.

Results of the surveys indicated that defoliation of tamarack stands by the larch sawfly was again general in Manitoba and Saskatchewan. In areas that have been repeatedly defoliated, the foliage was sparse and short. Smaller populations were evident in some areas that had been severely attacked for several successive years. The two main species of parasites were Mesoleius tenthredinis Morley and Bessa harveyi T.T. Effective parasitism by M. tenthredinis remained fairly low throughout the entire outbreak area. On the other hand, B. harveyi, an important parasitic fly, continued to increase in most areas. Tritoneptis klugii (Ratz.) was again present but showed a noticeable decrease in distribution. In 1951 it occurred in 14 areas while in 1952 it was recovered from only 3 areas.

1.2. DISTRIBUTION

Defoliation of tamarack stands by the larch sawfly was again general in Manitoba and Saskatchewan. The north and west spread of the infestation that has occurred in Saskatchewan in previous years continued in 1952. On the other hand, some recession in populations was evident in some of the older infestations in Manitoba. The prolonged attack of this insect in both provinces has still not caused any serious tree mortality. However, needle and terminal growth were generally sparse and short on trees that had been defoliated repeatedly.

In the extreme southeast corner of Manitoba, between Middlebro and the United States boundary, severe defoliation was recorded. In the area west of Middlebro to Sprague and South Junction and north to Moose Lake, tamarack suffered light to moderate defoliation except in a large swamp in

sec. 15, tp. 1, rge. 13, E.P. mer. In this swamp defoliation was severe and complete stripping of trees was common. Light to moderate defoliation was recorded from Vassar west to Piney and Minisino and north through Whitemouth Lake, Badger, Garrick and Woodridge. Between the Sandilands Forest Reserve Headquarters and Marchand defoliation varied from moderate to severe. Light to moderate infestations prevailed in the northern part of the Sandilands Forest Reserve. A few scattered areas of heavy defoliation occurred between Dawson Cabin and Hadashville. Infestations were light to moderate in the immediate vicinity of East Braintree and moderate to severe along the Greater Winnipeg Water District Railway to Waugh. North through Falcon Lake to West Hawk Lake the infestation was severe.

In the Eastern District of Manitoba the infestation was severe in the southern portion of the Whiteshell Forest Reserve while in the central portion along the Big Whiteshell Road, the Betula Lake Road, and Meditation Trail it was generally light with occasional patches of severe defoliation. In the large tamarack stands south of Dorothy and Eleanor lakes the infestation was light to moderate with pockets of heavy defoliation occurring immediately south of Eleanor Lake and at Picket Creek. North of Seddon's Corner and through the agricultural area west of Lac du Bonnet defoliation was moderate to heavy. Northwest of Lac du Bonnet through Great Falls and Pine Falls defoliation was light to moderate. In the Bird River area and north to Cat Lake tamarack was lightly defoliated. From Pine Falls south through Beacenia, Scantebury and Libau infestations were light. East of Lake Winnipeg and north of the Winnipeg River to Gods Lake infestations were generally moderate with an occasional pocket of severe defoliation.

In western Manitoba, larch sawfly infestations were very light to light throughout the district except along No. 10 Highway from Dauphin to Minniconas, south of Minniconas to Wellman Lake, and along the eastern slopes of the Porcupine Mountain Forest Reserve. In these areas defoliation varied from light to moderate. In Riding Mountain National Park, light defoliation occurred in tamarack stands along the Relling River, Whirlpool Lake and Katherine Lake roads, along No. 10 Highway to Moon Lake, and in the Crawford Park and Rosburn areas. In stands along the Tilson Lake and Deep Lake roads larch sawfly caused no appreciable defoliation. In northern Manitoba the infestation was moderate to severe. Moderate defoliation was recorded in tamarack stands between the Overflowing River and The Pas. In the area north of The Pas through Flin Flon and Sherridon and east to Pirvitonei tamarack stands were severely defoliated. Tamarack stands in the area south of Thicket Portage to Norway House and west to Moose Lake also suffered severe defoliation.

In the Hudson Bay District of Saskatchewan, infestations were generally light to moderate. Light defoliation prevailed in the Madge Lake-Pelly area.

North of Pelly through the Porcupine Provincial Forest to Hudson Bay defoliation ranged from light to moderate. West of Hudson Bay to Prairie River and north in the Pasquia Provincial Forest defoliation was, for the most part, moderate with occasional stands severely hit. A few small swamps within the Pasquia Provincial Forest were also only lightly defoliated. Infestations were moderate in the scattered tamarack stands throughout the Carrot River area except immediately northeast of the town where in some small patches almost no defoliation was noted. Moderate defoliation of tamarack occurred along the trail leading to Summit Tower and in the Torch River Provincial Forest. In the Nipawin Provincial Forest, as far north as the Fishing Lakes-Narrow Hills Tower area, and northeast of Nipawin along the Flin Flon Highway for a distance of approximately 35 miles, tamarack was moderately defoliated. A small area of heavy defoliation was noted north of Snowden in sec. 8, tp. 5th, rge. 18, W. 2nd mer.

Larch sawfly infestations were again prevalent in the Prince Albert District. Light to moderate infestations were recorded throughout the Fort a-la-Corne Forest and in the Holbein, Home, Round Lake, and Steep Creek blocks of the Nisbet Provincial Forest. In the Emma Lake and Candle Lake Provincial forests defoliation was severe except for an occasional small pocket of moderate. Surface water was present during most of the season in many swamps in the Candle Lake Provincial Forest but it did not appear to reduce larch sawfly defoliation appreciably. Throughout the Prince Albert National Park and as far north as Lac la Ronge larch sawfly caused severe defoliation of tamarack. Many of the larvae in sec. 13, tp. 53, rge. 2, W. 3rd mer. of Prince Albert National Park were affected by the fungus Beauveria bassiana. However, this was the only area in Saskatchewan where the fungus was abundant.

In the Big River Provincial Forest there was a noticeable increase in larch sawfly populations. Infestations were severe in the eastern and southern portions and gradually tapered off to moderate and light toward the west boundary. North from Big River to Dore Lake defoliation was recorded as severe for the first time. West of Big River there was a gradual lessening of defoliation through the Green Lake area to Meadow Lake where the infestation became very light. Light defoliation occurred in the area from Goodsoil to Pierceland and the Alberta boundary. Very light to light defoliation occurred in the Meadow Lake, Bronson and Waterhen Provincial forests. This was the first time since the beginning of the general outbreak in Saskatchewan that any noticeable defoliation has been recorded in these areas. This would indicate that the larch sawfly is continuing its westward spread in Saskatchewan.

1.3. SPECIAL REPORTS

Special reports, showing larch sawfly defoliation of tamarack, were submitted in 1951 on 106 tamarack stands throughout Manitoba and Saskatchewan. The reports were obtained through special examination of individual tamarack stands during the latter part of the season by Biology Rangers. About 42 per cent of the stands examined consisted of 80 per cent or more tamarack. The remainder were mixed stands varying from less than 20 to 79 per cent tamarack. A summary of the reports follows:

Total Number of Reports submitted	106
Number of Reports from Manitoba	62
Number of Reports from Saskatchewan	44
Approximate acreage involved	9,548 acres
Average d.b.h. of trees	3.7"
Range d.b.h. of trees	$\frac{1}{2}$ " - 11"
Average height of trees	28'

Other data contained in the reports were summarized according to the following: Relation Between Stand Composition and Defoliation; Relation Between Tree Diameter and Defoliation; Relation Between Stand Density and Defoliation; and Relation Between Curled Tips and Defoliation. The results of the summary are shown in Tables A, B, and C.

TABLE A

Relation Between Stand Composition and Defoliation

No. of Reports	Stand Composition % Tamarack	Defoliation %
45	80-100	33.9
35	50-79	37.5
22	20-49	35.0
4	< 20	23.7

TABLE B

Relation Between Tree Diameter and Defoliation		Relation Between Stand Density and Defoliation	
Tree Diameter (inches)	Defoliation %	Stand Density	Defoliation %
-3	36.8	Heavy	48.3
3.1-6	35.7	Medium	37.9
6.1-9	36.9	Light	30.1
$\frac{3}{4}$	7.6		

TABLE C

Relation Between Curled Tips and Defoliation

No. of Stands Involved	Incidence of [*] Curled Tips	Defoliation %
8	Many	69.2
26	Common	47.3
67	Occasional	27.6

^{*} The incidence of curled tips was classified as to three broad categories: i.e. Many, Common, and Occasional.

A review of the above tables indicates that there is no significant relationship between stand composition or tree diameter and defoliation. On the other hand, there appears to be some correlation between stand density and defoliation since analysis of the data accumulated to date shows that defoliation is consistently heavier in stands of heavy or medium density while in stands of light density defoliation is invariably lighter. Further analysis of the data on hand is necessary to determine if this trend is significant. As will be noted from the results shown in Table C, excellent correlation was again obtained between the number of curled tips and the degree of defoliation.

1.4. LARCH SAWFLY DISSECTIONS

Approximately 8,000 larch sawfly larvae were dissected during the winter in the laboratory in continuation of the larch sawfly parasite study now in progress. The cocoons were collected from 48 areas in Manitoba and 33 areas in Saskatchewan. Dissecting was done under the low power lens of binocular microscopes. The larvae were decapitated, inverted with blunt needle and forceps, and the viscera scraped from the exoskeleton. The viscera and exoskeleton were carefully examined for parasite larvae, parasite eggs, and disease. The data obtained from larval dissections are shown in the tables appended hereto. Recording was done in the same manner as outlined in the 1951 Annual Technical Report of the Winnipeg Laboratory.

A review of the data obtained in 1952 indicates that Mesoleius tenthredinis Morley and Bessa harveyi T.F. were still the two main parasites of larch sawfly. A large number of M. tenthredinis eggs failed to hatch or develop owing to a host immunity factor. Therefore, effective parasitism by this species, considering only M. tenthredinis larvae, remained low

throughout the entire outbreak area. The parasitic fly, *Eessa harveyi* F.F., maintained its previous distribution and level of abundance and is an important control factor in some areas. There was a noticeable decrease in the distribution of *Tritantia klucii* (Ratz.). In 1951 it occurred in 14 areas throughout Manitoba and Saskatchewan but in 1952 it was recovered from only 3 areas.

1.5. LARCH SAWFLY REARING

In an effort to improve rearing methods to obtain optimum emergence under laboratory conditions, three separate rearing experiments were set up during the early part of 1953. The treatments were called Experiment A, Experiment B, and Experiment C. Cocoons used for the experiments were collected from various points throughout Manitoba and Saskatchewan during the fall of 1952 and prior to treatment were stored at 34°F.

In Experiment A, 50 cocoons were used from each of 72 areas and were subjected to the following treatment. The cocoons were placed in jelly jars, 25 cocoons per jar, containing about one inch of wet sterile cotton. They were placed in a controlled temperature and humidity room at an initial temperature of 36°F. and a relative humidity of 80 per cent. The cocoons were incubated for a period of 90 days. During this period the temperature was increased at a daily rate of 1 to 2 degrees until a maximum of 68°F. was reached 47 days later. Relative humidity in the room varied between 75 and 80 per cent with a mean of 76 per cent for the incubation period.

In Experiment B, 50 cocoons were used from each of 60 areas and were given the following treatment. The cocoons were placed in jelly jars, 25 cocoons per jar, containing about one inch of dry sterile cotton. The cocoons were then placed in a basement room for an incubation period of 103 days where the temperature varied from 64 to 70°F. Daily records of relative humidity were not kept but periodic checks were made and it appeared to remain fairly constant at 40 to 44 per cent.

In Experiment C, 50 cocoons were used from each of 46 areas and were given the following treatment. The cocoons were placed in jelly jars, 25 cocoons per jar, containing about one inch of wet sterile cotton. The cocoons were then placed in a controlled temperature and humidity cabinet in an unheated section of the insectary where the room temperature ranged from 10 to -20°F. Initial temperature and relative humidity in the cabinet were 34°F. and 44 per cent respectively. The temperature and humidity were raised gradually during the incubation period until a

maximum temperature of 63°F. and a relative humidity of 80 per cent were reached 98 days after incubation first began. The entire incubation period lasted 108 days for this treatment.

The data from the different rearing techniques employed were recorded and are shown in Tables E, F, G, H, and I appended hereto. The tables show the origin of the material, the number of adult sawflies and parasite emergence, the number of living unemerged sawflies and parasites, the number of parasites that had reached the adult stage but failed to emerge, the incidence of *Tritoneptis klugii* (Ratz.), and the number of discarded cocoons that became damaged or infected with mould, fungi, disease, etc. during the incubation period.

Analysis of the data shows that while none of the experiments were too successful from the standpoint of emergence, the best results were obtained from treatment A in which high humidity conditions were maintained throughout the entire incubation period. Emergence from cocoons receiving treatments B and C was generally lower. The low emergence from these treatments could be attributed to a combination of low relative humidity and high temperature, which caused excessive drying of the cocoons during the incubation period. It was noted that adult larch sawflies and parasites were unable to emerge successfully from cocoons that had become slightly dry and hard.

Few living larvae of *Bessa harveyi* and *Mesoleius tenthredinis* were found when the unemerged sound sawfly larvae in cocoons were examined at the end of the incubation period. However, parasite emergence from all three treatments was considerably lower than the actual parasitism determined by dissections.

Results of the rearings suggest that one or a combination of the following factors could be responsible for low parasite emergence under laboratory conditions: (a) exposed to humid conditions parasitized larvae may be more susceptible to attack by fungi and bacteria and therefore greater mortality occurs in parasitized than otherwise healthy larvae; (b) the inability of adult parasites to emerge from hard cocoons; (c) improper temperature and relative humidity ratios; and (d) the lack of completely sterile rearing conditions throughout the entire incubation period. Further work will be carried out in 1953 in an effort to improve rearing techniques.

A summary of the results is shown in Table J. The table gives the per cent adult sawfly emergence, the percentage of the sawfly larvae remaining in diapause, the percentage *B. harveyi* and *M. tenthredinis* living to

total D. harveyi and M. tenthredinis, and the total mortality of cocoons caused by mechanical damage, fungi, bacteria, and disease. Only those areas from which cocoons were available for all three treatments and where Tritnopsis klugii was absent were used in the summary.

TABLE A.

RESULTS OF LARCH SAWFLY LARVAL DISSECTIONS - 1952
EASTERN-SOUTHERN AND INTERLAKE DISTRICTS - MANITOBA

Origin of Cocoons					Parasitism Determined by Dissections					Effective Parasitism			Dead Larvae		
Place	Sec.	Tp.	Rce.	Mag.	No. Cocoons Dissected	Living Larvae	Mesoleius Eggs Only	Mesoleius Larvae	Diptera Larvae	Diptera & Mesoleius	Tritneptis	Fungus	Misc.	Cause Unknown	Total Dead
Manahan's Bear Lake	14	10	16	E	100	99	9	0	3	3	0	1	0	0	1
Red Rock Lake	8	12	15	E	100	100	12	3	19	22	0	0	0	0	0
Hector area	10	11	13	E	100	81	3	1	31	32	0	16	3	0	19
Darwin	24	11	12	E	100	72	7	1	13	14	0	11	6	11	28
Darwin	18	11	13	E	100	71	8	1	29	30	0	16	0	13	29
Telford	17	10	16	E	100	94	16	7	16	23	0	3	0	3	6
Telford	16	10	16	E	100	88	17	1	17	18	0	3	4	5	12
Sedden's Corner	1	13	9	E	100	81	0	0	21	21	0	6	5	8	19
Sedden's Corner	3	13	9	E	100	77	3	0	46	46	0	8	0	15	23
Brightstone	23	15	9	E	100	94	0	0	17	17	0	0	0	6	6
Landerville	23	15	10	E	100	97	0	0	24	24	0	2	0	1	3
Pointe du Bois	30	15	12	E	100	74	0	0	25	25	0	7	8	11	26
Pointe du Bois	10	16	13	E	100	81	1	1	24	25	0	0	10	9	19
Pointe du Bois	24	15	11	E	100	72	3	0	36	36	0	0	14	14	28
Pointe du Bois	35	15	14	E	100	89	1	0	22	22	0	4	0	7	11
Murray Hill	14	17	8	E	100	65	5	1	24	25	0	13	8	14	35
Sandilands F.R.	34	5	9	E	100	84	1	2	16	18	0	12	0	4	16
Madashville	9	8	12	E	100	89	4	2	17	19	0	9	0	2	11
Sandilands F.R.	32	7	11	E	100	58	1	0	2	2	0	17	2	23	42
East Braintree	33	7	14	E	100	79	0	4	11	15	0	10	2	9	21
Piney	3	2	11	E	100	82	4	1	10	11	0	9	0	9	18
Falcon Lake	19	8	16	E	100	83	1	0	10	10	0	11	0	6	17
Sandilands F.R.	2	8	11	E	100	80	0	0	3	0	0	13	0	7	20
Middleboro	8	1	11	E	100	77	2	3	13	16	0	21	0	2	23
Sprague	16	1	14	E	100	74	0	0	14	14	0	24	0	2	26
Sandilands F.R.	5	8	10	E	100	58	0	0	24	24	0	40	0	2	42

TABLE B

RESULTS OF LARCH SAWFLY LARVAL DISSECTIONS - 1952
WESTERN - MANITOBA

Origin of Cocoons					Parasitism Determined by Dissections					Effective Parasitism		Dead Larvae			
Place	Sec.	Tp.	Rge.	Mer.	No. Cocoons Dissected	Living Larvae	Mesoleius Eggs Only	Mesoleius Larvae	Diptera Larvae	Diptera & Mesoleius	Tribneptic	Fungus	Misc.	Cause Unknown	Total Dead
(Southern & Interlake cont.)															
Riverton	32	23	4	E	100	78	2	1	26	27	0	15	0	7	22
Gypsumville	26	32	9	E	100	54	0	0	19	19	0	22	0	24	46
Riding Mtn. N.P.	5	20	17	WP	100	96	20	3	28	31	0	2	0	2	4
Riding Mtn. N.P.	16	20	19	WP	100	96	4	0	24	24	0	2	0	2	4
Riding Mtn. N.P.	23	21	19	WP	100	71	2	2	23	25	0	29	0	0	29
Riding Mtn. N.P.	25	20	19	WP	100	94	0	0	9	9	0	6	0	0	6
Riding Mtn. N.P.	14	21	21	WP	100	79	7	2	10	12	0	18	0	3	21
Riding Mtn. N.P.	36	19	17	WP	100	93	17	7	15	22	0	2	0	5	7
Riding Mtn. N.P.	4	22	19	WP	100	97	19	9	12	21	0	3	0	0	3
Selater	28	34	22	WP	100	97	9	1	33	34	0	3	0	0	3
Mafeking	19	44	25	WP	100	100	10	2	36	38	0	0	0	0	0
Mafeking	16	46	25	WP	100	92	5	1	62	63	0	5	0	3	8
Renver	15	36	23	WP	100	70	12	6	25	31	0	38	0	0	30
D.M.V.R. Singoosh L.	10	37	23	WP	90	90	9	8	17	25	0	0	0	0	0
Covan	11	32	23	WP	60	54	6	1	13	14	0	4	0	2	6
Field	22	26	26	WP	100	88	3	0	31	31	0	5	0	7	12
Hedge Lake	15	30	29	WP	100	98	15	9	10	19	0	1	0	1	2
<u>NORTHERN MANITOBA</u>															
Cormerant	31	60	21	WP	100	76	1	1	16	17	0	0	0	24	24
Clearwater Lake	36	57	24	WP	100	67	1	1	9	10	0	6	0	27	33
Freshford	20	54	26	WP	84	69	2	0	24	24	0	0	0	15	15
Vanless	7	60	26	WP	100	69	2	1	9	10	0	0	11	20	31
Flin Flin	30	66	29	WP	100	76	5	0	15	15	0	0	4	20	24

TABLE C

RESULTS OF LARCH SAWFLY LARVAL DISSECTIONS - 1952

HUDSON BAY DISTRICT - Saskatchewan

Origin of Cocoons					Parasitism Determined by Dissections					Effective Parasitism			Dead Larvae		
Place	Sec.	Tn.	Rco.	Mer.	No. Cocoons Dissected	Living Larvae	Mesoleius Eggs Only	Mesoleius Larvae	Diptera Larvae	Diptera & Mesoleius	Tritoneptis	Fungus	Misc.	Cause Unknown	Total Dead
Pasquia P.F.	5	46	4	W2	100	84	2	1	11	12	1	10	4	2	16
Pasquia P.F.	1	45	5	W2	100	78	0	7	12	19	0	9	13	0	22
Grassy Lake	35	54	15	W2	100	88	8	6	6	12	0	2	8	2	12
Carrot River	3	50	11	W2	100	93	4	4	7	11	0	1	6	0	7
Armit	17	44	1	W2	100	85	6	0	3	3	0	5	10	0	15
Snowden	11	56	18	W2	100	90	2	2	2	4	0	3	6	1	10
Fort a la Corne	29	30	17	W2	100	96	4	6	3	9	0	2	2	0	4
Hudson Bay	14	44	31	W2	100	89	1	1	7	8	1	3	8	0	11
Hudson Bay	21	45	3	W2	100	81	0	0	23	23	0	16	1	2	19
Armit	17	44	1	W2	100	92	2	1	35	36	0	3	0	5	8
Pelly	16	31	32	WP	100	85	1	0	11	11	0	1	9	5	15
Veillardville	6	46	4	W2	100	93	7	0	11	11	0	2	2	3	7
Coba	12	47	3	W2	100	85	2	0	15	15	0	2	8	5	15
Green Bush Trail	21	45	5	W2	100	89	1	0	5	5	0	7	2	2	11
Eldridge Lake	22	40	4	W2	100	90	1	0	32	32	0	9	0	1	10

TABLE D

RESULTS OF LARCH SAWFLY LARVAL DISSECTIONS - 1952

PRINCE ALBERT & MEADOW LAKE DISTRICTS, Sask.

Origin of Cocoons					Parasites Determined by Dissections					Effective Parasitism			Dead Larvae		
Place	Sec.	Tn.	Rce.	Mer.	No. Cocoons Dissected	Living Larvae	Mesoleius Eggs Only	Mesoleius Larvae	Diptera Larvae	Diptera & Mesoleius	Tritentis	Fungus	Misc.	Cause Unknown	Total Dead
Turtle Lake	34	53	18	W3	100	100	4	4	0	4	0	0	0	0	0
Fort a la Corne?	33	51	19	W2	100	78	8	4	1	5	0	0	0	22	22
Shank Creek	14	61	24	W2	100	94	18	6	0	6	0	0	3	3	6
Big River	32	55	7	W3	100	100	14	8	1	9	0	0	0	0	0
Beauvre Cabin	21	64	9	W3	100	99	5	6	0	6	0	1	0	0	1
Peiroeland	14	62	26	W3	100	98	1	0	0	0	0	0	0	2	2
Red Rock Blk	19	49	25	W2	100	83	28	12	0	12	0	11	3	3	17
Holbein	13	49	2	W3	100	83	23	14	0	14	0	11	5	1	17
Steep Creek-Nisbet	28	48	23	W2	100	89	28	13	2	15	0	9	1	1	11
Fort a la Corne	9	50	22	W2	100	86	14	7	3	10	0	5	5	4	14
Green Lake	5	61	12	W3	100	100	1	0	0	0	0	0	0	0	0
Candle Lake	13	56	24	W2	100	81	11	6	1	7	0	1	10	8	19
Crutwell	22	49	1	W3	100	87	26	12	5	17	1	0	0	13	13
MacDowall	21	46	1	W3	100	50	27	8	0	8	0	48	2	0	50
Home Blk. Nisbet	8	49	26	W2	100	57	19	21	2	23	0	43	0	0	43
Brenson P.F.	5	58	22	W3	100	98	3	3	1	4	0	1	1	0	2
Mayview P.A.N.P.	24	53	2	W3	100	78	10	10	0	10	0	22	0	0	22
Garwood	33	56	4	W3	100	73	25	12	0	12	0	18	6	3	27

TABLE 2.

Results of Larch Sawfly Rearings - 1952
 Eastern and Southern Districts of Manitoba - Experiment A.

Origin of Cocoons	No. Cocoons Reared	Number of Emergents				Number of Living Unemerged						Unemerged		Parasitized by <i>Tribentis</i>	No. of Cocoons Discarded
		Sawfly adults		Parasites		Sawflies			Parasites		Dead Adults				
		Female	Male	Dip.	Hym.	Larvae	Pupae	Adults	Hym. Eggs	Larvae	Dip. Larvae	Dip.	Hym.		
Telford	50	14	1	6	1	1	0	3	0	0	0	1	0	0	23
Telford	50	19	0	7	0	6	0	4	0	2	0	0	0	0	12
Darwin	50	12	0	6	2	5	0	0	0	1	0	2	0	0	22
Hester	50	11	0	11	0	7	0	0	0	0	0	5	0	0	16
Darwin	50	5	0	9	0	10	0	0	0	0	0	0	0	0	26
Bear Lake	50	31	0	0	0	6	2	0	0	0	0	2	0	0	9
Murray Hill	50	7	0	6	1	0	0	0	0	0	0	0	0	0	36
Brightstone	50	27	0	7	0	8	3	0	0	0	0	4	0	0	1
Pointe du Bois	50	22	0	13	0	5	0	0	0	0	0	14	0	0	6
Pointe du Bois	50	20	0	8	0	0	0	0	0	0	0	7	0	0	15
Pointe du Bois	50	13	0	11	0	3	2	1	0	0	0	8	0	0	12
Red Rock Lake	50	13	0	4	1	6	0	0	0	2	0	4	0	0	20
Pointe du Bois	50	6	0	14	0	9	0	0	0	0	0	10	0	0	11
Sedden's Corner	50	14	0	12	0	14	0	1	0	0	0	2	0	0	7
Sedden's Corner	50	9	0	14	0	9	1	0	0	0	0	5	0	0	12
Landerville	50	21	0	4	1	3	0	2	0	0	0	2	0	0	17
Hadschville	50	40	1	0	0	2	0	0	0	0	0	0	0	0	7
Sprague	50	29	0	5	0	3	0	0	0	0	0	0	0	0	13
Middleboro	50	27	0	2	0	6	0	0	0	0	0	0	0	0	15
Falcon Lake	50	31	0	1	0	6	2	0	0	0	0	0	0	0	10
Sandilands F.R.	50	27	0	5	0	6	1	0	0	0	0	0	0	0	11
Gypsumville	50	28	0	4	0	0	0	0	0	0	0	0	0	0	18
S.F.R. Man.	50	38	0	0	0	2	0	0	0	0	0	0	0	0	10
East Braintree	50	33	0	2	0	7	0	0	0	0	0	0	0	0	8
S.F.R. Man.	50	26	0	3	0	3	0	0	0	0	0	0	0	0	18
Sandilands E.R.	50	19	0	11	0	4	0	0	0	0	0	0	0	0	16
Piney	50	36	0	4	0	3	0	0	0	0	0	0	0	0	7

TABLE E. (Cont.)

Results of Larch Sawfly Hearings - 1952
 Eastern and Southern Districts of Manitoba - Experiment B

Origin of Cocoons	Number of Emergents					Number of Living Unemerged						Dead Unemerged		Parasitized by Trioxentis	No. of Cocoons Discarded	
	No. Cocoons Reared	Sawfly Adults		Parasites		Sawflies			Parasites		Adults		Parasitized by Trioxentis			
		Female	Male	Dip.	Hym.	Larvae	Pupae	Adults	Hym.		Dip. Larvae	Adults				
									Eggs	Larvae		Dip.				Hym.
Telford	50	2	0	0	0	0	0	0	0	0	0	0	0	0	5	42
Telford	50	3	0	0	1	2	0	0	0	0	0	0	0	0	0	40
Darwin	50	0	0	0	0	11	0	0	0	0	0	0	0	0	0	37
Hector	50	0	0	0	0	4	0	0	0	0	0	0	0	0	2	38
Darwin	50	0	0	0	0	2	0	0	0	0	0	0	0	0	0	45
Bear Lake	50	1	0	0	0	5	0	0	0	0	0	0	0	0	20	24
Murray Hill	50	0	0	0	0	8	0	0	0	0	0	0	0	0	0	42
Brightstone	50	0	0	0	0	7	0	0	0	0	0	0	0	0	0	39
Pointe du Bois	50	0	0	1	0	2	0	0	0	0	0	0	0	0	0	36
Pointe du Bois	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
Pointe du Bois	50	3	0	0	0	2	0	0	0	0	0	0	0	0	4	37
Red Rock Lake	50	3	0	0	1	4	0	0	0	0	0	0	0	0	6	33
Pointe du Bois	50	0	0	2	0	9	0	0	0	0	0	0	0	0	2	33
Sedden's Corner	50	1	0	1	0	10	0	0	0	0	0	0	0	0	0	35
Sedden's Corner	50	0	0	8	0	0	0	0	0	0	0	0	0	0	10	32
Landerville	50	1	0	0	0	6	0	0	0	0	0	0	0	0	0	34
Madachville	50	0	0	0	0	2	1	0	0	0	0	0	0	0	0	43
Sprague	50	1	0	0	0	2	2	0	0	0	0	0	0	0	0	42
Middleboro	50	3	0	0	0	2	2	0	0	0	0	0	0	0	0	39
Falcon Lake	50	2	0	0	0	4	0	0	0	0	0	0	0	0	0	38
Sandilands F.R.	50	0	0	0	0	2	1	0	0	0	0	0	0	0	0	44
Sandilands F.R.	50	0	0	0	0	2	2	0	0	0	0	0	0	0	0	42
Sandilands F.R.	50	0	0	0	0	1	2	0	0	0	0	0	0	0	0	45
Sandilands F.R.	50	0	0	0	0	1	0	0	0	0	0	0	0	0	0	45
Gypsumville	50	0	0	0	0	1	0	0	0	0	0	0	0	0	20	24
East Braintree	50	2	0	0	0	2	0	1	0	0	0	0	0	0	0	41
Piney	50	0	0	0	0	2	1	3	0	0	0	0	0	0	0	44

TABLE E (Cont.)

Results of Larch Sawfly Rearings - 1952
Eastern and Southern Districts of Manitoba - Experiment C.

Origin of Cocoons	No. Cocoons Reared	Number of Emergents				Number of Living Unemerged						Dead Unemerged Adults		Parasitized by Tritentis	No. of Cocoons Discarded
		Sawfly Adults		Parasites		Sawflies			Parasites			Dip.	Hym.		
		Female	Male	Dip	Hym.	Larvae	Pupae	Adults	Hym. Eggs	Larvae	Dip. Larvae			Dip.	Hym.
Telford	50	13	0	0	1	0	1	7	0	0	0	4	0	0	24
Landerville	50	5	0	1	0	0	0	5	0	0	0	10	0	0	29
Seddon's Corner	50	4	0	0	0	2	1	10	0	0	0	9	0	0	24
Telford	50	4	0	0	3	0	0	4	0	0	0	7	1	0	31
Darwin	50	3	0	0	0	2	0	11	0	0	0	4	0	0	30
Hector	50	7	0	0	1	2	0	2	0	0	0	7	0	0	31
Darwin	50	6	0	0	3	1	4	0	0	0	0	15	0	0	21
Bear Lake	50	15	0	0	0	4	2	9	0	0	0	1	0	0	19
Red Rock Lake	50	15	0	0	1	1	0	1	0	0	0	6	0	0	26
Brightstone	50	9	0	0	0	2	2	7	0	0	0	6	0	0	24
Pointe du Bois	50	3	0	0	0	2	5	10	0	0	0	15	0	0	15
Hedashville	50	5	0	0	0	3	0	0	0	0	0	3	0	0	39
Sprague	50	10	0	0	0	0	0	0	0	0	0	5	0	0	35
Sandilands F.R.	50	15	0	0	0	0	0	0	0	0	0	3	0	0	32
Sandilands F.R.	50	12	0	0	0	0	0	0	0	0	0	2	0	0	36
Sandilands F.R.	50	20	0	0	0	0	0	0	0	0	0	3	0	0	27
East Braintree	50	5	0	0	0	2	0	0	0	0	0	0	0	0	43
Falcon Lake	50	12	0	0	0	0	0	0	0	0	0	4	0	0	34
Gynessville	50	10	0	0	0	2	0	0	0	0	0	1	0	0	37

TABLE F.

Results of Larch Sawfly Hearings - 1952

Western District Manitoba Experiment A.

Origin of Cocoons	No. Cocoons Reared	Number of Emergents				Number of Living Unemerged						Dead Unemerged		Parasitized by Tritmentis	No. of Cocoons Discarded	
		Sawfly adults		Parasites		Sawflies			Parasites			Adults				
		Female	Male	Dip.	Hym.	Larvae	Pupae	Adults	Hym.		Dip.	Dip.	Hym.			
								Eggs	Larvae	Larvae						
R.M.N.P. Hergate #1	60	24	0	24	4	1	1	0	0	0	0	0	0	0	0	6
R.M.N.P.	30	25	0	2	1	0	0	0	0	0	0	0	0	0	0	2
R.M.N.P.	70	22	0	23	1	7	0	0	0	0	0	0	0	0	0	17
Lake Andy Rd.	50	40	0	6	0	2	0	0	0	0	0	0	0	0	0	2
R.M.N.P., P.O.W. Rd.	50	26	0	4	0	2	0	0	0	0	0	0	0	0	0	18
Moon Lake	50	37	0	9	0	0	0	0	0	0	0	0	0	0	0	4
Renver	21	10	0	10	1	0	0	0	0	0	0	0	0	0	0	0
Mafeking	50	10	0	25	0	0	0	0	0	0	0	0	0	0	0	15
Mafeking	50	14	0	19	2	2	0	0	0	0	0	0	0	0	0	13
<u>Western District - Manitoba - Experiment B.</u>																
R.M.N.P. Ik. Andy Rd.	50	12	0	5	0	0	0	0	0	0	0	0	0	0	33	0
R.M.N.P. P.O.W. Rd.	50	9	0	10	0	3	0	0	0	0	0	8	0	0	0	20
Mafeking	50	3	0	8	0	7	0	0	0	0	0	2	0	7	0	23
<u>Western District - Manitoba - Experiment C.</u>																
R.M.N.P. Ik. Andy Rd.	50	39	0	1	0	3	0	0	0	0	0	0	0	0	0	7
Mafeking	50	9	0	0	2	4	0	0	0	0	0	7	0	0	0	28

TABLE 0.

Results of Larch Sawfly Rearings - 1952

Northern District Manitoba - Experiment A.

Origin of Cocoons	No. Cocoons Rearred	Number of Emergents				Number of Living Unemerged							Parasitized by Tribnetis	No. of Cocoons Discarded	
		Sawfly adults		Parasites		Sawflies			Parasites			Dead Unemerged Adults			
		Female	Male	Dip.	Hym.	Larvae	Pupae	Adults	Hym.		Dip.	Dip.			Hym.
									Eggs	Larvae					
Cornerant Lake	50	7	0	9	0	26	0	0	0	0	0	0	0	0	8
Cranberry Portage	50	0	1	12	0	13	0	6	0	0	0	0	0	0	18
Westray	50	0	0	7	0	11	0	6	0	0	0	0	0	2	24
Vanless	50	0	0	8	0	0	0	3	0	0	0	0	0	0	39
Clearwater Lake	49	0	0	9	0	10	0	5	0	0	0	0	0	0	25
<u>Northern District - Manitoba - Experiment B.</u>															
Cornerant Lake	50	0	0	10	0	12	1	0	0	0	0	0	0	7	20
Cranberry Portage	50	0	0	8	0	8	0	0	0	0	0	0	0	0	34
Westray	50	0	0	7	0	10	0	4	0	0	0	0	0	0	29
Clearwater Lake	50	0	0	8	0	19	0	0	0	0	0	0	0	0	23
<u>Northern District - Manitoba - Experiment C.</u>															
Cornerant Lake	50	1	0	22	0	8	0	4	0	0	0	0	0	0	15
Cranberry Portage	50	0	0	7	0	5	0	0	0	0	0	0	0	0	38
Clearwater Lake	50	0	0	14	0	21	0	6	0	0	0	0	0	0	9

TABLE H.
Results of Larch Sawfly Rearings - 1952
Hudson Bay District Saskatchewan - Experiment A

Origin of Cocoons	No. Cocoons Reared	Number of Emergents				Number of Living Unemerged						Dead Unemerged		Parasitized by Tribentia	No. of Cocoons Discarded	
		Sawfly adults		Parasites		Sawflies			Parasites		Adults					
		Female	Male	Dip.	Hym.	Larvae	Pupae	Adults	Hym. Eggs	Larvae	Dip. Larvae	Dip.	Hym.			
Hudson Bay, Sask.	50	18	0	3	0	9	0	0	0	0	0	0	0	0	0	20
Hudson Bay *	57	12	0	0	3	3	0	6	0	0	0	2	0	0	0	31
Hudson Bay	50	4	0	1	0	9	1	0	0	0	0	0	0	1	0	34
Veillardville	50	14	0	2	4	7	0	9	0	0	0	0	0	0	0	14
Greenbush Trail	50	14	0	4	1	7	0	9	0	0	0	0	0	0	0	15
Armit	50	9	0	7	0	6	0	3	0	0	0	0	0	0	0	25
Armit	50	18	0	7	1	4	0	0	0	0	0	0	0	0	0	20
Snowden	50	31	0	0	0	4	0	0	0	0	0	0	0	0	0	15
Eldridge Lake	50	19	0	10	0	3	0	0	0	0	0	0	0	0	0	18
Fort a la Corne	50	23	0	1	0	4	0	0	0	0	0	0	0	0	0	22
Grassy Lake	50	24	0	0	1	4	0	0	0	0	0	0	0	0	0	21
Garret River	75	34	1	3	4	8	0	2	0	0	0	0	0	0	0	23
Pasquia P.F.	50	12	0	0	0	5	0	1	0	0	0	0	0	0	23	9
Hudson Bay District Saskatchewan - Experiment B.																
Hudson Bay, Sask.	50	0	0	2	0	0	0	0	0	0	0	0	0	0	36	12
Hudson Bay	50	0	0	0	0	0	0	0	0	1	3	0	0	27	0	19
Veillardville	50	0	0	5	0	0	0	4	0	0	0	0	0	8	0	33
Greenbush Trail	50	0	0	0	1	0	0	4	0	0	0	3	0	20	0	22
Armit	50	0	0	10	0	0	0	0	0	0	0	0	0	3	0	37
Armit	50	0	0	1	9	0	0	1	0	0	0	0	0	36	0	3
Snowden	50	0	0	0	0	0	7	0	0	0	0	0	0	41	0	2
Eldridge Lake	50	0	0	4	0	1	0	8	0	0	0	3	0	0	0	34
Fort a la Corne	50	1	0	0	0	0	0	14	0	0	0	1	0	9	0	25
Grassy Lake	50	0	0	0	0	0	0	7	0	0	0	2	0	1	0	40

TABLE H (cont.)

Results of Larch Sawfly Rearings - 1952
Hudson Bay District Saskatchewan - Experiment G.

Origin of Cocoons	No. Cocoons Reared	Number of Emergents				Number of Living Unemerged						Dead Unemerged		Parasitized by Trichentia	No. of Cocoons Discarded
		Sawfly adults		Parasites		Sawflies			Parasites			Adults			
		Female	Male	Dip.	Hym.	Larvae	Pupae	Adults	Hym.		Dip.	Dip.	Hym.		
									Eggs	Larvae					
Hudson Bay, Sask	50	1	0	0	0	7	0	19	0	0	0	7	0	0	16
Veillardville	50	13	0	0	0	6	0	0	0	0	0	7	0	0	24
Armit	50	6	0	0	0	3	0	0	0	0	0	6	0	0	35
Eldridge Lake	50	16	0	0	0	10	0	0	0	0	0	7	0	0	17
Grassy Lake	50	14	0	0	0	16	0	0	0	0	0	5	0	0	15
Fort a la Corne	50	6	0	0	2	4	0	0	0	0	0	10	2	0	26
Swanton	50	14	0	0	0	5	0	0	0	0	0	2	0	0	29

TABLE I

Results of Larch Sawfly Rearings - 1952

Prince Albert - Meadow Lake Districts - Experiment A

Origin of Cocoons	No. Cocoons Rearred	Number of Emergents				Number of Living Unemerged						Dead Unemerged		Parasitized by Tritmentis	No. of Cocoons Discarded
		Sawfly adults		Parasites		Sawflies			Parasites			Adults			
		Female	Male	Dip	Hym.	Larvae	Pupae	Adults	Hym.		Dip. Larvae	Dip.	Hym.		
									Eggs	Larvae					
Mayview, Sask.	50	13	2	0	2	4	2	0	0	0	0	0	2	0	25
Canwood	50	27	1	0	5	3	0	0	1	0	0	0	0	0	13
English Cabin	50	11	2	0	1	5	3	0	0	1	0	0	0	0	27
Turtle Lake	50	31	0	0	2	8	0	0	0	0	0	0	0	0	9
Waskesiu	50	25	0	0	2	10	1	2	0	0	0	0	0	0	10
Beaupre	50	36	0	0	1	6	1	0	0	0	0	0	0	0	6
Big River	50	21	1	0	0	2	3	1	0	0	0	0	0	0	22
Pierceland	50	37	0	0	0	7	4	2	0	0	0	0	0	0	0
Red Rock Blk.	50	19	1	0	1	0	7	3	0	0	0	0	0	0	19
Holboin	50	26	1	0	5	0	3	7	0	0	0	0	0	0	8
Steep Creek	50	25	1	1	6	4	1	0	1	0	0	0	1	0	11
Strong Pine	50	34	0	0	0	4	0	0	0	0	0	0	1	0	11
Green Lake	50	37	0	0	1	7	1	0	0	0	0	0	0	0	4
Candle Lake	50	29	0	0	0	6	0	0	0	1	0	0	0	0	14
Crutwell, P.A.	50	10	0	4	3	0	0	1	0	0	0	0	2	0	30
McDevall, P.A.	50	13	2	4	0	0	0	0	0	0	0	0	0	0	31
Prince Albert	50	5	0	2	5	6	0	3	0	0	0	0	1	0	28
Leon Lake	50	46	0	0	0	0	2	0	0	0	0	0	0	0	2

(Cont.)

TABLE I

Results of Larch Sawfly Hearings - 1952

Prince Albert - Meadow Lake Districts - Experiment B.

Origin of Cocoons	No. Cocoons Reared	Number of Emergents				Number of Living Unemerged						Parasitized by Tritaxotis	No. of Cocoons Discarded		
		Sawfly adults		Parasites		Sawflies			Parasites					Dead Unemerged Adults	
		Female	Male	Dip.	Hym.	Larvae	Pupae	Adults	Hym.		Dip.			Dip.	Hym.
									Eggs	Larvae					
Mayview	50	9	0	0	3	0	0	0	0	0	0	0	0	0	38
English Cabin	50	4	4	0	1	2	1	0	0	0	0	0	3	0	35
Turtle Lake	50	1	0	0	0	8	0	0	0	0	0	1	1	0	39
Waskesin	50	0	0	0	0	1	0	0	0	0	0	0	0	0	49
Beaupre	50	3	0	0	0	1	0	0	0	0	0	0	1	0	45
Big River	50	17	1	0	1	1	1	1	0	0	0	0	0	0	28
Pierceland	50	0	0	0	0	11	0	0	0	0	0	0	0	0	39
Red Rock Blk.	50	0	0	0	0	0	0	0	0	0	0	0	0	0	50
Holbein	50	0	0	1	0	1	0	0	0	0	0	0	0	0	48
Steep Creek	50	0	0	0	0	1	0	0	0	0	0	1	1	0	47
Strong Pine	50	4	0	0	2	2	0	0	0	0	0	0	0	0	42
Green Lake	50	0	0	0	0	0	0	0	0	0	0	0	0	0	50
Candle Lake	50	0	0	0	0	0	1	0	0	0	0	0	0	0	49
Crutwell	50	21	0	1	4	2	3	1	0	0	0	1	0	0	17
Prince Albert	50	8	1	1	8	0	2	0	0	0	0	0	0	0	30
Loon Lake	50	0	0	0	0	0	11	0	0	0	0	0	0	0	39

(Cont.)

TABLE I

Results of Larch Sawfly Rearings - 1952

Prince Albert - Meadow Lake Districts - Experiment C

Origin of Cocoons	No. Cocoons Rearcd	Number of Emergents				Number of Living Unemerged						Dead Unemerged		Parasitized by Tritaxia	No. of Cocoons Discarded	
		Sawfly adults		Parasites		Sawflies			Parasites			Adults				
		Female	Male	Dip.	Hym.	Larvae	Pupae	Adults	Hym.		Dip. Larvae	Dip.	Hym.			
									Eggs	Larvae						
Mayview, Sask.	50	3	0	0	1	11	13	0	0	0	0	0	0	1	0	21
English Cabin	39	4	0	0	0	10	8	3	0	0	0	0	0	1	0	19
Turtle Lake	50	9	0	0	0	6	10	15	0	0	0	0	0	0	0	10
Waskesiu	50	6	0	0	0	8	22	3	0	0	0	0	0	0	0	11
Bempre	50	20	0	0	0	4	6	15	0	0	0	0	0	0	0	5
Big River	50	25	0	0	2	1	8	2	0	0	0	0	0	0	0	12
Pierceland	50	40	0	0	0	2	4	0	0	0	0	0	0	0	0	4
Red Rock Blk.	50	8	0	0	2	5	5	6	0	0	0	0	0	2	0	22
Steep Creek	50	17	0	0	5	6	5	0	0	0	0	0	0	0	0	17
Strong Pine	50	13	0	0	2	9	6	4	0	0	0	0	0	2	0	14
Green Lake	50	41	0	0	0	2	4	0	0	0	0	0	0	0	0	3
Candle Lake	50	24	1	0	3	7	4	1	0	0	0	0	0	1	0	9
Crutwell	50	16	0	1	7	5	6	1	0	0	0	0	0	2	0	12
Prince Albert	50	12	0	0	6	0	1	0	0	0	0	0	0	1	0	30
Loon Lake	50	32	1	0	0	0	7	5	0	0	0	0	0	0	0	5

TABLE J

TABLE J - Summary of Larch Sawfly Hearings - 1952-53

Area	Per cent adult sawfly emergence based on total number of cocoons incubated			Per cent sawfly larvae remaining in diapause based in total number of cocoons incubated			Per cent Diptera living (emerged & unemerged) to total Diptera			Per cent hym. living (emerged & unemerged) to total hym.			Total mortality of cocoons		
	Treatment			Treatment			Treatment			Treatment			Treatment		
	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Southern Manitoba	58.86	1.43	22.57	8.86	4.00	1.43	100.00	0.00	0.00	--	--	--	25.43	93.43	24.00
Eastern Manitoba	28.75	1.25	12.50	15.50	12.75	2.75	72.92	7.89	1.41	100.00	100.00	100.00	34.75	83.5	67.0
Western Manitoba	28.00	6.00	18.00	4.00	14.00	8.00	100.00	80.0	0.00	100.00	--	100.00	26.0	64.0	70.0
Northern Manitoba	5.37	0.00	.67	32.88	26.00	22.67	100.00	100.00	100.00	--	--	--	34.23	56.0	41.33
Hudson Bay Sask.	43.00	0.00	30.00	7.00	1.00	26.00	100.00	44.44	0.00	100.00	--	--	39.00	80.0	44.0
Prince Albert Sask.	42.73	13.09	27.09	8.54	1.82	12.00	100.00	50.00	100.00	76.67	79.17	73.68	38.18	79.45	47.09
Meadow Lake Sask.	75.50	.50	61.50	11.00	9.50	5.00	0.00	0.00	0.00	100.00	0.00	--	7.5	84.5	10.0

Statistical analysis of the data shown in Table J indicates a barely significant difference at the 5% level in sawfly emergence as far as areas are concerned, but the difference between treatments is highly significant. The test also indicated that the different treatments had little or no effect on the number of larvae remaining in diapause.

The results of the analysis are given below.

Data	Sawfly emergence					Sawfly larvae remaining in diapause				
	d.f.	M.S.	Observed F	Tabular F		d.f.	M.S.	Observed F	Tabular F	
				.05	.01				.05	.01
Areas	6	557.98	3.25	3.00	4.82	6	162.70	3.19	3.00	4.82
Treatments	2	2432.40	14.18	3.88	6.93	2	12.52	.245	3.88	6.93
Error	12	171.48				12	51.01			
Total	20					20				

2. FOREST TENT CATERPILLAR
(Malacosoma disstria Hbn.)

by V. Hildahl and L. McDowall

2.1 INTRODUCTION

The forest tent caterpillar outbreak increased in size and intensity in 1952 as was predicted in 1951. It is now widely distributed throughout most of the poplar belt of Manitoba and Saskatchewan.

During the spring of 1952 approximately 1200 square miles of white poplar and other deciduous hosts were severely defoliated in Manitoba. The small local infestations reported in Saskatchewan in 1951 coalesced to form a large general outbreak. Further extensions of these two major outbreaks are expected to occur in 1953.

Egg surveys were carried out again in 1952 in order to predict the probable extent of infestations and the severity of defoliation expected in 1953. White poplar was examined at the 1951 sample points and at other well distributed points throughout the major outbreak areas. Outside these areas white poplar was sampled at 5-mile intervals for a distance of 50 miles from the outbreak area or until at least two consecutive negative reports were received.

The accompanying map indicates the general distribution and the two major outbreak areas of the forest tent caterpillar in 1952.

2.2 DISTRIBUTION

The 1952 outbreak of the forest tent caterpillar in the southeastern part of Manitoba has been the most serious to date. Increased populations along with a more widespread distribution of this insect were recorded. Large areas of white poplar and birch and its understory suffered complete or partial defoliation. Collections of first and second instar larvae were made on April 29 in the Hadashville and East Braintree areas. Light feeding damage was observed at that time. A new area of severe defoliation was recorded at Waugh and along the west and south shores of Indian Bay. The above infestation fanned out in a southerly direction and merged with the Moose Lake Northwest Angle outbreak. Large stands of white poplar in the

vicinity of Moose Lake, located in tp. 3, rge. 16, R.P. mer. were completely defoliated. From Moose Lake west to Twin Lakes, Whitemouth Lake and south to the United States boundary, moderate to severe defoliation was recorded. The heaviest defoliation occurred in white poplar stands around Whitemouth Lake, along the United States boundary and in the immediate vicinity of Middlebro. Complete defoliation was common in the above mentioned areas. Moderate defoliation occurred in and around Vassar. West of Vassar to Piney and Menisino defoliation was light to moderate. Light defoliation was recorded in small bluffs of white poplar between Menisino and Stuartburn. From Piney north to Badger, Garrick and Woodridge light defoliation prevailed. Light defoliation was recorded throughout the Sandilands Forest Reserve, with the exception of one area in the north-east corner, where defoliation was moderate. Heavy defoliation was recorded at Madashville, Malmun and East Braintree areas. Severe defoliation occurred from East Braintree north-west to Falcon Lake. In Eastern Manitoba populations of the forest tent caterpillar continued to increase. Pockets of heavy defoliation occurred west of Falcon Lake along the Trans-Canada Highway to Rennie. The infestation at the Big Whiteshell Crow-Duck Portage increased in size since 1951. North of Falcon Lake defoliation gradually lessened to moderate at West Hawk Lake. In the Caddy Lake area defoliation was medium. South of Bear Lake to Telford heavy defoliation occurred between Mi. 97 and Mi. 98 along the Trans-Canada Highway. West of Telford, defoliation was medium to heavy from Rennie to Darwin and medium in the agricultural areas around Whitemouth. In the central portion of the Whiteshell Forest Reserve and along the Whiteshell Road to White Lake medium defoliation was recorded. Light defoliation occurred from White Lake to the Big Whiteshell. East of Seven Sisters along the south side of the Winnipeg River populations were light. Heavy defoliation was recorded between Seig's Corner and Seven Sisters. North of Seven Sisters to Lac du Bonnet defoliation was moderate. North of Lac du Bonnet to Great Falls, St. George and Pine Falls defoliation was light. Defoliation was generally light along the Point du Bois Road. North of Beausejour to Stead, Gull Lake, Grand Beach, Belair and Hillside defoliation was light with a few areas of medium recorded. One collection of this insect was made in western Manitoba, in the vicinity of Mafeking. Increased populations of this insect were recorded in Northern Manitoba during 1952. Collections of larvae were made at Baker's Narrows, Big Eddy, the Radio Range and Egg Lake; but in all instances defoliation was light.

A more widespread distribution of the forest tent caterpillar was experienced during 1952 in the Prince Albert, Meadow Lake and northern Districts of Saskatchewan. Light populations of this insect were observed in the Nisbet and Fort a la Corne Provincial Forests. The infestation north of Bittern Creek continued to flourish and has now spread westward to Waskesiu Lake. Poplar throughout this area was severely defoliated. Light defoliation was

recorded at Lac la Ronge. A small area of moderate defoliation was recorded in sec. 27, tp. 58, rge. 9, W. 3rd mer. north of Big River on No. 3 Highway. Severe defoliation to white poplar occurred at Dere Lake, north of Big River. Heavy defoliation was also recorded from Dere Lake to Green Lake in the Meadow Lake District. Forest tent caterpillar was quite widespread, but causing only light defoliation in most areas throughout the Meadow Lake District. Collections were made north of Meadow Lake to Flotten Lake and as far west as Piereoland. One collection was made in the Bronson Provincial Forest. Defoliation was light in the above mentioned areas. The old infestation south of Meadow Lake still persists and defoliation remains severe. Collections were also made at Glaslyn and east to Cater but defoliation was recorded as light. In northern Saskatchewan small localized infestations occurred from Lac la Ronge east to Sturgeon Landing. The most severe defoliation occurred at Sturgeon Landing where white poplar was about 50 per cent defoliated.

2.5 EGG SURVEY

To predict the probable extent and severity of defoliation expected by the forest tent caterpillar in 1953, egg surveys were again carried out in the fall of 1952. Sampling procedures followed were the same as in 1951. Three trees were felled at each examination point and all twigs and branches carefully examined for egg bands. Examinations were made at 102 points in Manitoba and 61 in Saskatchewan. Included in these are the sample points used in the 1951 egg survey. The egg bands obtained from the survey were reared to determine the percentage parasitism and percentage survival of overwintering larvae.

A review of the data obtained indicates that the present outbreak of the forest tent caterpillar in Manitoba and Saskatchewan is still expanding and a two-fold expansion of the outbreak areas is expected in 1953.

The following Table gives the average number of egg bands per tree, percentage of eggs containing living larvae and percentages of eggs parasitized. Living larvae were found in all areas except two, one near Moose Lake in southern Manitoba and one at Clearwater Lake in northern Manitoba. The cause of egg and larval mortality in these areas could not be determined; however, further collections will be made in the spring of 1953.

TABLE A
Forest Tent Caterpillar Egg Survey
Manitoba - 1952

Place	Location				Aver.Ht. of Trees Examined	Aver.DBH of Trees Examined	Aver.No. of Egg Bands per Tree	% of Eggs Containing Living Larvae	% Parasi- tized
	Sec.	Tp.	Rge.	Mer.					
Moose Lake	18	3	17	E.P.	40 ¹	5 ¹	8.	91.2	0
Moose Lake	14	3	16	E.P.	42 ¹	4 ¹	10.	93.9	3.8
Moose Lake	6	3	16	E.P.	28.3	4.3	11.3	95.0	2.6
Moose Lake	10	3	16	E.P.	55 ¹	6 ¹	9.3	93.9	2.4
Moose Lake	10	2	14	E.P.	33.3	3.3	16.0	All F.T.C. larvae dead in egg bands	
Moose Lake	28	2	15	E.P.	22.7	3.6	15.0	92.2	6.0
Moose Lake	12	3	16	E.P.	36.6	3.6	9.0	83.5	10.6
Sprague	8	1	15	E.P.	21.	3.6	13.	93.7	2.9
Sprague	9	1	14	E.P.	29.3	3.3	10.3	94.3	1.2
Middlebro	7	1	16	E.P.	19.3	3.	7.7	77.0	17.1
South Junction	15	1	13	E.P.	26.	4.3	16.7	53.9	1.2
Vassar	7	2	13	E.P.	28.3	3.3	11.6	83.5	4.6
Vassar	26	1	12	E.P.	20.6	3.3	11.3	80.5	7.8
Whitemouth Lake	10	4	13	E.P.	33.3	4.3	6.7	83.7	6.8
Whitemouth Lake	8	3	13	E.P.	28.3	3.	11.6	96.4	-
Whitemouth Lake	20	3	13	E.P.	30.	3.	11.	93.1	3.1
Piney	6	2	12	E.P.	23.3	3.7	7.7	64.2	8.7
Caliente	23	2	8	E.P.	21.6	2.7	1.	97.6	-
Menisino	12	2	10	E.P.	25.	3.	2.	70.5	14.3
Sundown	12	2	9	E.P.	20.	2.3	1.7	78.7	15.7
Stuartburn	3	2	6	E.P.	16.7	2.3	1.	80.4	13.3
St. Labre Road	15	4	12	E.P.	26.6	3.	10.	90.4	6.5
St. Labre Road	12	4	11	E.P.	23.3	3.	3.3	96.3	2.4
Woodridge	11	4	10	E.P.	26.7	3.3	2.	90.9	2.7

(Continued)

TABLE A (Continued)
Forest Tent Caterpillar Egg Survey
Manitoba - 1952

Place	Location				Aver. Ht. of Trees Examined	Aver. DBH of Trees Examined	Aver. No. of Egg Bands per Tree	% of Eggs Containing Living Larvae	% Parasitized
	Sec.	Tp.	Egs.	Mer.					
Sandilands F.R.	26	1	12	E.P.	24.6	3.3	11.3	89.3	4.9
Sandilands F.R.	35	5	9	E.P.	21.	3.3	h.	73.1	1.8
Sandilands F.R.	7	6	10	E.P.	23.3	3.6	2.	77.1	1.9
Sandilands F.R.	7	8	10	E.P.	26.6	4.3	h.	59.6	2.4
Sandilands F.R.	12	8	11	E.P.	30.	h.	9.	84.5	6.5
Marchand	31	5	9	E.P.	26.7	4.3	3.3	70.5	4.5
Hadashville	11	8	11	E.P.	37.3	5.	17.	87.7	4.5
McKinley	8	8	13	E.P.	43.3	5.	9.3	84.6	4.4
Dawson Trail	12	7	13	E.P.	29.3	h.	3.7	75.5	18.6
East Braintree	34	7	14	E.P.	33.3	4.3	16.3	91.4	4.3
Falcon Lake Road	21	8	16	E.P.	48.3	6.	19.	71.8	16.7
Falcon Lake Road	10	8	15	E.P.	28.3	3.3	11.7	80.4	8.8
Harrison Creek area	10	6	16	E.P.	20.	3.	8.	81.9	9.4
Harrison Creek area	12	5	17	E.P.	26.7	2.6	h.	92.8	1.6
Springstein	2	10	1	W.P.	18.3	2.	.7	80.5	4.4
Holland	27	7	11	W.P.	25.	2.3	.7	74.7	47.2
Arnes	29	21	3	E.P.	25.3	2.7	2.	92.9	3.7
Bnausa	17	22	3	E.P.	23.	3.3	.7	84.1	10.4
Belmont	25	5	16	E.P.	23.3	2.3	.3	12.8	84.6
Nutiniik Lake	13	14	13	E.P.	15.6	2.	9.6	66.4	9.3
Heart River	29	13	14	E.P.	25.	3.3	7.6	90.3	5.2
Rennie	19	10	15	E.P.	18.6	3.	39.3	95.6	.2
Whitemouth	36	11	11	E.P.	11.6	2.	10.3	72.0	18.4
Betula Lake	10	13	14	E.P.	38.3	5.6	4.	93.2	.3
Rennie	10	11	13	E.P.	20.1	3.3	18.6	92.1	8.
Whitemouth	22	11	12	E.P.	25.	3.	13.6	69.2	18.2
Betula Road	33	12	15	E.P.	21.	2.6	19.3	91.2	1.8

(Continued)

TABLE A. (Continued)
Forest Tent Caterpillar Egg Survey
Manitoba - 1952

Place	Location				Aver.Ht. of Trees Examined	Aver.DBH of Trees Examined	Aver. No. of Egg Bands per Tree	% of Eggs Containing Living Larvae	% Parasitized
	Sec.	Tp.	Rge.	Mer.					
Dorothy Lake	9	14	13	E.P.	16.	2.3	11.3	38.8	57.8
Brereton Lake	1	11	14	E.P.	16.	2.	35.6	61.6	33.9
Gull Lake	36	16	17	E.P.	19.3	2.3	1.3	37.2	28.7
Beaconia	15	17	7	E.P.	18.3	2.	.7	.8	73.6
Belair	9	19	7	E.P.	28.3	2.6	.3	100.	-
Caddy Lake	5	10	17	E.P.	20.	2.6	10.3	88.9	5.4
Falcon Lake	38	8	16	E.P.	18.6	4.	59.7	91.7	2.7
Fleanor Lake	1	14	12	E.P.	25.	3.	3.3	47.1	32.2
Lake Brereton	13	11	14	E.P.	16.6	2.5	32.3	93.4	-
Lake Brereton	29	11	15	E.P.	15.	2.	6.6	73.	19.3
Liban	36	14	6	E.P.	15.	2.	.3	68.1	19.3
Stead	4	17	8	E.P.	13.	2.	1.3	49.9	41.2
Darwin	23	11	12	E.P.	28.6	2.6	18.3	63.4	18.9
Beausejour	31	12	10	E.P.	-	-	.3	87.7	10.5
Molson	29	12	19	E.P.	10.6	2.	1.3	43.4	49.9
Seddon's Corner	1	13	10	E.P.	20.	2.	4.	47.6	35.3
Whitemouth	30	11	12	E.P.	20.	3.	9.3	71.9	18.4
Big Whiteshell	15	13	16	E.P.	12.6	2.5	19.1	77.7	7.4
Green Lake	20	13	16	E.P.	16.	2.	4.3	85.6	10.2
Whiteshell Road	20	10	15	E.P.	25.	3.3	25.3	82.2	14.6
Red Rock Lake	8	12	15	E.P.	16.	3.3	7.	100.	-
Aneda	26	13	9	E.P.	19.3	3.	4.	40.6	32.7
Falcon Lake Road	8	9	17	E.P.	25.	3.6	47.6	85.3	2.1
Telford	17	10	16	E.P.	16.6	2.7	59.8	79.3	14.7
Rennie	29	10	14	E.P.	-	3.	34.6	77.1	14.6
Whiteshell Road	2	13	15	E.P.	20.	2.	6.	30.7	54.2
Mile 81 #1 Highway	11	11	13	E.P.	14.	2.	8.3	48.1	43.8

TABLE A. (Continued)
 Forest Tent Caterpillar Egg Survey
 Manitoba - 1952

Place	Location				Aver.Ht. of Trees Examined	Aver.DBH of Trees Examined	Aver.No. of Egg Bands per Tree	% of Eggs Containing Living Larvae	% Parasitized
	Sec.	Tp.	Rge.	Mer.					
Lake Brereton Road	20	10	15	E.P.	20.	2.	17.	79.1	11.8
Lac du Bonnet	25	14	10	E.P.	18.3	3.	.6	93.	1.5
Pointe du Bois	9	16	13	E.P.	15.	2.3	3.3	31.1	43.7
Manson Creek	15	10	16	E.P.	16.	3.	46.	96.5	11.1
Brookfield Road	32	13	11	E.P.	17.3	2.6	6.3	61.9	30.
Sedson's Corner	3	13	9	E.P.	15.	2.	1.7	68.7	23.9
Thalberg	12	16	17	E.P.	12.	2.	1.3	16.1	59.7
North Star Trail	15	17	8	E.P.	15.	2.	.3	-	83.7
Pointe du Bois	35	15	14	E.P.	15.	2.	2.6	58.1	28.9
Star Lake	20	9	17	E.P.	16.6	2.3	38.3	95.1	3.3
Milner Ridge	7	14	10	E.P.	13.	2.3	2.3	53.5	32.8
Lac du Bonnet	28	15	11	E.P.	16.	3.	15.6	85.9	7.3
Pointe du Bois	20	15	12	E.P.	14.	3.	4.	45.1	23.9
West Hawk Lake	14	9	17	E.P.	18.6	3.	71.6	99.6	0
Pointe du Bois	7	16	14	E.P.	20.	3.	1.	89.4	3.8
Grand Beach	16	8	7	E.P.	27.6	2.3	.6	4.4	79.1
The Pas	33	55	27	W.P.	15.6	2.5	.6	95.1	-
Freshford	3	59	26	W.P.	20.	2.5	.6	91.4	-
Westray	5	54	26	W.P.	21.	3.3	1.	95.3	-
Atikamig	9	58	24	W.P.	25.	3.	1.	93.1	-
Clearwater	3	58	25	W.P.	21.6	2.3	.3	All eggs & larvae dead	
Manless	3	59	26	W.P.	20.	3.3	1.	93.4	
Manless	12	60	26	W.P.	20.	3.3	.3	96.	

TABLE B.
Forest Tent Caterpillar Egg Survey
Saskatchewan - 1952

Place	Location				Aver. Ht. of Trees Examined	Aver. DBH of Trees Examined	Aver. No. of Egg Bands per Tree	% of Eggs Containing Living Larvae	% Parasitized
	Sec.	Tp.	Rge.	Mer.					
Waskesiu	16	60	25	W2	28.3	3.4	2.	73.2	26.4
Waskesiu	35	61	24	W2	37.	3.6	17.	94.88	3.4
Waskesiu	23	62	24	W2	26.3	3.	1.6	69.1	25.6
Molonoos	10	64	24	W2	43.6	3.8	2.	66.6	33.6
Waskesiu	18	57	27	W2	42.6	4.3	7.3	61.3	28.9
Waskesiu	35	57	27	W2	41.6	4.3	17.	92.5	.5
Waskesiu	16	58	26	W2	56.	5.3	7.3	77.	26.8
Waskesiu	17	59	25	W2	50.3	3.4	5.8	92.3	5.1
Tweedsmuir	3	54	1	W3	41.3	3.4	.3	92.3	7.7
Tweedsmuir	11	55	1	W3	24.7	3.	3.	60.1	38.4
Tweedsmuir	23	54	1	W3	34.6	3.	1.6	85.4	5.3
Tweedsmuir	34	55	1	W3	32.6	3.1	5.7	95.2	1.3
Big River	19	65	9	W3	61.	6.7	27.	93.8	3.9
Waskesiu	32	56	1	W3	32.6	2.7	3.7	80.2	15.7
Big River	23	62	10	W3	68.7	6.3	7.3	94.6	8.9
North of Big River	8	63	9	W3	53.7	5.2	22.	93.2	3.4
North of Big River	10	64	9	W3	62.6	5.4	16.6	90.8	2.9
North of Big River	32	64	9	W3	65.3	6.4	23.6	92.4	6.
Green Lake	20	58	9	W3	60.3	5.7	6.6	83.3	6.9
Green Lake	7	59	9	W3	53.	4.7	16.	93.5	3.3
Green Lake	1	58	9	W3	28.	2.6	10.3	93.5	2.9
Big River	21	61	10	W3	51.3	4.4	15.	88.4	7.9
Big River	3	61	10	W3	81.6	9.1	88.	91.6	5.8
St. Cyr	12	61	13	W3	38.	3.1	4.6	94.1	2.8
Green Lake	13	61	12	W3	64.3	5.1	15.6	90.4	4.9
Green Lake	4	61	11	W3	54.3	5.2	35.3	94.9	1.4
Green Lake	24	60	11	W3	55.3	5.1	18.3	79.7	10.7
Green Lake	34	59	10	W3	53.3	5.1	10.	68.4	25.9

(Continued)

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TABLE B. (Continued)
Forest Tent Caterpillar Egg Survey
Saskatchewan - 195

Place	Location				Aver. Ht. of Trees Examined	Aver. DBH of Trees Examined	Aver. No. of Egg Bands per Tree	% of Eggs Containing Living Larvae	% Parasitised
	Sec.	Tp.	Rge.	Mer.					
Meadow Lake	27	61	18	W3	35.3	3.2	1.	75.4	19.4
Dorintosh	31	63	17	W3	42.3	4.2	1.	89.8	7.
Dorintosh	30	64	17	W3	40.	3.3	.3	96.1	3.9
Dorintosh	15	65	17	W3	35.3	3.4	.3	100.	-
Dorintosh	29	67	16	W3	39.3	3.5	15.3	81.9	9.9
Dorintosh	4	68	15	W3	34.	2.7	.6	59.8	23.4
Glaslyn	16	55	17	W3	26.	3.1	4.	93.6	4.6
Glaslyn	3	56	17	W3	37.	3.	5.3	96.5	2.1
Glaslyn	25	57	17	W3	54.3	5.8	2.	87.1	4.0
Glaslyn	13	58	17	W3	38.3	3.4	3.3	82.3	14.9
Big River	29	56	9	W3	30.	2.6	2.6	99.5	-
Big River	7	57	10	W3	43.6	2.6	2.7	100.	-
Meadow Lake	1	60	19	W3	38.3	3.6	1.6	85.2	14.2
Glaslyn	12	53	17	W3	27.	3.1	3.	88.6	9.7
Glaslyn	1	54	17	W3	48.3	4.	2.	92.2	7.1
Candle Lake	26	55	23	W2	35.7	4.6	6.	69.9	26.5
Candle Lake	5	56	23	W2	45.	5.3	6.3	95.4	14.2
Candle Lake	3	57	24	W2	44.6	5.6	4.3	83.3	7.6
Red Rock Block	26	49	24	W2	28.3	3.7	1.	81.3	15.6
Steep Creek Block	28	48	23	W2	34.	3.1	.6	97.6	1.2
Steep Creek Block	13	49	23	W2	23.	3.7	1.3	98.0	8.9
Fort a la Corne	9	50	22	W2	31.3	4.6	.6	77.7	4.0
Fort a la Corne	25	50	20	W2	36.6	3.3	1.	91.4	5.8
Fort a la Corne	28	50	19	W2	64.	7.1	3.6	90.9	5.8
Candle Lake	15	53	23	W2	41.3	5.4	8.	100.	-
Candle Lake	14	54	23	W2	21.3	2.7	1.	94.7	2.7

(Continued)

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TABLE B (Continued)
 Forest Tent Caterpillar Egg Survey
 Saskatchewan - 1952

Place	Location				Aver. Ht. of Trees Examined	Aver. DBH of Trees Examined	Aver. No. of Egg Bands per Tree	% of Eggs Containing Living Larvae	% Parasi- tized
	Sec.	Tp.	Rge.	Mer.					
Molonosa	38	68	23	W2	47.3	5.4	2.	85.7	10.3
Molonosa	30	69	22	W2	44.3	5.2	11.	93.7	4.4
Molonosa	14	65	24	W2	51.6	5.2	1.6	75.9	13.6
Molonosa	29	66	23	W2	46.3	4.5	1.	78.9	14.2
Molonosa	11	68	23	W2	55.3	5.6	.3	96.3	.9
Dorintosh	21	66	17	W2				88.9	5.5

3. SPRUCE BUDWORM (*Choristoneura fumiferana* (Clem.)).

by V. Hildahl

3.1. INTRODUCTION

The spruce budworm again caused noticeable defoliation to white spruce stands in several areas of Manitoba and Saskatchewan in 1952. Defoliation was evident in white spruce stands east of Lake Winnipeg, in the Spruce Woods Forest Reserve, along the east shore of Namee Lake, and around the Sturgeon Landing Settlement in Saskatchewan.

In the area north of the Winnipeg River, the spruce budworm was more abundant in 1952. Aerial surveys of this section indicated that spruce budworm populations were general and several light to moderate infestations were present throughout the area. Ground checks were made of areas where defoliation of white spruce was visible from the air. In the Spruce Woods Forest Reserve, spruce budworm showed a slight decline but it was still widely distributed. The most severe defoliation recorded in the two provinces occurred at Namee Lake where the new foliage of white spruce was from 50 to 100 per cent destroyed and from 10 to 20 per cent of the old needles were eaten. In this area many small balsam firs were almost completely stripped.

3.2. DETAIL OF INFESTATIONS

3.2.1. Distribution and Abundance.

In Eastern Manitoba the spruce budworm was found on white and black spruce and balsam fir at Oiseau, Flintstone, Garner, Wallace, Aikens, Sasaginnigak, and Dogskin lakes. Moderate defoliation was recorded at Garner Lake in sec. 36, tp. 21, rge. 17, E.P. mer. and at Wallace Lake in sec. 1, tp. 24, rge. 15, E.P. mer. However, since both the spruce budworm and black-headed budworm occurred in about equal numbers it was difficult to determine which species was responsible for or causing the greatest defoliation. At Garner Lake the infestation covered about 100 acres. At the time of examination (July 7) spruce budworm in all stages (larva, pupa, and adult) were collected. Parasites of the spruce budworm (*Asanteles* and *Glypta*) were also common in the area.

Populations were general but light at Maskwa Lake, Lake St. George, and in the Lac du Bonnet, Pointe du Bois, Seven Sisters, and Seddon's Corner areas. Several small collections were also made at Arberg, Camper, and Gypsumville in the Interlake area but in all instances only very light defoliation was recorded.

Spruce budworm populations showed a slight decline in the Spruce Woods Forest Reserve. Although defoliation was still widespread, only one area of heavy defoliation was recorded. This area was located in sec. 7, tp. 9, rge. 13, W.P. mer. in the east block of the reserve.

The spruce budworm was found at four points in the Western District of Manitoba but caused little defoliation. Three samples were taken from white spruce at the following points north of Mafeking: sec. 3, tp. 46, rge. 25, W.P. mer., sec. 5, tp. 47, rge. 25, W.P. mer., and sec. 21, tp. 47, rge. 25, W.P. mer. One larva was collected from white spruce in sec. 14, tp. 20, rge. 19, W.P. mer. in Riding Mountain National Park.

In northern Manitoba, an infestation covering approximately 5,500 acres was discovered. The infestation occurred along the east side of Namew Lake in Manitoba and around the Sturgeon Landing Settlement in Saskatchewan. Within the infested area defoliation ranged from moderate to severe (See Map, Namew Lake Infestation). Collections of the spruce budworm were obtained from two other points in northern Manitoba; one from black spruce at Atik, sec. 24, tp. 61, rge. 27, W.P. mer., and the other from white spruce at The Pas, sec. 10, tp. 56, rge. 26, W.P. mer. In each case only one larva was found and no damage was apparent.

White spruce stands throughout the Hudson Bay, Prince Albert, Meadow Lake and Northern districts of Saskatchewan were extensively sampled for the spruce budworm but no evidence of it was found outside the Sturgeon Landing infestation.

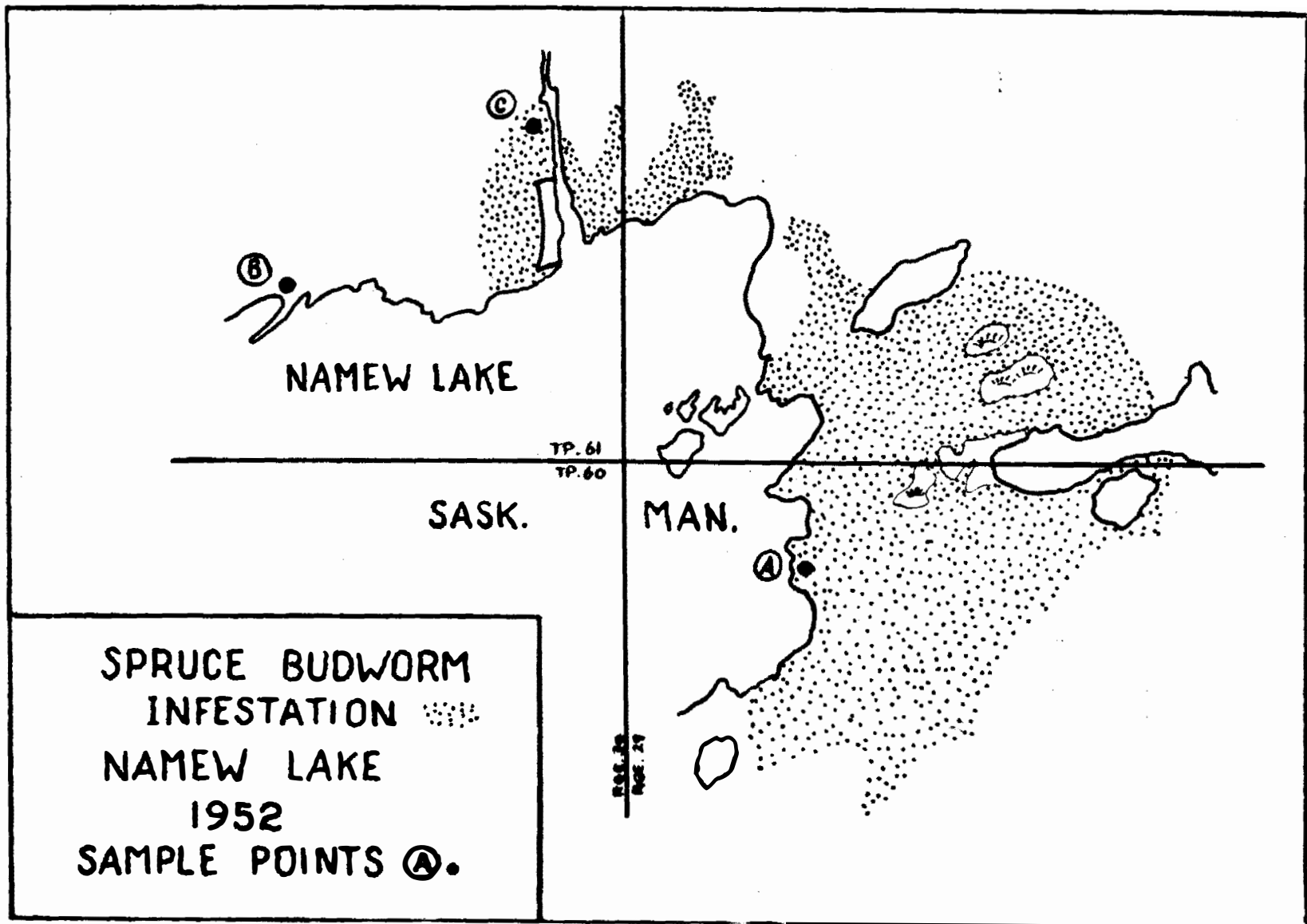
3.2.2. Namew Lake Infestation.

The infestation in 1952 covered an area of about 5,550 acres around Namew Lake. In Manitoba, 4,710 acres lie on the east shore of Namew Lake in tp. 60 and 61, rge. 29, W.P. mer., and 250 acres along the Manitoba-Saskatchewan border at the north end of Namew Lake. In Saskatchewan, the infestation was limited to about 590 acres around the Sturgeon Landing Settlement (see map).

The forest cover in the area is for the most part a spruce type, with black and white spruce intermixed with white poplar. Birch and jack-pines also occur in the area but as minor species. Most of the white spruce in the Manitoba part of the infestation is mature or overmature. Around Sturgeon Landing in Saskatchewan some white spruce stands are younger, averaging about 60 years old, and are more vigorous. The amount of balsam fir in the infested area is negligible. Regeneration consists mainly of white and black spruce and some scattered balsam fir.

On the Manitoba side in 1952, the new foliage of white spruce was from 50 to 100 per cent destroyed and from 10 to 20 per cent of the old needles were eaten. Many small balsam firs in this area were almost completely stripped. The infestation was lighter around Sturgeon Landing, where about 50 per cent of the new growth of mature white spruce was destroyed. However some of the younger 60 year-old spruce in this area suffered severe damage with about 75 per cent of the new growth destroyed and many of the leaders either severely damaged or killed.

During the fall of 1952, the infested and non-infested areas around Namee Lake were examined in an effort to determine the probable extent and intensity of attack expected in 1953. Results of these examinations indicated that in the 1952 infestation area there were enough eggs laid to produce a moderate to severe infestation in 1953. Outside the infested area eggs were either scarce or absent indicating that the area infested in 1953 will be about the same as in 1952.



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