

THE STATUS OF FOREST INSECTS AND DISEASES FOLLOWING STRIP  
THINNING OF JACK PINE THICKETS IN MANITOBA

by

J. J. Lawrence & J. C. E. Melvin

FOREST RESEARCH LABORATORY

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# THE STATUS OF FOREST INSECTS AND DISEASES FOLLOWING STRIP

## THINNING OF JACK PINE THICKETS IN MANITOBA

J. J. Lawrence & J. C. E. Melvin<sup>1</sup>

### INTRODUCTION

A large scale thinning program in jack pine reproduction was started in three areas of the Sandilands Forest Reserve in 1963 by the Department of Mines and Natural Resources, Forest Management Branch. The stands originated following a fire in 1955 and are near Dawson Cabin, Piney and Badger. A total of 60 study plots were established, 45 plots in the thinned stands and 15 control plots in the unthinned stands. The areas, plot size, thinning techniques and preliminary results of the growth studies were described by Bella<sup>2</sup>. At the request of the Manitoba Forest Management Branch additional studies were initiated in 1964 by members of the Forest Insect and Disease Survey to determine what influence thinning may have on the status of forest insects and diseases.

Surveys were carried out in the summer and fall each year on all the plots. These consisted of a critical examination of tagged trees and a general survey of the surrounding area. The results of these surveys to the end of 1966 are included in this report.

### RESULTS AND DISCUSSION

The four diseases most commonly found were: a needle cast of jack pine (Hypodermella ampla (Davis) Dearn.), a gall rust (Peridermium harknessii J.P.Moore), a blister rust (Cronartium comandrae Peck) and a needle rust (Coleosporium asterum Syd.).

The needle cast caused by H. ampla was found at all locations. It was light in the Dawson Cabin area but moderate to severe in both the Piney and Badger areas where it caused some premature defoliation in the lower half of the crown on some trees. If severe, the needle disease may result in the casting of all needles except those of the current year.

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<sup>1</sup>Senior technicians, Forest Insect and Disease Survey, Manitoba-Saskatchewan Region, Forestry Branch.

<sup>2</sup>Bella, I.E. 1966. Strip thinning jack pine thickets with a drum chopper in Manitoba. Information report MS-X3 Can. Dept. of For., Winnipeg.

The gall rust caused by P. harknessii was found at all locations. Very little damage occurred with a maximum of three trees infected per plot. This rust can be destructive particularly to seedlings and saplings. It may occasionally kill some trees and stunt and malform others, especially when the galls are on main stems. Direct infection from tree to tree makes control measures a problem.

The needle rust caused by C. asterum was found at all locations in 1964 and 1965 with up to 85% of the trees showing a very light incidence. In 1966 only the occasional infected needle was observed at any location. The needle rust attacks the older needles and when the disease is severe may result in retardation of growth of young trees. In order to complete its life cycle this fungus must infect an alternate host such as aster (Aster spp.) or goldenrod (Solidago spp.) or various other members of the Compositae.

The blister rust caused by C. comandrae was found at nearly all of the locations but was of very low intensity. It may cause severe branch mortality and trees may be killed if the infection is on the main stem. The range of this rust is governed by the alternate host of C. comandrae, bastard toad flax (Comandra spp.) from which re-infection of pine must take place.

In addition one collection of a root rot caused by Armillaria mellea (Quel.) Fr. was made. It is not usually a serious problem in thrifty trees but in stands in which trees have reduced vigor this root disease may result in considerable mortality. Other fungi collected in the study are listed in Table 1.

TABLE 1  
FUNGI OF MINOR IMPORTANCE ON JACK PINE

Species	Type	Status
<u>Fomes subroseus</u> (Weir.) Overh.	slash fungus	uncommon
<u>Irpex mollis</u> Berk. & Curt.	slash fungus	uncommon
<u>Lenzites saepiaria</u> (Wolt)Fr.	slash fungus	common throughout area
<u>Lophodermium pinastri</u> (Schrad. ex Fr.) Chev.	needle cast	common but light
<u>Polyporus perennis</u> L. ex. Fr.	soil and duff	uncommon
<u>Schizophyllum commune</u> Fr.	slash fungus	uncommon, jack pine
<u>Tryblidiopsis pinastri</u> (Fr.) Karst	saprophyte	common on lower dead branches of jack pine

Five insects were commonly found on the trees in the established plots and surrounding area: the eastern pine-shoot moth, Eucosma gloriola Heinr., the white pine weevil, Pissodes strobi (Peck), the jack pine budworm, Choristoneura pinus Free., the tube moth, Argyrotaenia tabulana Free. and the Nantucket pine tip moth, Rhyacionia frustrana (Comst.)

The eastern pine-shoot moth caused light to moderate damage during 1964-1965 in the Dawson Cabin area but damage was very light to light in the Piney and Badger areas. In 1966 very light damage was recorded at Dawson Cabin and a trace at Piney and Badger. The borer attacks jack pine reproduction in the 3 - 14 foot height class with the highest populations found in trees 5 - 7 feet in height<sup>3</sup>. It feeds in the current leader and laterals, which die and eventually break off causing reduced height growth, and bushy-topped trees.

Over the past three years the jack pine population has increased steadily. Defoliation of the new growth at Dawson Cabin is still light while at Piney and Badger severe defoliation has been recorded with up to 90% of the new foliage destroyed. Population increase and spread is quite rapid but usually of short duration, causing many dead tops and branches, and some mortality. In general, with the loss of vigor, trees are more susceptible to attack by other insects and disease organisms.

Damage by the white pine weevil was light to moderate at Dawson Cabin and light in the Piney and Badger areas each year. This weevil can cause considerable damage to the upper portion of the crown; it usually feeds in the leader and main stem.

The tube moth caused only very light damage at all three locations. It can cause serious defoliation of the new growth, but has not yet been found at epidemic levels in the Sandilands area.

The Nantucket pine tip moth caused very light damage at all three locations, but it may cause serious damage as it feeds on the current shoots.

Two insects, the wood borer, Asemum striatum (L.), and the pyralid moth, Diorcytria abietivorella Grt., were found in residual trees that had been damaged by the drum chopper. The many other insects collected (Table 2) damaged only individual trees.

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<sup>3</sup>Wong, H.R., A.E. Campbell & J.J. Lawrence. 1966. Bi-monthly Research Notes 22(6):4. Can. Dept. For. and Rural Development.

TABLE 2

## INSECTS OF MINOR IMPORTANCE ON JACK PINE

Species	Status
Coleoptera	
Cantharidae	
<u>Podabrus</u> sp. (soldier beetle)	rare
Buprestidae (wood borers)	
<u>Chalcophora liberta</u> Germ.	rare
<u>Chalcophora virginiensis</u> Drury	rare
Cerambycidae (wood borers)	
<u>Anoplodera chrysocoma</u> Kby.	rare
Coccinellidae (lady beetles)	
<u>Anatis mali</u> (Say)	occasional - predator of aphids
<u>Hippodamia convergens</u> Guer.	occasional - predator of aphids
<u>Hyperaspis congener</u> Watson	occasional - predator of aphids and scale
<u>Mulsantina hudsonica</u> Csy.	occasional - predator of aphids
Curculionidae (weevils)	
<u>Hylobius radialis</u> Buck	occasional
<u>Magdalis gentilis</u> Lec.	rare
<u>Pissodes approximatus</u> Hopk.	rare
<u>Pissodes terminalis</u> Hopk.	occasional on scattered trees
Elateridae (wire worms)	
<u>Ctenicera</u> sp.	rare
<u>Ctenicera appropinquans</u> Rand.	occasional
<u>Ctenicera ochreipennis</u> Lec.	occasional
Helodidae	
<u>Cyphon variabilis</u> Thunb. (flower beetle)	common - found in large numbers in some plots
Lampyridae (firefly)	
<u>Lucidota corrusca</u> Linn.	rare
Scolytidae (bark beetles)	
<u>Orthotomicus caelatus</u> Eich.	occasional
Diptera - (midges)	
Cecidomyiidae	
<u>Cecidomyia</u> sp.	common - general throughout area
Homoptera	
Aphidae - (aphids)	
<u>Cinara banksianae</u> Brad.	common
<u>Cinara canatra</u> H. & B.	common - found in large colonies
<u>Cinara pergandei</u> Wilson	common

Homoptera (Cont'd)	
Cercopidae (spittlebugs)	
<u>Aphrophora parallela</u> Say	common - throughout area
<u>Aphrophora saratogensis</u> (Fitch)	common - throughout area
Coccidae (scale)	
<u>Phenacaspis pinifoliae</u> Fitch	occasional
Hymenoptera	
Diprionidae (sawflies)	
<u>Neodiprion</u> poss. <u>compar</u> Leach	rare - single colonies
<u>Neodiprion maurus</u> Roh.	occasional
<u>Neodiprion nanulus nanulus</u> Schedl.	occasional
<u>Neodiprion virginianus</u> complex	rare - single colonies
Lepidoptera	
Gelechiidae	
<u>Evagora</u> sp. (needle miner)	rare
Geometridae (loopers)	
<u>Caripeta angustiorata</u> Wlk.	rare
<u>Eufidonia natataria</u> Wlk.	rare
<u>Hypagyrtis piniata</u> Wlk.	rare
<u>Semiothisa bicolorata</u> Fabr.	occasional - scattered larvae
Lycaenidae	
<u>Callophrys nippon clarki</u> Free. (jack pine hairstreak)	rare
Lymantriidae	
<u>Parorygia plagiata</u> Wlk. (Pine tussock moth)	rare
Noctuidae (owlet moths)	
<u>Anomogyna elimata</u> Gn.	rare
<u>Feralia jocosa</u> Gn.	rare
<u>Polia lutra</u> Gn.	rare
<u>Zale duplicata largera</u> Sm.	occasional
Olethreutidae	
<u>Petrova albicapitana</u> Busck. (pitch nodule marker)	occasional - on scattered trees in the plots
Psychidae	
<u>Psychid</u> sp. (bagworm moth)	rare
Pyralidae (pyralid moths)	
<u>Diorycytria</u> sp.	rare
<u>Diorycytria abietivorella</u> Grt.	rare
<u>Diorycytria zimmermani</u> Grt.	rare
<u>Tetralopha robustella</u> Zell.	occasional - on fringe of plots
Sphingidae	
<u>Lapara bombycoides</u> Wlk. (hawk moth)	rare

## Neuroptera

## Chrysopidae

Chrysopa sp. (green lacewing)      occasional

## Hemerobidae

Hemerobius sp. (brown lacewing)      rare

## CONCLUSIONS

Results of the survey to date do not indicate any increase in the activity of insects or disease organisms which could be attributed to the mechanical thinning program. Several fungi and insects belonging to the families Curculionidae and Scolytidae, were recovered from the slash left by the chopper. This material could serve as a reservoir of insects and pathogens which attack only dead trees or trees of low vigor and could conceivably attack the residual trees if conditions were such that these became weakened.