INSECT AND DISEASE CONDITIONS IN ALBERTA PROVINCIAL PARKS 1967

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INTRODUCTION

During 1967 staff of the Forest Insect and Disease Survey inspected all Provincial Parks in Alberta to detect the presence of organisms damaging trees, and if necessary to advise park officials of remedial action. Wherever possible, discussion with the park officials was arranged at the time of inspection to explain the nature and potential of the various tree pests.

The data and information gathered on all parks have been collated and this resumé outlines the more significant organsims. Charts are included to show the degree of infestation or infection of all those encountered. Generally, insects and diseases in 1967 were not causing appreciable damage. Some of the species present however, are potentially dangerous and further inspections are planned for 1968.

Aphids

Medium to high populations of free-feeding aphids were present in many of the Parks in 1967. Poplar species were most seriously affected, although willow, American elm, ash and Manitoba maple supported low to medium populations in some parks. Aphids suck the juices from the twigs and leaves causing discoloration of the leaves and premature leaf drop but otherwise do not cause permanent injury to the trees. An annoying feature of high aphid populations is the sticky secretion (honey dew) which often coats the trees and the surface beneath them. Control by chemical means is usually unnecessary as high populations of aphids do not usually persist for more than a year or two.

Another type of aphid common in the parks was the spruce gall aphid. This species exists in a free-feeding form on the needles of conifers and as a gall-maker on the new shoots of spruce. The gall is formed by the insects feeding in the twig at the bases of the needles. The shoot inevitably dies resulting in a brown, cone-like gall which, when abundant, gives an unsightly appearance. During 1967, populations of the free-feeding form were high on Douglas fir in Willow Creek Park. Medium populations of the gall producing form were present in Beauvais Lake, Bow Valley, Crimson Lake and Lac Cardinal Parks and light in many of the remaining parks.

Where small trees of high aesthetic value are concerned hand picking and burning the new galls in the early part of the season will give effective control. Control by insecticides is difficult owing to the nature of aphid feeding and should be considered only in extreme instances.

Choristoneura conflictana (Wlk.) Large Aspen Tortrix

The large aspen tortrix caused moderate defoliation of aspen poplar in Beauvais Lake and Cypress Hills Parks. Light defoliation occurred in Bow Valley, Saskatoon Island and Taber Parks. Since defoliation by this insect takes place in the early part of the season with re-leafing by mid-July there is no permanent injury to the trees. Chemical control is recommended only if the insects are bothersome in areas of high use.

Choristoneura fumiferana (Clem.) Spruce Budworm

Severe defoliation occurred to the current year's foliage of re-generation spruce in Beauvais Lake Park. Low populations were present in Big Knife and Cypress Hills Parks.

Several consecutive years of severe defoliation by budworm results in top killing or even tree mortality. Since spruce budworm is a defoliator of both spruce and fir, future plans for reforestation should take into consideration other tree species.

Malacosoma disstria Hbn. Forest Tent Caterpillar

Infestations of forest tent caterpillar were light in the following parks: Big Knife, Jarvis Bay, Ma-Me-O Beach, Miquelon Lake, Pembina River, Red Lodge, Rochon Sands, Thunder Lake, Vermilion and Wabamun Lake. In severe infestations these caterpillars completely defoliate the aspen and other deciduous shrubs in the early part of the season. New leaves usually occur in early July and permanent injury to the trees is slight. The caterpillars are annoying when they migrate prior to pupating in late June or when the food supply runs out. Under these conditions control measures may be feasible in areas of high use.

Oligonychus ununguis (Jac.) Spruce Spider Mite

High populations of spruce spider mite were present in spruce trees at Aspen Beach, Big Hill Springs and Long Lake Parks. Low populations occurred at Big Knife, Bow Valley, Crimson Lake, Cypress Hills, Lac Cardinal, Ma-Me-O Beach, Moonshine Lake, O'Brien, Park Lake, Red Lodge, Wabamun Lake and Willow Creek Parks.

The spruce spider mite is a very small mite that sucks the juices from the needles of the spruce trees. It forms a fine webbing along the twigs and between the needles and thrives on trees that are growing in crowded conditions. Very often they are found on trees growing along side dusty roads. Effective control can be gained by washing the trees thoroughly several times

a year with a strong stream of water.

Pikonema alaskensis (Roh.) Yellow-headed Spruce Sawfly

Although this sawfly is often found in natural stands of spruce it causes the most serious damage to open-grown and planted spruce. Light defoliation occurred in Cross Lake, Garner Lake, Long Lake, O'Brien, Red Lodge, Wabamun Lake and Winagami Lake Parks. A few small trees in some of these parks had moderate defoliation in 1967. A close watch should be kept for this sawfly and, if populations build up, control may be necessary.

Saperda calcarata Say. Poplar Borer

Aspen infested with poplar borer were noted in the following parks: Beauvais Lake, Bow Valley, Crimson Lake, Cross Lake, Garner Lake, Gooseberry Lake, Miquelon Lake, Rochon Sands, Slave Lake, Thunder Lake, and Vermilion. Generally, population infestations were low except in Rochon Sands where they were medium, and Thunder Lake where they were high.

This borer feeds in the main stem and larger branches of the tree and may weaken it to the extent that it becomes damaged by wind. Also, the oviposition and emergence holes become entry ports for disease organisms. When only a few trees are infested cutting and burning is recommended to reduce the chances of spread to nearby healthy trees.

Arceuthobium americanum Nutt. ex Engelm. Dwarf Mistletoe

In Alberta, dwarf mistletoe is a parasitic plant of lodgepole pine, Pinus contorta Dougl. var. latifolia Engelm., jack pine, Pinus banksiana Lamb. and spruce, Picea sp. An obvious symptom of the disease is excessive growth

of the host known as a "witches broom" which eventually results in the death of branches or the entire tree when the infection is near the main stem. The excessive weight of large brooms often causes breakage of heavy branches and this can be a hazard in areas frequented by the public. Pruning or cutting out and burning infected trees is the only effective control measure.

Light infections were reported from Cypress Hills and Slave Lake Parks.

Armillaria mellea (Vahl ex Fr.) Quél. Shoestring Root Rot

Trees which are growing on poor sites or have been weakened by other causes are often subject to shoestring root rot. Moderate infections were present in Bow Valley, Crimson Lake, and Red Lodge Parks. Rot was found in lodgepole pine, white spruce and aspen and some mortality in these tree species has occurred. A low incidence of infection was present in Cypress Hills and Entrance Parks. Some mortality occurred in these parks but was confined to regeneration and suppressed trees.

Cytospora chrysosperma Pers. ex Fr. Cytospora Canker

A high incidence of infection on poplar was recorded in Woolford Park and a low incidence at Aspen Beach, Big Knife, Gooseberry Lake, Jarvis Bay, Lac Cardinal, Moonshine Lake, Rochon Sands, Saskatoon Island and Vermilion Parks.

This canker disease is referred to as a "weak" disease in that it occurs mainly on overmature trees or those which have been weakened by another agent such as drought. It results in dead branches and tops. Pruning and burning dead parts of infected trees and ensuring that other trees are kept healthy and vigorous will help keep this disease in check.

Hypoxylon pruinatum (Klotzche) Cke. Hypoxylon Canker

Hypoxylon Canker of aspen poplar was present in Beauvais Lake, Crimson Lake, Cross Lake, Jarvis Bay, Pembina River, Red Lodge and Thunder Lake Parks. The numbers of trees infected were low and no mortality has been reported to date. These cankers occur mainly on the stems and are capable of killing the tree by girdling. The disease enters the tree through wounds and broken branch stubs,therefore,care must be taken when working around the trees with machinery. Cutting and burning infected trees will keep the source of infection to a minimum.

Foliage Diseases

There were a number of foliage diseases present on both conifer and deciduous trees,however,damage was slight. Foliage diseases occur from time to time and are sometimes spectacular but usually do not last for more than a year or two and the affected trees do not suffer permanent injury.

Mechanical Injury

Other factors detrimental to tree growth were noted in various parks. Most prominent was mechanical injury to the trees by machinery and persons using the parks. This type of damage leaves the tree susceptable to infection by severe disease organisms. Also, compaction of the soil around tree roots in areas of high use was evident. The results of this are lack of aeration for the root system and possible injury to exposed roots.

Winter drying of conifers has occurred in Bow Valley and Cypress Hills Parks during the past few years and has resulted in some mortality to lodgepole pine and white spruce in the Cypress Hills Park.

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C. R. Layton (Northeastern Alberta)

F. J. Emond (Northwestern Alberta)

L - Low
M - Medium
H - High

CAUSAL AGENT	Aspen Beach	Beauvais Lake	Big Hill Springs	Big Knife	Bow Valley	Bragg Creek	Crimson Lake	Cross Lake	Cypress Hills	Dilberry Lake	Dinosaur	Entrance	Garner Lake	Gooseberry Lake	Jarvis Bay	Kinbrook	Lac Cardinal	Little Bow	Little Fish	Long Lake
Poplar bud gall-mite (Aceria parapopuli)																M				
Black-headed budworm (Acleris variana)		L		L																
Gall aphids on conifers (Adelges spp)		M	L	L	M	L	M	L				L	L			M				L
Aphids			H	M	M	M			M				L	M		H				L
Ugly nest caterpillar (Archips cerasivoranus)																				
Birch skeletonizer (Bucculatrix canadensisella)																				
Large aspen Tortrix (Choristoneura conflictana)		M							M											
Spruce budworm (Choristoneura fumiferana)		H		L					L											
Leaf beetles (Chrysomela spp)																H		L		
Leaf tier (Compsolechia niveopulvella)				L																
Spruce cone worm (Dioryctria sp)				L																M
Gall mites (Eriophyidae)																H				
Grey willow leaf beetle (Galerucella decora)				L					L											
Blotch miners (Gelechiidae)							L		M											
Pine root collar weevil (Hylobius sp)									L		L					M				
Bark beetles (Ips sp)																		L		
Spruce seed moth (Laspeyresia youngana)									L											
Blister beetle (Lytta sphaericollis)																			L	
Forest tent caterpillar (Malacosoma disstria)				L											L					
Poplar vagabond gall (Mordwilkoja vagabunda)											L					M		M		
Sawfly (Nematus sp)													L						L	
Sawfly (Neodiprion sp)			L	L																
Spruce spider mite (Oligonychus ununguis)		H	H	L			L		L								L			H
Bruce span worm (Operophtera bruceata)																				
Spruce cone maggot (Pegohylemia sp)									L											
Poplar gall aphids (Pemphigus sp)				L				L		M	L		L		L	M	L	M		L
Pine needle scale (Phenecaspis pinifoliae)				M					L											
Poplar serpentine miner (Phyllocnistis populiella)		L				H						L								
Yellow-headed spruce sawfly (Pikonema alaskensis)								L					L							L
Engelman spruce weevil (Pissodes engelmanni)													L							
Larch sawfly (Pristiphora ericksonii)							L					L								L
Boxelder twig borer (Proteoteras willingana)																	L			
Leaf tier (Pseudexentera sp)																L				
Spruce bud midge (Rhabdophaga swainei)								L					L			L				
Poplar borer (Saperda calcarata)		L					L	L					L	L						
Leaf roller (Sciaphila duplex)				L																

L - Low
M - Medium
H - High

CAUSAL AGENT	PARK: Ma-Me-O Beach	Miquelon Lake	Moonshine Lake	O'Brien	Park Lake	Pembina River	Red Lodge	Rochon Sands	Saskatoon Island	Slave Lake	Taber	Thunder Lake	Vermilion	Wabamun Lake	Williamson	Willow Creek	Winagami Lake	Woolford	Writing-on-Stone
Poplar bud gall-mite (Aceria parapopuli)																			
Black-headed budworm (Acleris variana)					L														
Gall aphids on conifers (Adelges spp)			L	L	L		L		L			L		L	L	H			
Aphids	H		H	M	H	H	H	H	L	M		L		L	H	L	H	M	L
Ugly next caterpillar (Archips cerasivoranus)											L								
Birch skeletonizer (Bucculatrix canadensisella)				L											L		L		
Large aspen Tortrix (Choristoneura conflictana)									L		L								
Spruce budworm (Choristoneura fumiferana)																			
Leaf beetles (Chrysomela spp)				L					L										
Leaf tier (Compsolechia niveopulvella)																			
Spruce cone worm (Dioryctria sp)										L									
Gall mites (Eriophyidae)	H		L															M	
Grey willow leaf beetle (Galerucella decora)																			
Blotch miners (Gelechiidae)																M			
Pine root collar weevil (Hylobius sp)																			
Bark beetles (Ips sp)																			
Spruce seed moth (Laspeyresia youngana)																			
Blister beetle (Lytta sphaericollis)																			
Forest tent caterpillar (Malacosoma disstria)	L	L			L	L	L					L	L	L					
Poplar vagabond gall (Mordwilkoja vagabunda)																			
Sawfly (Nematus sp)										H				L					
Sawfly (Neodiprion sp)	L					L													
Spruce spider mite (Oligonychus ununguis)	L		L	L	L	L									L		L		
Bruce span worm (Operophtera bruceata)			L						L										
Spruce cone maggot (Pegohylemia sp)																			
Poplar gall aphids (Pemphigus sp)			L						M						L	M	M		
Pine needle scale (Phenacaspis pinifoliae)																			
Poplar serpentine miner (Phyllocnistis populiella)																			
Yellow-headed spruce sawfly (Pikonema alaskensis)				L		L								L			L		
Engelman spruce weevil (Pissodes engelmanni)												L							
Larch sawfly (Pristiphora ericksonii)																			
Boxelder twig borer (Proteoteras willingana)											M								
Leaf tier (Pseudexentera sp)									L										
Spruce bud midge (Rhabdophaga swainei)					H					L									
Poplar borer (Saperda calcarata)		L					M		L		H	L							
Leaf roller (Sciaphila duplex)															L				

L - Low
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CAUSAL AGENT	Aspen Beach	Beauvais Lake	Big Hill Springs	Big Knife	Bow Valley	Bragg Creek	Crimson Lake	Cross Lake	Cypress Hills	Dilberry Lake	Dinosaur	Entrance	Garner Lake	Gooseberry Lake	Jarvis Bay	Kinbrook	Lac Cardinal	Little Bow	Little Fish	Long Lake
Apiosporina witches broom (Apiosporina collinsii)				L					M											
Dwarf mistletoe (Arceuthobium americanum)									L											
Shoestring root rot (Armillaria mellea)					M		M		L			L								
Atropellis canker (Atropellis piniphila)							L		L											
Yellow witches broom of spruce (Chrysomyxa arctostaphyli)				L								M								
Spruce cone rust (Chrysomyxa pirolata)								L	L											
Spruce needle rust (Chrysomyxa weirii)							M													
Poplar ink spot (Ciborinia whetzelii)												L					L			
White pine blister rust (Cronartium ribicola)		H																		
Cytospora canker (Cytospora chrysosperma)	L			L										L	L		L			
Pine needle cast (Elytroderma deformans)					M	M														
White trunk rot (Fomes igniarius)							H	H												
Pine needle cast (Hypodermella concolor)					M				L											
Pine needle cast (Hypodermella montana)		L																		
Hypoxylon canker (Hypoxylon pruinatum)		L					L	L							L					
Balsam poplar leaf blight (Linospora tetraspora)							L													
Spruce needle cast (Lophodermium macrosporum)																				
Poplar leaf spot (Marssonina tremuloides)			L																	
Willow leaf rust (Melampsora epitea)					M												L			
Western gall rust (Peridermium harknessii)					L															
Powdery mildew (Uncinula salicis)																	M			
Shoot blight of balsam poplar (Venturia populina)			L									L					L			
Aspen shoot blight (Venturia tremulae)							L													
Birch die-back								L												
Mechanical damage																	L			
Mortality due to age, site conditions, drought									L				L				L			
Soil compaction																	L			
Winter drying of conifers "Red belt"					M				M											
Other chemical injury					L-M															

L - Low
M - Medium
H - High

CAUSAL AGENT	Ma-Me-O Beach	Miquelon Lake	Moonshine Lake	O'Brien	Park Lake	Pembina River	Red Lodge	Rochon Sands	Saskatoon Island	Slave Lake	Taber	Thunder Lake	Vermilion	Wabamun	Williamson	Willow Creek	Winagami Lake	Woolford	Writing-on-Stone
Apiosporina witches broom (Apiosporina collinsii)																			
Dwarf mistletoe (Arceuthobium americanum)										L									
Shoestring root rot (Armillaria mellea)							M												
Atropellis canker (Atropellis piniphila)																			
Yellow witches broom of spruce (Chrysomyxa arctostaphyli)							M			L									
Spruce cone rust (Chrysomyxa pirolata)										L									
Spruce needle rust (Chrysomyxa weirii)			L	L												L		L	
Poplar ink spot (Ciborinia whetzelii)	L		L																
White pine blister rust (Cronartium ribicola)																			
Cytospora canker (Cytospora chrysosperma)			L	L				L	L	L			L						H
Pine needle cast (Elytroderma deformans)																			
White trunk rot (Fomes igniarius)	H						L			H									
Pine needle cast (Hypodermella concolor)																			
Pine needle cast (Hypodermella montana)																			
Hypoxylon canker (Hypoxylon pruinatum)					L	L					L								
Balsam poplar leaf blight (Linospora tetraspora)			M	L				L								L		L	
Spruce needle cast (Lophodermium macrosporum)							L												
Poplar leaf spot (Marssonina tremuloides)																			
Willow leaf rust (Melampsora epitea)				L				L								L	L	L	
Western gall rust (Peridermium harknessii)																			
Powdery mildew (Uncinula salicis)																			
Shoot blight of balsam poplar (Venturia populina)			M																
Aspen shoot blight (Venturia tremulae)			L										L				L		
Birch die-back																			
Mechanical damage	L	L	L		L			L			L	L	M					L	
Mortality due to age, site conditions, drought							L			L									M
Soil compaction			L		L		L	L										L	
Winter drying of conifers "Red belt"																			
Other chemical injury																			