



Tree Pests

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About Us

Trees are our
Passion

ATTS Group Inc- Yard Whispers is a leading tree, forestry and agroforestry **consulting company** that provides services for sustainable management of trees/forest on public and private lands

We offer services to:

- ❑ Residential and commercial business
- ❑ Golf course industry
- ❑ Municipal governments
- ❑ Parks and campgrounds
- ❑ Urban developers
- ❑ Legal and regulatory bodies
- ❑ Educational institutions
- ❑ NGO – provincial, national and international

Yard Whispers is a **wholly owned subsidiary of** **ATTS Group Inc**

Key Messages

- ▶ Treatment without diagnosis is malpractice
- ▶ Diversify your property by planting variety of trees and shrub species
- ▶ Most of insects, fungus, wildlife, virus and bacteria's are beneficial
- ▶ Understand and recognize difference between symptoms vs cause
- ▶ Do not use any chemicals if possible - use them as last resource
- ▶ Do not panic but monitor, monitor, monitor
- ▶ Diseases are very difficult to control
- ▶ Environmental issues are very difficult to diagnose BUT most of time **AVOIDBALE**
- ▶ Pruning is one of tools to mitigate pest problem
- ▶ Educate/learn about pests



Photo by: Terry Krause

Diversity at Terry Krause place 64 species

Prairie Fire Crab	Snow Sweet Apple	Rescue Crab	Mock Orange
Brooks Poplar	Okanese Poplar	Northwest Poplar	Green Giant Poplar
Pembina Plum	Brookred Plum	Double Flowering Plum	Elderberry
Lodgepole Pine	Mugo Pine	Common Lilac	Vilosa Lilac
Red Osier Dogwood	Yellow Dogwood	Variiegated Dogwood	Red Elder
Nanking Cherry	Evans Cherry	Carmine Jewel Cherry	Cupid Cherry
Crimson Passion Cherry	Romeo Cherry	Juliette Cherry (all Romance Series but Carmine Jewel)	
Western Chokecherry	Western Sandcherry	Mayday	Red Maple
Highbush Cranberry	Snowball (vibernum)	Rowen Berry	Mountain Ash
White Spruce	Alberta Spruce	Balsam Fir	Bird's Nest Spruce
4 Juniper Species	Native Gooseberry	Hedge Rose	American Elm
Laurel Leaf Willow	Sharp Leaf Willow	Siberian Larch	Green Ash
Manitoba Maple	Red Maple	Saskatoon (smoky)	Siberian Elm
Black Currant (Ben Nevis)	Red Currant	5 Honeyberry Species (tundra, aurora, borealis +	
Raspberry - Boyne	Raspberry – Red Mammoth	Paper Birch	Pussy Willow
Bur Oak	Hazelnut	Cotoneaster	Forsythia

Protect natural woodlots, wetlands and prairie



Beneficial insects, fungus, bacteria and virus

99 % are beneficial



Ground beetle



Bumblebee



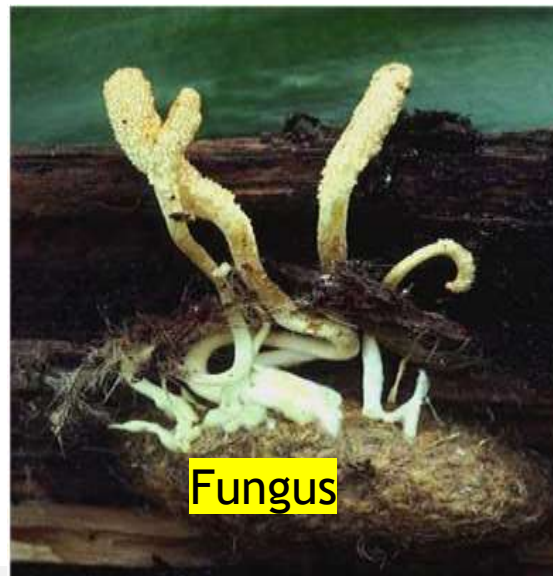
Tachinid fly



Tachinid fly



Wasps



Fungus



Bacillus thuringiensis
killed

healthy
Silkworm larvae

Symptoms vs Cause



Winter burn



Chemicals -
aerial spraying



Insect - Leaf roller



Fungus -Cytospora



Woodpecker



Porcupine



Fungus



Fireblight - Bacteria



Salt

Surrounding site assessment

- Salt on road may drain into trees
- Competition from mature trees
- Crop spraying
- Livestock damage (urea, browsing, compaction,)
- Roots damage
- Age of forest
- No understory vegetation due to grazing
- Wildlife in the area
- Drought on aspen
- Chemical use on the lawn
- Nutritional issues- change in color
- Soil compaction and other soil issues



The Bad/Very Ugly

Pest: Any unwanted or destructive organism that ranges from insects, fungi, plants, bacteria, viruses, etc.



MPB



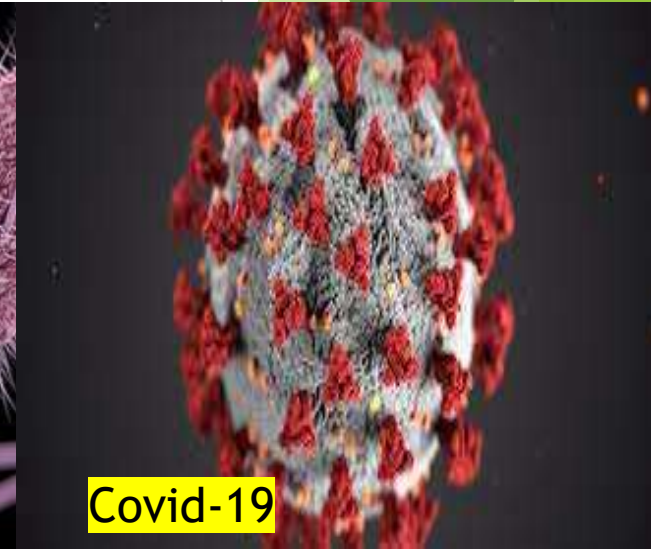
Nodding thistle



Armillaria root rot



Salmonella



Covid-19

What to look for - close inspection

Leaves



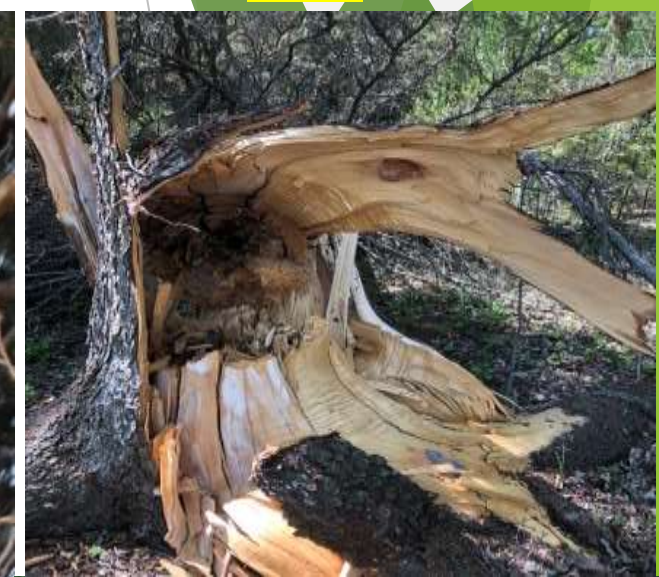
Needles



Trunk



Roots



Spruce Budworm



Time of year: late May to June

Symptoms: Rusty shoots usually on top, frass, webbing, defoliation. Feed on old needles first than on new growth. Wasteful feeder

Control Method:

- Hand picks for small trees.
- Sprays include biological insecticide such as *Bacillus thuringiensis* var *kurstaki* (Btk)
- variety of chemical insecticides (malathion).

Spruce Sawfly (yellowhead and European)



Host : spruce

Time: Larvae feed on bud needles until late June or July.

Symptoms: Defoliation of buds, presence of S-shaped worms, frass, etc.

- They feed in groups, after 5-6 years of defoliation it can kill tree

Control Method:

- Remove larvae by hand, squish with gloves.
- Chemical insecticides may be used for severe outbreaks. Use Malathion
- Insecticide application should be made when damage is first noted.

Aphids

- ▶ All different shapes and colours
- ▶ sucking the sap from leaves, causing them to turn yellow, curl or become deformed and eventually fall off
- ▶ Extract sticky honeydew
- ▶ Aphids attract the ants to protect them which can be nuisance
- ▶ Population grow rapidly and there are several generations
- ▶ **Control:**
 - ▶ Soak them high pressure water- they don't like water, cold weather, rain
 - ▶ Natural predators like lady beetles, lacewings and others
 - ▶ Insecticide soap, horticultural oil, dormant oil and
- ▶ Insecticides registered for control of aphids include: malathion, diazinon, dimethoate, permethrin and pirimicarb.
- ▶ Before applying any insecticide check for predators, the amount of aphid damage and make sure the insecticide is not toxic to the plant.



Spruce Spider Mite



Time: Late May to September

Symptoms: Webbing & discolored needles. Early damage is noticeable in lower branches (yellow colours) and then it spread in upper branches. Adults and nymphs pierce the needles and suck the sap.

Control Methods:

- Usually, natural predator's control mite population
- Heavy rain or soak with water, soapy water or insecticides (miticide) as well heavy wind.
- Encourage beneficial such as Predatory mites (*Typhlodromus*) or Lady beetles

White pine weevil (mostly on spruce)



- ▶ **Time:** Mid-May to June or July
- ▶ **Symptoms:** Wilting leaders with small holes in stem
- ▶ **Control Method:**
 - ▶ Prune in July
 - ▶ It will not kill tree but usually tree will have split tops
 - ▶ Infected leaders should be cut back at the level of the topmost whorl of unaffected branches.
 - ▶ New leader will form following year.
 - ▶ There is very few chemicals to control

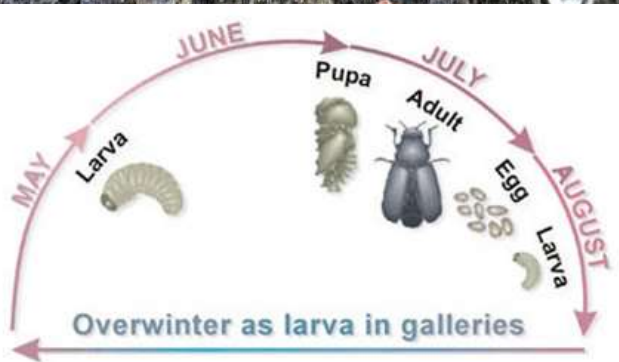
Mountain Pine Beetle (MPB)

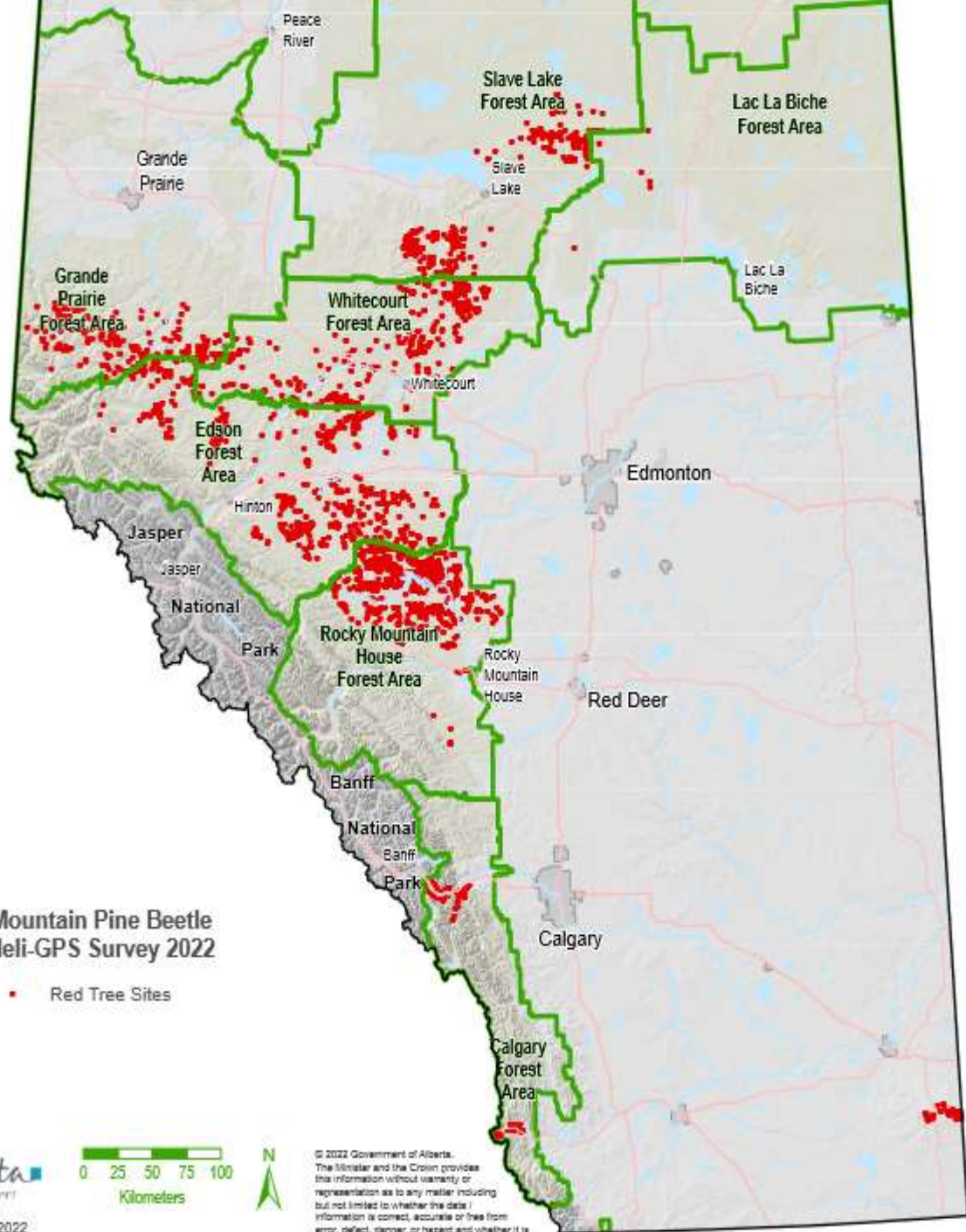


Time: Late May and June

Symptom: Yellow / red needles (July & August), trunk redness, pitch tubes, J-shaped galleries.

Control: Anti-aggregation - pheromone “verbenone” or trap logs, but best to remove tree and burn it.





Spruce Beetle

Time: Late May and early June

Symptoms: Entrance holes on lower stem, late May to June. trunk redness, some pitch tubes, sawdust. Foliage yellowish green over winter and needles drop in the following summer.

Impact: Transmits blue-stain fungus and kill tree within 2-3 years.

Control: Remove dead trees, burning infested trees



Spruce Engraver - Ips

Time: Late May and early June

Symptoms: Entrance holes on lower stem, late May to June.
Characteristic galleries
Piles of sawdust on trunk and branches

Impact: Transmits blue-stain fungus and kill tree within 2-3 years.

Control: Remove dead trees, burning infested trees



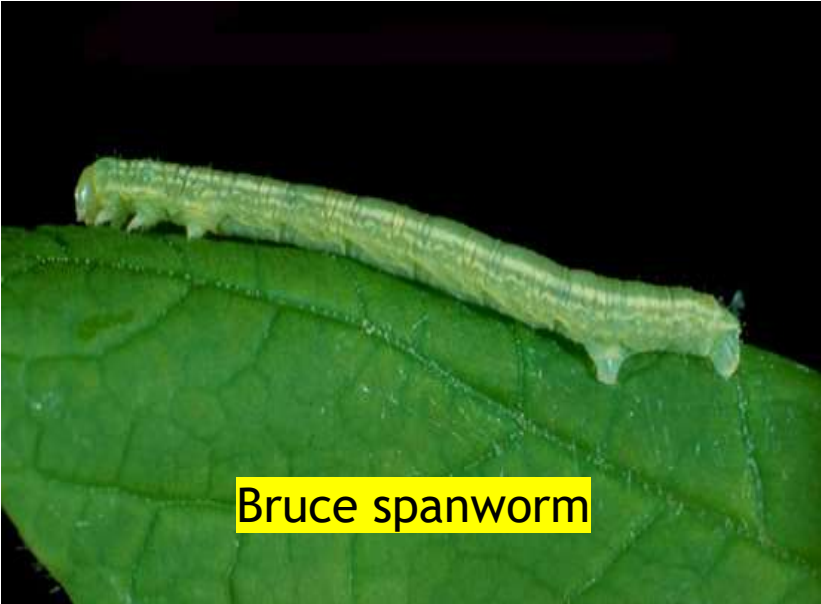
Galls - just cosmetics



Defoliators on hardwoods



Forest Tent Caterpillar



Bruce spanworm



Fall webworm



Large aspen tortix



Aspen leafroller



Cankerworm

Linden looper

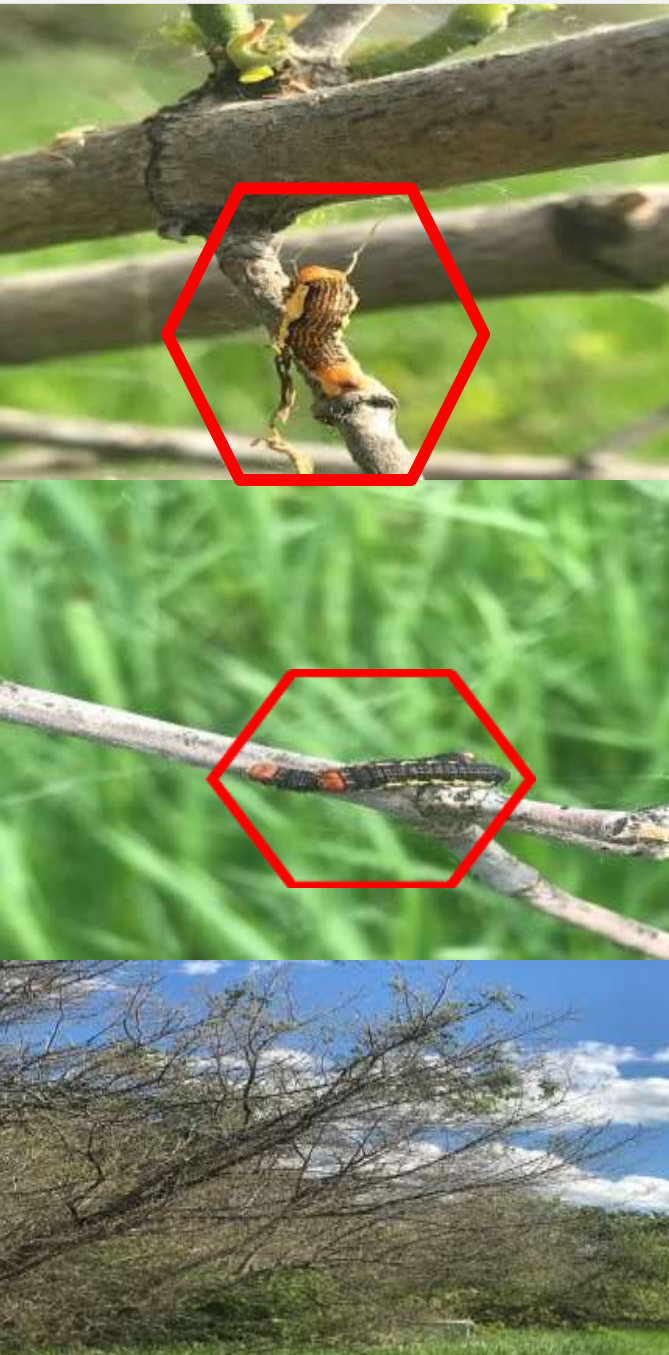
Hosts: Maple, elm, oak, linden, apple, birch, American plum and

Time: Early May till early July

Symptoms: Defoliation & no visible silk

Control Method: Sprays include biological insecticide such as *Bacillus thuringiensis* (Bt) in early larvae stage

Banding - In late September, before adult emergence, a 10 cm band of paper-backed insulation or cotton batting and tar paper (paper side out) is attached to the tree at a one meter height. A thin layer of sticky adhesive (Tanglefoot®) is applied to the band.



Willow leaf blotch miner

▶ **Host:** All willow species but prefer native willows

▶ **Time:** June and July

▶ **Symptoms:** Blotches on leaves and larvae will be visible inside the leaf if you expose leaf against light

▶ **Control Method:**

- ▶ Cosmetic pest
- ▶ It will not kill tree or shrubs.
- ▶ Water trees during dry periods to keep them healthy.



Oystershell scales

Cotoneaster, dogwood, fruit trees, lilac, ash, maple, dogwood, poplar, and willow.



- ▶ Time : early June
- ▶ Symptoms:
 - ▶ oyster-shaped “shells” cover bark on shrubs and trees
 - ▶ Reproduce mid June and eggs hatch “crawlers” that move to new position
 - ▶ Pierce bark and feed on “ fluids’ on twigs
 - ▶ Serious problem to cotoneaster.
- ▶ Control (in early spring/ June)
 - ▶ Apply a Horticultural Oil
 - ▶ ladybugs (lady beetles), lacewings and other natural predators
 - ▶ Pruning to the ground of infested branches

Insect management

- ▶ Do not panic- most of insects are beneficial insects
- ▶ **Monitoring, monitoring, monitoring and deal from the start - do not wait**
- ▶ Encourage beneficial wildlife
- ▶ Learn about major insect
- ▶ Insects usually are indicator of overall health issues with trees -weaken trees are more susceptible
- ▶ Use chemicals as last resort



Tree Diseases

Needle Cast

(Rhizosphaera, Stigmina and Lophodermium fungus)

▶ **Time:** Spring to Fall

▶ **Symptoms:**

- ▶ 2nd year needle discoloration in spring or early summer,
- ▶ black spotting (use magnifying glasses to see it)
- ▶ Interior needle drop
- ▶ Infestation starts in lower branches

▶ **Control Method:**

- ▶ It is cosmetic pest and rarely kill branch or tree
- ▶ Prune dead branches to increase air circulation
- ▶ Fungicides can be applied to high value trees.



Cytospora Canker

(wide range of tree and shrub species)



▶ **Time:** Spring to Fall

▶ **Symptoms:**

- ▶ spread by rain, wind or animals
- ▶ Infestation starts in lower branches
- ▶ Interior needle drop, whole branch dead

▶ **Control Method:**

- ▶ Prune dead branches to increase air circulation late in winter
- ▶ Do not prune during wet and rain period
- ▶ Sterilize pruning tools after every cut

Fire Blight (bacteria)

Infects: apples, pears, hawthorns, mountain ash, cotoneaster



► **Time:** Growing season with warm temperatures (24-28° C) and high. Fire blight can become very severe following hailstorms.

► **Symptoms:**

- Burnt colour of foliage, dieback, black colour cankers on stem and trunk
- amber-colored droplets of bacterial ooze

► **Spread by wind, insects, wind and improper pruning**

► **Control Method:**

- Pruning and removal of infected material with sterilized pruners at least 2 feet below
- Remove entire infected material and do not leave site

Black Knot (fungus)



- ▶ **Time:** Infection occurs during spring and growing season- spread by air, rain and human improper pruning
- ▶ **Symptoms:** Black swellings on branches
- ▶ **Control Method:**
 - ▶ Pruning - preferable January till end of March.
 - ▶ Cut at least 12 inches below infected branch
 - ▶ It is important to carefully sterilize pruners between every cut.
 - ▶ **DO NOT PRUNE** during growing season

Bronze Leaf Disease -BLD



- ▶ Aspen, Swedish poplar, towering poplar
- ▶ Spores are dispersed from April to June when temp are around 18 C with lot of rainfall ... Symptoms are visible in late August and early fall
- ▶ Control: Remove and destroy fallen leaves if possible.
- ▶ Prune to remove dead branches 12 inches below disease and increase air circulation; sterilize pruning equipment after every cut
- ▶ DO NOT chip, compose or use this material for firewood - put in landfill in plastic bag or BURN immediately
- ▶ Avoid dense plantings that can reduce air flow.
- ▶ Avoid using monocultures

Disease management

- ▶ Harder to determine - most of the time you need lab results
- ▶ Alberta Plant Health Lab provides services to municipalities to ID tree disease issues - contact your county to send samples
- ▶ Very little can be done to control -except pruning, removing leaves, cutting entire tree
- ▶ Very few chemicals that can be use - most of the time; timing is big issue

Drought - What is it?

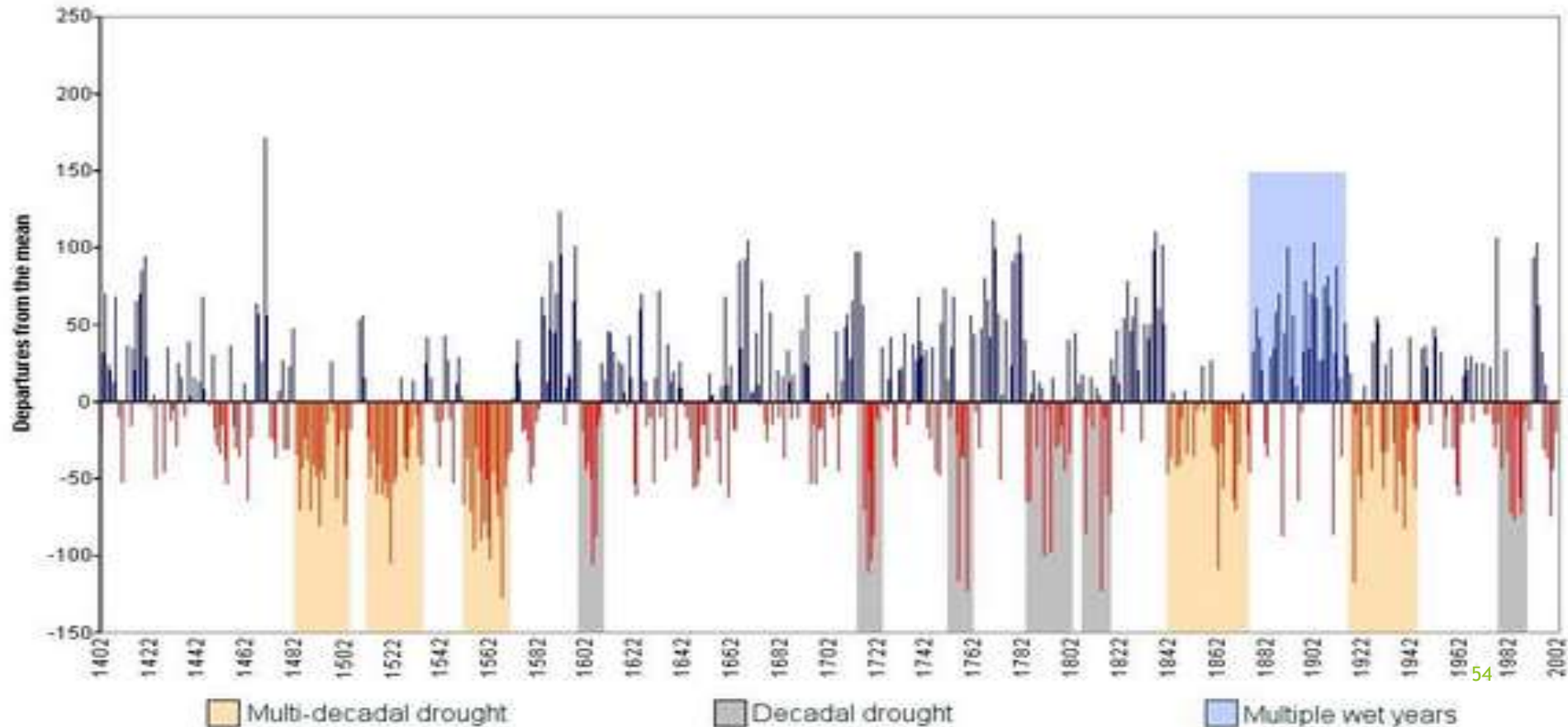
Definition: Drought is defined as a shortage of precipitation over an extended period, usually a season or more, resulting in insufficient water availability that adversely impacts vegetation, animals and people

Source: [NRCan - Government of Canada](#)



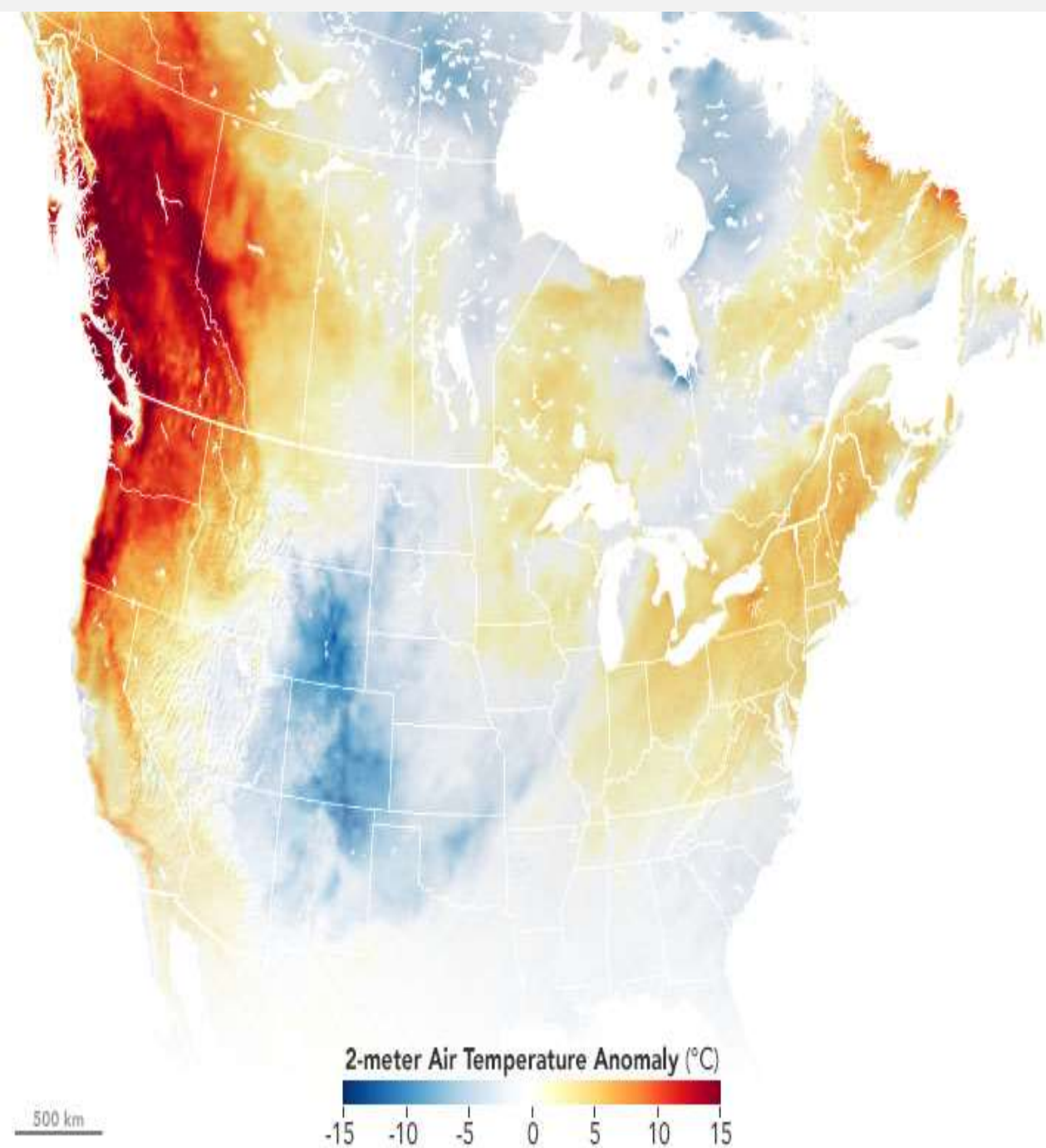
History of Drought in prairie provinces - Dendrochronology

Figure 1: Drought Frequency and Severity for the Prairie Provinces (1402 – 2002)

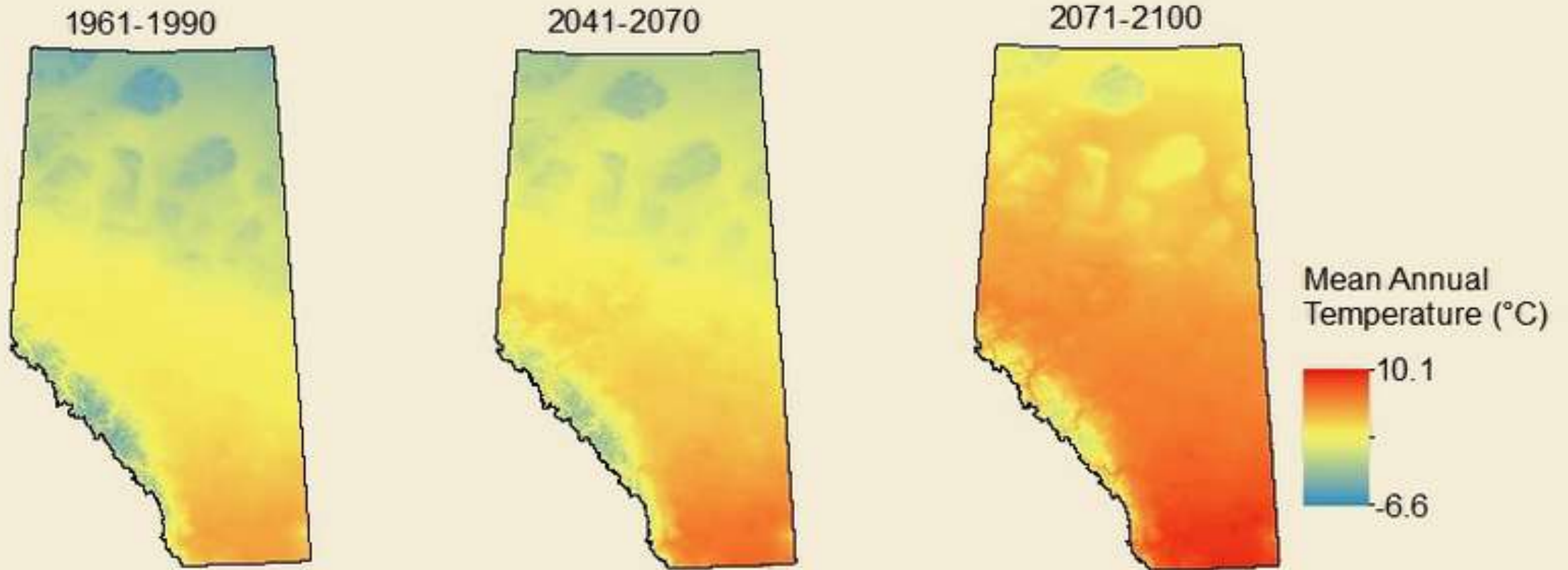


Heat Dome 2021

- ▶ In Alberta, the highest heat was observed in the period from June 29 to July 1.
- ▶ Banff 37.8 °C Beaverlodge 40.5 °C Cochrane 35.0 °C Fort McMurray 40.3 °C
- ▶ Jasper 41.2 °C Grande Prairie 41.5 °C Hendrickson Creek 38.3 °C , Nordegg 37.2 °C
- ▶ The strongest heat ever measured in these communities, most after breaking all-time records of the previous day
- ▶ Edmonton also saw temperatures approach the absolute maxima - the city centre registered 37.0 °C on June 30
- ▶ **Source:** NASA Earth Observatory image of temperature anomalies on June 27th, 2021 compared to 2014-2020 average for the same day during the 2021 western North America heat wave



Temperature changes



What to look for - Symptoms



Leaves



Needles



Trees



Symptoms of Drought

- ▶ Temporarily and permanent wilting of leaves
- ▶ Lighter green to **yellow-green foliage**,
- ▶ **leaf scorch around the margins- marginal leaf scorch**
- ▶ **Leaves cupping, curling, rolling, leaf scorch**
- ▶ **In coniferous leaves yellowing and browning needle tips**
- ▶ Leaves dropping them prematurely/ leaves shedding
- ▶ Cracks on bark
- ▶ Thinning foliage and increase number of dead branches in canopy
- ▶ Small leaves
- ▶ Dieback on tree crown
- ▶ More susceptibility to insect and disease attack
- ▶ Dead trees

What is cause ?



Long Term Impact of Drought

Wood borers

Cankers

Drought

Stressed trees

Mortality

Defoliators

Root rot



Contributing factors to mortality

Salt

Improper
planting

Drought

Stressed
trees

Soil

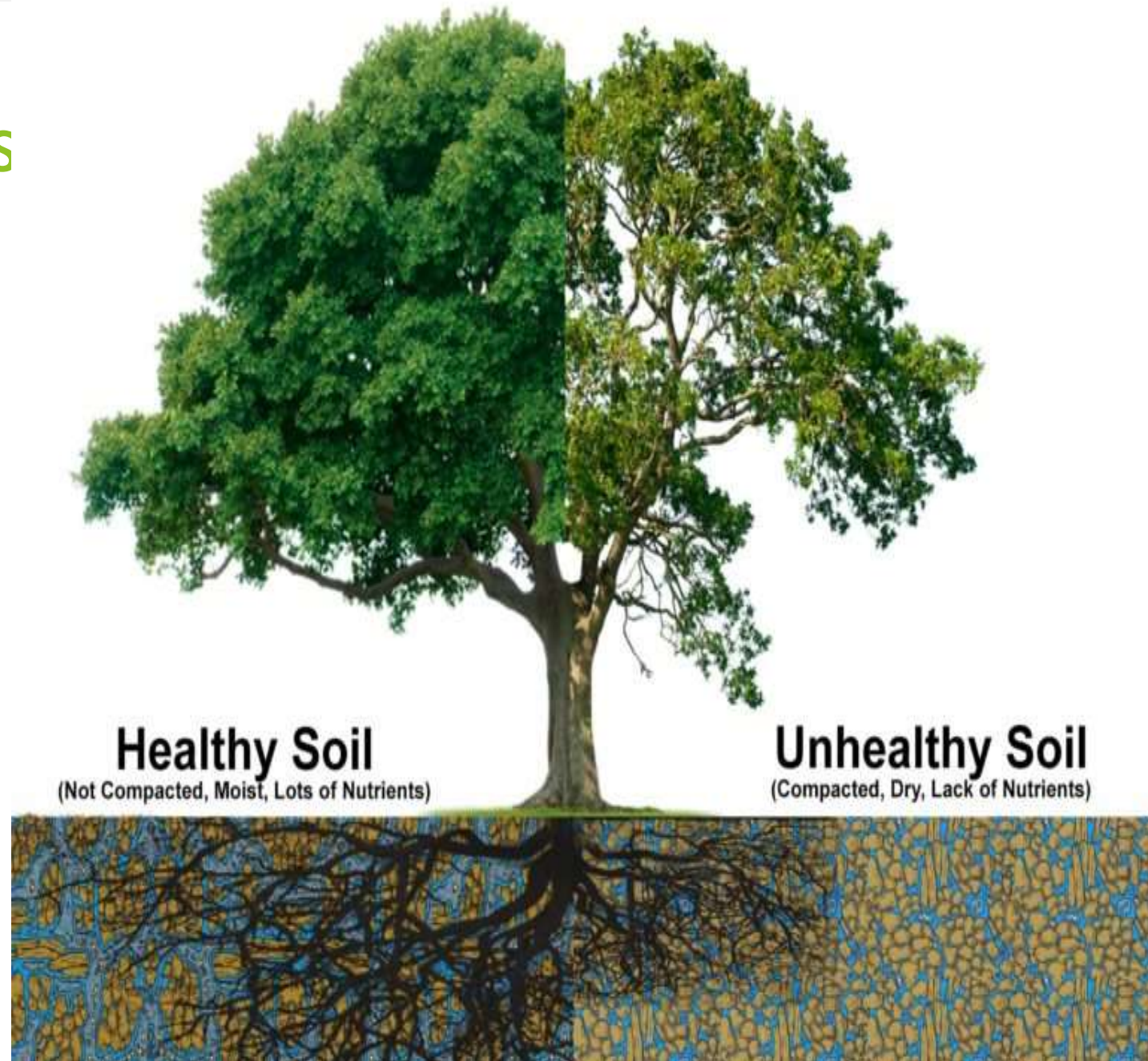
Mortality

Weather



Soil Drought and Trees

- ▶ **Dry soil kill small fine roots (most important roots)**
- ▶ Surface soil moisture is the water that is in the upper 10 cm of soil, whereas root zone soil moisture is the water that is available to plants—generally considered to be in the upper 200 cm of soil.
- ▶ When the amount of water in the soil decreases it gets increasingly difficult for the roots to provide water to the plant and compensate for the simultaneous loss of water from the leaves.



Winterkill/Sunburn

Time:

- Usually, trees get red above snowline
- Browning is noticeable in late winter
- Damage in cold winter with little or no snow

Control:

- Watering in early spring and before freezing
- Mulching around trees
- Avoid planting trees next to building or reflective surfaces
- Consider fertilizing trees following harsh winter conditions
- Do not wrap evergreens
- Avoid planting sensitive trees on south/SW exposure



Winterkill



Road Salt injury



Tree buried in snow and salt



Herbicides

▶ Common herbicide mistakes

- ▶ Direct spraying damage
- ▶ Drifts and vapor inversion uptake
- ▶ Root absorption/uptake: by weed and feed fertilizer

Symptoms

- **Deformed foliage:** leaf cupping, curling, twisting, Twisted, curled or stunted stem and branch growth
- Clusters of stunted shoots or leaves
- **Discolored foliage:** yellow, reddish, purplish,
- **Leaf scorch** (leaf edges turn tan to brown), or complete browning and death of leaves
- **Defoliation** (leaves or needles drop)
- **Branch dieback** or death of entire tree



Cupping



Aerial spraying



Twisting



Animal damages

- ▶ Barking - the outer protective layers away.
- ▶ Browsing - eating buds, foliage and shoots
- ▶ Budding - feeding on buds and emerging foliage.
- ▶ Clipping - severing shoots, stems and roots.
- ▶ Pulling - extracting seedlings from the ground,
- ▶ Rubbing - damaging the branches or main stem tree.
- ▶ Trampling -- bruising or crushing seedlings.





Yellow-bellied Sapsucker

- ▶ **Time:** April - September
- ▶ **Symptoms:** Wilting top, dieback, gallery on trunk and branches.
- ▶ **Control Method:** Protected under the “Migratory Birds Convention Act” so best to deter. Putting old CD discs, noise, sounds of predators.
- ▶ **Note:** Hummingbirds rely on spring sap!



Ungulates

Time: Winter - year round

Symptoms: Browsing damage, twigs and branches broken

Control Method:

- Fencing,
- early discouragement, repellants
- invite hunters



Porcupines

- ▶ **Time:** Winter
- ▶ **Symptoms:** Extensive gnawing of branches, twigs and bark.
- ▶ **Control Method:** Monitor often if damage occurs consider repellents, exclusion fences or removing offender.
- ▶ *It is illegal to poison porcupines in AB.



Voles

Control

- Metal mesh around tree
- Blend hottest peppers with onion- be careful with pets



Mechanical injuries



Environmental issues- management

- ▶ Sometimes very difficult to diagnose -it almost always combination of few things at same time
- ▶ **Drought** - watering during dry year not just young trees but also mature spruce trees
- ▶ **Chemicals** - try to avoid as much as possible
- ▶ **Salt** - try not to use in shelterbelts near roads
- ▶ **Winterkill** - nothing you can do
- ▶ **Compaction** - aerate soil before planting, remove livestock around trees, make room for roots to grow
- ▶ **Animals** - remove livestock around trees while with wildlife deal on individual wildlife species issues

Helpful Hints

- 1) **Don't Panic!** Not all critters you see are harmful, most are quite helpful. Take some time to learn about them.
- 2) Monitor & Survey Trees Often
 - ▶ Prune off dead or dying branches or stems. Prune properly! Sterilize pruners before, after and between different trees. Bleach & water or alcohol works!
- 3) Diagnose the problem:
 - ▶ Stand Characteristics (# trees, type of tree, age)?
 - ▶ Location (near road, drainage ditch)?
 - ▶ Recent Climatic Event (storm, hail, frost)?
 - ▶ Is there a stand characteristic that could affect the trees (eg. high water table, dense planting)?
 - ▶ Damage Characteristics? What are affected? Trunk, foliage, branch, root, leader, cones, etc)
- 4) Hit the books

INSECT PESTS of the PRAIRIES

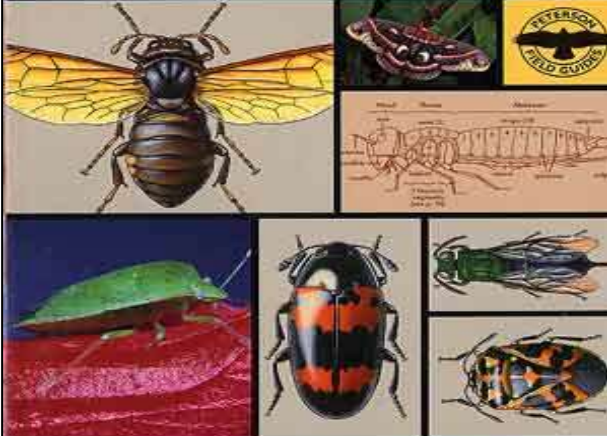
Hugh Kelly & Elmer Waggoner



University of Alberta

PETERSON FIELD GUIDES

Insects



Donald I. Borror/Richard E. White

LONE PINE • FIELD GUIDE

BUGS of ALBERTA



John Acorn
Ian Sheldon

A field guide to FOREST INSECTS AND DISEASES OF THE PRABIE PROVINCES

By Thomas C. Brink and P. C. Cole
Second Edition



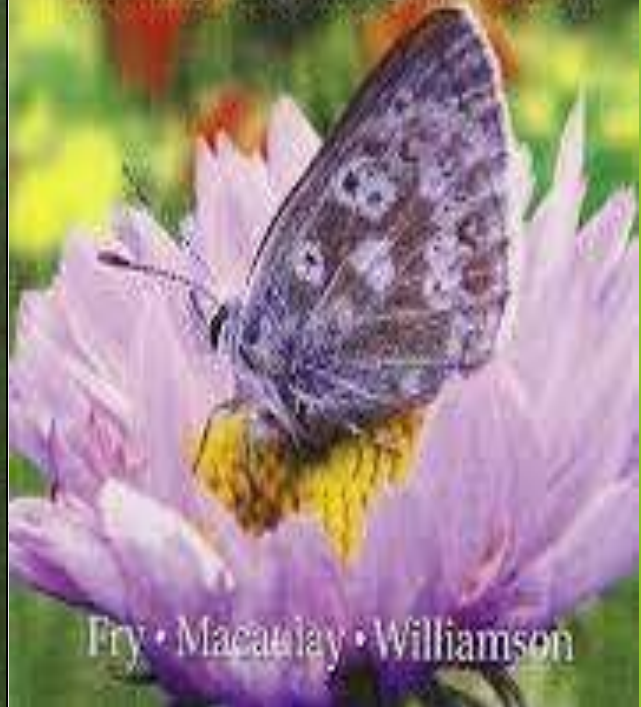
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LONE PINE

Garden Bugs of Alberta

Gardening to Attract, Repel and Control



Fry • Macaulay • Williamson

Treatment options

- ▶ **Cultural treatment** - pruning, fertilizing, watering, and keeping trees overall healthy - this is most common and many times ONLY options to keep your trees alive
- ▶ **Physical treatment** - physical removal and destruction of insects, or diseases. This include hand picking, using high pressure water jets, water soaking, putting barriers, pruning and removal of weeds
- ▶ **Biological treatment** - natural enemies of pest such beneficial insects, bacteria's, fungus and viruses. This also include birds, rodents and other insects eating animals. Bacterium called *Bacillus thuringiensis* Kurstaki (Btk) is very common biological agent to control variety of caterpillars
- ▶ **Chemical treatment** - there are variety of insecticides and fungicides that are available BUT key thing to consider :
 - ▶ Safety, timing, application rates, toxicity, equipment, etc



Key Messages

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- ▶ Diversify your property by planting variety of trees and shrub species
- ▶ Most of insects, fungus, wildlife, virus and bacteria's are beneficial
- ▶ Understand and recognize difference between symptoms vs cause
- ▶ Do not use any chemicals if possible - use them as last resource
- ▶ Do not panic but monitor, monitor, monitor
- ▶ Diseases are very difficult to control
- ▶ Environmental issues are very difficult to diagnose BUT most of time **AVOIDBALE**
- ▶ Pruning is one of tools to mitigate pest problem
- ▶ Educate/learn about pests



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<https://yardwhispers.ca/blog/>

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