



The Verdant Element

TREE ASSESSMENT TIME

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Trees are the trademark of living in the Lakeland. The best part of travelling from southern Alberta to the north is the appearance of trees on the landscape. The Lakeland is part of the boreal forest. The boreal is circumpolar as it encompasses Canada, Russia, Sweden, Norway, China and several other countries. Globally, the boreal zone is 1.9 billion hectares; which is 14% of the Earth's landmass. Canada contains 28% of the Earth's boreal zone which is the equivalent to roughly 552 million hectares (Natural Resources Canada, www.nrcan.gc.ca/forests/boreal). Not all of the zone is forested as it includes mountainsides, rivers, lakes and wetlands. It is home to many people, and an extensive range of mammals, insects, fungi and micro-organisms. The boreal is constantly changing due to forest fires, insects and disease. These natural disturbances are required to rejuvenate the forest, allowing for a new generation of plant species to succeed.

Trees provide numerous benefits to the landscape from providing habitat to wildlife, preventing erosion and increasing snow capture, stabilizing soil structure, providing a windbreak to homes and for livestock to adding natural beauty in a yard site. Many people in the past few years have noticed that several of their tree species have visible issues. Not all are due to bugs and disease, but rather have more to do with winter desiccation, salt, frost and moisture issues. Vigilant inspections can help you assess and properly diagnose and treat your trees so that they will last for years to come. Winter damage can occur on a small area of the tree, consisting of a few branches, but can affect the entire tree altogether. Even after losing most of it's needles or leaves, the tree can still survive, taking several years to recover.

Proper scouting is important so that you are not doing more harm than good. Many insect species are beneficial to your tree and by spraying chemicals such as malathion, you are removing the trees

Tree Assessment Continued

natural protectors and could be opening up your tree to detrimental species, as well as killing all the pollinators in the

process.

Winter injuries can severely impact your trees, especially coniferous varieties. These can include winter desiccation, sunscald and temperatures.

Winter desiccation can damage or even kill your conifers. It is caused when too much moisture is lost through the needles into the air and the water loss is not replaced by the frozen root system.

Sunscald is caused with winter temperature fluctuations damaging the bark of the tree. This damaged bark becomes an entry point for insects and disease. This usually affects younger trees including species of fruiting trees, ash, oak, birch and willow.

Fluctuating temperatures have a much greater effect on trees than long cold winters. As well as dry soils are more damaging to roots, as well as winters with very little snowfall. Winter root damage symptoms usually become visible the following summer when trees can suddenly turn brown and die.

To ensure trees are healthy and to prevent winter injury make sure that you provide them with enough moisture. Fertilizer is also very beneficial, but it is nutrition not a medicine. Water evergreens in the fall, this is when it is most beneficial to prevent winter injury. However also watering in the spring will help trees recover. Use mulch (2-5 inches thick) to help keep moisture around the trees in the root zone, or have your trees planted in a “well” where they can get sufficient moisture. If you are going to fertilize the trees do so in the spring, and no later than July 1st. Do not wrap evergreens in burlap or plastic for the winter as this can make the temperature fluctuate with sunny days and take them out of a dormant state. If you do have small trees that you wish to protect, ensure that there is adequate snow coverage instead.

You do not need to be an expert in trees. If you have questions, found an interesting insect or diseased branch, don't hesitate to give us a call at LARA and we will assist you in identification and advice.

Silvopasture ~

Agroforestry & Woodlot
Extension Society

Silvopasture: What Is It?

The formal definition from the Ministry of Agriculture in British Columbia (there is none in Alberta) is the following: Silvopasture is an agroforestry system that intentionally blends management of trees, forages, and livestock such that:

- The interactions among these components are planned and managed.
- The system is operated for and evaluated as a single enterprise rather than as separate parts. (1)

Based on the definition, practicing silvopasture involves producing multiple crops on the same parcel of land. These crops are usually some type of forage crop, woody species usually trees and cattle. The two key words in the definition are **management** and **single enterprise**.

In Alberta there are many landowners that have parcels of land that have both cattle and trees on them; but not very many are intentionally managed together. In actual fact, most of the land where they both exist is being used as pasture land and cover for the cattle, comes at the detriment and loss over time of the others (typically woody or tree species).

Many landowners have maintained residual forested lands as a form of protection or shelterbelt for their livestock and have allowed “free-rein” to the animals in those areas. This is not management of the land and multiple crops, but a management of a single crop being the cattle.

Other situations where some of the area has also been cleared sufficiently to allow removal of natural or mixed hay crops when not used for grazing the cattle; this would be management of forage crops and not the multiple crop approach.

The most severe impact or complete loss of the trees or forested land is a result of the “free-rein” approach to cattle grazing on these lands. The effect is the same if it is residual forested lands, or planted shelterbelts. The impacts to the non-managed lands from a forest or “silvo” standpoint is reduction in regeneration capability, compaction of soils and eventually severe effects on the growth pattern of the trees. In the long term, these impacts undermine the woody component of a potential silvopasture system.

The alternative to the majority of the practice in Alberta is to manage for multiple crops by moving away from the “free-rein” approach for the cattle. One silvopasture approach that has shown promise is rotational grazing and cropping while also conducting cleaning and maintenance work on the same parcel of land when the cattle are not using it. Removing the cattle for periods of time or modifying herd size allows for some natural regeneration to occur for some species (like aspen and poplar and possibly white spruce) and also reduces the amount of soil compaction which assists in root development and access to soil moisture and nutrients for the trees present on the site.

Why do Silvopasture?

The four main benefits of Silvopasture are: increased crop production and economic gain, soil conservation and improved soil quality, increased carbon capture and increased biodiversity. Studies in Saskatchewan, Manitoba and North and South Dakota have shown an average yield increase of 3.5 percent for wheat crops and up to 6.0 percent for alfalfa crops, when grown adjacent to treed shelterbelts or residual tree areas.

These numbers account for the area taken out of production for growing trees, and the competition factor that occurs within the 5-10 meters of land adjacent to the trees. The increases in productivity occur because of improved site and soil conditions in the agricultural lands from trees controlling winds, snow movement and addition of nutrients to the soil as result of their growth characteristics. (2)

The increase in crop productivity will translate directly into an economic gain for the landowner, while the trees being grown have the potential to provide products (e.g. timber, biomass, fruit/nuts, etc.) that provide alternative revenue streams in the longer term.

This article is part one of a two-part series on Silvopasture, and included details on the What and Why. The second article will go into the How and Where and provide more details on the other benefits of Silvopasture such as; livestock productivity, energy savings, home heating, snow control, carbon capture and sequestration benefits and the increase in biodiversity on the site. It will also provide current Alberta examples of lands being managed using a Silvopasture or “alley-cropping” approach and some research being done to demonstrate how all of these benefits that can be obtained. Look to future issues for more on the Silvopasture approach.

1: British Columbia Ministry of Agriculture: Lisa Zabek, Ph.D., P.Ag. Dave Trotter, M.Sc., P.Ag. B

2: Government of Canada: Science and Innovation: Agricultural Practices: Benefits of Agroforestry



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Prairie Shelterbelt Program Disease Leaflet

RHIZOSPHAERA NEEDLECAST

Rhizosphaera kalkhoffii

Distribution and Disease Cycle

Rhizosphaera needlecast is a fungal disease affecting mainly Colorado spruce, and occasionally other spruce. The disease begins in the lower portion of the tree with infected needles being shed, causing branches to look sparse. Spore dispersal from infected needles occurs during wet weather in spring, spreading by rain from needles infected the previous season to newly emerging needles. Under suitable conditions, the disease gradually progresses up the tree continuing to cause loss of needles, leading to eventual decline of trees.

Symptoms and Signs

Symptoms of Rhizosphaera needlecast appear in the spring following infection, with infected inner (2nd year) needles turning yellow, then purplish-brown by end of summer, with black fruiting bodies appearing in lines as they emerge from needles' stomatal pores. Most infected needles will be shed by fall, although some may remain attached, acting as an infection source the following spring. Repeated infections will cause trees to begin having a sparse looking interior and after 3-4 years of severe infection, branches may begin to die.

Control

Management of Rhizosphaera needlecast can be difficult. To reduce the spread of Rhizosphaera needlecast, avoid pruning or shearing trees during wet weather and sterilize pruning tools frequently by dipping in 70% alcohol for 3 minutes. Remove any severely infected branches and rake fallen needles from the base of trees where practical. Promote good air circulation and encourage rapid drying of foliage by mowing weeds or other vegetation near trees. Chemical controls registered for Rhizosphaera needlecast control include fungicides containing chlorothalonil. Apply as per label instructions beginning in spring when new shoot growth is 1 to 5 centimetres in length, and again several times at 3-4 week intervals until conditions no longer favour disease development.

Colorado spruce infected with *Rhizosphaera kalkhoffii*.
Photo credit: Joe Zeleznik and Kasia Kinzer, North Dakota State University

Close up of infected needles (top) and healthy needle (bottom).

Photo credit: Michael Kangas, NDSU - North Dakota Forest Service, Bugwood.org



For further information please contact:
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P.O. Box 940
Indian Head, Saskatchewan, S0G 2K0
Phone: 1-866-766-2284
Email: agroforestry@agr.gc.ca
Website: www.agr.gc.ca/shelterbelt

Western Water Hemlock and Cow Parsnip

Pest Watch



Western water hemlock is a very toxic native member of the parsnip family. Its toxins are concentrated in

the hollow rootstock, but are also found in the leaves and stem. It can easily be mistaken for Cow Parsnip as both grow in marsh areas such as wetlands and along roadsides with moist ditches and have umbel flowers. Western water hemlock can be distinguished by its compound pinnate leaves with coarse teeth. Flowers are white or greenish in color. It takes very little of the toxin to be lethal and can cause death in as little as 15 minutes after consumption. Symptoms include: stomach pain, nausea, vomiting, diarrhea, fever, labored breathing, tremors, convulsions, and weak and rapid pulse.

Cow parsnip, part of the carrot family, can grow to 1 to 2 meters tall. It has large hairy heart-shaped leaves with small white flowers that grow in flat-topped clusters and produce flat seed pods. The leaves can cause skin irritation and blisters in humans and livestock. Cow parsnip can also be confused with Giant Hogweed, an introduced ornamental which contains phytotoxins.

Above: Cow Parsnip. Top Right: Cow Parsnip flowering. Below (from right, clockwise): Western Water Hemlock flower; Water Hemlock leaves; Water Hemlock entire plant.



To report prohibited noxious weeds call the Alberta Pest Surveillance System at :

310-APSS (2777)

Maintaining Your Cistern – Working Well

Rural Albertans who live in areas of the province where groundwater is low yielding may need to pump groundwater from their well or divert water from a water co-op pipeline into a cistern to store enough water to meet their household needs. Where the groundwater is unsuitable for drinking due to taste, odour or undesirable mineral characteristics, typically an approved water hauler is hired to deliver municipally treated water. A cistern might also be part of a water treatment system such as aeration to remove gas or iron.

Your cistern and stored water are considered a private water supply so it is your responsibility, as a homeowner, to protect it and keep it safe.

What is a cistern?

A cistern is a watertight tank used to store a large volume of water to meet a water demand. To prevent the water from freezing, cisterns are usually buried below the frost level but may also be located inside a heated building. The Canadian Standards Association's (CSA) Standard B126 Series-13 Water Cisterns dictates the design, materials, installation and decommissioning standards for modern cisterns. Acceptable materials include steel, concrete, fiberglass or polyethylene. Cisterns must have an access point at ground level, a watertight lid, a fill port and a vented overflow pipe.

Cisterns come in various sizes. Your water demand dictates the size of cistern you will need. A 15,000 L or 3,300 Imperial gallon cistern will store enough water to meet the demand of an average household of four for two-to-three months. Some situations, such as a low yield well system, will require smaller storage amounts. Bear in mind that the longer water is stored in a cistern, the greater the risk of microbiological contamination. Keeping your water safe requires periodic testing and inspection, cleaning and disinfection of your cistern.

How do I know the water in my cistern is safe to consume?

Cistern water should be checked twice a week using either test strips or a chlorine test kit you can purchase from a chemical supply company. You need to maintain a free chlorine residual of 0.2 mg/L in the water from your cistern.

If your water comes from a municipally treated source you can restore the chlorine residual by adding 20 mL of new unscented 5 percent bleach for each 1000 L of stored water (about 2 ounces for every 1000 imperial gallons). Chlorine concentration in stored water decays over time and can lead to microbial re-growth. If your cistern is filled with untreated groundwater you need to obtain a chlorine residual by installing a disinfection system such as continuous chlorination.

How often should I test the water in my cistern?

The water from your cistern should be sampled 1-2 times every year for bacteriological quality. If test results show the presence of total coliform or E.coli bacteria, both the cistern and your distribution pipes should be disinfected with chlorine. Total coliform could indicate the chlorine residual in the water is too low or the water has become contaminated.

The presence of E.coli indicates the water is not safe to drink because it has been contaminated with human or animal feces. See the fact sheet Taking Water Samples for more information.

Are there other contamination risks?

Insects, rodents and small birds/animals can enter your cistern if there has been any physical damage. Surface water can infiltrate, bringing dirt and other debris. Fertilizer, manure and other chemical or biological contaminants can be carried in by rainwater or snowmelt. CSA's Standard B126 Series-13 Water Cisterns requires a cistern be located a minimum 10 meters from a septic tank and 15 meters from a septic field or other sources of contamination such as livestock facilities and chemical storage.

How do I inspect my cistern?

Visually inspect the ground around where your cistern is buried to confirm it is sloped and can divert away rainwater and snowmelt. Inspect the access lid and fill port for a watertight seal.

Look inside the cistern for evidence of dirt, insects or rodents. Look for light coming in from possible cracks or faulty connections. Check the vented overflow pipe is located properly to continuously draw air. Confirm it is down turned, covered with a fine mesh screen cover and high enough not to be submerged under rainwater or snow.

Large roots can become a problem if trees are located too close to your cistern. If any damage is found you should hire a qualified cistern installer to make repairs.

Do I need to clean my cistern?

Routine maintenance of your cistern should include an annual cleaning to remove any build-up of sludge or biofilm. A qualified cistern installer will drain your cistern and physically clean the inside surfaces using a pressure washer or cleaning brushes. They will also remove bottom sludge using a wet-dry vacuum and take care to ensure all equipment is appropriately disinfected prior to use.

Should I shock chlorinate my cistern?

If you pump groundwater from a low yielding well into your cistern you should annually shock chlorinate both the well and cistern. See the fact sheet Shock Chlorinating Your Well for more information. Otherwise you should shock chlorinate only if your cistern has been contaminated or you have a confirmed presence of total coliform or E.coli bacteria. Before beginning the procedure be sure to arrange for an alternative supply of water to meet your needs for 12-24 hours.

After cleaning out any sludge build-up from the cistern add enough chlorine to obtain a concentration of 50 ppm while the cistern is being refilled. This can be achieved by adding 1 L of new unscented 5 percent bleach for every 1000 L of stored water. Circulate the chlorinated water through your distribution system by turning on each tap, one at a time, until a chlorine odour is detected at each outlet. Be sure to by-pass any water treatment equipment.

You need to allow for a minimum contact time of 6-12 hours. After this, the chlorinated water can be removed from the cistern by turning on an outside tap, being sure to divert the water away from your septic system and sensitive plants. If your cistern is located in close proximity to a water body, such as a lake front property, you may need to collect and safely dispose of the chlorinated water. Discharging chlorinated water directly into a water body is a punishable offence under provincial regulation.

When can I refill my cistern?

Once your cistern has been cleaned out or the shock chlorination procedure has been completed you can refill your cistern with potable water. Any remaining chlorine residual in the distribution system will not harm your septic system. Backwash and regenerate any water treatment equipment according to supplier recommendations.

It is a good practice to submit a water sample for bacteriological quality after cleaning or shock chlorinating your cistern.

Do I need to treat the water in my cistern?

If your water comes from a treated municipal source no additional treatment should be required as long as you maintain a free chlorine residual of 0.2 mg/L. However, water coming from a low yielding well will need additional treatment. Using a continuous disinfection system is necessary to prevent microbial growth and ensure the water is safe to drink. If UV or ozone disinfection is used instead of chlorine more frequent total coliform testing is required because these systems do not have a residual that can be monitored.

For More Information: Working Well

www.workingwell.alberta.ca

Maintaining Safe Domestic Water Quality with On-Farm Cisterns and Water Tanks

This Agriculture and Agri-Food Canada publication explains how to maintain safe drinking water in rural homes after storage in on-site water tanks and cisterns. Learn more at: [http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/wqe11319/\\$FILE/cisternstorage.pdf](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/wqe11319/$FILE/cisternstorage.pdf)

Rural Water Quality Infor- mation Tool

An on-line tool to help you assess the quality and suitability of raw water sources for privately owned and operated water supplies <http://www.agric.gov.ab.ca/app84/rwqit>

Environmental Farm Plans

The environment is becoming a more prominent issue. It is a large factor in marketing agriculture and food products in today's global markets. Consumers are demanding more transparency and are demanding high quality and safe products. Reputation of food safety is critical to retain and gain access to domestic and international markets.

Environmental Farm Plans (EFP) provide a tool for producers to self analyze their operation and identify environmental risks, current standards, areas for improvement and also highlight what they are doing well.

Having a completed EFP allows producers to access different funding opportunities, such as the Growing Forward Stewardship Program. It is also useful in product branding that demonstrates specific environmental standards.

The EFP Process

An EFP can be completed through workshops, online or one-on-one session(s). The EFP first identifies the soil and farm site characteristics. Following this, the producer completes only the relevant chapters that apply to their operation; such as wintering sites, fertilizer, pesticides, crop management etc.

Upon completion the EFP is submitted to a Technical Assistant for review. Once reviewed the EFP will be returned along with a letter of completion.

The EFP is a living document and should be reviewed and updated periodically.

If you wish to complete an EFP or have any questions regarding EFP please contact Kellie at the LARA office at 780-826-7260

Effective April 1, 2018, producers will need to have an EFP completion letter dated within the last 10 years to be considered current and eligible for cost-share funding with the Environmental Sustainability and Climate Change programs of the Canadian Agriculture Partnership (CAP). That means, for example, if you apply in September 1, 2018, your EFP will need to have been approved on or after September 1, 2008 to be considered for current funding.

Riparian Health Assessment

The riparian zone is the interface between the upland and a water course. A healthy riparian area: traps and stores sediment; builds and maintains banks and shorelines; stores water; recharges aquifers; filters and buffers water; creates primary production and much more!

A riparian health assessment is a tool designed to evaluate the site and can provide a foundation to build an action plan and identify priorities.

If you would like a FREE Riparian Health Assessment conducted on your property or more information please call Kellie at 780-826-7260 or email sustainag.lara@mcsnet.ca

CANADIAN AGRICULTURAL PARTNERSHIP

The Canadian Agricultural Partnership is a five-year, \$3 billion federal-provincial-territorial investment in the agriculture, agri-food and agri-based products sector set to begin in April 2018, and is the successor of the 2013-18 Growing Forward 2 partnership. In Alberta, the Canadian Agricultural Partnership represents a federal - provincial investment of \$406 million in strategic programs and initiatives for the agricultural sector.

Currently accepting funding applications is the Environmental Stewardship and Climate Change program and Farm Water Supply.

Funding Opportunities Stewardship covers projects such as:

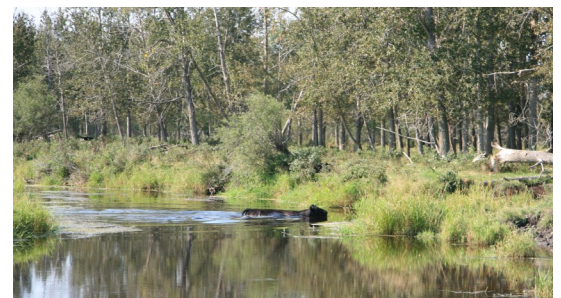
Riparian Area Fencing and Management	Permanent fencing and potentially cross fencing	Funding Maximum: \$75,000 Cost Share: 30%, 50%. Or 70%
Year-Round / Summer Watering Systems	Portable or permanent systems that are not in your yard site	Funding Maximum: \$50,000 Cost Share: 30%, 50%. Or 70%
Watercourse Crossings	Construction materials needed for watercourse crossing in accordance with the Water Act	Funding Maximum: \$10,000 Cost Share: 30%, 50%. Or 70%
Grazing Management Strategies or Innovative Solutions	Consideration will be given to projects that provide solutions to improve grazing management. The projects must meet the objectives of Environmental Stewardship and Climate Change Program and significantly improve the grazing management performance of an operation.	Funding Maximum: \$100,000 Cost Share: 30%, 50%. Or 70%
Manure and Livestock Facilities Management	Construction of surface water management system; engineering assessment; improved storage facilities; relocation of livestock facility; improved land application; manure and livestock facilities management	Funding Maximum: \$15,000 - \$100,000 Cost Share: 30%, 50%. Or 70%
Agricultural Input and Waste	Improved pesticide management; improved nutrient management (sectional controls); plastic rollers; shelterbelts; wetland assessments	Funding Maximum: \$7,000 - \$15,000 Cost Share: 30%, 50%. Or 70%

More Information On Funding Opportunities

For more information on these funding opportunities go to: <https://cap.alberta.ca/CAP/index.html>

Call the LARA office to set up a time to go over funding possibilities and for assistance with the application forms.

Please note that applications must be approved prior to work being done or purchases made to be eligible for the funding.



Stuck in the mud? Consider an offsite watering system.

Black Knot of Plum and Cherry (and Maydays)

Black Knot is becoming more prevalent in many trees in the area. It is caused by the fungus *Apiosporina morbosa* or *Dibotryon morbosum*, and affects a wide variety of trees including: Mayday tree, apricot, Chokecherry, flowering almond, flowering plum, cultivated plum, Japanese plum, wild plum, Prunus hybrids, and many varieties of cherry (Black, Sand, Sour, Nanking, Amur, Mongolian, Pin, Korean, Dropmore). The disease is widespread throughout commercial, municipal, private and natural plantings. The infections spread rapidly, and very high amounts of black knot can result in the death of the tree.

Symptoms

Rough, elongated, hard, black swellings commonly on twigs but also on branches or stems are characteristic of this disease. Usually knots occur on one side of the twig but occasionally branches become completely girdled killing the portion above the infection. New infections show up as green swellings which enlarge, develop cracks and turn black with age. Old black knots may be partially covered by a white to pinkish mold and be riddled with insect holes.

Disease Cycle

Winter spores formed in mature black knots are spread by wind and rain to twigs where infection takes place through unwounded tissue. Infection continues to occur until terminal growth stops and it is most severe when conditions are mild and wet. Only several months after initiation of infection do green swellings become visible and usually not until spring. These newly formed knots produce summer spores. The gall will mature after 2-3 years into a hard black 10-15 cm growth. The fungus extends several inches beyond the knots and knots will expand with age, eventually killing the branch.

Control

1. Clean up trees annually. This involves pruning out swollen areas during winter or early spring. Prune at least 3 inches below the visible swelling as the fungus extends several inches beyond the knot. Wounds should be covered with a wound dressing, such as Braco, shellac, Bordeaux paint (Bordeaux powder plus linseed oil mixed into a paste) or other reliable wound dressing products available from seed and garden supply dealers. Destroy all pruning's by burning before spring since pruned knots will still produce spores which can spread the disease. Severely infected trees should be removed and burned. Diseased knots can continue to produce spores 4 months after removal.
2. In establishing new plantings and also in helping to control disease in established plantings, wild cherries and plums in the vicinity should be thoroughly cleaned up or removed.
3. The above control measures will usually be sufficient to keep the disease under control, however, where the disease is a severe and continual problem additional control measures may be needed.

In this regard, thorough applications of several fungicide sprays, along with diseased wood removal will help control the disease. Spraying alone will not control the disease. However, when using chemical control read the product label carefully since it shows the purpose for which the chemical is sold, directions for use, and handling precautions.

Dormant Spray

1. Spray just before buds break in the spring with one of the following: 2 tablespoons/gallon (=2 lb/100 gal.) of thiram, or lime-sulfur solution (1 part lime-sulfur to 8 parts of water), or 4:6:100 Bordeaux Mixture (see below for preparation).
2. At least two additional sprays at Full Bloom and at Shuck Fall. Use one of the following:
2 tablespoons/gallon of captan, or 2 tablespoons/gallon of thiram, or lime-sulfur solution (1 part lime-sulfur to 50 parts of water).

A small volume of 4:6:100 Bordeaux Mixture is made by dissolving 2 ounces copper sulfate in one gallon of water and 3 ounces of hydrated lime in two gallons of water. Pour the copper sulfate solution into the lime water and strain through fine cheesecloth. Use the solution immediately after mixing and also fresh lime is essential not some left over from the previous season.

<http://www.agr.gc.ca/eng/science-and-innovation/agricultural-practices/agroforestry/diseases-and-pests/black-knot-of-plum-and-cherry/?id=1198101468695>



Be On The Lookout for Leafrollers

Your poplar trees may be host to leafrollers and leaftiers (*Pseudosciaphila duplex*). These four stage insects (egg, larva, pupa and adult) are moving into the area. The adult stage is seen as a grey, tan or brown mottled colouration moth. In the spring to early summer the larvae are present and build protective shelters by rolling developing leaves together; feeding within the damaged leaves. The damage is temporary and will not kill the trees. Leafrollers and leaftiers have many natural controls including parasites, predators and disease.



Photo left: *Leafroller larva.*
Photo credit: *USDA Forest Service - Ogden Archive, USDA Forest Service, Bugwood.org*

Photo right: *Leafroller moth.*
Photo credit: *Cliff Bernzweig, bugguide.net*



Cooley Spruce Gall Adelgid *Adelges cooleyi*

Hosts: Colorado spruce, Douglas fir and White spruce

Appearance and Life Cycle:

The cooley spruce gall adelgid has a very complex life cycle which is not fully understood. Adelgids are a small group of insects that are closely related to aphids. The normal life cycle of this adelgid consists of six different forms of the insect over a two-year period on two hosts; spruce and Douglas fir. In Saskatchewan and Manitoba where there is no native Douglas fir, the adelgid has the capability of completing its life cycle entirely on spruce. Only the first form of adelgid causes a formation of galls, whereas, the remaining forms feed openly on needles. Another form of the cooley spruce gall adelgids produce white, cottony protective covers for their eggs. These cottony covers appear as white specks early in the spring and continue throughout the summer, and can cover an entire tree during a severe infestation.

Damage:

Damage first occurs in late May when the new growth of the branch tips form into cone-shaped galls. Galls vary in length from 25 to 75 mm and 12 to 18 mm in diameter. The galls are green at first but later turn a reddish-purple color. The old galls dry out and turn a reddish-brown color and may remain on the branches for several years. During a heavy infestation, young spruce may be severely deformed because the buds die on the gall-infested twigs. On established spruce, the growth and vigor may be reduced but trees are rarely killed.

Control:

Some control may be achieved by picking the new galls off as they form and burning them.

This will improve the tree's appearance and reduce the aphid population. Chemical control of the cooley spruce gall adelgid can be achieved by applying carbaryl in early spring just as the buds begin to open. <http://www.agr.gc.ca/eng/science-and-innovation/agricultural-practices/agroforestry/diseases-and-pests/cooley-spruce-gall-adelgid/?id=1198183048120>



Gall on spruce caused by the cooley spruce gall adelgid. Photo credit: *insectsofalberta.com*



New gall (above) on spruce caused by cooley gall adelgid. Old gall (below) is necrotic and brown. Photo credit: *Ministry of Forests and Range, Forest Practices Branch*

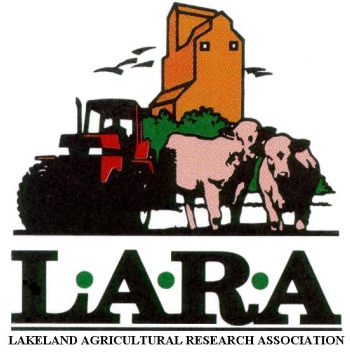
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Sustainable farming encompasses a wide range of practices and principles; combining environmental stewardship with profitability and ensuring that the family farm will be there for generations to come.



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Food For Thought...

- * Access to clean water increases animal performance and shown improved growth in yearlings by as much as 23%
- * 80% of cattle will choose to drink from an offsite watering system than directly accessing the water source
- * To create one pint of beer, it takes roughly 20 gallons of water
- * Less than 1% of the Earth's water supply can be used for drinking water
- * Water dissolves more substances than any other liquid

WWW.LARAONLINE.CA

Upcoming Events:

- ◆ Dugout Workshop - August 13th at Fort Kent
- ◆ Gabe Brown - August 22nd in St. Paul
- ◆ Western Canada Conference on Soil Health and Grazing - December 10-12 in Edmonton (<https://www.absoilgrazing.com>)
- ◆ Soil Health Academy - July 14-16, 2020

