



Grow With Us

Lakeland Agricultural Research Association

September/October 2021

Safe Storage of wheat and barley Alberta WheatBarley Commission's

With a highly variable crop coming off in the central and northern parts of Alberta, storage considerations will need to be front of mind. After a dry early and mid-season, late tillers have emerged due to the later summer rains. These late tillers increase moisture in the harvested grain and can create storage risks.

Safe storage of wheat and barley grain comes down to two factors: grain temperature and moisture. If one or both factors are not properly managed, the risk of spoiled grain increases significantly. The Canadian Grain Commission (CGC) developed stage storage charts for both wheat and barley (Figures 1 and 2). If the initial temperature and moisture of the wheat or barley grain is within the 'spoilage' range (purple areas) of these charts, the risk of spoilage is higher (i.e., 16% seed moisture at 25°C). According to the CGC, if the temperature and moisture content falls within the 'no spoilage' range (green areas), the crop can be safely stored for up to five months, or six months in the case of wheat (i.e., 15% seed moisture content at 5°C). However, this does not mean the grain can be left unchecked over those five to six months. Continued monitoring of the grain and grain bins is essential to ensure conditions do not change. Depending on environmental conditions during storage, moisture or temperature conditions of the grain can change leading to spoilage. Luckily, many technology-based systems are available to help monitor bins without having to physically sample the bins.

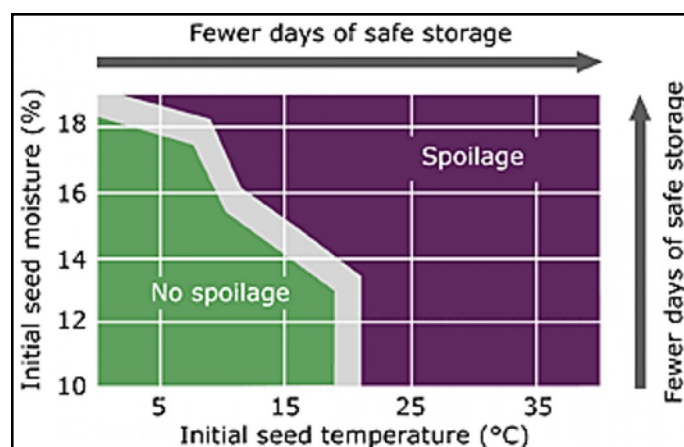


Figure 1: Safe storage chart for barley (Source: Canadian Grain Commission <https://www.grainscanada.gc.ca/en/grain-quality/manage/manage-storage-prevent-infestations/prevent-spoilage.html>)

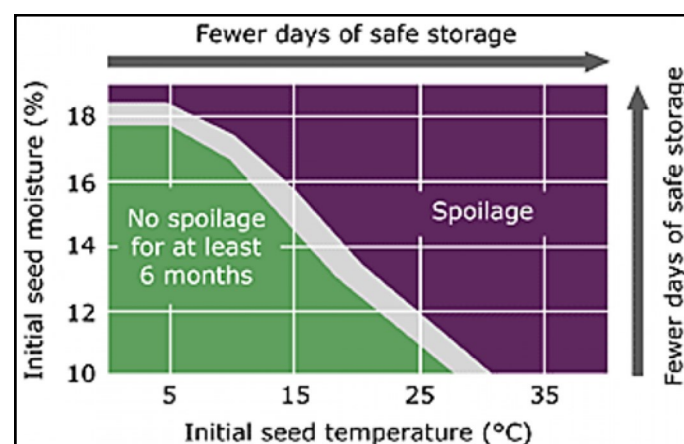


Figure 2: Safe storage chart for wheat (Source: Canadian Grain Commission <https://www.grainscanada.gc.ca/en/grain-quality/manage/manage-storage-prevent-infestations/prevent-spoilage.html>)

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2021 Calendar of Events

Building Soil Resilience through regenerative Ag	October 20, 2021 @10:00am	Flat Lake Hall
Living Lab Producer Opportunity	October 20, 2021	Flat Lake Hall
An Evening with Leslie Kelly	November	Ashmont Agriplex



Call the LARA Office for help with:

Age Verification, Feed Testing, Environmental Farm Plans,
Canadian Agriculture Partnership
Applications and more.
780.826.7260

Feed Testing

We offer two free feed tests to all producers in the MD of Bonnyville, Lac La Biche County, Smoky Lake County and the County of St. Paul.
Call the office to borrow a bale probe or to drop off a sample: 780.826.7260



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Safe Storage of Wheat and Barley

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One of the best ways to mitigate spoilage is to harvest the grain when the moisture content is within the safe storage range. If the grain is harvested at the ideal moisture range, grain can immediately go into storage or receive aeration if the grain temperature needs adjustment (i.e., if grain is harvested at 16% seed moisture at 25°C the grain will need to be cooled to 10°C safe storage). However, this scenario is rarely the case. Between variable tiller maturity and a short harvest season, harvesting the grain prior to ideal moisture content is commonly needed to avoid yield and quality loss. This means post-harvest grain management must be implemented to condition the grain and reduce spoilage risk.

Swathing can be used to bring grain closer to the desired moisture range prior to harvest and storage. With variable crops, swathing can reduce variability by allowing the later tillers to dry down and reach a lower moisture level which reduces the risk of stored grain spoilage. However, this does not completely remove risk as wet weather can reduce the quality of grain in a swath.

However, swathing is not always an option. Even if it is an option, it will not always bring grain completely to storable moisture conditions. This is when tools such as natural air drying (NAD), NAD with supplementary heat, and heated air drying may need to be implemented. Use of these options will depend on on-farm equipment availability, drying availability and discounts at local elevators. If on-farm options are not available, some local elevators charge a fee for grain drying service. In some fortunate cases, neighbor's with grain dryers may also have grain drying capacity.

NAD requires the use of a bin with a airflow system to remove moisture through forced airflow. However,

NAD requires appropriate ambient air temperatures and favorable relative humidity to remove moisture from grain. The addition of supplemental heat to an NAD system can increase the utility of the NAD. Prairie Agricultural Machinery Institute (PAMI) has developed a useful guide for supplemental heat for NAD

systems that can be found [here](#). Finally, a heated air grain drying system can also be utilized to dry grain to an appropriate moisture content for longer term storage. However, these systems can be expensive to install and operate. Examples of grain dryer cost and operational information can be found [here](#).

The bottom line is that crop and weather conditions can cause significant challenges when it comes to safe grain storage.

Storing grain at moistures and temperatures outside of the safe storage range (Figure 1 and 2) can lead to significant spoilage. Producers must take steps to protect their grain through appropriate harvest management, grain conditioning, grain drying and grain storage options

Resources:

**By Jeremy Boychyn (M.Sc)(P.Ag),
Agronomy Research Extension
Specialist | Alberta Wheat and Barley
Commissions**

[Safe storage of wheat and barley
grain - Alberta Wheat and Barley
Commission](#)

albertawheatbarley.com



**Alberta
Barley**

Nitrate Threat in Frost Damaged Crops

Alyssa Krawchuk, LARA

With the approach of fall weather comes the risk of frost. Although grain harvest is ahead of schedule this year, many annual crops harvested for silage or greenfeed are showing significant regrowth that could be used for additional fall grazing or greenfeed options. However, before swathing or turning cattle out, producers need to assess the risk of nitrate buildup in those crops as a result of cool frosty nights.



normal levels after two weeks or 14 days. If the crops are unable to be swathed the day after a frost, producers need to wait 14 days before cutting that field.

If producers still have concerns with potential nitrate accumulation, a feed test can be done to determine nitrate levels.

Nitrate poisoning occurs when nitrate is converted into nitrite in the rumen. Under normal circumstances, nitrite is further broken down into ammonia in the rumen and is then used by rumen microbes to make protein. Issues occur when large amounts of nitrates are eaten over a short period of time and nitrite levels exceed the capacity of the microbes to convert it to ammonia so it begins to be absorbed by the animal. Once in the bloodstream, nitrite interferes with oxygen transport by red blood cells and starts to starve the animal of oxygen.

Nitrates can begin to become an issue after crops experience as little as one to two hours of -1 to -2 degrees Celsius. These conditions cause damage to the above ground parts of the plants, but leave the roots undamaged. Nitrate accumulation occurs over the next three to four days as the damaged leaves cannot effectively utilize the nutrients that the roots continue to send up to the plant.

Killing frosts are a different story. When temperatures go below -5 to -6 degrees Celsius, the inner workings of the plant are destroyed and, therefore, water and nutrients can no longer move within the plant. As a result, nitrates will not accumulate.

After a light frost, damaged crops should be cut as quickly as possible to prevent nitrate buildup in the plant tissues. Nitrate levels tend to peak after three to four days following a frost event and will return to

Which crops are the most susceptible?

Annual crops such as oats, barley and wheat are the most susceptible. Producers utilizing immature salvaged canola crops as well as many cover crop species such as sorghum, kale or millet, also need to be concerned with the potential for nitrate buildup.

Does manure application increase risk?

Nitrogen load on a field is another risk factor for increased potential of nitrate buildup following a frost event. This includes fields that have been heavily fertilized, had manure applied, used as winter feeding areas or used for swath grazing in previous years.

What is the risk with alfalfa?

Nitrate accumulation in alfalfa or clover is extremely rare. Similar to peas or lentils, alfalfa plants have nodules attached to the root system that regulates nitrogen transport within the plant by releasing only as much nitrogen as the plant requires.

Can I graze an annual cereal after a light frost?

Nitrates can begin to accumulate fairly rapidly following a frost event. Cutting the field as quickly as possible is the best method of ensuring nitrate accumulation is prevented.

Can you get nitrate accumulation in weeds?

Many weeds are known to accumulate nitrates such as lambsquarters, pigweed and kochia.

Weed Management Before and After Harvest

Canola Watch

Pre-harvest is a good time to dry down weeds to make straight combining go more smoothly. A pre-harvest application can also provide some weed control on late growing weeds — but is often too late to stop seed production.



Suspicious patches.

When scouting fields for pre-harvest herbicide, look for patches that could be herbicide resistant. Identifying patches can limit the potential spread of weeds through the field and farm. Collect seed samples from those patches for testing over the winter. Labs need weed seeds to do herbicide resistant tests. Tests cannot be done on live plant samples. Remember labs conduct testing on a first come first serve basis as much as possible, so make sure to submit early. For large seeded weeds (i.e. wild oat) a large coffee can (approximately 0.75 to 1 kg) is needed per subgroup (Group 1 dim) and for small seeded weeds about 0.5 to 1 cup of seed is needed for testing. Make sure the sample is dry and free of debris.

Fall regrowth.

Post harvest weed timing is often most effective, and recommended as a good weed management strategy in many cases, especially for low growing weeds that are deep in the canopy and may be missed by a pre-harvest treatment.

Fall is a good time to control perennial and winter annual weeds, but wait approximately four to six weeks after harvest for enough regrowth to offer a good target for herbicide and make sure that glyphosate rates are adequate for the target weed. Keep in mind that post-harvest control of perennials requires roughly three times the

rate of pre-harvest applications to get the same amount of herbicide in the plant root.

Fall timing.

—Perennials are best controlled in early fall prior to a killing frost. Use of glyphosate requires warm temperatures, bright sunlight and a recovery period of roughly 48 hours with temperatures above 4 degrees at night and 13C daytime minimums after a frost to be effective.

—October is usually the best time to control winter annuals such as narrow-leaved hawk's-beard, stork's-bill, annual sow thistle (common and spiny) and cleavers. That way you get all that have emerged.



Alberta Clubroot Map

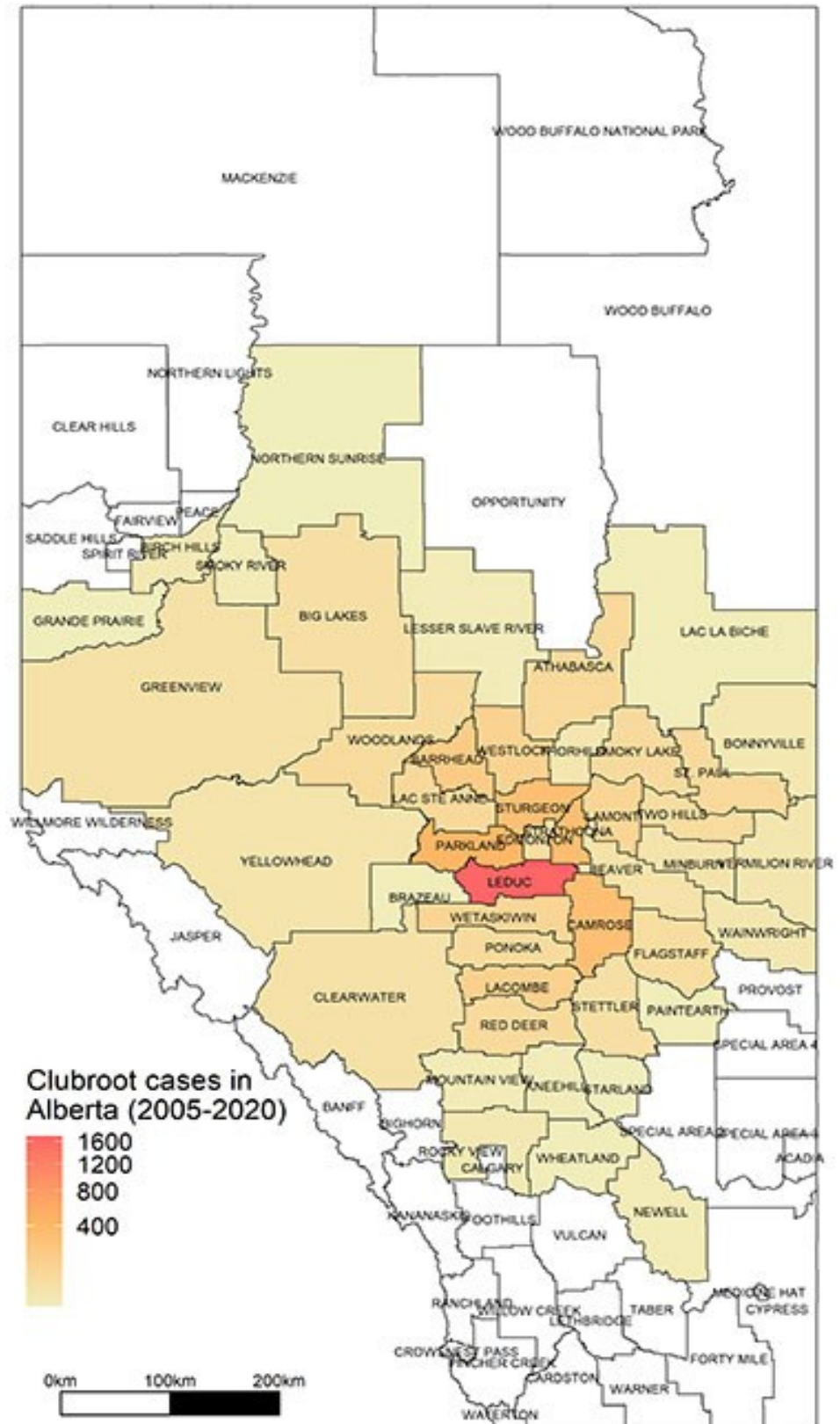
Alberta Agriculture and Forestry

Clubroot is a serious soil-borne disease of canola, mustard and cole crops, and is a declared pest under Alberta's [Agricultural Pests Act](#). It is not a new disease in Canada or Alberta for cole crops. However, since its discovery in the first canola field near Edmonton in 2003, it has spread to a number of counties in Alberta. Clubroot continues to spread and is a significant concern for Alberta producers.

This map shows the extent and intensity of clubroot infestations in Alberta by county. The infestations are cumulative results from the efforts of many surveyors over the years: staff from the University of Alberta; Agricultural Fieldmen from counties, municipal districts and special areas; and Alberta Agriculture and Forestry.



Photo source: Canola Council of Canada





LAKELAND AGRICULTURAL RESEARCH ASSOCIATION

SOIL HEALTH ACADEMY

With Gabe Brown and Dr. Allen Williams

JUNE 22-24, 2022

MALLAIG AB

Through hands-on training from the world's leading experts, Soil Health Academy participants learn how to increase profitability, build resiliency into the land, decrease input costs and improve nutrient density of food and agricultural products. No matter where you farm or what you grow, the Soil Health Academy will teach you how to improve soil health through practical regenerative agricultural principles.

Optimizing Use of Winter Feed Supplies

Barry Yaremcio, Yaremcio Ag Consulting Ltd.

With high feed prices this fall, it is important to get the most out of the cattle rations as possible. Preventing feeding losses reduces the overall cost of feeding the herd and can increase the number of animals that can be kept on farm.

Knowing the quality of the feed, size, and stage of production the cows are in makes it possible to blend higher quality hay or silage with straw to stretch feed supplies. Feeding a straw-grain ration pre-calving is also an alternative. Working with a nutritionist can make the most of the feed that you have to provide a balanced ration to the animals.

Feeding systems can alter what the cows eat, how much they waste, and the nutrients that are consumed. Ring bale feeders can have 3 to 14.6% waste depending on design (Buskirk et. al., 2003). Preventing the cows from pulling hay out of the feeder and dropping it onto the ground is key to reducing waste. Once the hay is trampled upon, the cows will not eat the forage.

Bale processors and bale unrollers are common methods used to feed cows. When cows are fed in the field, there are times when feed is delivered onto snow. Physical feed losses can be as high as 19% when a bale processor is used, and 12% when bales are unrolled. Up to 75% of the lost material is less than 18 mm or $\frac{3}{4}$ of an inch in size. (Yaremcio, 2009). When cows walk over the windrow, leaves and flowers are shattered off the stem and are trampled into the snow. This can result in protein losses up to 22% and 26% of the Calcium. These losses can be prevented by placing the feed into fence line bunk feeders or portable feeders.

To prevent or to minimize losses, a portable bunk feeder out of drill stem pipe and rough planks is an option to reduce waste. A feeder that is 28 feet long, 5 feet wide and 2.5 feet tall has sufficient space to hold a 1400 pound bale of hay or greenfeed. This will supply enough feed for approximately 40 cows. To prevent cows from getting into the feeder, the bottom should be narrower than the top so the cow cannot get a foot down inside the feeder and be able to climb in.

Harlan Hughes from North Dakota State University in the mid 1990's calculated that a dollar (\$1) reduction in winter feeding costs increased net profit of the operation by \$2.48. Considering the increased costs associated with feed, equipment and labour, the current rate of return would be much higher. Reducing feed waste could help improve the bottom line.

For more information on optimizing feed supplies for winter feeding, contact Barry Yaremcio at 403-741-6032 or by email at bjyaremcio@gmail.com

References cited:

Buskirk et. al., 2003, Journal of Animal Science, 81:109-115

Yaremcio, 2009, University of Alberta Press



Fall Disease Scouting Urged For Canola

The Western Producer

The Canola Council of Canada recommends growers scout their fields for diseases this fall to head off potential issues in the spring.

Autumn Barnes, an agronomist with the canola council, said blackleg and clubroot are of particular concern across the Prairies.

“A lot of people don’t realize they have it until they have a disaster with it,” said Barnes. “It’s a unique disease and one which some of the spores have great longevity.”

In the fall, farmers should pull plants and look for it on roots on a cross-section of a field, said Barnes.

“Because it’s soil borne, it’s a little patchy in nature,” she said.

If growers are doing soil testing, Barnes suggested they focus on areas that have a lot of traffic because clubroot spores are commonly spread by vehicles. Areas with high moisture levels should also be targeted, she added.

“If you take samples from the entire field, you might be diluting the sample so much that the one spot that was really high in spore count, it’s so diluted to be undetectable,” she said.

One of the best ways to avoid clubroot altogether is through rotating crops and seed variety selection.

“The really important thing growers can do is, regardless of whether they have confirmed clubroot in their area or not, is grow clubroot resistant hybrids,” said Barnes. “If what the canola people are growing is clubroot susceptible, it has the ability to rapidly increase the number of clubroot spores in the soil.”

Scouting for blackleg should be conducted even if the field is seeded with a disease-resistant strain, she said because there is no guarantee it won’t be present.

“A lot of growers assume because all of our varieties have some resistance to blackleg, some people just don’t look for it. The reality is genetic resistance is very complicated and we do end up seeing blackleg in resistant hybrids.”

Locating blackleg in such resistant varieties now will allow for time to consider a different variety, said Barnes.

Growers should pull plants, clip stems at ground level and check for blackening on the inside. If part of a rotation, check for older plants as dried samples can be tested as well, she said.

Soil testing in Manitoba and Saskatchewan can be done for free and Barnes encourages growers to contact their respective provincial canola associations for more information.

While sclerotinia can affect yields the most in the long term, it’s easily identified and usually shows up in areas of excessive moisture.

“This year was dry so, not a sclerotinia year,” said Barnes.

References:

[Fall disease scouting urged for canola | The Western Producer](#)



If growers are doing soil testing, Autumn Barnes, an agronomist with the canola council, suggests they focus on areas that have a lot of traffic because clubroot spores are commonly spread by vehicles. | Michael Raine photo

Diagnosing Pesky Forest Pests

Alberta Agriculture and Forestry

The new Alberta Forest Pest Diagnostic System will help landowners determine the most likely pest problem based on the type of tree and the symptoms they see. Once the problem is determined, the website provides more information about the pest and what can be done to manage it.

‘This website brings tree health right to your fingertips,’ says Tom Hutchison, senior forest health officer with Alberta Agriculture and Forestry.

‘When you’re looking at a damaged tree, you input the information right in front of you, like discoloration or puncture holes. Everything is in the Alberta context. We’re focusing on the trees and pests found right here at home.’

The information can be useful for a broad spectrum of people, including homeowners and farmers.

‘You could use it to identify pests affecting trees in your backyard, and farmers can use it to help manage pests affecting their shelterbelt trees. For many pests, management options are included. We’re hoping to show homeowners that in many cases there are a variety of pest management options other than pesticides,’ adds Hutchison.

The dynamic tool will continue to be updated with new pests or management options. Users are also welcome to provide feedback on the site.

Visit the Alberta Forest Pest Diagnostic System website: <https://forestpestdiagnostic.alberta.ca>



Close The Wheat Yield Gap

Take part in an international, prairie-wide project to generate baseline producer data on current CWRS wheat management practices. The project is led by Farming Smarter out of Lethbridge Alberta and is seeking 325 CWRS wheat farmers across Alberta, Saskatchewan and Manitoba to share production information from 2019/2020.

The project aims to identify the key factors preventing CWRS wheat producers from obtaining potential yields on individual farms. Lakeland Agricultural Research Association is participating in the project and is looking producer to share grain yield and agronomic data on 10 CWRS wheat fields in the Lakeland Area.

All information collected is confidential. The project objective is to use this data to help local producer realize higher yield on their operations by identifying the production factors that are holding back current wheat yields.

If you are interested in participating, please contact the LARA office at (780) 826-7260.

You can visit www.farmingsmarter.com/wheat-producers-we-need-you/ to read more about the project.



Building Soil Resilience Through Regenerative Agriculture



Learn Practical Hands On Skills!

FEATURING DR. KRIS NICHOLS AND KEVIN ELMY

Speakers will focus on soil health and cocktail mixes; using soil health principles to build soil carbon and resilience on your farm or ranch. Increase your understanding of soil sample results, and practical application of various crops, including perennial pasture for soil health.

Please bring a sample of soil from a field you are interested in, along with any soil results (if you have) for some hands-on learning.

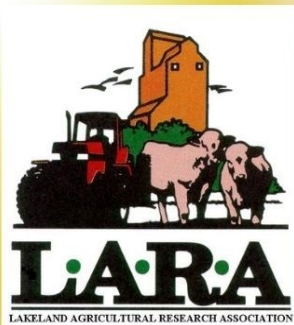
October 20 10 AM-4 PM Flat Lake Hall

Registration Required for either session by calling 780-826-7260 or email sustainag.lara@mcsnet.ca ****Following Current COVID Regulations.****

Living Labs Producer Opportunity!

Join us to learn about living labs! Discover what it is, participate in the development of potential beneficial management practices within regenerative agriculture principles, and explore the possibilities of having a living lab on your operation.

Network with the Experts from 5 PM to 6 PM followed by supper and an engaging session on living labs.



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Lakeland Agricultural Research Association

Mission Statement:

*The Lakeland Agricultural Research Association (LARA)
conducts innovative unbiased applied research and extension
supporting sustainable agriculture.*

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