



# Grow With Us

Lakeland Agricultural Research Association

November/December 2020

## *Setting Goals and Adding Diversity is key for Intercropping*

*Beef Cattle Research Council*

There is a lot of buzz in beef and forage production systems around the concepts of sustainability and soil health and the numerous different production practices that can support those ideas. Innovative producers are seeking ways to work within their landbase to become more efficient and improve their soils, whatever that may mean to them on their farms. Intercropping is one strategy that may help them achieve their goals.

What *is* intercropping? Is it different from planting cover crops, interseeding, or relay crops? How does intercropping fit in for beef and forage systems?

### *The lines are blurry but the goals are clear*

Manitoba producer Alan MacKenzie considers intercropping to be two crops that are grown at the same time to be harvested together. The Nesbitt area cow-calf producer has been an organic farmer for twenty years and has used intercropping on-and-off as a tool on his mixed farm for the past decade. “I would say the main benefit is just trying to get some diversity and anytime we can get some legume in the mix for the nitrogen, that’s good,” MacKenzie explains.

This pea and oat intercrop is one of many combinations Alan MacKenzie has used on his Manitoba farm. Photo courtesy of Alan MacKenzie.

Some cash crop combinations he has tried include pea and mustard, a pea and

oat mix, or wheat and flax, but he says there are numerous combinations that could work depending on the individual farm. “I seed everything at the same time, same depth,” he



says. He mixes his seeds together in a mix mill and tries to choose an intermediate seeding depth to compromise different species’ requirements. MacKenzie also typically underseeds his cash crop mix to a forage “relay crop,” and usually seeds everything in one pass in the spring. “Relay cropping opens extra things, I’ll throw in vetch or Italian ryegrass or sweet clover at the same time,” MacKenzie says. He’ll harvest an intercrop of peas and oats for example, spread or bunch the straw, and then his cattle will graze the green forage crop that’s growing underneath in the fall. He says that some years it’s very dry and you don’t see the response, or sometimes some crops outshine the others, but this cattle herd always has access to good feed. Researcher and professor Yvonne Lawley, PhD, based out of the University of Manitoba, says terms like intercrops, cover crops, and relay crops are often used interchangeably, however they are all strategies for intensifying how to utilize land to capture sunlight. “I’m ok with the blurry lines and the confusion.

Yvonne Lawley, PhD, is an agronomy researcher from the University of Manitoba who studies cover crops and intercropping.

### **In This Issue:**

Setting Goals continued..	2
LARA Garden 2020	5
Eleven ways to avoid feed waste	6
Orphan Well Association	8
Soil Health Academy	10
Overview LARA Research 2020	11

## ***Setting Goals and Adding Diversity is key for Intercropping*** *Continued..*

The important thing is to think about what your goals are and what strategies are going to help you meet your goal,” Lawley explains.

“If one of your goals is soil health, understand what aspect is important to you,” says Lawley. “Is it infiltration? Nutrient cycling? Then find a measurement that is successful for you that you can follow over time to see if that investment is impactful to you,” she suggests. “If your goal is to provide more forage of whatever quality you need then that is an important measure.”

Corn is a common winter grazing crop, however corn alone may not meet the protein needs of all classes of cattle. Researchers from the University of Manitoba are evaluating corn intercropped with other species to fill the gap.

Lawley, an agronomy researcher, has teamed up with fellow University of Manitoba colleague Emma McGeough, PhD to evaluate corn intercropping systems for cattle grazing. “Corn is a great winter feed crop because it has so much biomass and energy in a small amount of space, but the inherent problem with corn is that it has lower protein,” she says, adding that can be limiting when trying to graze different classes of cattle that have higher protein requirements. Lawley and McGeough will study different species of intercrops with corn as well as two different fertility rates. McGeough will study how cattle perform on intercrops compared to corn alone and there are collaborative test sites set up in Alberta, Saskatchewan, and Manitoba.

### ***The advantages of diversity***

MacKenzie says that for their farm, diversity is about managing risk and not putting “all their eggs in one basket.” He says they seed a plow-down crop, such as sweet clover and vetch, every three years, terminating the crop by working it into the soil to incorporate

organic matter and clean up weeds. It’s a versatile mix and adds that they sometimes divert the plough down crop for feed. “We will benefit from that, utilizing that cropland as cattle feed that doesn’t cost a lot of money,” he explains. He also adds that having both crops and cattle is complimentary when it comes to utilizing screenings from seed cleaning and separation.

Lawley explains that seeding intercrops or cover crops can create multiple opportunities in the whole operation. “From a livestock perspective you can grow forage for different windows and provide more options for grazing throughout the entire growing season,” she explains. “Are the crops for feed? For soil? In reality, it’s for both,” she says.

*“If one of your goals is soil health, understand what aspect is important to you. Then find a measurement that is successful for you that you can follow over time to see if that investment is impactful to you.”*

### ***Balance hassle with reward***

Every innovative production practice comes with a learning curve. Lawley says there is no one recipe and each farm has to individually decide what new change will lead to an innovative practice that will help the overall operation.

MacKenzie identified a few challenges, including separating crops after harvest. “Make sure you have buyer acceptance,” he says, explaining that some buyers

have stringent guidelines and may reject a nice sample of oats, for example, if they have a minimal amount of pea chips present. He adds that cleaning seed is a fair amount of work and sometimes there may not be enough of a reward in the marketplace to offset the hassle. He’s experienced other learning curves, including a time when they used lentils in an intercrop mix somewhat unsuccessfully. “Timing the species right is so important,” MacKenzie describes. “By the time the other crop was ready for harvest, the lentils had shelled out,” he says.

## *Setting Goals and Adding Diversity is key for Intercropping Continued...*

Accessing versatile equipment can be another frustration, Lawley says. “Having equipment that allows you to easily intercrop either by adjusting rate on alternate rows or allowing you to have bins that you can set different rates on for different seed sizes,” she says.

“Those become important if you’re doing this on a large scale or want to operationalize over large acres.”

“Another challenge may be getting connected to a group of intercroppers,” Lawley explains, which is helpful for producers looking to gain logistical information, share ideas, and learn from others’ experiences. She added that social media has been helpful in building new networks of farmers and enabling those conversations.

Overall, intercroppers are very observant. Lawley says they learn from successes but they also learn from mistakes. “They learn from the failures and thinking through what went wrong, regrouping, pivoting, and moving forward,” she says. “The surprises are where a lot of learning is going to happen.”

Resources:

<http://www.beefresearch.ca/blog/setting-goals-and-adding-diversity-is-key-for-intercropping/#more-9494>



## 2021 Calendar of Events

Soil Health Academy	July 19– 21, 2021	St. Paul County
---------------------	-------------------	-----------------

*For future updates on LARA events and webinars,  
Please visit our website at [www.laraonline.ca](http://www.laraonline.ca) or keep an eye on  
our Facebook page.*



### 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



Find us on Facebook



Follow us on Twitter  
[LakelandARA](#) [LARA livestock](#) [LARA cropping](#)

# LARA Garden 2020

## Lara Staff

### Garden 2020

2020 has certainly been an interesting year – and our garden shared in the 2020 “blues.” All our vine crops (pumpkins, squash, cucumbers) “drowned” and replanting was not very successful. Our corn suffered a similar fate. Carrots did grow but many resembled an octopus – the result of excess moisture.



Our potatoes were lucky enough to be on a higher plot of land and did quite well. An interesting variety – Clancy (pictured above) was included in our garden. This variety was started from seed (early March) and transplanted outdoors in late May. An advantage is that US seed houses can send seeds but not tubers to Canada – this allowed us to try varieties that may not be available in Canada yet. We also had 4 other varieties of potatoes – all were harvested in late September. Yields shown below are for 10 plants of each variety.

Purple Viking – 19.1 kg

Rande’s Golden Gem - 19.7 kg

Purple Magic – 20.4 kg

Snow Finger – 14.1 kg

Tomatoes seemed to suffer from the weather also. Those in the greenhouse did very well – with Sweet Orange (a cherry tomato) winning the “taste category.”

Hopefully 2021 will give us more favorable conditions.



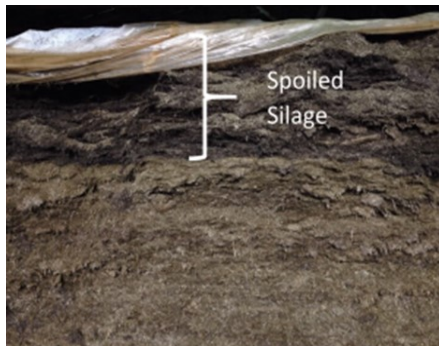
## *Eleven Ways to Avoid Feed Waste this Winter*

### *Beef Cattle Research Council*

Harvesting, storing and delivering a beef herd's winter rations are the largest expense for most operations.

Even small improvements in a winter feed system can result in significant feed cost savings.

Whether a winter feed system uses a silage bunk or pit, baled forage, or swath grazing, significant feed waste losses can happen. Spoilage, mould, trampling, and weather are just a few examples of how losses can occur.



In addition to the expense of the feed lost, cow-calf operations can experience significant reproductive losses from spoiled or low-quality feed such as cows failing to rebreed the following breeding season and poor calf performance

[Feed testing](#) can be the first step toward using stored feed efficiently. Once a plan is in place based on the feed test results, optimizing the consumption of the feed by limiting spoilage and wastage is a logical next step.

### **How to Limit Silage Waste**

Reducing waste in silage starts in the field says Les Halliday, PhD, Beef Specialist at PEI Department of Agriculture and Land. Here are Les' top tips to reduce silage waste:

- ◇ **Use balers with knives.** Les says coarse chopping allows for tighter packing of the forage in the bale resulting in less air and 10 -15% higher density which means less bales to wrap. Chopped grass in baled silage will also undergo a faster, more efficient fermentation than in regular baled silage. At feed out, cattle are able to access chopped silage more easily resulting in higher intake and less

waste, however, Les cautions that if bales are too tight it can hinder cattle from physically eating the forage, and cause them to tire out.

- ◇ **When wrapping silage bales in rows, ensure bales are consistent in size and shape.** Wrapping bales that are the same size will reduce large air pockets that can form when bales are not consistent. He also strongly suggests, "if you're going to try to cut your costs anywhere, don't let it be your plastic." The plastic wrap around silage bales creates a barrier from oxygen that is critical for good silage production. Without proper coverage, even a tiny hole (such as from rodents or barn cats) can lead to spoilage from mould.

- ◇ **If storing chopped silage in a bunker system, packing density and a tight air seal is key.** Les says higher packing density can be accomplished using a silage compaction roller which can increase packing density by as much as an additional 2 pounds of dry matter per cubic foot.

- ◇ **Double seal bunks or use oxygen barriers.** Double sealing or oxygen barrier plastic have shown positive results to reduce spoilage in bunks.

- ◇ **Maintain a smooth silage bunk face to reduce secondary spoilage.**

An uneven bunk face, caused by feed re-



moval, can result in a significant amount of air (oxygen) infiltration which wakes up the microbes that begin to use up nutrients (sugars, silage acids, and proteins) which leads to the production of carbon dioxide, ammonia and other gases. This can also lead to the growth of moulds, yeasts and certain pathogenic bacteria.

## Eleven Ways to Avoid Feed Waste this Winter Continued...

### How to Reduce Waste in Dry Hay

According to Duane McCartney, a retired forage-beef systems research scientist at Lacombe, AB, limiting waste in dry hay also starts in the field.

◇ **When cutting hay, set your mower on the widest setting.** This will enable shorter drying time, lower respiration losses, higher sugar content, and more digestible energy. It also improves fermentation and reduces the likelihood of rain damage.

◇ **When storing bales, arrange them to allow sufficient air flow.** Where the bales touch, moisture can accumulate which can lead to spoilage losses.

Duane also suggests that bales are stored in a well-drained area.

◇ **Assess any leftover hay and straw bales that may need to be rearranged to ensure there is adequate air space around all the bales.** Otherwise the summer rain will creep into the bales and spoilage will result.

◇ **When feeding forages in round bale feeders, ensure each cow has enough space at the feeder to reduce competition and minimize trampled feed.** Duane says he has observed the least waste in tapered cone style round bale feeders.

◇ **Avoid feeding stored forages directly on the ground if possible.** Whether it is chopped silage or round bales rolled onto snow, feed losses can range from 23-26%. Duane suggests a portable feed bunk can be a better option to reduce wasted feed.

◇ **Swath grazing** can be an effective method of

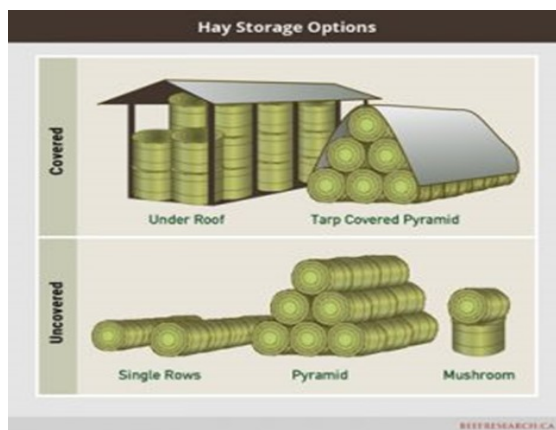
**feeding cattle; however, it requires planning to minimize feed waste.** Duane suggests cattle be fenced into a small section that can be cleaned up ideally within three days. Not fencing off sections for swath grazing can result in an unbalanced diet and risk of acidosis. The accessibility of the swaths for the cattle

may also need to be addressed. To open up areas in times of heavy snow, a tractor may be driven down the swath or a blade used to move snow off the swath. It is also important to provide adequate shelter, either through natural shelter or portable windbreaks, to prevent cattle from bedding down in the feed.

Regardless of the style of winter feeding, continually working to reduce feed waste and minimize the loss of nutrients protects your farm's large investment in stored forage.

Resources:

<http://www.beefresearch.ca/blog/eleven-ways-to-avoid-feed-waste-this-winter/>



## The Orphan Well Association and Your Land

### ARECA

Do you have orphan oil and gas infrastructure on your land and are wondering what happens next?

The Orphan Well Association (OWA) is responsible to decommission and reclaim the site. The OWA operates under the legal authority of the Alberta Energy Regulator (AER) and is a not-for-profit, industry-funded organization that works to decommission and reclaim the wells, facilities, and pipelines left behind by defunct oil and gas companies.

#### How the OWA works

When a well, pipeline, facility or associated site no longer has a legally or financially responsible party that can be held accountable, it is known as an 'orphan.' At this point the orphan becomes the OWA's responsibility, and work will be undertaken to safely decommission the infrastructure and restore the land as close to its original state as possible.

To complete this work, the OWA hires experienced contractors with excellent safety records. Throughout the process, the contractors strictly adhere to Alberta Energy Regulator (AER) and Alberta Environment and Parks (AEP) regulations and requirements.

#### Is it an orphan?

When it comes to which sites are considered orphans, only those with no responsible party are formally designated as orphans by the AER. Until the AER designates the site as an orphan, the OWA cannot undertake work on the site.

Within a month of a site being designated as an orphan, landowners will receive a letter from the OWA that will outline our process and seek your input on the site. A listing of all orphans in the Province can be found on our website (<http://www.orphanwell.ca/about/orphan-inventory/>). If you have not received a letter and cannot find the well listed on the OWA website, landowners are encouraged to contact the AER to determine who is responsible for the site. The AER may be contacted at 1 855 297 8311 or [LiabilityManagement@aer.ca](mailto:LiabilityManagement@aer.ca).

Not all inactive sites are considered orphan under provincial regulations. Some sites may be operated or owned by a solvent company or may be under the custody of a court-

appointed receiver to be sold. In other cases, the defunct operator may have working interest partners (WIPs), which are viable partners that hold some working interest in the well, pipeline or facility. These WIPs are then legally responsible for the decommissioning or reclamation work.

New legislative changes may allow the OWA to work on these WIP sites, but only in cases where the OWA and the WIP have signed an agreement.



#### What does this mean for you as a landowner?

After arranging access on your land, contractors will perform an inspection of the infrastructure. Once everything is deemed safe, and equipment is documented and photographed, the OWA will place signage at the site indicating the location is now under the care of the OWA.

A company will then be assigned to safely plug the oil and gas wells, otherwise known as decommissioning (abandonment in regulatory terms). The wells are plugged, cemented, and the surface wellhead is cut below ground. Cutting below ground will allow landowners to safely cultivate over the former well. Crews will also remove any equipment in the area and then purge and decommission any accompanying pipelines.



At this point, your land will be ready for remediation, if required, and reclamation.

Once sites have been examined, crews will work to clean up any contamination that may be present (remediation). This may involve using a hoe or small drill rig to determine the extent of contamination. Any realized contamination is typically excavated and sent to an industrial landfill for disposal or treated on site. Clean backfill, if required, is sourced with landowner approval before being brought in.

The reclamation process includes removing any leftover gravel on site, recontouring the site to original drainage patterns, replacing topsoil and returning the lease and access road to its previous state. Weeds are also controlled at this stage.

The reclamation process includes removing any leftover gravel on site, recontouring the site to original drainage patterns, replacing topsoil and returning the lease and access road to its previous state. Weeds are also controlled at this stage.



## The Orphan Well Association and Your Land

Continued...

Once work is complete, a reclamation certificate will be obtained from the AER, and the land can again be used as it once was.

### Access to your land

Due to the downturn in the economy in recent years, the OWA has accelerated work because of the need to reclaim thousands of upstream orphan oil and gas sites in Alberta. This may mean that the OWA will need to access your land throughout the year, regardless of what agricultural stage your land is in. The OWA appreciates your cooperation in allowing access for work crews. Wherever possible we will limit our footprint to the former lease and access road held by the defunct company. If off-lease work is required, the OWA will compensate landowners for any off-lease access.

Of course, throughout the process, the OWA will be in constant communication with landowners, keeping you up to date about what is happening. The OWA is committed to developing positive relationships with landowners while minimizing impact to any agricultural practices.

### What the OWA can and can't do

While the OWA does not take place of the former operator, the regulations grant the OWA the legal right to access both public and private land to complete work on a well, facility or pipeline that has been deemed an orphan. Any surface lease remains in the name of the defunct operator. As such, the OWA is unable to compensate landowners/occupants for unpaid surface lease payments from any defunct company. Landowners may apply to the Alberta Surface Right Board (SRB) for the recovery of unpaid surface leases. For information respecting these payments, please contact the SRB (toll free at 310-000, then 780 427 2444) or visit their website at <https://surfacerights.alberta.ca/>.

The OWA enjoys a long history of working closely and cooperatively with landowners. In rare cases, some landowners have restricted access in an attempt to secure unpaid lease payments from the OWA. In these circumstances the OWA has an obligation to inform the SRB of the situation. Section 36(8) of the *Surface Rights Act* gives the SRB the discretion to not grant any payments if the landowner is refusing access for decommissioning and reclamation.

Landowners can obtain further information regarding the impact of restricting access through the Farmers Advocate Office at 310-FARM (3276)

or visit <https://www.alberta.ca/farmers-advocate-office.aspx>, or the Pembina Institute at

<https://www.pembina.org/pub/landowners-primer-what-you-need-know-about-unreclaimed-oil-and-gas-wells>).

Interested in learning more about the OWA? For additional information please visit [www.orphanwell.ca](http://www.orphanwell.ca) or contact the OWA at via email at [landowner@orphanwell.ca](mailto:landowner@orphanwell.ca).

### Helpful Definitions:

#### **Orphan**

When a well, pipeline, facility or associated site no longer has a legally or financially responsible party that can be held accountable. This requires formal designation by the AER.

#### **Inactive**

A well or site is considered inactive when there has been no production for one year (six months in the case of a sour well). An inactive site may be due to economic or technical reasons.

#### **Decommissioned (Abandoned)**

Sometimes referred to as abandonment or decommissioning, the well is permanently plugged and cut off below ground, pipelines are purged and cut-off, and any associated surface equipment removed.

#### **Remediation**

The process of cleaning up any contamination left on site. Contaminants are managed and removed according to AER and AEP requirements. Contaminated soil may be hauled to a landfill and then replaced with clean soil, or may be treated onsite until it meets AEP guidelines.

#### **Reclamation**

The process of returning the land to how it looked and was used before oil and gas development took place. This may involve recontouring the subsoil, replacing the topsoil, and re-establishing the vegetation.

Resources:

[www.orphanwell.ca](http://www.orphanwell.ca)



In July of 2021, LARA is proud to be hosting a Soil Health Academy. The goal is to move beyond sustainable agriculture to regenerative agriculture. Regenerative agriculture is a system of farming principles and practices to improve all aspects of the operation from increasing biodiversity, soil health and improving water quality; increasing carbon capture, farmer profitability and resilience. The Soil Health Academy is an intense 3 day hands-on course that examines all aspects of regenerative farming and ranching, focusing on soil health, plant health and animal health.



#### **What You Will Learn:**

- 1. Principles of Soil Health & Adaptive Stewardship**
- 2. Restoring Vibrant Ecosystems Through Adaptive Grazing**
- 3. Making Grazing Highly Profitable & Desirable**
- 4. Successful Marketing: Strategies for Enhanced Net Margins**
- 5. Nutrient Management**
- 6. Designing Cover Crop Mixes**
- 7. Farm Economics and Whole Farm Planning**

So stay tuned for more information regarding this fantastic opportunity in the Lakeland. We are moving towards a world where consumers are demanding to know their food's story and that requires regenerative practices. General Mills, one of the largest food companies in North America has pledged to have their producers utilizing regenerative agriculture practices on one million acres by 2030. Take advantage of this opportunity to take your farm to the next level and learn about the benefit that regenerative agriculture can have for you.

Call Kellie Nichiporik at the LARA office for more details about this exciting event!

(780) 826-7260

## Overview of Research and Demonstration Projects 2020

### Replicated Small plot Trials

#### ◆ Regional Variety Trials

CWRS & CWHWS  
CPSR & CWSWS  
Barley  
Oats  
Triticale  
Green Field Peas  
Yellow Field Peas  
Faba Beans

#### ◆ Yield and quality of Cereal Crops For Forage Production in Alberta

Barley  
Oats  
Triticale/ Wheat  
Pea/Cereal Mixture  
Winter/Spring Cereal mixture

#### ◆ Longevity of Perennial Forage Varieties and Mixtures for Production in Alberta

Legumes  
Grasses  
Mixture

#### ◆ Impact of Seeding Date and Seeding Rate on Spring wheat Production

Ultra Early Seeding Date  
Regular Seeding Date

#### ◆ LARA Spring Cereal Variety Cereals

#### ◆ Regional Assessment of ESN on the Productivity and Grain Quality of Wheat and Barley in Northeastern Alberta

#### ◆ Impact of the Application on Two Liming Products on Soil pH and Long-Term Impact on Alberta Crop Yield.

Barley

### Field Scale Trials

- ◆ *Silage Bale Yield and Quality for Livestock Feed in northeastern Alberta*
- ◆ *Alberta Soil Health Benchmarking Project*
- ◆ Long-term Impact on soil Biological, Physical and Chemical Health of Four Extended Grazing Strategies in Northeastern Alberta
- ◆ Long-Term Impact of Five Cover Crop Mixtures on Soil Biological, Physical and Chemical Health

### Demonstrations

- ◆ Wheat Variety Demo



For More Information on any of the trials listed above, please contact the LARA office at (780) 826 - 7260

***We are currently planning our research and demonstration program for 2021. Contact us at (780) 826-7260 to provide your input on the program!***

## Lakeland Agricultural Research Association

### Mission Statement:

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

## LAKELAND AGRICULTURAL RESEARCH ASSOCIATION

Box 7068  
Bonnyville, Alberta  
T9N 2H4

Phone: 780-826-7260  
Fax: 780-826-7099

E-mail:  
livestock.lara@mcsnet.ca  
sustainag.lara@mcsnet.ca  
cropping.lara@mcsnet.ca  
technician.lara@mcsnet.ca

Find us on Facebook

Follow us on Twitter:  
@Lakeland ARA  
@LARA Livestock  
@LARA Cropping

[www.laraonline.ca](http://www.laraonline.ca)

## LARA Staff

**Alyssa Krawchuk**  
livestock.lara@mcsnet.ca  
Forage and Livestock Program

**Kellie Nichiporik**  
sustainag.lara@mcsnet.ca  
Environmental Program

**Amanda Mathiot**  
cropping.lara@mcsnet.ca  
Cropping Program

**Stephanie Bilodeau**  
technician.lara@mcsnet.ca  
Agronomy Technician

## LARA Board

**M.D. of Bonnyville**  
Murray Scott  
Ulf Herde  
Marc Jubinville (*ASB rep*)  
Mike Krywiak (*ASB alt*)

**Lac La Biche County**  
Wanda Austin (*Chair*)  
Laurier Bourasa  
George L'Heureux (*ASB alt*)  
Colette Borgun (*ASB rep*)

**County of St. Paul**  
Carl Agnemark  
Phil Amyotte  
Cliff Martin (*ASB rep*)  
Kevin Wirsta (*ASB alt*)

**Smoky Lake County**  
Barb Shapka  
Charlie Leskiw  
Dan Gawalko (*ASB rep*)  
Johnny Cherniwchan (*ASB alt*)

Luc Tellier (*LFA Rep*)

## Upcoming Events

*Don't forget to keep an eye on  
[www.laraonline.ca](http://www.laraonline.ca) for more event details as  
they become available.*



This publication is made possible in part by:



Thank you to our municipal and county partners:

