

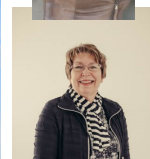


## Grain, Grass & Growth

September 2020

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

## CARA's 2020 Staff



*The 2020 CARA Crew 'outstanding in their field'.* It takes many hands to establish, maintain, harvest and document applied research trials.

2020 has provided the world with lots of challenges. Although covid related issues have influenced many things in our day-to-day activities, much of agriculture has carried on with business as usual except for the extreme intervention delivered by Mother Nature during the past few months. Fortunately, the severe hail storms missed our project sites but moisture was limited at several sites, reducing yield potential. Watch for trial results once samples are processed this fall.

Now for some good news: CARA will soon be receiving \$266,942 from the Western Grains Research Fund Capacity Grant! These funds will be used to for a new truck, tractor, cargo trailer, GPS equipment, mower and to pay off our Winter Steiger combine. Money for capital expenditures has been hard to find so this grant to maintain our applied research capacity is very much appreciated.

### Inside this issue

- New Staff
- Covid-19 & Ag
- Grassfire Safety Tool Kit
- Upcoming Events
- 2020 Project & Trial Highlights
- Producer Funding Opportunities
- The Orphan Well Association and Your Land
- Eight Ways to Boost Your Herbicide Resistance Prevention Strategy
- Fall-related Considerations for Your 2021 Lentil Crop
- Feed Testing & Analysis for Beef Cattle

## NEW CARA Staff



### Braeden Peers Crop Agronomist Technician

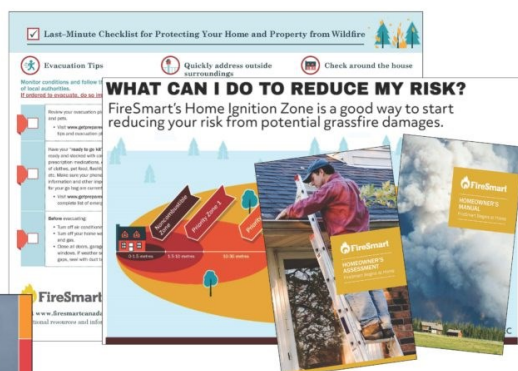
Braeden grew up farming in Acadia Valley, where he developed an interest in agriculture. He obtained a Bachelor of Science with specialization in geology from the University of Alberta in 2015, followed by a B.Sc. in Agriculture with Distinction in crop science in 2018. For the past two years he has been farming full time with his family, joining the CARA team in April 2020.

Email: [cara2@telus.net](mailto:cara2@telus.net)



## GRASSFIRE SAFETY TOOLKIT

*Now available - get yours today!*



The Grassfire Safety Toolkit is full of useful information to help you prepare for, respond to, and mitigate damage from grassfires.

Grab one and learn how you can start reducing your grassfire risks today.

Grassfire Safety Kits are available free of charge at any Special Area District Offices or the Youngstown Service Center. They have information, tools, and checklists to help you prevent, prepare, and mitigate grassfires in your home, on your property, and in your community.

Contact your local office to get yours today.

<https://specialareas.ab.ca/living/emergency-services/>



**CARA has compiled a list of Covid-19 resources for Agriculture producers. We will be updating this as new information is announced.**

*If there is a program that you have seen available and we do not have it posted, please email [cara-3@telus.net](mailto:cara-3@telus.net) with the details and a link to the*

**[ChinookAppliedResearch.ca/Resources/Covid19-Ag](https://ChinookAppliedResearch.ca/Resources/Covid19-Ag)**

# AGRI WEBINARS



## Upcoming Webinars

All registration links can be found on the CARA website

**[ChinookAppliedResearch.ca/calendar-of-events/AgriWebinars](http://ChinookAppliedResearch.ca/calendar-of-events/AgriWebinars)**

### SEPTEMBER

**Passive Solar Greenhouse**  
September 24th

### DECEMBER 2020

**Agricultural Excellence  
Conference**  
December 8—10

### TO BE ANNOUNCED

Cattle Water Supply  
Cattlemen Clinic  
Navigating Alberta Farm Grants  
And more!

### RECORDED WEBINARS NOW AVAILABLE ON CARA'S WEBSITE

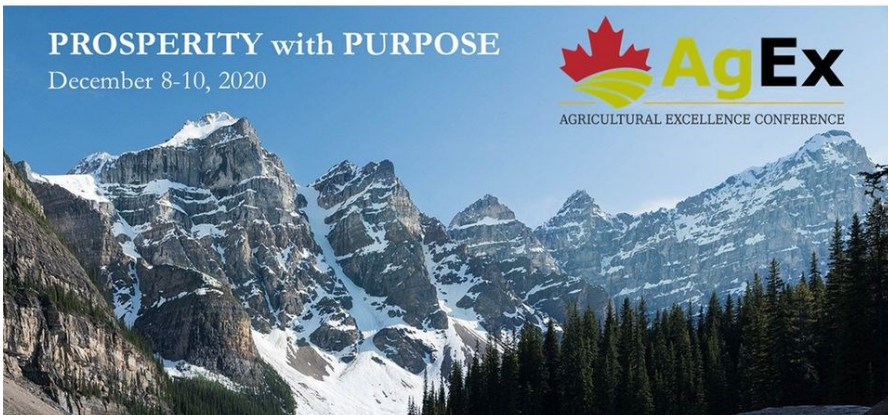
Market Outlook  
Grazing School Webinar Series  
Weather Outlook with Drew Lerner  
Sprayers 101  
Pasture & Hay Rejuvenation  
Farming Safe During Covid-19  
Social Media & Agriculture

### **Have a webinar suggestion?**

Send us an email with your idea to  
[cara-3@telus.net](mailto:cara-3@telus.net)

If you would like to give us your input on extension methods CARA should utilize please complete the quick survey  
**[www.surveymonkey.com/r/JQXQY7F](http://www.surveymonkey.com/r/JQXQY7F)**

**PROSPERITY with PURPOSE**  
December 8-10, 2020



# 2020 Project & Programs

## 2020 Projects & Programs

Check out

[www.ChinookAppliedResesarch.ca/2020-projects-trials](http://www.ChinookAppliedResesarch.ca/2020-projects-trials)

for highlights from our 2020 program. Site information and downloadable maps are available for on-site self-guided tours. See below for a few highlights.

### Regional Variety Testing program (RVT)

Alberta's RVT program is one of the most trusted sources of crop information in the province.

*The RVT program is responsible for generating unbiased, post-registration data of varieties of wheat, durum, barley, oats, rye, triticale, flax, field pea, chickpea, lentil, dry bean and fababean crops from locations across the province.*



CARA contributes to the data base for most of these crops at sites located near Oyen, Acadia Valley, Hanna and Consort. This information provides growers with data they can use to choose the best varieties to keep their operation competitive. Tables summarizing the information are published each year in the Alberta Seed Guide.

In addition to the Alberta crop trials, CARA also manages trials for the Saskatchewan RVT Program. Evaluation of annual crops for silage and green-feed are included in CARA's program which also contribute data to the Alberta Seed guide.

### Soil Health Benchmarking Project

Understanding soil health will give Alberta producers a valuable tool for use in making strategic management decisions on their farms and ranches. Development of a benchmark data base is very important to better recognize soil health limitations and develop appropriate management strategies.



Photo Courtesy of FFGA

CARA is coordinating a five year soil Health Benchmark project funded by the Canada Agriculture Partnership (CAP). 10 associations throughout the province are participating, collecting soil and field information from local producers. Impact of management practices on the sites will be monitored. Approximately 1000 samples will be processed at CARA's Soil Health Lab during the project duration.

## Pest Monitoring

Every year we participate in several crop pest monitoring surveys. These survey results contribute to Alberta Agriculture's pest monitoring program by contributing to either the current years' real-time mapping of infestation risk levels or the Forecasting maps.

In the 2020 season, we will be conducting surveys for the:

- Cabbage Seedpod Weevil
- Clubroot
- Grasshoppers
- Wheat Midge & Wheat Stem Sawfly
- & more!

These surveys are being conducted within the Special Areas, MD of Acadia and surrounding counties. The results of these surveys can be found in our Annual Report or the real-time maps on-line.



## Crop Fertility Trials

CARA manages fertility trials for wheat and barley funded by the Alberta Wheat Barley Commission which monitor the impact of various rates of nitrogen and other fertilizer blends on yield and quality. The effect of various rates of mono-ammonium phosphate (MAP or 11-51-0) on field pea production is also under evaluation with support from the Alberta Pulse Growers.

## Bio-Control of Canada Thistle With the Stem Mining Weevil

CARA, along with other applied research groups, introduced the Stem-Mining Weevil as a biological control agent to help control Canada thistle populations at various points in Alberta. The purpose of this project is to decrease and control Canada thistle populations in sensitive areas such as riparian zones, organic farms and native pasture. It is hoped the weevil may be a tool to reduce the use of chemicals to control weeds in sensitive areas.

CARA is currently monitoring 4 sites.



## Cocktail Cover Crops for Soil Health Improvement and Livestock Feed



Cocktail cover crops have gained popularity in recent years with the acres seeded in Alberta slowly increasing. These crops can be an important tool for producers to generate on-farm benefits such as improved soil health, weed suppression, insect management and forage production.

# NEW FUNDING OPPORTUNITY

## Agriculture Training Support



This program is to provide support to the agricultural and horticultural businesses and services to help address the impact of COVID-19. The program will provide a grant to eligible employers to offset the costs of training and ensuring safety protocols are in place for new employees hired from the available domestic labour pool.

### Eligible activities

A) training for New Hire Employees in the area of COVID-19 safety procedures, including:

- physical distancing, as defined by Alberta Health Services (<https://www.alberta.ca/prevent-the-spread.aspx#p25621s3>);
- proper handwashing and other steps to prevent the spread;
- proper use of Personal Protective Equipment, if required;
- proper disinfection of equipment, buildings and facilities;
- requirements for self-reporting of symptoms of COVID-19 to the employer; and
- the process for confidential reporting of infractions for sections i. to v. above to the employer; and

B) training for New Hire Employees in occupational health and safety; and/or

C) training for New Hire Employees in work-related duties and activities.

### Important Notes from Terms and Conditions

- The New Hire Employee must be a Canadian citizen or permanent resident residing in Alberta, including students, that is newly employed, or will be newly employed, by an Eligible Applicant for a minimum of 25 hours per week for a minimum employment term of 12 continuous weeks.
- A Proof of Employment for each New Hire Employee must be submitted with the Application.
- A New Hire Employee cannot be an individual who is related to the Applicant (including executives/shareholders) by blood, marriage, adoption, common law relationships, or have close business ties.
- Grant funding cannot be used towards the wage/salary of the New Hire Employee.
- This Program provides funding support at 100% to cover Eligible Expenses for approved Applications up to a maximum of \$2,000 per New Hire Employee to a maximum of \$50,000 per Applicant.
- All Applicants must provide, to the satisfaction of the Minister, a Confirmation of Training Form for each New Hire Employee within 60 days of the completion of the Project.

For assistance email Olivia with CARA at [cara-3@telus.net](mailto:cara-3@telus.net) or call 310-Farm (3276)

**[www.cap.alberta.ca/CAP/program/TRAINING](http://www.cap.alberta.ca/CAP/program/TRAINING)**

## FUNDING OPPORTUNITIES

### Watering Systems to Help Preserve Your Riparian Areas

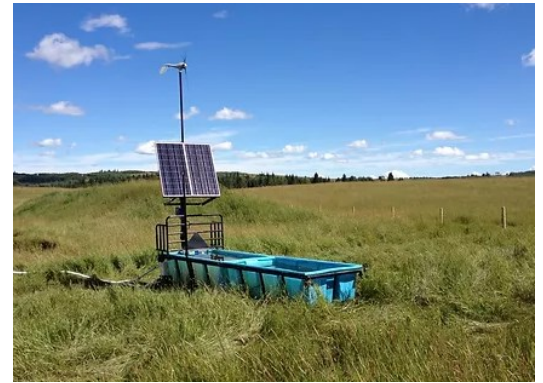
*\*Apply before you Buy\**

#### ALBERTA

Under the Canadian Agricultural Partnership (CAP), the Alberta Ministry of Agriculture has several programs available to your operation. The Environmental Stewardship & Climate Change—Producer Program offers a cost-sharing opportunity of 30-50 per cent of eligible costs to a maximum of \$50,000 to help producers with fencing to restrict livestock access to riparian areas. If you are considering installing a watering source from a well, a new dugout, a new well or pipeline for agricultural use, be sure to check out our Farm Water Supply Program. Funding for the development of new projects, which may include watering systems, is available at one third up to a maximum rebate of \$5,000 for eligible costs.

#### SASKATCHEWAN

Under the Canadian Agricultural Partnership (CAP), the Ministry of Agriculture has several programs available to your operation. The Farm Stewardship Program offers a cost-sharing opportunity of 50 per cent of eligible costs to a maximum of \$10,000 to help producers with fencing to restrict livestock access to riparian areas. If you are considering installing a new dugout, well or pipeline for agricultural use, be sure to check out our Farm and Ranch Water Infrastructure Program. Funding for the development of new projects, which may include watering systems, is available up to a maximum rebate of \$50,000 at 50 per cent of eligible costs.



**WIN\* A SPOT**  
in the 2020-21

**FARM YOUR**  
**numbers\$ #**

program

**CYFF**

\* For complete rules visit <https://cyff.ca/fyn-competition-rules/>



#### A Message from the FarmTech Foundation of Alberta

The FarmTech Foundation of Alberta has made the decision to cancel the FarmTech 2021 Conference which was scheduled to take place from January 26 to 28, 2021. The safety of all our attendees, speakers and sponsors is the priority during the COVID-19 pandemic.

For more than twenty years, FarmTech has been Alberta's gathering place for farmers and the agricultural industry to learn and connect with each other. For everyone that attends the FarmTech conference, the networking and social aspect are as important as the keynote speakers, educational sessions and the agricultural showcase.

The FarmTech Foundation looks forward to when we can safely reconvene for the interactive and engaging event that attendees have come to expect from Canada's premier crop production and farm management conference.

The FarmTech Foundation of Alberta is comprised of Alberta Barley, Alberta Canola, Alberta Pulse Growers, Alberta Seed Growers Association, and the Alberta Wheat Commission.

FarmTech Foundation of Alberta  
[farmtechconference.com](https://farmtechconference.com)



# The Orphan Well Association and Your Land

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.

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).



Before OWA work



After OWA work

## All About a VBP+ Audit

Despite having completed the VBP+ training, for the beef cattle producer to become fully certified on the VBP+ program they need to be audited. The audit is a check on how a beef cattle operation is applying the VBP+ program requirements. It's a review of records and observations used to determine if a beef cattle operation is meeting the requirements.

VBP+ third party auditors are an objective and knowledgeable "outside eye" trained in ISO auditing. Auditors use a combination of observation, interviews, record reviews and listening skills to determine whether the beef cattle operation family or staff fully understand the program and can demonstrate responsible actions. To be eligible for a validation audit, cow-calf operations must have a minimum six (6) months of records and feedlots a minimum of three (3) months of records. These records need to be complete according to the program requirements outlined in the VBP+ Program Summary Checklist.

Once ready, contact your provincial VBP+ coordinator who will assign an auditor. The auditor will then contact you to arrange a suitable time/day. The provincial coordinator will take steps to address potential conflict of interest between a producer and an auditor. Potential conflict of interest includes current or former business arrangements, family ties or close contact as friends.

All VBP+ auditors follow strict bio-security protocols so, to protect animal health, you will be asked if there are any specific actions needed prior to them visiting the beef cattle operation.

After the audit, the auditors submit a recommendation to the provincial coordinator who conducts a review, along with possible

corrective actions, and notifies the beef cattle operation of the results of the audit. If there are corrective actions needed, these must be met before official VBP+ certified status is granted. For more detailed information refer to 'After An Audit' .

VBP+ certified beef cattle operations submit either a sample of records or a self-declaration each year to the provincial coordinator. The VBP+ provincial coordinator will remind certified operations of their pending renewal and, once in hand, will review and provide confirmation whether program requirements have been met. The sequence occurs once annually and then in the sixth year, a full audit is required and the cycle continues. VBP+ may do a random audit at no cost to the beef cattle operation during any of the Self-Declaration years to assess program conformance.

To find information on a VBP+ audit cost contact your VBP+ provincial coordinator as costs may vary by region and may be reduced if more than one audit is conducted locally.

If you are interested in taking the VBP+ Training Course please contact CARA at [cara-3@telus.net](mailto:cara-3@telus.net) to be put on the notification list. We need a minimum number of people to be signed up to host the session in person.



# Eight Ways to Boost Your Herbicide Resistance Prevention Strategy

## The latest information and improvements to management systems

It's a dire situation that the number of herbicide groups various weeds are resistant to continues to grow across the Prairies; however, farmers should take heart as there are many actions they can take to protect their fields this year and for years to come. It's about managing weeds to reduce reliance on, and enhance the efficacy of, herbicides as much as possible, says Tammy Jones, weed specialist at Manitoba Agriculture. "There isn't any new strategy, but just using the latest ideas for improving old systems — and really working the tried-and-true (ones)."

However, Jones wants to stress the seriousness of the situation. While hope springs eternal for new commercialized herbicide modes of action, she reminds farmers that even a broad, new mode of action may not work on many of the weeds that Prairie farmers contend with. Growers must therefore continue to use every weed control option, making sure all of the pieces of the herbicide resistance management puzzle are in place. Here is a roundup of most of them, with Jones' newest pieces of advice.

**1. Ensure your seed spacing and row spacing favour the crop and not the weeds.** Some crops lend themselves to this better than others, however, keep on top of favourable seed and row spacing to stay ahead of weeds.

**2. Use cover crops.** For weed control, cover crops can work like a mulch that prevents weed seed germination, says Jones. "Fall rye has a great ability to cover the soil, to be competitive and produce high amounts of biomass. It seems like we'll have good soil moisture this spring, so the crop can get a good start. In a dry spring, the fall rye can use valuable soil moisture. Fall-seeded oats can also produce good biomass accumulation and are winter-killed, so there's no need for termination (a herbicide pass) in the spring."

**3. Significantly change your crop rotation.** While many farmers have made some changes in rotation to address herbicide resistance, Jones encourages them to try for even greater diversity. "It's tough because shortening a rotation may bring more profit this year, but you really need to keep the long-term view in mind," she says. "There are many aspects to rotation and you may think you can apply a

different herbicide because the crop is different, but the weeds in the new crop might be resistant to that herbicide too."

**4. Change things up.** By using different seeding dates, different crop maturities for varying harvest dates, or a deep-rooted perennial crop that doesn't favour a more shallow-rooted weed population can make a significant impact. Jones points to studies in the 1980s and 1990s that showed a certain crop or tillage pattern favours the success of specific weeds, such as winter wheat favouring downy brome grass. Avoiding these patterns helps to keep the weeds from establishing a foothold.

**5. Become an expert patch manager.** What works best can differ among patches, but Jones notes that mowing or hand-pulling before seed set provides a lot more benefit than growers realize.

**6. Clean your equipment as needed.** Also, leave weedy fields until last.

**7. Look at newer tillage equipment.** Inter-row tillage is becoming a more reasonable option, even with narrow rows, since cameras can help make adjustments to stay between the rows or even provide shank control to prevent crop damage. There are costs associated with this, but Jones says the investment may be worthwhile.

**8. Use the time you have.** This spring will be challenging in terms of getting ruts smoothed out after last fall's wet weather. "Getting rid of ruts has to happen, and most growers will be in a hurry to get into the fields to seed, but I'm worried about weed control," says Jones. "The time needed to get rid of ruts means a narrower window to control those weeds earlier. Mark green patches when you are out there smoothing the fields. Do another tillage pass later before planting to disturb weeds when they are small, if you have adequate soil moisture and have the time before seeding. We don't always have the flexibility we want and there are hard decisions to make."

Overall, Jones says growers need to subject these herbicide-resistant weeds to death by a thousand cuts. "Farmers are good at this for the most part and it's complex and there is only so much time in the day," she says. "All you can do is your best."

## Fall-related Considerations for Your 2021 Lentil Crop

In preparation for growing lentils in 2021, field selection, residue management and fall weed control should be considered in the fall of 2020.

While land rollers, flex headers, higher podding varieties and improved lodging resistance have allowed producers to grow lentils on less than ideal fields, it continues to be important to select fields with fewer rocks for harvest efficiency. Lentil plants have a very low tolerance to waterlogging and are susceptible to root diseases, so avoid selecting poorly draining soils as much as possible. Lentils do well on clay soil in lower rainfall areas, however, turn out better on sand and loam soils in soil zones with customarily higher precipitation or during growing seasons with higher than average rainfall. If lentil is grown on canola or mustard stubble, be prepared to consider a fungicide application for sclerotinia white mould.

Grow your lentils in fields where much nitrogen was extracted from the soil by the previous crop. Planting lentils in fields high in nitrogen prevents the plants from effectively forming nitrogen fixing nodules, increases disease pressure on a wet year due to an increase in vegetative growth and delays maturity. Although newer lentil varieties are generally more determinate than older varieties, excess nitrogen in the soil continues to heighten the risk of excessive vegetative growth instead of adequate seed set if rainfall continues in July and August.

Lentils are sensitive to some herbicide residues in the soil. Check cropping restrictions of herbicide chemistries applied over the past few years with other crops to realize if it's okay to plant lentils. Some residues do not break down for two or more years, especially under dry growing conditions. If you are unsure about a field, submit soil samples to a lab for a bioassay.

Root rots have been more problematic in pulse crops over the past few years, with the same root rot pathogens generally affecting both pea and lentil. To help prevent root rot from occurring, leave 3 years between field pea and lentil crops or between lentil and lentil crops; 6 years if the aphanomyces pathogen is present.

Ensure a uniform lentil stand next spring by evenly spreading residue or straw from the previous crop. Good straw management not only prevents variable crop emergence, but also provides maximum efficacy of the pre-seed herbicide application. Further to this, lentils seeded into heavy crop residue are more susceptible to spring frost injury. Even spreading of excess straw allows additional bare soil to absorb the sun's heat during the day, releasing it at night, minimizing potential frost injury.

Avoid market class contamination by not growing red and green lentil varieties in rotation on the same field for at least four years. Experienced producers assign specific fields for only red or only green lentil.

Lentil has a thin crop canopy at the onset of the growing season, making it a poor competitor with weeds. Wild oat, as well as volunteer wheat and barley, are important weeds to control because they are difficult to clean from the smaller seeded lentil varieties. Given that some wild oats are resistant to Group 1 (i.e.: Poast Ultra) and Group 2 (i.e.: Odyssey) herbicides, a wider herbicide rotation slows their resistance development. Therefore, it is important to consider a fall application of a soil-applied granular herbicide like ethalfluralin (Edge), which uses a Group 3 mode of action. Edge suppress wild oat, volunteer barley and volunteer wheat as well as controlling other weeds resistant to other herbicide groups. Edge is the preferable fall applied herbicide in the Brown and Dark Brown soil zones because it also controls kochia, which can be resistant to Group 2 (i.e.: Odyssey) and Group 9 (i.e.: glyphosate) herbicides. Edge is only registered in lentil production for fall application. While Edge can be successfully applied without incorporation later in the fall when daylight hours are shorter, reducing chance of photo degradation, registered practice is to incorporate with a heavy harrow operation to ensure herbicide/soil contact while also evenly spreading crop residue. As a soil applied herbicide, Edge controls susceptible weeds in the treated soil layer as weeds germinate in the spring.

Some Group 14 and Group 15 herbicides can be applied in the fall, providing lentil growers with more weed control options. However, they don't have the same residual effect as Edge to provide season-long weed control the following year. Moisture is necessary to activate Group 15 (pyroxasulfone). Focus (Groups 14 and 15) can be applied in the spring or the fall, controlling some grassy and broadleaf weeds. However, caution is advised as Focus can damage lentil growth when growing conditions are not optimal, i.e.: high soil pH (7.5 and above), cool weather, prolonged and excessive moisture, seedling diseases, and poor agronomic practices, i.e.: shallow seeding. Although research shows that lentil crops generally recover from damage by Focus, nonetheless, setting a lentil crop back always puts it at more risk of flower abortion during July heat, which can reduce overall yield. Valtera/Chateau (Group 14) is only registered for fall application in lentil production. However, over-use of Group 14 herbicides can lead to selection pressure for weed resistance. Therefore, do not apply Heat, also a Group 14 herbicide, as a pre-seed burnoff in the spring when a Group 14 herbicide is applied in the fall.

**Neil Whatley, 2020**

# Feed Testing & Analysis for Beef Cattle

When you don't know the quality of feed on an operation, maintaining animal health and welfare can become significantly more difficult. Visual assessment of feedstuffs is not accurate enough to assess quality and may lead to cows being underfed and losing body condition, or wasting money on expensive supplements that aren't necessary.

## Why feed test?

1. Avoid sneaky production problems, such as poor gains or reduced conception caused by mineral or nutrient deficiencies or excesses;
2. Prevent or identify potentially devastating problems due to toxicity from mycotoxins, nitrates, sulfates, or other minerals or nutrients;
3. Develop appropriate rations that meet the nutritional needs of their beef cattle;
4. Identify nutritional gaps that may require supplementation;
5. Economize feeding, and possibly make use of opportunities to include diverse ingredients;
6. Accurately price feed for buying or selling.

## Obtaining Feed Samples

It's critical to collect a feed sample that is representative of the feed ingredients that you are testing. Any feed type that will be used to feed beef cattle can and should be analysed, including baled forages and straw, by-products, silage, baleage, grain, swath grazing, cover crops, and corn.

Feed quality will change as the feeding season progresses. Samples should be taken as close to feeding or selling as possible, while leaving enough time for the results to come back from the lab.

For baled products, use a forage probe to obtain a minimum of twenty cores for each sample you wish to submit. Sample square and round bales 12-15" deep and stacks or chopped hay 18"

deep. Round bales should be sampled from the side (round end) and squares should be sampled at the end. Separate your forage inventory into lots with similar characteristics – same field, same maturity at cutting, same plant composition, etc. Hand grab samples will not be representative enough to give accurate results.

I have the sample now where do I send it?

Some counties, rural municipalities, applied research associations, and forage testing labs also have probes for rent. Forage probes can be purchased from farm supply stores and range in price from about \$100 to upwards of \$500 for fancier drill driven models. Producers can construct their own forage probes but should ensure the diameter is between 3/8" to 3/4". The tip should not be angled, and needs to be kept sharp regardless of whether it is serrated or not. The probe should not be longer than 24 inches.

Collect the forage in a plastic zip-lock bag, removing as much air as possible before sealing. Clearly label with your name, the type of forage, the lot/area where the sample was collected, the date of sampling and any notes that might affect the results. For silage,

collect hand samples or use a longer probe, from the upper, middle, and lower parts from four quadrants of the silage pile or pit as long as it is safe to do so.

This will result in a larger sample size than what can be submitted. Mix these samples well and obtain a sub-sample from the combined material. For swath grazing or standing crops, obtain representative samples of the sward (for swaths) or the whole plant, according to lab specifications.

## What Should I Test For?

This can depend on the types of feeds being tested, the management decisions you need to make, and how much you are willing to spend. Generally, hay and greenfeed analyses should include dry matter, crude protein, acid and neutral detergent fibre, calcium, phosphorus, potassium and magnesium. Silage tests should also include pH; if the pH is less than 5, it has been properly fermented.<sup>7</sup>

Forage that is baled or ensiled when it is too wet can undergo heating and become brown to black in colour with a sweet, tobacco-like smell. This means that some of the protein in the forage will become unavailable to the animal. If heat damage is suspected, analysis of acid detergent insoluble nitrogen or protein (ADIN or ADIP) should be requested. Heating can also produce nitrites, which are ten times more toxic than nitrates.

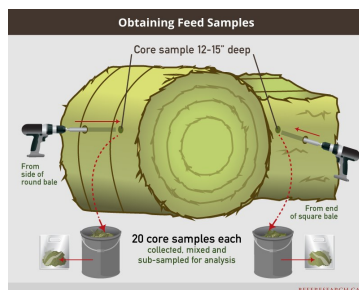
Some by-product feeds (such as distillers' grains) or annual forages (such as canola or mustard) may have high levels of sulphates. This can cause polio in cattle. Other considerations include nitrates and mycotoxins.

## Preventing Problems

One of the major benefits of feed testing is preventing costly and devastating problems before they start. Every season is different and some years there is an abundance of high quality forage. Other years, there is a lack of available feed, or perhaps there is an abundance of low quality forage, grain, or grain by-products available that may look economical but can potentially pose significant risks if a feed analysis has not been performed or understood.

## Moulds & Toxins

Mould can occur in forages, grains, clover, corn, and by-products or derivatives of those feed ingredients. Moulds occur due to plant diseases such as ergot, fusarium head blight, Aspergillus, and many others. The incidence of these plant diseases increases during cool and wet growing conditions, or in crops left standing throughout the winter. Mould will reduce the energy content and palatability of feed. Mouldy feed can also cause production problems including abortions and respiratory disease and can cause the development of mycotoxins in feed. Mycotoxins such as alkaloids, vomitoxin, and aflatoxin can lead to reproductive failure, reduced milk production, depressed gains, convulsions, gangrenous symptoms (i.e. sloughing of hooves, ears or tail), and death.



Avoiding moulds in feed isn't always possible, so it's important to test feed to determine how much and what type of mould may be present so producers can realistically deal with the situation. Avoid feeding mouldy feed to young or pregnant animals, and obtain guidance from a nutritionist about safe ways to blend potentially problematic feed to dilute the contaminants. The Saskatchewan Ministry of Agriculture has a helpful mycotoxin calculator available online to assist producers with determining their risk level.

### Mineral Nutrition

Mineral nutrition as provided by forages depends on:

- Feeding situation (i.e. grazing pastures vs. winter-feeding)
- Plant species
- Forage management
- Stage of plant growth
- Soil type and zone
- Weather
- Available stock water and water quality.

Trace minerals, particularly copper, zinc, and manganese, are important for the reproduction, health, and growth of an animal, and almost always require supplementation. Other minerals, such as molybdenum and sulfur, have antagonistic properties that work against an animals' ability to absorb these minerals. Stock water that contains high levels of sulphates, or forages that contain high levels of sulfur, such as Brassicas (i.e. canola, radish, turnip), can interfere with copper absorption and cause deficiencies. Soils and/or forages high in molybdenum can also lead to copper deficiencies, so producers must consider all sources of minerals when consulting on their supplementation needs.

In most cases, minerals must be supplemented year-round. Producers should work with a nutritionist to ensure they understand how their mineral supplementation program works, and that they are meeting the needs of their cattle depending on the stage of breeding or gestation. It's also critical to determine whether the products they are purchasing are being consumed (and minerals are being absorbed) at appropriate levels, by all cattle.

### Nitrates

Annual crops such as oats, barley, corn, or millet can accumulate nitrates under certain growing conditions, including severe drought, hail storms, or frost. Cattle can metabolize a certain level of nitrates, but if the diet contains more than approximately 0.5% nitrate (NO<sub>3</sub>) on a DM basis subclinical toxicity can occur causing reductions in weight gain, decreased feed intake and milk production, and an increased risk of infections. Diets containing more than 1% NO<sub>3</sub> may result in death loss and abortion. Mature cows and replacement heifers are most at risk and can have symptoms such as abortions, premature calves, newborn calf mortality, poor growth and reduced milk production.

A simple and cost-effective feed test can rule out potential problems due to nitrates. Depending on the level of toxicity, the feed may be blended off to dilute the nitrates to safe levels.

### What About Water?

Feed testing is critical, but beef cattle also obtain nutrients from water. Producers must consider regularly sampling stock

water to prevent nutritional problems. In many cases, forage alone or water alone may not cause toxicities in beef cattle, however when the two are combined, the cumulative effects may lead to problems. This may be particularly true for sulphates or nitrates and can occur in either grazing or winter feeding situations.

Testing stock water quality may be particularly important during a drought, when minerals and nutrients may become concentrated as water tables drop in surface or ground water, or evaporation occurs in stock ponds.

### Formulating Rations

Producers may wish to use software such as CowBytes, a low-cost program available to producers to help formulate rations. Once feed test results are available, producers can formulate an appropriate ration for their cattle using the services of a qualified nutritionist, the assistance of agriculture extension staff, or through a software program such as CowBytes (Version 5). CowBytes is currently available for purchase through Alberta Agriculture and Forestry. There are also several free, useful online tutorials available.

Different rations need to be developed for as many separate classes of cattle as necessary. Producers may choose to group their herd according to needs. For example, a breeding herd may be split into one group of mature cows that have a good body condition score and simply require maintenance, and another group of older or thin cows that need to gain weight. Minerals and salt most often need to be supplemented during the winter feeding period according to feed results. For rations comprised mainly of alfalfa, grass, or a mix of the two, calcium and phosphorus typically needs to be supplemented in a 1:1 mix. For rations that contain more cereal-based forages, including pellets, straw, or greenfeed, supplementation of a 2:1 or 3:1 mix may be required. Animal needs will also change as they move through gestation and lactation.

### Interested in feed testing? What's next?

- Assess your feed resources. What types of feeds are you planning to use and which tests best suit your forage types?
- Do you have the right tools, including a forage probe? Are the samples you've collected representative of your feed types?
- Evaluate your goals for feed testing. What is motivating you? How do you plan to use the results? Have you contacted a nutritionist, agronomist, or veterinarian that you can work with to interpret the analyses?
- Are there potential problems you want to avoid? For example, are you concerned about the risk of mycotoxins in barley, or nitrates in a crop that was stressed? Have you or your neighbors had particular problems in the past?
- Understand the realities of potential results and study your feeding options. If your feed is poor quality or contains potentially dangerous toxins, how can you use it best? Do you have experience using poor quality feed? Do you understand the risks of using potential problem feeds?

**CARA lends out bale probes for sampling forage and staff can help you navigate the CowBytes program. Call the office at 403-664-3777**



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FarmRite members advocate for and collaborate on applied research and knowledge transfer that help Alberta’s agricultural communities remain strong and competitive. Check out the FarmRite website ([www.farmrite.ca](http://www.farmrite.ca)). Along with other producer associations and industry representatives, FarmRite groups are participating in the development and direction of the Results Driven Agricultural Research (RDAR) initiative.

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

CARA Staff are preparing a producer survey on programming needs and management practices to establish a snapshot of our local agricultural community. Watch for your opportunity to participate in this on-line (or mail-in if you prefer) survey which will be distributed within the next 2 months.

## UPDATE

CARA has temporarily suspended in-person events for the season. We are working to create videos, webinars and more to still give you access to CARA trial and project information. Follow us on Social Media @CARAresearch for the latest updates.

Visit [www.CARASoilHealthLab.ca](http://www.CARASoilHealthLab.ca)

to have your Soils Health analyzed to help your farm become more sustainable.



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If you would like to receive this newsletter via email, please contact Olivia at [cara-3@telus.net](mailto:cara-3@telus.net)

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