



Grain, Grass & Growth

Summer 2020

www.ChinookAppliedResearch.ca

NEWSLETTER UPDATE

Due to Covid-19 CARA has made the decision to temporarily suspend printed newsletters (after this edition). Follow us on Social Media @CARAResearch or join our e-newsletter through our website (www.ChinookAppliedResearch.ca) so you do not miss any industry information or event notification.

Weed survival not always resistance issue

Herbicide resistance isn't the first thing to blame if weeds persist after herbicide application.

There are a few options to consider before making that leap, said Agriculture Canada weed ecologist Charles Geddes. Scouting is essential to accurate determination of why herbicides fail.

Successful application is determined by favourable soil moisture, good fertility, moderate temperatures, high relative humidity, young and growing weeds, a healthy and competitive crop stand and clean water.

Failure can occur through errors in dose or equipment, inappropriate weed staging, hard and dirty water, rainfall after application, conditions that are too hot, too cold, too wet or too dry, and of course, herbicide resistance of the weeds.

"It's only after you've ruled out all of these other potential options for herbicide failure where you can consider that the population might be herbicide resistant and even at that point, the population can be suspected resistant but it's not confirmed resistant until its sent for resistance testing," Geddes said during a webinar organized by Alberta wheat and barley groups.

He added that on that list, spraying when weeds are not at the appropriate stage of growth is a common problem.

"It's important to pay attention to the weed stages that are on the herbicide label... because often we see applications outside of that window."

Geddes said herbicides are the "Goldilocks of weed management" because conditions have to be just right for them to work best.

There are several clues to guide farmers on whether to have weeds tested for resistance.

Live weeds that survive next to dead ones is a major one. If one weed species escapes in a field where others listed on the herbicide label are controlled, that's another red flag.

Under-dosing in areas around water bodies or sloughs could lead to lack of control in general but could also lead to development of resistance.

Repeatedly using the same product or products from the same group is also ill advised.

Ideally, the crop should be scouted 14 to 21 days after post-emergent herbicide application and then weekly after that, Geddes said.

If other factors have been ruled out and herbicide resistance is still suspected, he suggests further steps:

- getting a second opinion
- considering other chemical control options if weeds are in early stages
- considering non-chemical management if weeds are in later stages
- sending a sample for testing
- leaving a small patch to produce viable seed collect it and send it to diagnostic lab.

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

2020 CARA Summer Staff

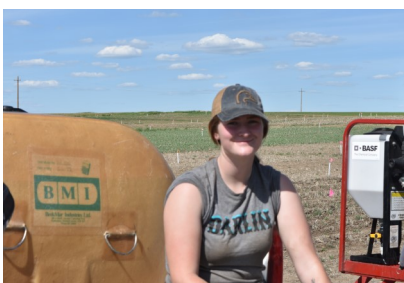


Danielle Niwa

Danielle was raised on a farm just outside of Acadia Valley and is currently attending Lakeland College. She will be entering her third and final year for an environmental sciences double major diploma in conservation reclamation and remediation.

Garrett Peers

Garrett is a fourth year biology student at Acadia university in Wolfville, Nova Scotia. He was raised in Cochrane, Alberta and has a large number of extended family members in the Oyen and Acadia Valley areas.



Christine Kilpatrick

Christine is an agronomy student at the University of Manitoba. She grew up in the Interlake region of Manitoba but has family in the Sibbald area. She is really excited to learn with CARA this summer.

COVID -19 & AGRICULTURE

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 with the details and a link to the information.

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

AUGUST 2020

Adaptive grazing: what is it & how to implement it with Dr. Allen Williams

Tuesday, August 18

7:00 pm – 8:30 pm

Weed Resistance Management at Harvest

Wednesday, August 26

11:00 am– 12:00pm

SEPTEMBER 2020

Lowering Input Costs & Rejuvenating Soil with Gabe Brown

Tuesday, September 1

7:00 pm – 8:30 pm

DECEMBER 2020

Agricultural Excellence Conference

December 8—10

TO BE ANNOUNCED

Grain Marketing 101 online course

Cattlemen Clinic

Navigating Alberta Farm Grants

EFP online workshop

Soil Health

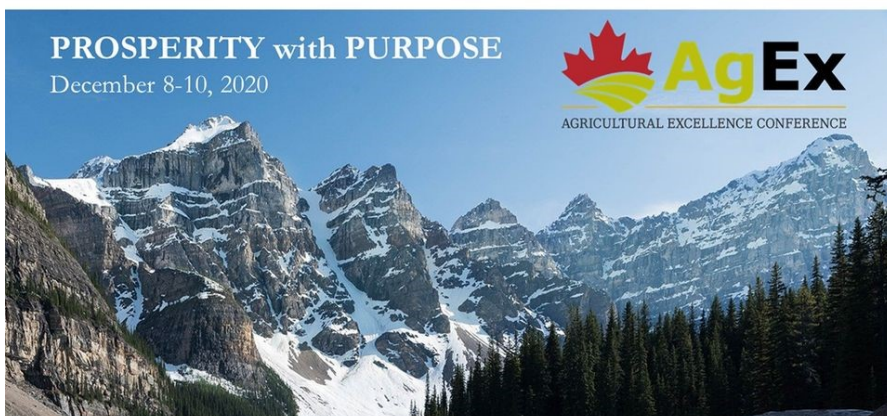
Have a webinar suggestion?

Send us an email with your idea to

cara-3@telus.net

UPDATE

CARA will be temporarily suspending 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.





GRASSFIRE SAFETY TOOLKIT

Now available - get yours today!



Grassfire safety kits are available free of charge at any Special Areas District Office 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.

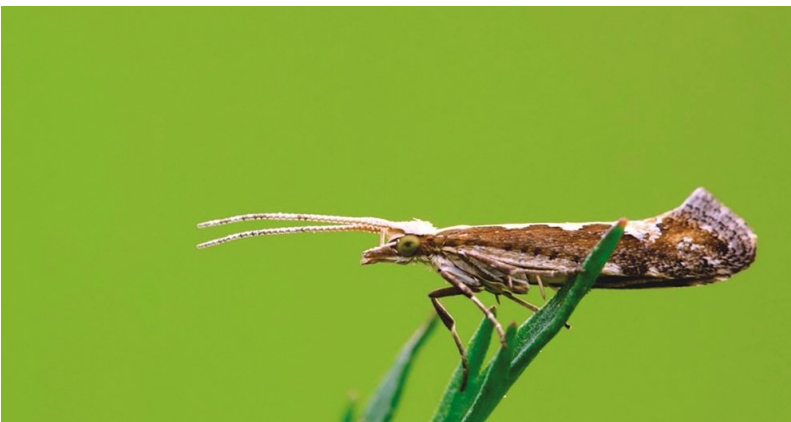
<https://specialareas.ab.ca/living/emergency-services/>

Crop pest survey tools up and running

The Alberta Insect Pest Monitoring Network has “live feed maps” up and running for the province. The maps show results from traps around the province set up and overseen by co-operator farmers. As co-operators post results from the traps, they are posted immediately to the map.

The five insects covered by these maps are bertha army worm, cabbage seedpod weevil, cutworm, diamondback moth, and wheat midge. The maps have colour-coded pins indicating the infestation risk level (from low to severe).

The website of the pest monitoring network (which can be found by going to www.alberta.ca and searching for ‘pest monitoring’) also has insect survey and forecast maps for six pests, videos on scouting and trapping, and information on invasive species.



WIN* A SPOT
in the 2020-21

FARM YOUR
numbers\$ #

program

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

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



2020 Project & Programs

Due to Covid-19 event restrictions we are currently using alternative extension methods to showcase our trials and programs. If you would like to give us your input on extension methods CARA should utilize please complete the quick survey www.surveymonkey.com/r/5KHFXMR

www.ChinookAppliedResearch.ca/2020-projects-trials

STAY TUNED!

As the season continues we will be making downloadable maps for on-site self-guided tours as well as having pre-recorded videos of projects available on our website.

Regional Variety Testing program (RVT)

The Alberta Regional Variety Testing program (RVT) is the most trusted source of various information for producers in Alberta. Farmers need accurate, regional and the most current variety information to stay competitive.

The RVT program is responsible for generating unbiased post-registration information for varieties of wheat, barley, oat, rye triticale, flax, field pea, chickpea, lentil, dry bean and faba bean.

The goal of the RVT is to provide cereal, flax and pulse crop growers, and industry and extension specialists with scientifically valid crop variety performance information under different agro-climatic conditions. Data is published in the Alberta Seed Guide and in Alberta Agriculture's Varieties of Cereal and Oilseed Crops for Alberta pamphlet.

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.



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 in order to better understand soil health limitations and apply appropriate management strategies.

The Soil Health Benchmarking Project is in year 3 of 5 that CARA coordinates with the CARA Soil Health Lab. Funding through Canada Agriculture Partnership allowed us to develop a benchmark and monitor lands in specific areas and get baseline

information, in partnership with the other applied research & forage associations of Alberta. Each association has 20 sites that they began sampling & testing in fall 2018.



Photo Courtesy of FFGA



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 currently has 4 sites being monitored.

Cocktail Cover Crops for Livestock Feed

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



CARA Extension & Webinars

The CARA staff are currently utilizing webinars as an alternative method to CARA's traditional in-person events in order to align with what is promoted to prevent potential spreading of the Covid-19 virus.

[ChinookAppliedResearch.ca/calendar-of-events/AgriWebinars](https://chinookappliedresearch.ca/calendar-of-events/AgriWebinars)

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 or call 310-Farm (3276)

www.cap.alberta.ca/CAP/program/TRAINING

Noxious Weed Look Alike

In Alberta there are two weed classifications according to the provincial Weed Control Act. Each designation means something different for you as a producer.

Noxious Weed: A person shall control a noxious weed that is on land the person owns or occupies.

Prohibited Noxious: A person shall destroy a prohibited noxious weed that is on land the person owns or occupies.



Dame's Rocket

Hesperis matronalis

This noxious perennial is part of the *Brassicaceae* (mustard) family and is often spread through wildflower mixes. Because of its shallow root, hand picking prior to flowering is a reliable control method. It can also be controlled through chemical means. If you see this plant, please call your local



Fireweed

Chamerion angustifolium

Fireweed is often mistaken for Dame's Rocket in the Special Areas. This northern-hemisphere native perennial is part of the *Onagraceae* family and is not considered noxious. In fact, fireweed is the official provincial flower of the Yukon!

Your local Ag Fieldman

Jesse Williams
Special Areas No.2
Hanna District Office
403-854-1114

Don Hogan
Special Areas No.3
Oyen District Office
403-664-3618

Justine Comeau
Special Areas No.4
Consort District Office
403-577-3525

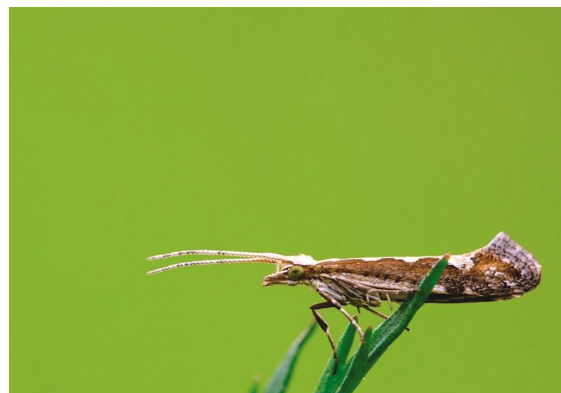
Jordan Hoffman
MD of Acadia No. 34
Hanna District Office
403-972-3808

Crop pest survey tools up and running

The Alberta Insect Pest Monitoring Network has "live feed maps" up and running for the province. The maps show results from traps around the province set up and overseen by co-operator farmers. As co-operators post results from the traps, they are posted immediately to the map.

The five insects covered by these maps are bertha army worm, cabbage seedpod weevil, cutworm, diamondback moth, and wheat midge. The maps have colour-coded pins indicating the infestation risk level (from low to severe).

The website of the pest monitoring network (which can be found by going to www.alberta.ca and searching for 'pest monitoring') also has insect survey and forecast maps for six pests, videos on scouting and trapping, and information on invasive species.



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."

Five things you can do to increase sprayer efficiency

BY: TOM WOLF | | AGRIMETRIX RESEARCH & TRAINING

We all know that good agronomy is all about timing. From seeding to pest management to harvest, getting a job done at the right time is necessary to preserve yield and crop quality. Looking at it another way, good agronomy is as much being prepared to do something as it is knowing what needs to be done.

In the sprayer business, we often talk about the right way to spray. We're looking for the correct water volume or spray quality, perhaps a specialty nozzle, to get the job done in the best way possible. And that's obviously important. But in emphasizing these, we risk relegating the timing aspect as a secondary concern. As a result, we might do an excellent job spraying, but, alas, at the wrong time.

How do we ensure good spray timing? By being productive. That means being able to get a job done quickly, ahead of bad weather, or when the task load is heavy. Here are the top five recommendations for improving the efficiency of the spray job:

Do a time accounting. It sounds boring, and that's probably why nobody does it. It simply means making notes of how time is spent on a spray day. Let's assume the weather is good and the crop is ready. If you're not applying product, what are you doing instead? Are you picking up product from your retailer? Are you scouting the field? Are you filling the tender truck, or loading the sprayer on a flatbed and struggling with the tiedowns? Perhaps you're on the field, but filling, cleaning, adjusting, repairing, record keeping. Write it down. Soon you'll have a much better idea of how much spray time you've spent on other tasks, and you'll be able to adjust your habits and squeeze more spray time out of the day.

Invest in the largest time users first. Look at your time accounting list. If you're driving the sprayer back to the yard to fill, you could be spending most of your spray day on the road. Even if you use a tender truck, make it worthwhile by filling as fast as possible. A good pump and induction system can reduce fill times to 10 minutes for a 1200 gallon tank. A pre-mixed transfer can be done in four. A neat idea by one farmer was to place tanks in the corners of some of his outlying fields, and keep them full of water. This saved time for re-filling, and didn't require a tender truck.

Don't dismiss the little things. After tackling

filling and cleaning improvements, you may feel that the rest is comparatively unimportant. But it still adds up. How do you check for plugged nozzles, or deal with them when you found them? Are you using boom section remotes, or flow sensors? Do you ever misjudge your remaining volume in the tank and fill up one round early to be safe, or run out? You might be a candidate for a more accurate tank volume measuring system like the AccuVolume.

Invest in very low-drift nozzles. Windy conditions have done the most to prevent timeliness. Most nozzle manufacturers now have a new generation of Ultra Coarse nozzles. Check for the TeeJet TTI, the Hypro ULDM, the Greenleaf TDXL-D, or the Wilger DR or UR. These nozzles permit spraying under windier conditions without increasing drift risk. Of course, there are worries about coverage. With a bit more water volume, noticeable performance losses can be minimized.

Commit to an off-season project. Some sprayer improvements require more than a few days that the sprayer is idle. Installing a new, wider boom, converting to a recirculating plumbing system, installing a continuous rinse system, or creating the ideal tender truck setup takes time to do it right, to test and improve.

Remember, productivity isn't about driving faster. It's about spending more time driving.

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in the 2020-21
FARM YOUR numbers\$ #
program

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

Do the math for proper pasture populations

Overgrazed pastures are all too common on the Prairies, so it's important to calculate the carrying capacity of a field before turning out cattle or horses. ^[P] | File photo

Carrying capacity is the average number of animals a pasture can sustain over time. Stocking rate is the number of animal unit months (AUM) supplied by one acre of land. It's time to take stock when your pasture looks like a pool table.

Or rather, it's time to take stock off.

Overgrazed pastures are all too common on the Prairies, so it's important to calculate the carrying capacity of a field before turning out cattle or horses.

Barry Yaremcio, a beef and forage specialist with Alberta Agriculture, says producers make four common mistakes when calculating how many animals to put in a pasture. "Number one, the actual size of the animal. When was the last time a farmer has actually weighted 10 percent or 15 percent of his cows and took an average cow weight? Most times they are underestimating weight by anywhere from 100 to 200 pounds."

Yaremcio said that miscalculation has big ramifications. A 1,400 lb. cow will eat about 160 lb. of fresh grass per day. By underestimating average weight, the cow might be short by 22 to 25 lb. of needed forage intake each day.

The second common error is miscalculating how much feed is available to animals, which depends on grass and forage species, precipitation, soil type and other environmental factors.

Third on Yaremcio's list is consumption.

"I might have 1,000 lb. of grass per acre, but how much are the animals actually going to consume? Is it 60 percent, 70 percent? How much will they lie on, how much will they manure on and how much will they actually waste and not eat?"

Cattle eat the most attractive grass and forage first. The remaining fibrous and chewy grasses will not be as attractive and cattle will likely eat less. Producers have to take that into account when calculating their stocking rates.

Then there's the major matter of pasture health, which can easily be jeopardized by overgrazing and inattention.

Grazing in one year will affect grazing quality in the following year. Overgrazing damages plants and leaves pastures open to buckbrush and weed growth, as well as soil and wind erosion.

"There's guys that just throw the cows into the pasture and say go, and they leave them there from the first of June to the end of October, and they graze the heck out of this land," Yaremcio said.

"It looks like a pool table, and there's nothing there to promote growth."

He recommended rotational grazing, which can be reasonably easy using portable fencing that divides pastures into several paddocks.

Moving the cattle after they've eaten about 50 percent of available forage will leave the paddock in good condition for regrowth.

Grazing cattle also fertilizes the land. Studies show plants have higher nitrogen retention from fresh cattle manure than they do from manure hauled from elsewhere.

That's part of the financial benefit, but Yaremcio also points to the costs of inadequate summer grazing in terms of cow condition.

"Let's say you've overgrazed your pasture, you didn't wean your calves and that cow is going to be 100 pounds lighter than what she should be going into winter.

"Comparing the thin cow to the average condition cow, you're looking at 1,400 lb. more hay to keep the thin cow warm and get her back up to good condition by calving season."

Horses require more careful pasture management than cattle, Yaremcio said.

They eat more than cattle and have a grazing style more damaging to plants. They clip grass off rather than pull it as cows do.

"Potential for injury and harm to those grass species is much higher with horse than with cows," he said.

"You have to be a better manager, you have to be on top of when to rotate those horses ... than you do with cows because they'll do more damage in a shorter period of time."

How much do they eat?

- cow intake depends on animal size and feed quality
- cows normally consume 1.4 to four percent of their body weight daily
- a lactating cow will eat 40 to 60 percent more than a dry cow
- older cows eat more than younger cows
- feed intake can increase up to 30 percent in colder temperatures and decrease by that amount in hot and humid conditions
- snow and mud can decrease feed intake by up to 15 percent
- nutrient deficiencies can decrease intake by 10 to 20 percent
- growth promoting implants increase feed intake
- cattle graze about 12 hours per day; horses graze 14 to 17 hours per day
- a mature horse will eat about 22 pounds of dry matter daily and require 1.5 times as much pasture as cattle

Consider Watering Systems to Help Preserve Your Riparian Areas



By Hillary Luchinski AAg, Agri-Environmental Specialist, Humboldt, and Karen Smith PAg, Ag Programs Specialist, Tisdale
April 2020



There are many reasons why a properly designed watering system is an advantage to your livestock operation. Watering systems provide livestock with clean, good-quality water which will improve overall herd health. Remote watering systems also preserve riparian areas and provide environmental benefits including improved water quality and wildlife habitat. When riparian areas are preserved, it is a win for the producer, their livestock, wildlife and the environment.

A riparian area is the "green zone" between waterbodies or watercourses and their surrounding uplands. A healthy riparian area is thick with deep-rooted grasses, trees and shrubs. They hold our shorelines together while cycling nutrients (including water) and slowing down and dissipating floodwater energy. Riparian zones are also important to wildlife because they provide food, water and shelter. Almost all of our Saskatchewan wildlife depends on riparian areas for survival at some point in their life cycles. Incorporating and maintaining the health of these areas on our farming operations increases biodiversity and ensures these resources remain for many years to come.

Riparian areas are often high producing and provide an important grazing resource. They are also sensitive areas and considerations should be made regarding the location of your water source, to ensure they are not damaged as animals naturally prefer to graze close to water sources. Maintaining several watering systems around your pasture will help distribute your grazing pressure more evenly as well as take the pressure off riparian areas.

Maintaining our riparian areas with tools like off-site watering systems demonstrates good land stewardship. Remote watering systems allow producers to limit livestock access to riparian areas during sensitive times, which improves water quality by preventing damage to the shorelines and trampling of riparian plants. These plants are crucial for filtering contaminants out before they reach our water bodies and by maintaining a healthy buffer zone, sediment and pollutants are kept out of streams and wetlands

FUNDING OPPORTUNITIES

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.

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 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.

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.

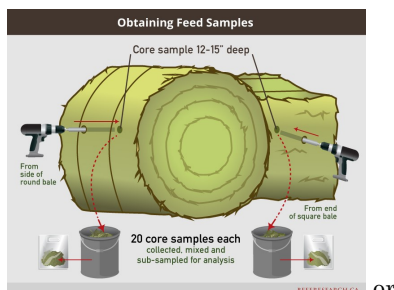
Some by-product feeds (such as distillers' grains) or annual forages (such as canola or mustard) may have high levels of sulphates. This can cause polio in cattle. Other considerations include nitrates and mycotoxins.

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



or

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 animal's 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 (NO₃) 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% NO₃ 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.

CARA staff are available to help you navigate the CowBytes program

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



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FarmRite

FarmRite is a group of six agricultural organizations that work directly with farmers and land stewards to bring best practices into the norms of agricultural production.

Individually, the organizations involved act as bridges from pure and applied science to on-farm practice improvements and knowledge growth. Each organization is focused on a specific Alberta region, but open to working together on projects that provide common good across regions.

As a group, they are FarmRite and advocate for and collaborate on research that moves Alberta's agriculture community into the future as a strong community serving global food needs. These collaborators serve Alberta's agricultural producers that operate in a constantly changing, globally competitive and regulated industry.

OUR PURPOSE

To enhance or maintain regionally adaptive research and knowledge translation and transfer capacity to build sustainable agricultural communities in Alberta. Organizations collaborate using sound science to develop and promote practices that enhance competitiveness while maintaining responsible stewardship of natural resources for the public good.

Www.FarmRite.ca

UPDATE

CARA will be temporarily suspending 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

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



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Publication and distribution of this newsletter is supported by the Alberta Opportunity Fund and Alberta's Commodity Commissions