



The Blade

Monthly Newsletter of the
Grey Wooded Forage Association

OCTOBER 2020



News release

GWFA biochar project shortlisted for emissions reduction challenge

November 3, 2020

The Grey Wooded Forage Association, in collaboration with Lakeland College and additional partners, leads one of 40 proposals invited to the Full Project Proposal (FPP) Stage in Emissions Reduction Alberta's \$40-million Food, Farming, and Forestry Challenge.

GWFA's large-scale, multi-year project, "Supplementing Biochar to grazing cow-calf pairs on pasture: Impacts on production efficiency, methane emissions, animal health, and economic benefit to producers," proposes feeding biochar-infused pasture mineral as a free-choice mineral supplement to cow-calf pairs as a strategy for mitigating greenhouse gas emissions.

Support from the ERA funding opportunity will accelerate technology innovation in support of long-term competitiveness and stimulate growth in the critically important agriculture, agri-food, and forestry sectors. It provides near-term capital to innovators, while also identifying opportunities and solutions for longer term economic recovery, investment attraction, and job creation.

ERA will fund up to \$5 million per project and up to 50 per cent of total project costs. Funding is being sourced from the carbon price paid by large final Emitters in Alberta through the Technology Innovation and Emissions Reduction fund. More than 80 project proposals were submitted to this challenge.

The unabridged version of this news release has been emailed to all GWFA subscribers.

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Published by Brenda Kossowan
Cover Photo: Swath grazing, by Ron Richardson

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The Grey Wooded Forage Association is a member of the Agricultural Research and Extension Council of Alberta



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Office Report

By Brenda Kossowan, Business Manager

Say “Hello” to my little friend. Bambi—an immature mule with only two points on his antlers—showed up in the pasture while I was walking the dog and apparently likes it there. He was still mingling with the field ornaments when we returned from our loop and deftly resisted the corgi’s attempts to herd him. She wisely let him be when called off and he was still hanging out with the herd a couple of hours later.

Dancing with deer during morning walks is just one of the benefits of working largely from home while the world wrestles with a resurgence of covid-19.



The impacts at GWFA have been neither severe nor costly, outside the need to replace a keyboard and calculator that both succumbed to repeated disinfections.

However, coping with covid has brought about some important changes in the way we do business and in our plans during the foreseeable future. As noted before, staff are taking turns working from home and attending the office. We rarely see each other, but communicate regularly. This has been a fairly simple concession, since we are highly portable with laptop computers and smart phones. The only real disadvantage is the loss of access to our laser printer and to other equipment and supplies stored at the site.

More noticeable are the changes we’ve had to make in the way we deliver information to the producers we serve. Early in the year, plans had been laid for a number of events, including a summer kick-off with interactive workshops, a keynote speaker and a barbecue. This just couldn’t happen. Our only in-person event since the declaration of a pandemic late last winter was a pasture walk in August, featuring various ways to



protect riparian areas within the property.

Like our 11 sister organizations across the province, we have shifted our focus from in-person events to online webinars and workshops, with the hope of reaching more producers at a similar or lesser cost than having them gather in a hall or on a farm.

GWFA is setting up a series of 12 monthly webinars that will each feature in-depth discussion on a timely subject. Ag Field Specialist Greg Paranich and the Events Committee have worked out a schedule and are now putting the details together with a plan to start the series sometime after our November board meeting, likely in January. We still have a few details to work out and a lot to learn about hosting webinars to make sure that this effort produces worthy results.

There has been recognition among the 12 applied research associations that producers may be getting a little burned out on the various sessions and seminars being offered online. In recent weeks, we have been looking at ways we can work together to both improve the product and to avoid overlap. That way, producers from across the province will have access to the same webinars and can expect a heightened level of information through the collaboration between associations.

This coordinated effort falls neatly into the mindset expressed by leaders of the newly formed Results Driven Agriculture Research corporation, which is taking charge of financing research and extension within Alberta. RDAR made its initial call for proposals in October, seeking applications to fund agriculture-based research projects.

Our boards still have some questions for officials from RDAR and from the Ministry of Agriculture and Forestry concerning the operating funds that allow us to hire people and cover day-to-day costs. We hope to see this issue sorted out while we focus on delivering information of value to the producers whose reliance on us has ramped up with the layoff of extension specialists, scientists and other key staff at Alberta Agriculture and Forestry.

Congratulations to GWFA Director Lee Eddy, Ag Field Specialist Greg Paranich and the team they have put together for a project proposal that is now on the funding shortlist with Emissions Reduction Alberta. An abridged news release is on Page 2 of this month’s edition of *The Blade* and further details are supplied in an email sent to everyone on our list on November 4. Additional information will soon be posted on our website.

Thanks to Olds-area grass farmer Ron Richardson for this month’s cover photo. Ron shared some fabulous images from his farm, located in the Eagle Hill area between Olds and Sundre. As much as I enjoy shooting for *The Blade*, the images that are most valuable to our readers are those that our producers provide from their operations.

You are all invited to send in high-resolution photos for consideration in this publication. Please.

Water Systems For Beef Cattle

This is the final installment from an information blog published by the Beef Cattle Research Council and reprinted here with permission. The blog is being published as a series in *The Blade*. It can be viewed in its entirety at beefresearch.ca

Powering the System

There are many ways to effectively supply power to water systems, which will vary with the water source, the herd size and type of cattle, compatibility with the watering system selected, and the cost. Some systems will operate with multiple power sources such as a combination of solar and wind to ensure batteries are sufficiently charged to maintain water capacity. New technologies such as motion detectors, drones, and cameras can assist producers in overall water system operation and monitoring. For all systems, the use of insulated tanks helps to keep water from freezing during cold weather.

Electricity - is the most reliable power source for systems that are in close proximity to current electrical infrastructure. It is able to lift water from greater depths. A common livestock water system is an automatic electric waterer, due to convenience, multiple season use, efficiency, reliability and long-term value. These systems consist of an insulated base and a heated bowl that fills from a pressurized line, maintaining water level with a float. Most have anti-siphoning valves to prevent back flow of water. These bowls are equipped with a thermostat, so are simple to operate during winter months. These water systems perform best when protected from wind and snow and when located on a concrete pad to provide firm footing for cattle and prevent shifting of the tank which can damage water lines and wiring. Waterers with dual bowls are an efficient way to increase utilization, by installing in a fence line to service more than one pen or pasture. Low energy versions of these bowls are also available with well insulated tanks and insulated covers. Small herds may have trouble keeping an adequate amount of water cycling through the system in cold winter months to keep it operating well. In very cold weather, these systems need to be checked several times daily, and may need to have the float thawed or knocked open in the morning.

Fossil Fuels or Propane - portable pumps hooked up to generators or propane tanks can be used to move water from a source to a trough. This can be time consuming as pumping generally needs to occur more frequently, and generators/propane tanks must be checked frequently.

Gravity fed - is a low-cost way to provide water, by using the existing landscape to direct spring water to a trough if it has the appropriate slope.

Solar - solar panels are durable, operate in a range of temperatures, and can remain operational for over 15 years. Solar panels can provide power to pumps in several applications. They can operate floating pumps in dugouts or can lift ground water from a well to a summer trough or insulated trough. When properly sized to fit the water

consumption of the herd, they will generally keep from freezing and operate with little trouble during winter months. The use of a back-up power source provides extra reliability during cloudy periods. Deep cycle batteries can be protected in an insulated box to store power to keep up with pumping.

Windmills - the rotary motion of the propeller drives a pump which moves water to a trough. They are simple, robust and cost-effective ways to supply water to livestock in areas where site conditions allow. There are three types of pumps used in windmills, with the most common being a positive-displacement cylinder pump. An alternative is the airlift pump, which has no moving parts and can lift water at rates between 20-2000 gallons (75-9000 litres) per minute, up to about 750 feet (230 metres) high. Even in the windiest sites, wind power will vary, so a backup water system that stores extra water or a backup energy source such as a deep cycle battery is recommended. Windmills can also be used to aerate water sources, which can improve stagnant water quality.

Batteries - deep cycle batteries can be used to store energy in remote systems created by solar and wind. Match battery type to the system for best results. For example, flooded lead-acid batteries are cheaper to purchase, but require more maintenance to ensure reliable operation. Gel batteries are more expensive to purchase; however perform better in cold temperatures and may be more reliable in winter water systems.

Water - sling pumps use a water driven propeller to create power. A sling pump requires a stream with a water velocity of at least 60 centimetres/second (2 feet/second) with a depth of at least 25-40 centimetres (10-16 feet) to operate¹⁸. There are few moving parts and very little maintenance.

Animal powered - cattle can learn how to operate a nose pump to move a lever which pumps water into a bowl. Cattle activate the pump when they push and release a lever with their noses. The pumping action allows the water to enter a basin. The basin must be secured tightly so cattle are not able to push it around and it must be level to ensure that the water doesn't run out of the basin. Nearby water sources such as ponds, shallow water or a well can provide the water and the diaphragm pump has a maximum lift of 20 feet from the source to the bowl.

This system is suitable for small herds or groups. It only allows one animal to drink at a time, so it may not be a good choice with a continuous grazing system where all animals come to drink at the same time. To reduce competition, more pumps would be required. While prior information suggests that one pump can provide enough water for about 30 animals, some producers have successfully watered up to 100 head per pump, once cattle are well trained.

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Win with weaning

By Greg Paranich, Ag Field Specialist

It's that time of the year for cattle producers. Just as harvest gathers in the crop after a season's effort for a grain farmer, the cattle producer's harvest comes at weaning time. Actually, weaning is just the beginning of an actual harvest. The calves will need to be weaned from their dams before they are prepared for market, and the eventual payday. The timing of weaning also has to do with getting the cows in better shape for wintering and their remaining trimesters leading to the next calf crop by stopping their lactation. It is also about having the least amount of weight loss in calves due to shrink and poor health. How we do that varies across the cattle industry.

Abrupt Weaning

Historically and still very much practiced is what we call "abrupt weaning". That is, completely removing calves from their dams without any intermediate steps to reduce the number of stressors the calf will experience at one time. With this tactic, the calves' two biggest stressors that impact them immediately are the removal of milk (nursing), and their momma. Other factors include strange surroundings (pens), new feed such as hay, and the mutual bawling and pacing of their pen mates. The result is usually reduced feeding, weight loss (shrink), depression, and often respiratory disease. All of this also puts stress on the cows with the vocalization of their now separated calves calling for them. Put this all together, it makes for a noisy, stressful and potentially costly five to seven days. If you are selling your calves directly to feedlots or backgrounders, healthier and more productive calves will attract premium prices. Therefore, low stress weaning will be to your benefit as well as the buyer's.

A few strategies promoting low stress weaning have been successfully used to the benefit of the calves, cows and the cattle producer's peace of mind and pocketbook.

Two of the most promoted techniques include the "two-stage weaning" and "fenceline" weaning.

The Two-Stage Weaning

As in the name, this weaning occurs in two stages and involves direct handling calves two times. It will be more effort on the front end, however, has significant advantages post-weaning. The first stage is the separation of calves and cows, running calves through a handling facility and chute, and fitting them with a temporary "nose paddle." This removable device easily snaps onto the calf's nose and has a flap that prevents the calf from suckling. It does not interfere with eating or drinking, just nursing.

Calves are returned to their dams and the only thing removed from their environment is access to milk, which at this stage is more of a security/bonding process than nutritional. The milk is gone, but momma, the herd mates and familiar surroundings are still there. So, there is only one stressor at work and it's not so bad. After four to five days the calves are considered weaned from their habit of nursing their dams. Some producers have said leaving them any longer would have some of the



calves learning how to "cheat" the devices if they were persistent enough. The second stage is to handle the calves again through the chute to remove the nose paddles (they are reusable). Some producers take this opportunity to treat the calves for any weaning health processes they usually administer. The calves are then separated from the cows. Ideally it is better to remove the cows to another

site rather than the calves so as not to change the calf's environment (one less stressor).

The immediate observations have been reduced bawling and pacing, eating more readily and more often, a more relaxed calf pen and significant reduction in morbidity (treatment for illness). There was also less bellowing in the cow herd, and cows adjust to calf removal without the calves calling for them. All in all, there is a smoother transition from the loss of milk and separation to the conversion of feeding and good health. The nose paddles cost about \$2.40 each and are reusable, so an investment vs a cost. The extra handling for the application and removal of the nose paddles, according to some producers, well outweighs the loss in calf shrink, treatment for respiratory illness, and producer stress. A key factor to note is that when handling the calves, use low stress stockmanship techniques to keep the benefits of "low stress" weaning.

Fenceline Weaning

This weaning technique involves what it suggests, a fenceline separating cows and calves. Rather than the nose paddle, we are separating the calf from momma's milk as a day-to-day practice with a fenceline. While the sorted calves are physically removed from their dams, they can still see, smell and touch noses through the fence to retain a level of contact and less drastic and more gradual removal. Of course, this would require a very effective fence to enforce the separation especially with very persistent calves or their mommas.

Recommendations are for a five to six strand barb wire or two to three wire electric fence to be secure. After the four to five days of adjustment, the cows can be removed to another site and the two groups can carry on with minor adjustments and an easier transition to being on their own. Ideally the calves will have the same feed, water and weaning grounds that they were separated into, therefore less changes and stress when the cows are removed to another location. This may be a preferred strategy for very large herds and/or operations without the assistance or facilities to manage nose paddles.

According to the Western Canadian Cow-Calf (2017) survey "over 34 per cent of respondents used fence-line weaning, and almost 12 per cent used two-stage weaning. Compared to the last survey on the 2014 calf crop, the use of fence-line weaning has increased by over one per cent, and the number of producers using two-stage weaning has almost doubled.

The most common reason given for the high proportion of

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Powering water Systems, from Page 4

Multiple basins can be installed on top of an upright culvert to accommodate larger herds of cattle. Young calves may not be strong enough to pump this type of system and cows require a bit of training to learn how to use it. Monitor the system carefully when it is first installed to ensure all cattle learn how to use the pump and are getting enough to drink.

Winter tolerant nose pumps that operate year-round are another animal powered option.

Rather than relying on a diaphragm to lift the water, the system employs a mechanical piston pump to draw water from a relatively shallow water source in the ground below the frost zone. The pump relies on geothermal heat and livestock power. This system has been observed to water 100 head per unit due to the unique pump action, supplying water on demand to cattle.



Weaning success, from Page 5

continued use of traditional separation or abrupt weaning was that calves are marketed at, or shortly after, weaning.”

The end game to either strategy, is to reduce the number of stresses the calf has to deal with at any one time. Gradual adjustments in low stress environments and handling all contribute to a happier and healthier calf, rancher, and pocketbook. Here's wishing you a profitable and peaceful weaning!



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The many shades of autumn

By Angie Quist, Riparian Specialist, Cows and Fish

When summer fades, so to does the lush green cherished so dearly in the warmer months. As the nights get cooler and days shorter, the green accents of the past turn hues of gold, orange, red, and brown. For many agricultural producers this means haying is complete and harvest begins. For many, harvest is a time to gather the fruits of their labour and give thanks for all that nature and life has provided. For nature, the turn of the season means many things. Native bull trout begin their journey through the local watershed, swimming upstream to the headwaters to spawn; their success being dependent on cool, clean, and connected streams. Trees and shrubs begin to pull back the resources put towards their leaves and invest into their deep roots. This drawing in of the carbohydrates allow the plants to go dormant to survive the harsh winter climate before using this energy for new growth in the spring. Additionally, fallen leaves and grass sheaths, blanket the ground providing sustenance and cover over the upcoming winter months for a variety of microbes, insects, and animals.

For those looking to repair degraded streambanks and restore native trout habitat, the falling of leaves means it is time to get to work on a technique called soil bioengineering. Soil bioengineering makes use of living materials such as balsam/black poplar and willows that have deep binding roots to help stabilize streambanks and eroding slopes. For this method to be put into practice these woody plants need to be harvested during dormancy as that internal stored energy is required for new roots to form. Stems of dormant willows and poplars can be cut off, have their branches removed, and be staked into wet ground to form various live structures. When winter leave us and the plants begin to wake up, these live stakes will begin to form roots and shoots and in time provide stability to the soil. Not only that but they will also provide shade for the stream, filter sediments and pollutants, and provide habitat.

Trees and shrubs can also provide benefits to your own agricultural operation. Having vegetation with deep binding roots, like willows and poplar, helps stabilize streambanks and therefore protects infrastructure that is close to the creek. The roots of these plants also increase water infiltration deeper into the soil; this water retention aids in flood and drought mitigation providing assistance during these difficult periods. To maintain these features special management of these areas is key to their success.

Because riparian areas are influenced by a high water table and have wet soils, they need to be managed differently than the adjacent uplands. In ranching this means encouraging cattle to move away from waterbodies with distribution techniques such as mineral placement away from streambanks and providing alternative water for live-stock. Other grazing management strategies to consider include: avoiding or minimizing grazing riparian areas during fragile or vulnerable periods, such as when soils are saturated in the spring; providing effective rest from grazing during the growing season to sustain plant vigour and rebuild roots; and leaving enough carry-over or litter by balancing animal demand with forage supply.

For hayland and cropland this means leaving a riparian buffer around water bodies to allow desired native species to provide varying functions such as stabilizing the banks and shores, and filtering runoff.

As summer fades away and you are enjoying the changing colours of the leaves, take note of that special area, known as the riparian area, surrounding the body of water on your property. What does it look like? Is it well vegetated with native species providing the many functions listed above? Is the stream going through your land connecting fish to the upper reaches and supplying cool and clean water? Or do you have a section of the riparian area that is lacking deep binding roots and has begun to or is eroding away? When healthy, riparian areas and the native trees and shrubs that form the foundation of these areas, can provide many beneficial services to your agricultural operation. Through proper management of riparian areas these they can continue to provide these services, and if streambanks are degraded soil bioengineering can be used to restore them.



If you would like more information on how to protect or restore your riparian area or streambank contact Riparian Specialist Angie Quist, out of Rocky Mountain House with the Alberta Riparian Habitat Management Society (also known as Cows and Fish).

Cell: 825-365-8557

Email: aquist@cowsandfish.org

https://cowsandfish.org/wp-content/uploads/protecting_shorelines.pdf

https://cowsandfish.org/wp-content/uploads/growing_restoration_en.pdf

ARECA project: Carbon sequestration on Alberta rangelands

By Devon Lloyd, Agriculture Research and Extension Council of Alberta

The two year Carbon Sequestration on Alberta Rangelands project is funded by the Government of Alberta-Canadian Agricultural Partnership (CAP) and run by the Agricultural Research and Extension Council of Alberta (ARECA).



ARECA partnered with six of the applied research and forage associations throughout the province, including: Grey Wooded Forage Association, Foothills Forage and Grazing Association, Gateway Research Organization, North Peace Applied Research Association, Mackenzie Applied Research Association and Battle River Research Group.

The purpose of the ARECA Carbon Sequestration on Alberta Rangelands project is to educate

and create awareness for producers on the importance of carbon sequestration in rangelands and pastures in Alberta through soil health and grazing management. The applied research and forage associations are focusing on engagement and extension activities for producers. The extension materials developed from this project will outline soil health and grazing management practices such as livestock grazing rotations. Through articles, films, webinars, field days and other extension activities, resources will be provided to producers throughout the province. ARECA is working with the associations and Story Broker Media House to create a short producer based video on the importance of grazing management, soil health and carbon sequestration. The video will be released this winter and will be available to producers through the applied research and forage associations and various media platforms.

Good rangeland management can enhance soil carbon sequestration and reduce the likelihood of the release of greenhouse gases. Carbon sequestration is the process of carbon dioxide (CO₂) being taken from the atmosphere and stored in the soil. Carbon Sequestration is accomplished by plants photosynthesizing and taking the CO₂ and storing it as soil organic carbon (SOC). Soil health, as well with a healthy plant root system, increases soil carbon sequestration. Improving soil health using grazing management strategies not only increases SOC, but it also helps with soil structure, water infiltration which improves drought tolerance and flood mitigation, improved plant growth, and other beneficial qualities. Grazing management practices to help increase SOC being stored and soil health are not limited to, but include rotational grazing systems, adequate rest and recovery periods, proper livestock distribution for even grazing throughout the pasture, carry over and good ground coverage.

For the project the Applied Research and Forage Associations involved have provided 7-8 volunteer producer sites within their association for ARECA to collect soil samples for a total

of 47 sites. A site history interview will be completed for each site involved. The site history interview is to help understand the various grazing management practices involved, such as how the sites are grazed (simple rotational, continuous, intensive rotational), rest and recovery periods, stocking rates, vegetation present, fertilizer and pesticide practices, and any changes in the pasture. All of the producer sites sampled were on long term forage stands used for grazing and have a wide range of grazing systems in place.

Each association either has or is going to be hosting at least two extension events. These events include workshops, field days, virtual webinars or other extension events on soil health, grazing management practices, the importance of soil carbon and carbon sequestration.

For more information on extension activities please contact Agriculture Field Specialist Greg Paranich at GWFA (contact information on inside cover), visit ARECA at www.areca.ca or email devon@areca.ab.ca



Yes, we are grass farmers. Healthy foliage above ground grows from healthy soil below. Devon Lloyd photo. Portrait of Devon and Ottis by Kendra Rawluk.

Botanical factors in nitrate toxicity



This is the second article in a series on nitrates, written by Karin Lindquist, creator of the Bovine Practicum. Karin is an independent consultant seeking to share her knowledge and experience gained as a producer, a research assistant, a customer service rep and a forage and beef specialist with Alberta Agriculture and Forestry.

Currently located in Stettler, she was raised on a mixed farm northwest of Edmonton, where she and her family backgrounded calves and grew forage, cereal and oilseeds crops.

Karin has a BSc in Agriculture with an animal science major from the University of Alberta, including studies in applied beef and dairy sciences; ruminant digestive physiology and nutrition; forage, pasture and cropland management; rangeland management and ecology of Western Canadian plant communities, and wildlife and lake ecology. She is an Agrologist in Training with the Alberta Institute of Agrologists.

Karin is available for presentations and consultation in the area of beef and forage management. You can find the full text of this and other articles on Karin's website, bovinepracticum.com

Botanical Conditions: *Plant Species*

All plants take up nitrate at some level (or ammonia) to be converted into plant protein. However, certain plants are much more likely to readily accumulate nitrates than others.

A common question that arises is if legumes, such as alfalfa, clovers, peas, and beans, are apt to accumulate nitrates. They are, but only if they are given a very high amount of fertilizer. Otherwise, in normal situations (including those where they are given adequate fertility via manure or synthetic inputs), they are not a risk at all. The primary reason is that they have root nodules that are created by their partnership with *Rhizobium* bacteria that assist in regulating the amount of nitrate that goes up into the plant. Instead of an unregulated amount of nitrate being pooled up in the plants' leaves and stems, the root nodules act as the nitrate pools instead, allowing only enough at a time according to the rest of the plant's needs. This makes nitrate accumulation in legumes a rare occurrence. It's worth noting that not all species are going to accumulate nitrates at the same rate or carry the same risk of nitrates as others. For instance, many sources state that weeds like those listed above are a much greater risk for containing nitrates than other domesticated annual or perennial species. Corn and sorghum have been noted in most publications from the United States as having a lower risk of nitrates than cereal crops.

Finally, some sources stated that many perennial cool-season grasses pose little to no risk over annual cereal crop species.

These claims—such as I will call them—often forget two very important factors that I will address below: the first being stage of growth and the second is the application of nitrogenous fertilizers. The latter carries the greatest influence on nitrate levels in plants and can mean the difference between not concerned at all to risking great economic losses if the feed is not tested prior to feeding.

Botanical Conditions: *Stage of Growth*

Immature plants pose a greater threat for nitrate toxicity than mature plants. This is because these plants are focusing a lot of energy and protein synthesis into developing more leaves, as well as what will eventually become flowers (or inflorescences) and seeds. Plenty of protein synthesis activity will be happening in the leaves, especially the newer flag leaves at the top of the vegetative plant. Grasses grow by pushing the youngest leaf to the top from the base and the very centre of the plant, thus a lot of nutrients, including nitrate, is pulsating up into this new shoot so that it will grow to maturity. The final seedhead pushes up the same way and heralds that a plant is nearly at the end of its life.

Courtesy NC State Extension Publications.

Vegetative plants or tillers from older plants that range from the two-leaf stages to boot stage are a particular risk; plants that are pre- and post-flowering and starting to fill out their seeds are also a risk, but less so than when they were still in their vegetative stages.

These young plants are particularly susceptible to accumulate nitrates when they're coming back from a long dry period. This is a big problem in areas with longer growing seasons such as in Australia and India because the new growth is taking advantage of a sudden bout of moisture, plus the fertility available, largely as some sort of nitrogen source. The rains after a drought for these parts of the world give producers a false sense of security, and Sidhu et. al. (2011) discussed in their paper (see Sources below), there were significant death losses as a result of high nitrate concentrations in the young,

(continued on next page)

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Botanical factors in forage nitrates (*continued from previous page*)

seemingly-grazable plants.

In colder climates (such as here in Alberta, Canada), with more defined seasons (as opposed to wet versus dry), this is perhaps less of an issue, unless there is a sudden rush of growth after a particularly dry spell during the spring into summer, and where fields were fertilized last fall or possibly that spring.

However, for this to happen, the young plants will have to have felt some level of stress for this to happen, such as a late frost or a dry period right when they are young and growing.

While I shouldn't say that this will never happen (because it certainly *can* happen), a scenario such as this is virtually so rare that it's not something to be worried about.

However, it's still a precaution to take when there are young plants that are coming out of a very dry summer and are responding to late-season rains. There still is enough sunlight and warmth during the days for these plants to grow during the autumn right up until a killing frost, making these young plants still a risk for nitrate accumulation, and thus poisoning to livestock.

What about more mature plants? Because they're nearing the end of their life cycle, they're not so intent on pushing up nitrates to the top as with younger plants. Instead, much of the nitrate, if they have not reached full maturity, will be *more heavily concentrated at the bottom third of the plant*. The top third, going into the grains, will have the least amount of nitrate concentration. Plants that have reached full maturity (hard-dough stage) have virtually no nitrate in the seeds whatsoever.

Managerial Conditions: *Plant Access to Fertility*

Synthetic nitrogen fertilizers and manure are perhaps the most influential of all other factors when it comes to nitrate accumulation and nitrate toxicity. Whether or not the pasture or field was fertilized—and how much was applied—will depend on how long you will need to wait before you can harvest for forage or graze.

As a general rule of thumb, the more fertility that was applied to the field the greater the chance of nitrate toxicity will be present. Fifty pounds (22.7 kg) or less of actual N is a rate I would be comfortable in stating that nitrate risk is low; between 50 to 90 lb (22.7 to 40.8 kg) per acre of actual N is still

less of a concern than a rate of 100 lb (45 kg) or more of actual N (NOT the actual product or the actual amount of fertilizer applied to the field; see Manitoba Agriculture's Soil Fertility Guide for help with fertilizer calculations.)

Most fertilizer applications are done in the spring, versus later in the year like in summer or in fall. This usually indicates to me that, especially with rates that are less than 100 lb (45 kg) of actual N, the plants will have used up most of the nitrogen from spring applications versus those later in the year, thus carry less of a risk for nitrate accumulation by the time autumn comes around. However, you cannot be absolutely sure until you get them tested for nitrates.

In most farming operations, most pastures and hayland almost never get fertilized; and if they do, in my line of work I have not heard of fertilizer applications being all that significantly high; certainly not to the amount that is commonly applied in growing corn, wheat, canola, and other crops intended for the grain market. (With regards to growing corn here in Alberta, most of the fertilizer cost is for growing corn to graze or chop into silage; conditions are just not suitable for grain production in this part of the world.) Thus, nitrate risk is low for such areas. Again, the exception is if a heavy amount of fertilizer was applied; or, if a large amount of manure was also applied. Manure is a whole different beast in itself. A large portion of manure is organic matter, and not much of it (when you compare with concentrated pelleted fertilizers such as urea [46-0-0]) is actual fertility product; where urea has 46% actual N, the average percentage of N for manure from beef cattle is only around 1 to 2%. It would have to take a LOT of manure (say in excess of 9,000 pounds of actual product per acre!!) to provide the same amount of recommended nitrogen to the stand compared with the amount required to apply 46-0-0 fertilizer. However, this is still different if the land was grazed (no manure was spread from the home corrals, it was all dumped there by the cattle that were grazing away), and in such a way where the manure was, as much as possible via temporary fencing, spread evenly across the land with a large concentration of animals being grazed per unit area. When this is the case, that means a lot of nutrients available for plants to uptake at will, which means potential for nitrate accumulation. How much the manure or fertilizer has contributed to the uptick in nitrates in the forages is a question best for the next section in this series, which will discuss testing for nitrates in forage.

Is your annual compensation review coming this year?

It is time to start planning.

I can help. Give me a call.



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MEASURING THE IMPACT OF ALUS



WHAT IS THE ISSUE?

If cows spend too much time near a wetland, creek, river or stream, they can hurt the health of the water body: damaging the soil, removing native plants, depositing manure. This reduces the amount of ecosystem services coming from these important natural areas.



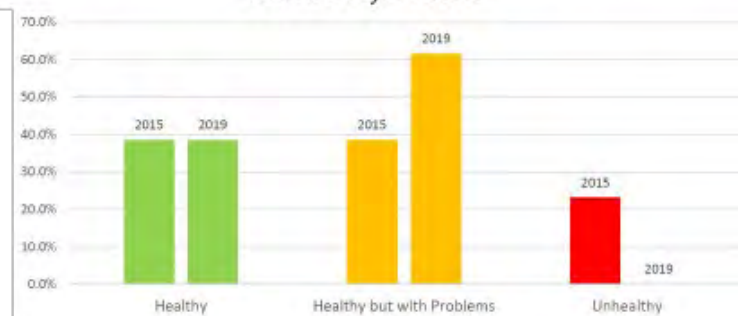
Before (2015): the cows have done their damage to the wetland and its surrounding riparian area. After (2019): the ALUS Farmer has put in wetland fencing and an alternative watering system, and already, the health of the riparian area has gone up 40%

WHAT IS THE SOLUTION?

Farmers using tools to manage how, when, and if cows spend time near the water bodies. Things like putting up fences along the water body or providing the cows an alternative drinking water source, up on high ground away from the water body. ALUS helps farmers do these things, by providing funding to cost-share on projects and for annual payments for their ongoing management that produces increased ecosystem services.

IS IT EFFECTIVE?

Overall Riparian Health 2015 v 2019 for 13 Red Deer County
ALUS Project Sites



By using third-party, objective measurement, we are starting to get evidence that farmers can produce increased ecosystem services from water bodies and riparian areas when they adopt practices like these. Red Deer County contracts Cows and Fish to do “before” and “after” Riparian Health Assessments. They measure ecological functions when a farmer first does an ALUS Project, then go back 4 or 5 years later and do the assessment again. They can measure how ecological function, or ecosystem services production, has improved.

www.rdcountry.ca/conservation | www.alus.ca
403.350.2150 | Red Deer County, AB | T4S 2L9



GREY WOODED FORAGE ASSOCIATION

greywoodedforageassociation.com | 403-844-2645

2020/21 Membership Application Form

Membership in the GWFA is open to anyone interested in forage production, grazing management and environment sustainability

The fee is \$40 per year, running from April 1 to March 31

For information, call 403-844-2645 or email office@greywoodedforageassociation.com

Benefits of joining GWFA:

- ♦ Discounts on courses, seminars, workshops and tours.
- ♦ An automatic subscription to *The Blade*, published monthly online. Hard copy is available on request.
- ♦ Assistance with your Environmental Farm Plan.
- ♦ Equipment rental (deposit required).
- ♦ Access to our reference library.
- ♦ Access to our members-only Facebook group.
- ♦ Networking with like-minded producers and advisors.
- ♦ Farm consultation services (farm calls are 55 cents per kilometre, each way).
- ♦ A copy of the GWFA Annual Report.

Please mail your completed form and cheque to:

Grey Wooded Forage Association

PO Box 1448, Rocky Mountain House, AB T4T 1B1,

Or scan and email the completed form and send an e-transfer to office@greywoodedforageassociation.com

Renewal <input type="checkbox"/>	New member <input type="checkbox"/>	How should we send your copy of <i>The Blade</i> : Email <input type="checkbox"/>	Canada Post <input type="checkbox"/>
Name: _____		Email: _____	
Mailing address: _____			
Landline: _____		Cell: _____	

***How do you describe your operation (tick all that apply)**

- ☐ Beef producer
- ☐ Sheep/goat\ producer
- ☐ Dairy producer
- ☐ Annual crops producer
- ☐ Forage producer
- ☐ Other _____

***How many head of livestock do you manage:**

Beef cows/heifers _____
Dairy cows _____
Feeders _____
Ewes _____
Does _____
Other _____

***How many acres of land do you manage:**

Pasture _____
Hay _____
Crop _____
Other _____

**These questions are voluntary.
We do not share your information*

How can we improve our service to you?

Please suggest topics you would like to learn more about: