



The Blade

Creating an Awareness of Forages

Monthly
Newsletter
of the
**Grey Wooded
Forage Association**

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Photo Credit: Jasmine Boucher

Mission Statement

*To promote environmentally and economically
sustainable forage and agricultural practices.*

Vision Statement

*The community is engaged in regenerative
agricultural production methods.*

Message from the Chair

By Ken Ziegler

Greetings everyone from the Grey Wooded Forage Association! Trusting you and your family are all well including the beasts out in the yards and fields. I'm encouraged by the wisps of green growth coming out of the earth again doing it's annual quest for seed set. Re-generation seems to be such an important part of a healthy ecosystem.



The upcoming season seems quite promising at the moment considering soil moisture levels. With the high moisture levels going into the winter and now with the wet April, the land is close to saturated in many areas which is perfect for those of us growing forages.

We hope you enjoy this newsletter again. Ginette and Devin have been working hard in putting together a good document that will be of value to you. Take special note of the advertisements of our many sponsors.

We appreciate their financial support. Also, take note of the events planned for the days ahead. We encourage you to join us as we continue to learn new things and experience the learnings of other people.

Best wishes for this coming month of May and remember to stay safe as you operate your machinery and handle you animals.

Ken Ziegler

Hello,

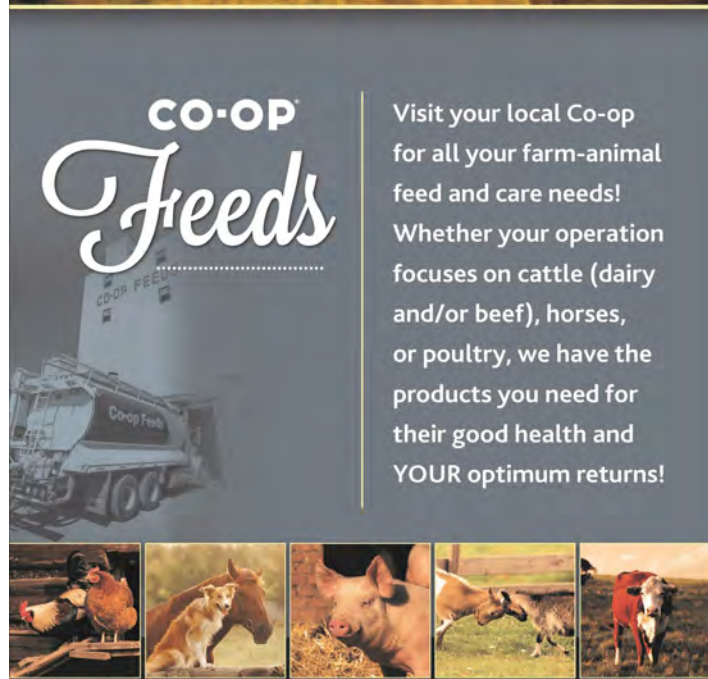
I'm the summer student for GWFA this year. I grew up in Rocky on the family farm, Lodgepole Ranch, but I've spent the past four years in Lethbridge where I've been studying Environmental Science, a degree that combines biology and geography. Some of my favourite areas I've studied are GIS, statistics (believe it or not), and hydrology. When I'm not studying for exams I like to get outside, and spend some time hiking and backpacking. Mostly in Waterton, the Crowsnest Pass or along the David Thompson Highway, but I'm hoping this summer to make a trip to Burg Lake, at the base of Mount Robson. I'm very excited for this summer. I've always been passionate about learning and I believe this is a great opportunity and I can't wait to be a part of GWFA.



Enna Graham

The Grey Wooded Forage Association would like to propose a bylaw change for our upcoming AGM on June 12th:

We would like members to consider a membership fee increase to \$40.00.



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Manager's Notes

By Ginette Boucher

We've received many blessings lately. We welcome Enna Graham as our summer staff. In this publication, Enna has shared a few words for your interest. We welcome the much needed additional manpower. Enna started off updating our tired website and refreshing it. We will be adding resources to better serve you. If you have some sites you refer to, and would like to share them with us we would be happy to include these as resources for others to benefit. Stay tuned for a new look and additional resources.

We received approval this week from Service Canada; they will be funding a portion of the wages for the summer position.

We have a new platinum sponsor effective May 1st. A combination of two organizations featuring "Precision Grazing Management". Their full-page advertisement and article will be featured every month.

Please be sure to contact them with inquiries. GWFA welcomes Lloyd Quantz of Greenedges Precision Fence and Douglas Greff of Fotocure as our newest platinum sponsor. May 10th is approaching quickly, in last month's publication a full-page poster was advertised for our Advanced Fencing for Precision Grazing event. Come join us and learn about this new technology. We look forward to this joint venture partnership. We also welcome two new renewal Corporate Sponsors AFSC, and the Rocky Mountain House HhCo-op.

The member benefits and form have been improved. You'll find the updated form at the back of the publication and on the website. Be sure to take a moment to review it. The form will assist us in learning more about your operations and enable us to better serve you.

Memberships dues are trickling in for the 2017-2018 fiscal year. Please submit your renewal as soon as possible to prevent disruption of your member benefits. We accept e-transfers, cash or cheque.

In this publication, you will see the poster of our upcoming AGM. Please be sure to make a note of it. Our AGM is scheduled for June 12th; it will take place at the Olds College Atrium. We are planning a tour prior to the business meeting and meal.

We have hosted our first webinar with Dr. Surya Acharya, a plant breeder at the Lethbridge Research Station and feel it was very successful. We plan to use the webinar as an additional method of extension delivery. This seems to be an easier way for those unable to make it out to events, to conveniently join us. You can use your iPhone or Android device to listen in from your tractor. May 30th we are hosting a weeds webinar; we will send an email invitation soon.



We have signed a contract with ARECA for the Operation Pollinator Project and have sent out an invitation for all interested to contact us.

In closing we are developing a Corporate Membership for businesses. Once it is in the works we will share the information with you. This should broaden our membership base and allow us to network through a wide variety of corporations. Stay tuned.

Best regards,

Ginette

Save the Date

**GWFA is hosting a
Weeds Webinar**

Speaker: Devin Knopp P. Ag

May 30th

12:00-1:00 pm

Stay Tuned for the Invitation





OLDS COLLEGE LAND SCIENCE
BUILDING

MONDAY
JUNE 12
TOUR & AGM

Tour will include Technology Access Center, the Constructed Wetlands in the Botanic Gardens, and the Brewery. Tickets are \$35.00, available from Eventbrite: <https://goo.gl/ox3msi> or contact the office at 403-844-2645

**GREY WOODED
FORAGE
ASSOCIATION**

**ANNUAL GENERAL
MEETING**

**LAND SCIENCE
BUILDING ATRIUM**

**OPENING REMARKS
12:30**

MEETING 5:00

DINNER 6:00



Grey Wooded Forage Association

Creating an Awareness of Forages

Water Quality in Dugouts

By: Devin Knopp, P.Ag.

Recently I had a conversation with a producer about water quality in his dugout. He was out in his pasture and stopped by his dugout to see how well it had refilled this spring. To his surprise the water was not a normal colour. The water looked like manure water runoff, but he, nor anyone around him, has fed cattle where runoff would have made it to his dugout. He was quite concerned about it, and was thinking of getting a water test done to test for tannins because he has poplar trees and low growth shrubs all around the dugout. There are non beneficial tannins in leaf and plant litter that, under high concentrations, can have negative effects upon livestock. Tannins aren't the only thing that can show up in your dugout water, so it's important to determine the water quality of your dugout before you need to use it.

This winter and spring, at least around the Rocky area, has seen average to above average moisture levels in the snow pack before runoff. Since we had all that moisture there was a spring runoff, water ran down usually dry water courses, river levels swelled, and creeks bust their banks. This isn't unusual with a spring melt; however we haven't had a spring melt and runoff like that in a few years. On top of that, this April we have been getting snow or rain every other day and combined with the wet fall, our soil moisture levels are saturated. That means there's ample water running into our dugouts. It also means, the running water and runoff water is much more nutrient saturated than it normally is, and it's all flowing into our dugouts.

You may be wondering why I think there are higher concentrations of nutrients in runoff water than normal. The winter of 2014 was cold but dry, which lead into the drought in 2015. Fertilizers and other nutrients were left stranded as crops were heavily damaged due to the lack of moisture and there was minimal snow that winter. The winter of 2016, was also very dry, most everyone was ready to seed by mid April. These past two and a half years, have seen minimal moisture with a minimal runoff. Fertilizer applications, nutrients from feed grounds/yards, and surface plant litter has piled up. Now the winter of 2017 saw normal moisture levels, with high spring moisture. Livestock producers in many cases were looking for dry or high ground they could feed their livestock on. This placed additional nutrients in areas where the leaching potential is much higher. Also, a normal to above normal runoff saw a lot more of these stored nutrients from plant litter, fertilizers, and feeding grounds move or leach into the soil. Unfortunately, there are a lot of dugouts out there that are not designed and engineered to prevent direct runoff from entering. Most have put the dugout in the lower point of the pasture, so water naturally flows and collects within. All those leachable nutrients will flow with the water and accumulate in the dugout. It's these dugouts that must be monitored closely.



It's not just tannins producers need to worry about. The runoff is going to carry phosphates, nitrates, sulphates, organic matter, bacteria and the list goes on into your dugout. Their presence in small concentrations isn't usually a major concern. These nutrients are used up by plants present in the dugout for their life cycle. However, under high nutrient loads, which may be an issue this year, species like cyanobacteria, also known as blue green algae, bloom. These bacteria species rapidly use these nutrients when they are present in high concentrations, but also release toxins into the water that can be detrimental to livestock. Also, other species of algae and plants may expand rapidly and can be damaging to the infrastructure in the dugouts. They'll clog intake pipes and filters, damage pumps, etc.. It can also become a vicious circle, because a lot of these algae then die and release all the stored nutrients back into the water only to have another flush.

If you're concerned about colour, odour or presence of materials in your dugout, get a water test done. It'll be a simple way to determine what you're dealing with. Algae blooms will not be occurring now, they'll happen in the summer when the water temperature increases. However, anticipating the potential allows you to react now before you have an issue. If you determine there may be an issue, there are a few things you can do. An aeration system helps keep the water moving and cycling which will help prevent algae blooms. Coagulants, such as hydrated lime, can be added to the water which will help bind dissolved nutrients together making them too heavy to stay suspended and they will settle to the bottom or they may float and can be removed through filtering or screening. In dugouts, this is only a temporary fix. Before using coagulants in your dugout do a bit of research to determine the right one for you and ensure you follow the directions. By being proactive now, we can help to mitigate any potential issues that could occur throughout the summer months.

General Inquiries:

Alberta Agriculture & Rural Development

Toll free help line: 310-FARM (3276)

or Email: Info@Albertaefp.com

ARECA

Alberta Growing Forward 2 Canada

Forage Industry on Shaky Ground

Beef and Crop Prices Influencing Acreage Allocation

Alberta has been home to the largest herd of cattle in Canada for years, but the high level of fluidity in the beef industry has meant the sector has been affected by fluctuations in various factors, foremost among them prices, and not only of the cattle but also of crops.

Beef farmers rely on forages and grasslands to a great extent as the source of the most convenient input in their operations.

“We know that the majority of cost to raise a beef animal is the feed stuff and the delivery of the feed stuff to the animals and the harvest of the feed stuff is more expensive than grazing,” said Grant Lastiwka, Forage/Livestock Business Specialist at Agriculture and Forestry, Alberta.

But with the cash crop prices rising, land has been increasingly allocated away from forages to annual crops. For instance, according to latest available figures from Stats Canada, acreage seeded to lentils in the province showed a staggering 803.2 per cent growth between 2006 and 2011. In terms of percentage, lentils were followed by corn for grain with a 296.4 per cent expansion. In terms of area, dry field pea acreage grew in the same period by slightly over 20 per cent to 706,726 acres.

On the other side of the coin, the area for forage seeds declined in the same period from 244,615 acres to 131,993, the biggest percentage drop, by about 45 per cent. In the second biggest percentage drop, by almost 25 per cent, other tame hay and fodder crop acreage declined to 1,466,557 acres from 2,060,967. Tame or seeded pasture area shrank to 5,920,507 acres from 6,137,362 with alfalfa and its mixtures decreasing to 3,657,114 acres from 3,935,022.

Lastiwka believes the downward trend in the forage acreage was fueled by both the decline in the herd numbers in Alberta and the appeal of profitability in investment in cash crops.

“Because cattle prices had been low, there was land moved out of forages into grain crops. What we saw was a higher potential for profitability from land being seeded to cereals and oil seeds,” he said.

“With cattle numbers dropping first, there was more land that could be taken out and put into the cereals and oil seeds acreage. But at the same time higher grain prices were also a reason for it and land coming back into forages is slow to happen because somebody has to invest in a crop that is going to take several years, invest in seeding of a crop that will give returns back in investment over several years.”

Prof. Edward Bork, Mattheis Chair at the Agricultural, Life and Environmental Sciences Department at the University of Alberta, agrees.

“At least on the native grassland side, we are continuing to see a decline, it is a slow, gradual erosion of grassland being converted into cultivated land, so that pattern is happening,” Bork said.

“The number of cattle, at least in Alberta, has been continuing to decline for the past 12 months, which would suggest that we would not need that much forage. So I would find it very likely

that indeed the area of forage is declining,” he went on. “It would be a strict function of supply and demand.”

Christine Fulkerth, Board Chair at the Alberta Forage Industry Network, says they are concerned about the shrinkage of forage acres, but also that they see some encouraging signs of a change in the trend.

“We are seeing a bit of a trend to increase growing forages largely due to the Ecological Goods and Services provided by forages and grasslands,” she said in an email. “With continued consumer demand for environmentally friendly food, producers are responding by growing food that shows benefits to society. It also makes agronomic sense to rotate into forages to break pest cycles”.

Lastiwka also says the allocation of what he calls “marginal land” to cereals and oil seeds might not have produced desired results and those acres might be returning to forages again.

“We know that we have had three years with a lot of forage seed being sold into the industry,” he said.

“What is happening there is that a lot of people that seeded marginal land into cereals and oil seeds didn’t have the grain yields they were expecting and it ended up being some people also knew that this wasn’t a good solution.

“So those same people know that those lands are best suited to be in forages, so some of it has gone back.”

But Lastiwka cautions that repeated periods of seeding acreage to forage do produce some negative impact on the quality of the forage.

“A lot of acres ended up being acres in forage production for more years, so what quantity also reflected was the fact that the yield off of the land was reduced because the stand had been down for hay 12 or 14 years versus seven or eight years,” he said.

“And with that longevity of a hay stand comes less legume surviving in that stand over such a long period of time. So now you are also affecting quality along with quantity because (of) the natural progression to an old forage stand tending to have less legume.”

It remains to be seen whether acreage will expand in 2017 crop year now that cattle prices seem to be on the rise, and there is likely to be increased demand for forage.



Can I Graze My Cows on land that I've enrolled in ALUS?

By Ken Lewis, Red Deer County Conservation Co-ordinator

YES. Well, that's the quick answer. By the way, this is the most common question we get about the ALUS (Alternative Land Use Services) Program in Red Deer County.

Of course, the full answer is also the longer answer.

The full answer is: *Yes, you can graze land that you've enrolled in the ALUS Program—as long as long as you are changing how you graze that land, so that more ecosystem services are getting produced from that land.*

So far, most ALUS projects involving grazing, involve a change from continuous grazing to some kind of controlled, management intensive rotational grazing.

For the most part, the grazed acres being enrolled in ALUS, are the riparian areas around wetlands and along creeks and rivers. Fencing is sometimes involved, but not always.

We have developed a suite of "Sustainable Grazing Management Guidelines." In most situations, if a grazer changes his/her grazing management to adopt this kind of grazing management, there will be an increase in ecosystem services being produced from the land, and ALUS can pay you for that new management.

Below are the Guidelines. Please note that these Guidelines are just that...guidelines. They are NOT hard, set-in-stone rules. This includes the numbers you will read. Every site, every situation, every year, is different. These Guidelines give us all a place to start our conversations.

Sustainable Grazing Guidelines

1. Grazing when the soils are at their driest, or frozen (typically but not always, July 15 to April 15). This timeframe is also typically after most wildlife and waterfowl have reared their young.
2. Providing a long rest and recovery time between grazes (typically but not always, 60-90 growing season days)
3. Balancing stocking rate with forage production. Balanced stocking rates are typically but not always, around 0.6 AUM/acre for riparian areas, 0.2 AUM/acre for aspen forest, 0.1 AUM/acre for coniferous forest,



0.3 to 0.6 AUM/acre for native grass, and up to 1.0 AUM/acre for tame grass (note: AUM means "Animal Unit Months"). Typically but not always, achieving this stocking rate using shorter grazing times (around 3 to 5 days) is preferable.

4. Providing upland drinking water (further is generally better, typically at least 100' and preferably 200' from the water body)
5. Providing upland salt and minerals (further is generally better, typically at least 100' and preferably 200' from water body)
6. Controlling weeds
7. Leaving sufficient grazing residual: a general guideline is 6" standing of this year's growth, or managing such that the amount of accumulated litter (from past years) is at least 800 pounds per acre
8. (If applicable) Removing livestock if they are browsing preferred trees and shrubs.

If you have areas in your pastures around wetlands or along streams and rivers on your place, and you think these Sustainable Grazing Management Guidelines can fit into your operation, let's talk (please call me at 403-505-9038 or email klew-is@rdcounty.ca).

With ALUS, you can get up to 75% of the costs of infrastructure like fencing and alternative watering systems. PLUS, you can get up to \$30 per acre per year for the grazing lands that you are enrolling.

The ALUS Program in Red Deer County is working closely with Grey Wooded Forage Association to develop sustainable grazing plans for our ALUS producers who request assistance.

Note from GWFA:

The Grey Wooded Forage Association has developed a partnership with Red Deer County and its ALUS program. GWFA provides an advisory role to the Partnership Advisory Committee (PAC), and assists producers with their grazing management plan when projects are approved and implemented.

We provide a report to the producers and to Red Deer County after the consultation process. We often provide a follow-up consultation with each producer to ensure their success. Thank you, Red Deer County and the ALUS program for the partnership opportunity.

Is your annual compensation review coming this year?
It is time to start planning.

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Growing Forward 2 

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Good Land Management Requires Measurement

That's the take-home message of the new partnership joint venture announced this spring by two central Alberta technology companies focusing on grazing management. The driving rationale for bringing new, but proven technology into this challenging arena of the feed and food production business, is the need for land and livestock managers to have access to good planning and operating data.

The joint venture partners have chosen to introduce and announce the initiative through the Grey

Wooded Forage Association by undertaking an annual platinum sponsorship to assist the Association in fostering better grazing technologies through the dedicated staff and volunteers who have been industry leaders in developing programs to assist the industry.

The joint venture called *Precision Grazing Management* by the two Olds, Alberta based companies; Fotocure, a remote sensing company, and Greenedge Precision Fencing, is a merging of interests which aim to provide a vital service to land owners seeking better grazing results.

Fotocure is headed by Douglas Greff and supported by skilled pilots and data-analysis experts, specializing in aerial data acquisition and management. It is focused on the best ways to bring drone and data cloud technology to the challenge of observing and recording plant growth data and animal management and movement records. Greff says "the challenge of getting better planning and operating data in useful geo-indexed format is accomplished by capturing multi-spectral imagery and geospatial data made up of hundreds of individual aerial images. These images are then processed by our powerful data-cloud service and stitched together to produce several products that provide incredible insight.

Our solution delivers 3 dimensional interactive maps of your grazing lands and allows for processing of various land and plant signatures that can guide and enhance management decisions for years to come".

Greenedge Precision Fencing has developed new electric fencing technology based on aerial mapping, production planning and laser-guided, robotic fence installation technology; using aerial data for effective and economical grazing systems.

The company under the ownership of founder Lloyd Quantz has been noted internationally for its innovative and safe post vibration and wire installation methods. As a former cattle association and ranch manager he brings 35 years of planned grazing management to the challenge of producing better pasture results. Based on this experience he says "we often we see a doubling, or more, of production output from a properly designed and installed precision grazing system. It's like getting free land for the owners of the projects as reward for the controlled harvesting opportunities these systems provide".

While security of custody and control of animals is accomplished by installing Greenedge electric fence systems, the challenge today for ranch land managers is to find the optimal grazing control patterns to fit individual land and forage situations of each portion of the land base. The growth patterns of forages on each site vary with seasonality, species of grass or animal and the schedule of harvesting and stimulating plant growth. Continuing

to annually review and tweak the grazing plans, the operators are able to incrementally achieve their goals for optimum production of forage and animals.

The new drone service will be developed along with the experience of land owners to bring more efficient planning tools for layout of the fences, and watering locations to best meet the various livestock species seasonal requirements. The steps include:

1. An initial assessment to determine the most likely area to be used for enhanced grazing
2. An estimate of the costs and benefits to the land owner for the planning service with add-ons as the land owner may determine – eg. Ranch property photos, etc.
3. The initial flights and data processing adjusted for the needs of the project
4. A layout proposed for permanent, semi-permanent and portable fences
5. Location of riparian projects and critical watering needs and facilities
6. Follow up pasture flights to determine photosynthesis activity based on use patterns
7. Recommendations and execution of the fencing/watering project.

Fotocure recognizes that some land owners would like to invest in or experiment with their own drone programs. They provide consulting, data analysis, as well as a half day educational session to get you started.

The Precision Grazing joint venture is fully supportive of the Grey Wooded Forage Association and its many projects and activities showing that factual data can benefit the land management challenge.

*"Enthusiastic platinum partners
of the Grey Wooded Forage Association"*

FOTOCURE

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▶ A NEW JOINT VENTURE



▶ Introducing

PRECISION GRAZING MANAGEMENT



This joint venture brings proven innovation to Precision Grazing. Using a new electric fencing and post vibration technology in conjunction with aerial pasture biomass measurement and terrain modelling, our clients can expect to see a doubling of production output.



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DEADLINE REMINDER: WLP-IP-Calf is available to purchase from Feb 1 to May 31.



Environmental Planning

Carving out a role in the succession of your farm



Besides all of the expected reasons to have an environmental farm plan, one often overlooked reason is the opportunity to engage youth in your operation. If your farm is looking for a way to transition to the next generation, consider creating, finishing or updating an environmental farm plan.

Connect to the Bigger Picture

If you farm, you're connected to the land and have concern for the future viability of the natural resources it houses. If you live on your farm, you care about clean water, air and viable soil. Creating a plan to reduce environmental impact is a starting point where people on the farm can agree. A critical part of the Alberta Environmental Farm Plan is to connect the natural resources, to the operations. Through this process, you are bound to understand the natural resources even if you have been living on the farm for years. You can engage a younger (or older) member of the farm by deepening their connection to the land can be a motivating force.

Develop a Clear Role

Planning in this way makes your operation relevant for generations to come. The next generation on the farm needs to carve out a role for themselves (or perhaps carving out a new role for someone who is looking to pass the farm on). Having a clearly defined project like an environmental farm plan can be a great way for a person to transition to a new decision-making role. It can also help those parents and the young person to highlight ways that they can build management thinking not only in the operations but the full scope of the business.

Leverage Strengths and Interest Areas

A report by the UN points out that youth should be more motivated to help in this area since they will be likely living with the consequences of the choices made today. On a micro level, this is may be the case for your farm too. Young people looking to take over the farm are going to have to manage the natural resources to make sure that it provides a living in the long term, much like older generation has for years. The same UN report highlights how intergenerational education is a useful way to gain a depth of knowledge that they can't get from youth culture or peers alone. The process of environmental farm planning encourages independent learning and can lead to a new under-

standing of the industry that these young people are about to enter. At the same time, just because the older generation is looking for change themselves, doesn't mean that they don't care about the farm and its impact. On the contrary, those that have farmed the land for generations have a unique connection to it, seeing it go through many growing seasons and knowing how it has provided for the family.

Train, Discuss, Plan

Adopting an environmental plan is such a useful training tool. The plan is thorough and likely there will be many conversations on the inner workings of the farm because of the requirements of the project. The environmental farm planning process is an excellent way to stimulate that discussion so that a young person can get a very thorough understanding of many aspects of the farm operations. If there is not a formal training program already in place, this is an easy way of implementing one that can take into account a variety of learning styles. Combining new technologies with the wisdom of previous generations is important to be able to see the advantages the farm has through a different lens. Innovation that can contribute to the farm to reduce its environmental impact may also be the discovery of a practice that helps to lower costs or increase efficiencies. Fresh eyes (or at least perspective) on the operation can highlight overlooked opportunities.

If your farm is going through a succession planning process, consider environmental farm planning as a tool to help you through the transition. Building a clear role for new (and old) partners in the farm can be motivating and inspiring for all involved.

References:

Huddart-Kennedy, E., Beckley T.M., McFarlane, B.L., Nadeau, S. 2009 "Rural-Urban Differences in Environmental Concern in Canada" *Rural Sociology* 74(3), pp. 309–329 Copyright E 2009, by the Rural Sociological Society

United Nations 2003. *Youth and the Environment, World Youth Report*; (pp 131-147) New York, United Nations Reproduction Section

Contact:

Alberta EFP Director, Paul Watson. 780-612-9712.
EFP@areca.ab.ca





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Use of Fertilizers, Manures and Pesticides for Sustainable Farm Management

Optimum crop production depends on inputs of commercial fertilizer and herbicides. Today's technology-based agricultural practices have had a huge effect on increased food production across the prairies. Generally, the economic effects of increased production have been very positive; however, the ecological effects are not always as positive.

Background

Commercial fertilizers and animal manure are used to increase crop yields and to replace soil nutrients removed with harvested crops. Both have been valuable in reversing the trend of declining soil productivity and soil nutrients. Research across western Canada has clearly shown that added fertilizer not only increases crop yields, but also builds soil organic matter when more crop residue and root matter are returned to the soil.

The management and use of fertilizers, manure and pesticides vary widely across Alberta due to the wide range of soil and climatic conditions. For example, the Brown soil zone has an average growing season precipitation of about 125 to 150 mm, a high evapotranspiration potential and a fairly long growing season. In the Dark Brown soil zone, the average growing season precipitation is about 175 to 200 mm, with moderately high evapotranspiration potential. In the Black soil zone, the average annual precipitation is approximately 250 mm, with moderately low evapotranspiration potential. In the Gray Wooded soil

zone, the average annual precipitation is approximately 150 to 200 mm, with a lower evapotranspiration potential and shorter growing season.

With the use of fertilizers, livestock manure and herbicides comes the increasing environmental concern over potential contamination of soils, surface water and groundwater. A number of new and ongoing research studies by Alberta Agriculture and Rural Development, and Agriculture and Agri-Food Canada are being conducted across Alberta to address various concerns.

A number of important lessons have been learned from previous and ongoing research across Alberta. With practical knowledge, producers can take a very proactive approach now to minimize the potential negative effects when utilizing fertilizers, various manure types and pesticides on their farms. ³

Producers can take a proactive approach to minimize potential negative effects

Nitrogen and nitrates

Nitrogen (N) in various fertilizers and manure is converted by soil microbes to nitrate-nitrogen (NO⁻-N), the form that plants take up. Nitrate is negatively charged and is not held by soil particles. Therefore, higher levels of nitrate in soil combined with excess rainfall or irrigation can result in leaching through the soil root zone into groundwater.

(Continued from Page 12)

High nitrates in soil occur when manure or commercial fertilizers are applied in spring before significant crop uptake has occurred during the growing season or when applied at rates greater than crops require. Some of the suggested ways to minimize the potential for nitrate leaching include the following:

- Soil test to determine soil nitrate-nitrogen levels; then, use the information to determine the optimum nitrogen fertilizer and/or manure application rates. Select a realistic target crop yield and apply the nitrogen to meet (similar to average) crop requirements.
- Take all sources of nitrogen into account, including nitrogen from previous manure applications, N in crop residue and previous pulse crop or legume plowdown.
- Areas of each field that have uniquely different soil types or management history may require different fertilizer management. These unique areas should also be soil sampled separately from the rest of the field and managed separately.

Optimize nitrogen application method and timing:

- Band or side-band N fertilizer instead of broadcast-incorporation to maximize crop efficiency of uptake and minimize N fertilizer losses for annual crops.
- Apply split N fertilizer applications on hay and pasture land.
- Apply split N fertilizer applications for longer season irrigated crops grown on sandy soils using fertigation (fertilizing through irrigation equipment).
- When manure or N fertilizer is applied in fall, wait until late fall when surface soil temperature is $< 7^{\circ}\text{C}$.
- Consider the use of new, slow release N fertilizer products to minimize the amount of nitrate-nitrogen in the soil.

Shift to direct seeding

The shift to direct seeding to minimize soil disturbance and maintain as much significant crop residue cover as possible on the soil surface has a number of sustainable benefits to producers and the environment:

- Reduced soil disturbance results in less rapid soil organic matter breakdown, resulting in increased soil organic matter levels and improved soil structure, leading to improved soil quality.
- Improved soil organic matter levels and improved soil structure result in reduced soil moisture loss and increased water infiltration rate, therefore reducing surface runoff of water.

- Improved soil moisture conditions can reduce the need for land to be summerfallowed. Summerfallowed land has a higher risk of nitrate leaching, a higher occurrence of soil salinity and a greater risk of soil erosion.
- Weed seeds are less likely to germinate and grow on the undisturbed soil surface, reducing annual weed problems and potentially reducing the need for herbicides.
- Less fuel is needed for field operations with direct seeding, which reduces greenhouse gas emissions and is a cost saving for the producer.
- Continual soil cover protects soil from wind and water erosion, which greatly reduces the risk of soil and nutrient movement into surface waters.

Effective use of crop rotations

The use of diverse crop rotations can be beneficial to combat some weeds, crop diseases and insects. Growing a range of cereal, oilseed, pulse and forage crops will result in the use of a wide range of herbicides from different groups, which will reduce the potential for herbicide-resistant weeds to develop.

Diverse rotations with different crops can disturb weed populations to help keep weed populations in check. Some diseases and insect pests can also be kept in check with diverse crop rotations.

Always avoid growing the same crop two years in a row on the same land to minimize pest problems and reduce the need for crop protection chemicals (herbicides, fungicides, insecticides).

The inclusion of legumes in the crop rotation will reduce the need for nitrogen fertilizer application. The nitrogen-fixing ability of legumes generally means that no N fertilizer is needed for crops such as alfalfa, sweet clover, pea, chickpea and lentil. In the year following an annual legume, plant-available nitrogen is added to the soil as legume residues break down, reducing or even eliminating the need of N fertilizer.

The N from the legume residue is released slowly over the next growing season; therefore, there is less risk that nitrate will accumulate, which can reduce the risk of nitrate leaching.

Reduced N fertilizer requirements will reduce the amount of energy needed to manufacture and transport the fertilizer to the farm, thereby reducing greenhouse gases and conserving energy.

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Use livestock manure wisely

Livestock manure is an excellent fertilizer and must be viewed and managed as a resource rather than as a waste:

- Soil testing is critically important to allow good nutrient management planning. By determining nutrient levels in soil, producers can match nutrient levels in manure and balance them with crop nutrient requirements. This practice will lead to reduced problems of nutrients entering surface and groundwater.
- Use conservative rates of manure application to avoid leaching and runoff problems.
- When applying manure, always stay a safe distance away from surface water bodies.

There is increasing concern about phosphorus (P) from agricultural lands causing problems with surface water contamination. Phosphate leaching into groundwater is rarely a problem as P is normally not mobile in soil and does not leach. Generally, P is attached to soil particles and other soil elements such as calcium, iron and aluminum.

However, P can be carried with sediments into surface water. Contamination of surface water from urban waste is a concern. Runoff from agricultural lands can also be a serious potential problem. Ensuring that water and wind erosion do not occur on farms will go a long way toward minimizing contamination of surface waters in Alberta. The shift to direct seeding has played a strong role in minimizing soil erosion and movement of sediments into surface waters in Alberta.

Pesticide residues

Pesticides in surface waters in Alberta are also of increasing concern, and routine monitoring of surface waters over the past 15 years for pesticides has indicated there are problems. Fortunately, most detected herbicides have been below the current water quality guidelines for aquatic life and drinking water.

It is thought that the primary means of herbicide transport into surface waters is by wind and water movement of sediments from fields. Soil conservation efforts, such as reduced tillage and direct seeding, can go a long way toward minimizing this transport mechanism. When using soil-applied herbicides in the fall, keep a good trash cover to minimize soil erosion and water runoff from fields.

Leaching of herbicides into shallow groundwater has been identified as a concern on irrigated land. Leaching will occur when excess water moves through the soil before herbicide breakdown has occurred. Herbicides with the greatest risk of leaching are soluble and have a longer half-life (resist breakdown).

To minimize herbicide leaching, producers should pay particular attention to herbicide solubility and rate of breakdown:

- Consult the Alberta Agriculture *Crop Protection* book, Agdex 606-1 (commonly called the Blue Book), to select herbicides with lower solubilities and more rapid breakdown.
- Select herbicides with lower solubility when farming sandier soils with higher leaching potential on irrigated land or soils in higher rainfall areas.

To avoid pesticide contamination of water at point source, producers are strongly advised to use a nurse tank to fill sprayer. Using a nurse tank will avoid the problem of back-siphoning from a sprayer tank into a water source.

Herbicide spills during tank fill can also contaminate water sources. To prevent this potential problem, add the concentrated pesticide product to the tank at a distance away from the water source.

These tips are intended to stimulate thought and discussion concerning how agricultural cropping practices can be made more sustainable for many generations. With continued research and development of practical knowledge, Alberta producers can continue to take a very pro-active approach to minimize the potential negative effects when utilizing fertilizers, various types of manure and pesticides on their farms.

It is critically important that agricultural cropping systems be complementary to maintaining healthy productive ecosystems, which are essential to human well-being.

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10/08

Understanding & Using the Animal Unit Month (AUM)

By Karin Lindquist, Forage-Beef Specialist, Ag-Info Centre, Stettler

The grazing season is almost here. Pastures are starting to green up already in many parts of the province, but there's still several weeks left before animals can be put out to pasture.

I thought that this is a good time to talk about the Animal Unit Month (AUM). The article, *"Using the Animal Unit Month (AUM) Effectively,"* has since been updated to reflect a more accurate value for what an animal unit month actually is, and thus how to properly use it.

The concept of the AUM has been quite useful in helping range and pasture managers to work out suitable stocking rates for pastures under a variety of conditions. The goal is to get the best utilization from the pasture resource (the vegetation), and to do that an ideal stocking rate needs to be determined to produce maximum returns without causing damage to available pasture resources.

An "animal unit" (AU) is defined as one mature cow and her suckling calf weighing a cumulative 1,000 pounds (a 920 pound cow with a 80 pound calf) requiring 26 pounds of dry matter (DM) forage per day. An animal unit may also be only a 1,000-pound cow that requires about 26 pounds of DM forage per day.

One animal unit is the standard base used when calculating average stocking rates for range and pasture. But adjustments to create Animal Unit Equivalents based on the actual size of the grazing animals (or how much more they consume compared with the standard AU) are important when you need to calculate out the area needed for a certain number of animals, or the number of animals for a specific sized pasture, for the grazing season.

An animal unit equivalent (AUE) is an adjusted value that has been calculated from the standard animal unit based on the actual animal weight of a grazing animal. AUEs are necessary to understand because the animal unit does not accommodate for the changes in frame size of various livestock or grazing animals, including cattle. Adjustments to the standard AU are typically calculated based on differences in body size or weight, or daily forage intake compared with that standard animal unit.

For example, a 1400 lb cow may have an AUE of 1.4. A mature bull weighing around 2000 lb would have an AUE of 2.0. Weaned calves would have an AUE of 0.5 to 0.6. The method for determining AUEs with regards to metabolic weight are also used, but it's not nearly as common as, mentioned above, using the differences in body weight or daily forage consumption compared to that of the standard AU.

Now, the Animal Unit Month (AUM) is determined by first understanding that the daily average rate of consumption is approx-



imately 2.6 percent of a cow's body weight in a dry matter basis, meaning that a 920-pound cow is going to be consuming 26 pounds of forage per day if she were to produce 10 pounds of milk per day. Her 80-pound calf is not going to be eating as much because most calves at this weight are relying predominantly on milk compared with forage. Thus, the definition of an animal unit month (AUM) is

one animal unit (1.0 AU) consuming approximately 800 pounds of forage on a monthly basis.

Forage consumption rates are going to vary significantly according to a host of different factors, from physiological needs of the animal to level of plant maturity. Forage quantity and quality, though, are going to be the greatest factors on consumption rates of livestock.

As forage plants mature, digestibility decreases. As a result, anticipate a higher level of forage intake in pastures composed of primarily vegetative growth versus more mature growth. Also, average consumption estimation is a relatively safer alternative to reduce the complexities that go with calculating out the stocking rate for a pasture.

Typically, early season growth or forage re-growth in managed grazing systems will provide the highest quality and, therefore, higher consumption rates. Forage growth in extensive grazing systems will provide more mature forage and, therefore, a lower level of forage consumption.

There's more information to be had on this improved fact sheet. Check it out on Ropin' the Web of Alberta Agriculture. There's also an Frequently Asked Questions document on stocking rates--*"Stocking Rates and AUM - Frequently Asked Questions"*--to visit for further information.

Alberta Ag-Info Centre

310-farm

Phone 310-FARM (3276) toll-free to contact Alberta Agriculture and Rural Development, or visit one of our field offices across the province for your agricultural information needs.

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Beef Cows/Heifers: _____
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How many acres are you managing?

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What topics are you interested in learning more about? _____

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