# The Blade

*Creating an Awareness of Forages*

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

***July, 2018***

Photo by Erin Willsie

I mentioned last month how fortunate we are to have our new employees. Erin has taken control of the field projects and the website updates, and Brenda takes care of office management. The Grey Wooded Forage Association is very fortunate to have these ladies step into the breach after losing both of our staff in one month.

During the month of July, the projects we have underway are being monitored and will be checked by Erin with assistance from Devin as required. We are leading or participating in six projects at present: Pollinator, Weevils, Alfalfa, 3D Fence, High Legume Pasture and County Demo Plot. An update on all of these is provided in this issue of the Blade.

Mark your calendar for August 10. Jim Gerrish from May, Idaho will be presenting his talk on soil health. This is a full day talk and walk held in the Caroline and Dovercourt areas. Check out the poster in this Blade for details and register as soon as possible. This should be a sold out event. Jim is well known for his grazing schools and articles in the Stockman Grass Farmer.

We started haying this past week on our farm. Production is about half of last year. It could be a tight year for hay unless we get some rain and a good second cut. Hope that your area fares better.

Have a great month!

*- Gil Hegel*

***The Blade* is a monthly publication of The Grey Wooded Forage Association**

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## *In This Issue:*



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

## Office Report

*By Brenda Kossowan, acting office manager*

A lifelong addiction to needlework gives considerable insight into the infinite variety of courses a single thread can take and the intriguing results any one of those courses can produce. Get it right and you've got a comfy pair of socks or an ugly Christmas sweater. Get it wrong and you've got a mess.

The common thread in this issue of *The Blade* is wound around the very broad topic of soil health, the one factor in nature over which livestock and forage producers have a measure of control. And yet, members of the GWFA Board of Directors have identified achieving and maintaining health soil as an area in which there are significant information gaps. What is the best way to alleviate compaction on your soil type? How do you manage the pH balance on acidic soil—or not? How much punch can a MiG (management-intensive grazing) program provide?

Questions like these form the basis for a variety of clinics and workshops taking place in the next few weeks, as well as a research article published in this edition of The Blade. Make sure you have a good set of walking boots and prepare to take part in some or all of the events planned for July and August. And then get back to us with your ideas and let us know about areas that you think could bear more research. There is an outline of events at the bottom of Page 5 and a poster for TALKDIRT2ME, a one-day clinic with Jim Gerrish, on Page 12. The GWFA is truly grateful for the work our fellow associations have done to bring Jim back to Alberta, and in particular to Laura Gibney of Foothills Forage and Grazing Association for her persistence in ensuring that the GWFA was securely on board for his tour.

Further on the thread of gratitude, The GWFA board of directors has been treated to outstanding service from the Eckville Branch of the Mountain View Credit Union, where the association holds its monthly board meetings. Special thanks to Brenda Ethier and the rest of the crew for everything they do to provide a spacious, comfortable and nicely lit boardroom at a very reasonable fee.

Thanks also to KeyAg and Gem Silage for hosting a field day at Jim Bower's alfalfa field, east of Red Deer. The crew chose a sunny June morning to demonstrate the latest equipment at work cutting and wrapping haylage. Please see Page 11 for photos. The question remains: What do you do with all that plastic? There are a number of research projects underway, including potential for creating edible silage wrap. It would be great to hear how haylage producers are handling the leftovers and any ideas you may have for effective disposal methods.

There are some opportunities to get out of your comfort zone as well, pull on a pair of good walking boots and get a close look at what your fellow producers have accomplished in their fields. On Ken Ziegler, former chair of GWFA and our current ARECA (Agricultural Research and Extension Association) representative, will host a pasture walk to show the results he has been getting from seeding a pasture with Kura clover. There is no charge for the event, but anyone interested in joining in is asked to pre-register. Ken has asked that, instead of providing directions, everyone meet at the GWFA office in Rocky Mountain House and then follow the leader to his place.

Another of our members, John Reid of Solar Harvest Farm near Leslieville, has joined the annual Open Farm Days Tour, operated by Travel Alberta, the Province of Alberta, the Alberta Association of Agricultural Societies and the Alberta Culinary Tourism Alliance.

Next month, *The Blade* will focus on environmental sustainability, including articles about the Environmental Farm Plan and how it can work for you.

### PASTURE WANTED/PASTURE AVAILABLE

**Dry conditions this summer mean many producers have lost their pastures, while those in other areas may have pasture available. Whether you have animals that need grass or grass that needs grazing, please call the GWFA office and we will connect you with producers who can help.**

### *TALKDIRT2ME*: Agenda for Jim Gerrish Soil Health Clinic, August 10

| | |
|---|---|
| **09:00-12:00** | Classroom Session at Caroline HUB (Kurt Browning Arena)<br>- Creating excellent pasture from the soil up<br>- Nutrient cycling and fertility with MiG |
| **12:00-1:00** | Lunch—burgers and salad, and then travel to Cattlegrass Ranch near Dovercourt |
| **1:00-5:00** | Pasture Walk, with primary discussion around ecosystem processes (solar energy flow, water cycle, nutrient cycling, biodiversity above and below ground) |

*TALKDIRT2ME* IS HOSTED BY THE GREY WOODED FORAGE ASSOCIATION WITH SUPPORT FROM CLEARWATER COUNTY AND EVERGREEN CO-OP. PLEASE VISIT THE EVENTS PAGE ON OUR WEBSITE, WW.GREYWOODEDFORAGEASSOCATIO.COM.

**Register by calling 403-844-2645, email to gwfa5@telus.net or search talkdirt2me at www.eventbrite.ca**

# Legumes, Bees and Weevils—Oh My!

*By Erin Willsie, GWFA projects co-ordinator*

The focus for this summer is on Operation Pollinator, Cover Crop Demo Plot, Stem Mining Weevils and the Hardy Alfalfa projects. July is a busy month for projects as a lot of the research needs to be completed at some point during the month.
The Pollinator project is more of a check up to make sure that there is sufficient crop growth to attract pollinating species and will be completed at the beginning of July.
We are partnering with Clearwater County and Performance Seeds to create a cover crop demonstration plot. The plot is a planned stop on the West County Ag tour with a goal of showing how cover crops can be used to enhance soil health and provide fall/winter grazing for livestock. The Weevil project necessitates the extraction of several thistle plants and cutting them open to see if there are any Weevil larvae in the plant. If there are, the project is following protocol as it is the larvae that eat the thistle and kill it.
The research for the Weevil project is to be completed later in the month. Finally, the Alfalfa project constitutes multiple clippings of the forage from the site to have the different plants present identified, as well as, studying the plants themselves and what is present for nutrients and growth. By the end of July most of the project work for the summer will be completed leaving only the research side of the projects left to complete. Stay tuned for our results.
On the event side of the organization we hosted a Goat Pasture Walk on July 22 at Will-O-The-Wisp Paddocks. The walk focused on the rotational grazing techniques for goats used by their farm and also featured a custom bridge to be used to move goats over a fence when there isn't a gate close by. The event was free to attendees as a welcome to our new season. Later in the summer we will have a soil health clinic hosted by Jim Gerrish as part of his Alberta Grazing Group Tour.
The event will be on August 10th starting at 9:00 a.m. in Caroline at the HUB (Kurt Browning Arena) for a classroom session followed by a barbeque lunch before moving to our chosen pasture to compare soils for the rest of the day.
We decided to focus this event on Soil Health as it was the number one concern collected by our survey responses from last year. We hope to plan more events throughout the summer, including walks and clinics and would enjoy feedback from our members and readers about they want to see most from our organization.

**New weevils purchased for release in 2017**

**Pollinator project: Phacelia left to selfseed with sweet clover**


**Video cameras set up for the 3D Fencing project caught deer trying their luck with varying results.**

## ALUS News for Red Deer County

*By Ken Lewis, Conservation Coordinator, Red Deer County*

Hello everyone. It's been a while since Volume 17, but then again, spring happened. Happened.
Here's the latest ALUS Red Deer County related news:

**Award:** the ALUS Programs in Mountain View County, Lacombe County and Red Deer County (this includes all ALUS Farmers / Ranchers!) received a Blue Skies Award from the Parkland Airshed Management Zone.
Visit pamz.org/blue-skies to find out more.

**Alternative Beaver Management:** Working with the Medicine River Wildlife Centre, Red Deer County ALUS is looking for a few more sites to try out alternative (to dam/animal removal) management techniques for beavers. The most likely method to try, is what's called "Beaver Pond Leveling", where you use a pipe to set the dam level, at a level both you and the beavers can live with.
Folks from the Medicine River Wildlife Centre would do all the work.

You just have to identify a good location.
Please let me know if you are interested.
To find out more about Alternative Beaver Management, visit http://www.rockies.ca/beavers/landowners.php

**Help With Projects:**

We still have funding available for new ALUS Projects in 2018. Please contact me as soon as possible if you or some one you know would like to do an ALUS Project on your place or theirs.

ALUS Canada
A Weston Family Initiative

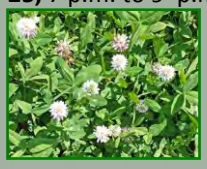
All the best,
Ken

# COMING UP

**July 10 and 11**, 9 a.m. to 5 p.m. — **Forage to Beef Demonstration Days**, hosted by Foothills Forage and Grazing Association, Lvestock Gentec, Rocky View County, Municipal District of Bighorn and Mountain View County. Visit www.foothillsforage.com to learn more. Register by searching Forage to Beef at www.eventbrite.ca

**July 13,** Breton Field Day — **Perennial Grains Workshop** at Breton Plots, offered by Rural Routes to Climate Solutions, a program of the Stettler Adult Learning Centre.
Visit www.facebook.com/ruralroutes2climatesolutions to learn more.

**July 25,** 7 p.m. to 9 p.m.



See a healthy stand of **Kura Clover** in action at Ken Ziegler's place, just outside of Rocky Mountain House. Meet at the GWFA office and then follow the leader. Please pre-register with GWFA by noon on Tuesday, July 24, to ensure that you're not left behind!
Call 403-844-2645 or e-mail gwfa5@telus.net

**August 10,** 9 a.m. to 5 p.m. — **TALKDIRT2ME** soil health clinic with Jim Gerrish.
Please see our detailed agenda on Page 3 and our poster on Page 12.

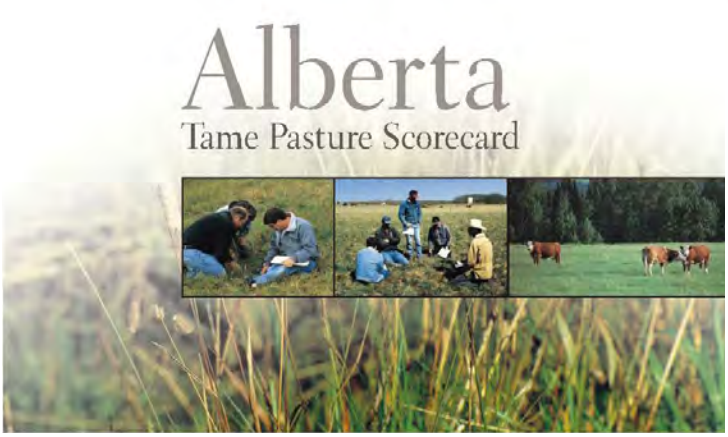
**August 18,** 9 a.m. to 6 p.m.: — Tour an intensive rotational pasture system at John Reid's Solar Harvest Farm, west of Leslieville. There is no fee for this event, which is part of **Alberta Open Farm Days**.Come meet John and other members of the Grey Wooded Forage Association!
Learn more online at albertafarmdays.ca

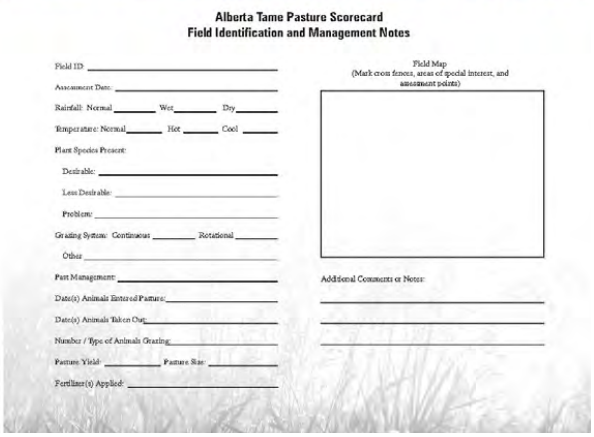
# GWFA Director Profile

Hello everyone,
My name is Dallas Jenson. I have been a member of the Grey Wooded Forage Association for a few years. I always enjoy reading the articles in *The Blade* and seeing new innovative ideas. This is my first year as a director and I look forward to learning the ins and outs of GWFA. I live west of Rimbey in the Last West area where I operate the family farm. We run a commercial cattle operation of 250 Angus cross cows. We graze cattle on tame pasture in the summer and have been swath grazing the cows in the winter months the last few years.
We have been doing rotational grazing for many years now to improve old pastures and lengthen the grazing season which also lessens winter feed costs. With the cost of equipment, fuel and inputs on the rise, it's hard to keep doing things the same way it has been done in the past.
I know that change is not always easy but sometimes when you see someone else trying new methods, it allows for easier transition.
This year we are trying cover crops with oats. Our goal is to improve feed nutritional value, palatability and volume, along with enriching soil health, feeding the bugs, the bees and those Mycorrhizal Fungi! We are very excited to see the outcome of this crop.
When not farming, I enjoy playing softball during the summer for our local team and participate in our community hall events. I feel it's important to have community halls and make efforts to keep them functional in our rural settings.
I look forward to being involved with GWFA as a director and bringing new ideas to the board for future events and trials that include new methods and new technology. I Look forward to meeting everyone at upcoming events and throughout the year.
Have a great summer!
*Dallas*

## A New Management Tool from Alberta Agriculture and Forestry

**Pick up your copy at the Grey Wooded Forage Association office**
**5039-45 St., Rocky Mountain House**



# Take What You Can Get Now for Hay, Don't Wait!

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

It's past the middle of June already, and haying season is upon us. There's just one problem, and it's a growing concern amongst producers in many parts of Alberta: Forage plants are heading out earlier than normal and are not as tall as they should be.

A number of factors may explain why forage crops are not doing well this spring, and they all go back to the weather patterns from last year. Summer of 2017 provided hot and dry conditions, and some areas were so parched that no precipitation was received for three months or longer. Other areas fared a little better, and others still received more precipitation than they could shake a stick at. But overall the heat and the lack of moisture severely stressed plants that were trying to survive. By the time some rain came for these dry areas in the fall, it was already too late as plants had already gone dormant for the year.

Plants that came back this spring more than likely had lower root food reserves than normal, but it was enough to get growth started. Yet, with dry conditions arriving again this spring, plants became stressed early into the season. This has impacted growth rates and yield potential.

Moisture is always a prominent focus in situations like these. However, other factors such as insufficient residue cover, low cutting height, poor soil fertility, individual plant species sensitivity to hot and dry or cool and wet conditions, and presence of insects and diseases combine to create a situation where plants are primarily physiologically focused on mere survival. Plants respond to such stresses by being significantly shorter in height, as well as producing flowers or seed heads earlier than normal. Once a seed head has fully emerged and gone to seed, the plant has done its job for the year and will go dormant much earlier in the season than normal.

When faced with a hay crop that isn't coming in as tall or thick as hoped, there is not much that can be done to change yield potential. The only thing to do is to take what you can get and cut the crop now, while the plants are still green, flowering and has decent feed value. Otherwise leaving the crop alone, or just letting it grow for two or three more weeks, will not increase yield, it will instead create a reduction in forage quality. Also, since we're quickly swinging into another potentially hot and dry summer, late cut plants may not even grow enough for a producer to get a second cut.

Why cut now, though? There are three phases of growth for most forage plants, early stage (Phase 1) where plants are just starting to emerge; the mid or "teenage" phase (Phase 2) where plants are vegetative but almost ready to put up a seed-head; and Phase 3 where the seed-head has emerged, and all the plants' energy and resources have changed from leaf production and growth into flowering and seed production. Plants that have entered into the third phase, are still actively green, and have not entered dormancy, are at a good stage where cutting now will send those plants back to Phase 1. If the rains finally come, then that field will be ready start growing to produce a better second-cut.

While the yields will not be there, putting flowering plants back to their growing stages by getting out there with the cutter as soon as possible may be a saving grace in the end. There is no guarantee as to when the rains will come, but having the field ready for the next rain event will have you ready to take advantage of the next cut this year.

# Straight Hail Insurance Program - a Producer's Friend for Decades

*By Mustafa Eric, AFSC*

Prairie weather has always been challenging for agricultural producers, with hail being one of the most destructive occurrences of Mother Nature's wrath.

When the earliest settlers homesteaded in Western Canada in the late 19th and early 20th century, hail was the biggest risk for their crop production operations. Despite all advances in weather forecasting and agricultural technology over the decades since then, hail remains an ever-present risk to most farming operations.

Efforts to manage the risk posed by hail to agricultural operations are almost as old as the start of the organized agricultural crop production in Western Canada.

In early 1900s, even before Alberta became a province, an insurance plan to protect crop producers from the destruction of hail was implemented by the then Territorial Government based in Regina. After Alberta became a province in 1905, the new provincial government introduced a plan to protect farmers of the province against hail damage. However, due to the failure of low premiums to provide solid coverage, the provincial government incurred massive losses and the program had to be abandoned.

Then it was the turn of the private companies, licensed by the provincial government, to sell hail insurance for the next quarter of a century. Over that period, in spite of some 40 private companies getting involved in hail insurance business – or perhaps because of it – that enterprise failed to take hold as well.

In 1938, the Alberta Hail Insurance Board (AHIB), AFSC's predecessor, was created by the provincial government as a cooperative-mutual organization whereby the founding members of the organization were also its clients. AHIB took a loan of $25,000 in the spring of 1938 and repaid it with interest in the fall of that year. From then on, straight hail insurance in Alberta has been a completely premium-funded business without any governmental subsidies.

**Hail insurance changes over the years**

Since the days of AHIB, straight hail insurance practices have gone through several changes. In the ensuing years of the foundation of AHIB, hail and crop insurance sales continued with private insurers remaining involved in the business at varying scales. Beginning in 1948, a premium refund policy was instituted and it continued over the years, with several changes being introduced along the way as refund calculations and eligibility criteria were revised multiple times due to evolving circumstances and legislative environment. *(continued on next page)*

(*continued from previous page)* During late '60s and early '70s, private insurance agents who were mainly selling crop insurance also started to sell hail insurance, causing confusion among crop producers with regard to their crop and hail coverage. Hail Endorsement was introduced in 1973 as a new option to secure insurance coverage for hail damage and this new feature associated with crop insurance also underwent administrative changes in the following years.

**Straight Hail coverage: Fluctuating trends**

Straight hail coverage data show some sharp fluctuations over the years in terms of the number of contracts while the changes in hail coverage by acres seem comparatively more stable. For instance a comparison of straight hail contracts during 1990s shows that the number fell from 7,287 in 1991 to 6,910 in 1992 but jumped to 10,484 in 1994 and to 12,518 in 1996. But when examined from a standpoint of insured acres, from 1994 to 1998, the acreage insured under straight hail contracts remained stable around 4.8 million acres annually, with exception of 1996, when insured acres increased to 6.3 million for a single year.

More recently, due to the changing landscape of farming operations throughout Canada, whereby number of farms declined while their size grew, there has been a decline in the number of contracts.

**Straight Hail Insurance in 2018**

With improvements that have been introduced to the program over the years, Straight Hail Program currently stands as a convenient risk management program to secure protection for spot loss caused by not only hail, but also accidental fire or fire caused by lightning. And alongside producers, a tenant with an interest in the insured crop or a crop-share landlord is also eligible to purchase protection against these hazards through the program. While viable annual and perennial crops are eligible to be insured, pastures are not, and a full list of crops insurable under a Straight Hail contract can be found at www.AFSC.ca, where a straight hail premium calculator is also available.

Some key considerations to keep in mind when purchasing straight hail insurance include:

- Coverage comes into effect at noon on the day following the date of application;
- Straight hail coverage expires if the crop is put to another use, when harvest is complete or at midnight on October 31 of the year of application;
- Clients can choose full coverage or coverage with a 10 per cent or a 25 per cent deductible; the higher the deductible, the lower the premium rate;
- There are maximum coverage limits per acre, and the combined dollar coverage per acre of all insured parties cannot exceed the coverage limit.

Producers can benefit from premium discounts when they purchase Straight Hail insurance from AFSC.

There are two ways of making use of the discounts: Buying the insurance coverage online allows a producer to get a two per cent discount in premiums. Opting for "auto-select" while purchasing crop insurance before April 30 also entitles a producer to a two-per cent discount.

Premium refunds are allowed for Straight Hail policies. Premiums can be refunded at a certain percentage by June 16 for winter-seeded crops and by July 1 for spring-seeded crops provided that no indemnity has been paid for hail or fire damage and if the crop is put to another use. After these dates, a graduated scale is used to determine the amount of premium refund that is available. For winter and spring seeded crops, no premium refunds are available after July 16 and July 31 respectively.

More information on the cancellation and premium refund policies is available under section 26 of the Straight Hail Contract of Insurance 2018 (Pages 23 and 24) available at www.AFSC.ca.

# Baling Hay

*Barry Yaremcio, Beef and Forage Specialist, Alberta Ag-Info Centre*

This year is going to be a challenge deciding when to bale hay. With yield differences in a field, areas with a low yield will be dry and ready to bale while areas of the field with higher yield potential may need more time to dry and cure before baling. Baling too soon could result in mouldy, heated feed that is lower in quality compared to what is in the windrow.

Moisture content in the forage is key to having a bale store properly and not mould or deteriorate in the bale. Large round bales should have 15-16 per cent moisture while the large squares should be down to 12 percent. When it is hotter than usual, the hay temperature in the swath is higher and the heat is retained in the bale. This provides a great environment for microbial growth which leads to spoilage. For every 10°C increase in temperature, bacterial growth rates double. Thus, with higher temperatures, safe moisture levels for baling decrease because of the retained heat in the bale. The bales will go through a sweat for 3 to 4 days after baling. This also causes an increase in bale temperatures. Leave the bales out in the field for a couple weeks so that the evening and overnight winds can cool the bales which reduces the risk of spoilage.

Evaluating hay visually and by smell fine may be misleading. It needs to be physically evaluated to determine if it is cured. Take a small sheath of hay (1/2 to ¾ inches in diameter) out of the middle of the swath and try to break it, just like breaking spaghetti into a pot. If it breaks after bending the stalks, and you can hear it snap and crackle, the plants are cured. The second physical test is to take a sheath of hay and hold it in both hands (no different than the breaking test). With hands three to four inches apart, rotate the hands in the same motion as when pedaling a bicycle. If the stems break and it is possible to separate your hands after three or four revolutions, the hay is cured and ready to bale.

Moisture probes work reasonably well with cured hay they will give a false moisture reading with uncured hay. The meters measure the electrical current from one side of the tip to the other. Moisture content in the hay is calculated using equations that are contained in the unit. The amount of current is directly related to moisture present on the outside of the stems and leaves. It does not measure the moisture content inside the stem, thus a false reading is possible if the probe is used when checking hay that is not cured. Moisture content in the centre of the stem could be significantly higher than what is found on the leaves and outside of the stem.

Use of an inoculant can reduce the wait time before baling. Adding inoculant to the hay windrow where yields are heavier and usually with higher moisture content, allows hay to be baled when moisture content is 2 to 3 percent higher than recommended. Each product is different so following label instructions is required.

With hot weather, baling hay during the day can result in high leaf loss especially if there is significant amounts of legume in the stand. Leaves and flowers are the highest quality components of a plant. If there are significant amounts of fine material behind the baler where the bale is dropped, or significant amount of leaves are visible on the ground where the windrow was, it might be beneficial to bale the hay at night when temperatures are lower. Baling from midnight to 8 am may reduce leaf loss and improve the overall quality of the hay. It can also increase overall yield because more leaves are retained in the bale.


## DEMO DAY AT JIM BOWER'S HAYFIELD

KeyAg and GEM Silage joined forces on June 18 for their annual field day. Clockwise from top: A Red Deer staffer chats with a visitor; Old meets new as KeyAg CEO Harv Schimke's 1951 truck gets a visit from Austin Michael's drone; visiting Hutterites watch a rotary rake pull swaths together for baling; Sylvan Lake producer Wes Swainson visits with Ralph Mamchur from GEM Silage.

# TALKDIRT2ME

## SOIL HEALTH CLINIC WITH

## *JIM GERRISH*

**August 10, 2018 , 9 a.m. to 5 p.m.**

***Hosted by The Grey Wooded Forage Association***

**LUNCH AND BIOSECURITY BOOTS PROVIDED**

**Members: $60/person**

**Non-Members: $70/person**

9am—Classroom and Lunch at Caroline HUB

1pm—Pasture walk near Dovercourt

**Tour Partners:**

Chinook Applied Research Association CARA MEMBER

NPARA North Peace Applied Research Association

PCBFA Peace Country Beef & Forage Association

Foothills Forage and Grazing Association Sustainable Grazing Solutions

Battle River Research Group

***Contact GWFA by August 7 to reserve your spot***

*Limited walk-in available*

Phone: 403-844-2645 | Email: gwfa5@telus.net

Clearwater County

Co-op Rocky Mountain House

# The Relevance of Agricultural Associations

*By Amber Kenyon, Gateway Research Association (Westlock)*

Compared to the majority of farmers that I meet, I came into the world of agriculture much later in life. Having grown up in the city of Vancouver, BC, there was not a lot of farming to be had. It was rare even to find a backyard garden. Lucky for me the area that I grew up in had an abundance of wild berries and natural landscapes.

When I met my husband, Steve, I was immersed in a whole new world. Originally, I just followed him around everywhere on the farm, drilling him for answers to the 'whys' of what he was doing. I learned everything from cattle handling skills, to fence repair, to water system builds and maintenance, to soil health, and even more than I ever thought that I would want to know about dung beetles and other similar types of bugs. Part of following Steve around included attending conferences and seminars with him throughout the winter. This was such a huge blessing; the amount of information available at these events was unlimited. Not only was there a plethora of engaging speakers at every single one, but the networking sessions throughout (lunch, dinner and meetings) had me speaking with such a wide variety of producers that all had so many different perspectives. I found that there was something to learn from every person that I crossed paths with, and usually more than just one something.

The majority of these conferences, seminars and speakers are hosted by local agricultural associations. Whether they are applied research associations, forage associations or other similar groups, they all have a hand in hosting speakers and conferences. They are at the front lines of bringing unity to the many wonderful producers across the country and the best part is that these groups are unbiased. These agricultural associations are generally led by a volunteer board of directors. This board typically represents the broad range of producers and growers that I have had the pleasure of meeting throughout my farming experience. Every single one of these people have a say in how the agricultural association will be run.

There is another aspect to agricultural associations that I found to be unique to the farming industry. The idea of applied research. To think that these groups spend the majority of their time and funds each year testing new methods and products to bring their producers relevant information and unbiased research is amazing. Agriculture is incredibly unique in that what works in one location may not work in the next. What grows here in the Westlock region of Alberta may not grow in the Drayton Valley region. This is where the applied research comes in so handy. By producing the 'error' part of 'trial and error' and sharing that information, these research associations can save their producers both time and money.

I personally am so thankful to the many terrific groups that are in place across the country keeping producers informed and on the same page. Without them I would have spent a lot more time learning and would have made a whole lot more mistakes before I ever made it to the point in agriculture that I am now. If you are not a part of your local agricultural association, today is a great day to get in touch with them. Most groups host tours of their research plots and are happy to have producers out asking questions. If you are unsure who your local agricultural association is, ARECA (Agricultural Research and Extension Council of Alberta) is a great resource and can be found at www.areca.ab.ca.

# On-farm Assessments of Pasture Rejuvenation Methods on Soil Quality Indicators in Northern Alberta

*Akim Omokanye1, Calvin Yoder, Lekshmi Sreekumar1, Liisa Vihvelin and Monika Benoit*

The study was aimed at providing livestock producers with options on practical methods to improve soil quality of pastures for improved forage production and livestock carrying capacity.

Our objective was to investigate how to manage degraded soil under grazing systems with minimal environmental effects, as well as to demonstrate practical and identify potential methods for improved soil quality for sustainable pasture production.

The study was carried out on-farm from 2015 to 2017 at two sites in northern Alberta. The methods of rejuvenation (treatments) evaluated were: Sub-soiling, break and re-seed (pasture renewal), a combination of manure application plus subsoiling, pasture rest, inorganic fertilizer application, high-stock density grazing and bale grazing. A check/control treatment was included for comparison. For break and re-seed, the forage mixture seeded (16.8 kilograms/hectare) consisted of 60 per cent grasses and 40 per cent legumes. Overall, bale grazing improved soil organic matter (SOM) by up to 3.8 per cent over other methods including check. In terms of soil compaction penetration resistance, water infiltration rate, water content and nutrients particularly nitrogen, phosphorous and potassium, the bale grazing system as a method of rejuvenating old pastures significantly showed higher values than check at both sites. Without having to break and re-seed old pastures, the first option that livestock producers would have success with in improving soil quality for better pasture productivity would be bale grazing. The next two methods or rejuvenation strategies with great potential for improving soil conditions for pastures would be a combination of manure application plus subsoil in fall and high stock density grazing.

In Canada, the province of Alberta alone accounted for about 40 per cent of the national cattle herd in 2011, with pasture land accounting for 43per cent of total farm area (Statistics Canada, 2012). Cow-calf producers know that grazing on productive pastures can be very profitable on their operations. However, over time, in northern Alberta, the productivity and livestock carrying capacity of pastures on beef cattle operations would usually decline, largely a result of reduced plant stand vigor, which is mostly a consequence of soil compaction, occasional lack of moisture (drought), pests, weeds, overgrazing and poor soil fertility (Omokanye, 2015). Land degradation under pastures may occasionally be irreversible or expensive to rejuvenate and would have a major impact on the biodiversity and productivity of the pasture land. Therefore, producing high-quality forage and maintaining productive pastures is a major challenge livestock producers encounter. Breaking and re-seeding old pastures (renewal) or using other methods of rejuvenation can be a complex and costly challenge, as well as time consuming for producers. Recently, Omokanye et al (2018) showed that breaking and reseeding an old pasture would cost a minimum of $625CAD/ha in northern Alberta. The high costs associated with break and reseeding is causing livestock producers to look at other strategies or rejuvenation methods that are practicable and cost less for sustaining a forage stand while improving or maintaining soil quality longer.

An available option for the implementation of such practice strategies is through the concept of soil quality proposed by Karlen et al (1997). Soil quality is the capacity of a specific kind of soil to function, within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality and support human health and habitation. The concept of soil quality is determined by inherent and dynamic characteristics of the soil (Karlen et al, 2003) and is found valid when indicator parameters such as permeability and penetration resistance are present and when such parameters will allow for evaluation of the level of soil quality (Reynolds et al, 2009; Horn and Fleige, 2009). *(continued on next page)*

*(continued from previous page)* Soil quality indicators are those measurable soil properties and processes that have greatest sensitivity to changes in soil function and its ecosystem services (Zornoza et al, 2015; Andrews et al, 2004).

Soil compaction resulting from cattle trampling in pastures could reduce soil respiration by reducing pore space and limiting oxygen diffusion (Collin and van der Driessche, 2000; Shestak and Busse, 2005). Reduced soil respiration may indicate less microbial activity and anaerobic conditions, both of which could negatively affect forage yield. If this situation persists, anaerobic conditions in the root zone could negatively affect plant growth (Linn and Doran, 1984). This is because soil compaction can impair water infiltration into soil, root penetration and nutrient uptake.

Consequently, the profitability of the beef cattle operation is negatively affected in northern Alberta (Omokanye, 2015). Where soil condition is good, the soil would have great potential to absorb and store water (rain and melted snow), store and recycle nutrients, provide habitat for seed germination and growth and consequently resist erosion. Remediation of compaction through subsoiling is one approach which producers can use on pastures.

**"For the majority of prairie (grasslands) soils in western Canada, nitrogen is typically the most deficient nutrient, followed by phosphorous, potassium, and then sulfur."**

Northern Alberta has a high content of expanding clay mineral soils often referred to as "gumbo" and are classified in the vertisolic order (Soil Classification Working Group, 1998). These are mainly heavy-textured soils (mostly greater than 60 per cent clay, with one-half of the clay being smectite minerals). The gumbo soils are characterized by a tough, impermeable hardpan that may vary from five to 30 centimetres or more below the surface (Lickacz, 1993). Some of the properties of the soils include the high shrink-swell potential, low bearing capacity and extreme stickiness when wet. This hardpan severely restricts root and water penetration of the subsoil (Lickacz, 1993).

Therefore, on-farm investigations on methods of rejuvenation of old pastures on gumbo soils that can lead to increase in soil nutrients, organic matter, microbial activity and earthworm populations, and with positive effects on soil aggregation and macro porosity would be of particular importance to livestock producers in northern Alberta. For the majority of prairie (grasslands) soils in western Canada, nitrogen is typically the most deficient nutrient, followed by phosphorous, potassium, and then sulfur (AAF, 2008). An important part of efficient livestock production is ensuring there is sufficient grass for both hay and pastures. However, low soil nutrient levels often limit forage production. With good soil fertility and fertilizer management, the productivity of many hay and pasture fields can be greatly improved.

In addition to breaking and reseeding as a means of pasture renewal, one option that some producers have used in rejuvenating pastures is bale grazing. Bale grazing on fields is a method of providing feed to beef cattle particularly during the winter months, in the later parts of the fall or in early spring.

**Conclusion**

Maintenance of optimum soil physical conditions is an important component of soil fertility management. In the present study, bale grazing, subsoil in fall, manure plus subsoil in fall, and break and re-seed all consistently played significant roles in improving soil water content and infiltration rate as well as reducing compaction. Subsoil in fall, manure plus subsoil in fall and break and re-seed consistently reduced compaction up to 30 cm of soil depth. Bale grazing also reduced the soil compaction. In addition to the role played by bale grazing in improving soil function, it is important to note that the combination of manure plus subsoil in fall may be a good strategy that can be used to enhance soil health through improved SOM, increased infiltration rate and reduced compaction. High stock density grazing may not be able to reduce soil compaction or drastically improve infiltration, but other resulting benefits from high stock density grazing such as improved soil nutrients levels as well as SOM would make it a good choice for rejuvenating old pastures. This study concluded that overall, soil quality indicators measured here, and taking into consideration other potential benefits, the practicable top four (bale grazing, subsoil in fall, manure plus subsoil in fall, high stock density grazing) are the methods of rejuvenation that would be recommended to livestock producers. There is no doubt that soil health, pasture productivity and farm profitability would increase when the selected methods are properly implemented on old pastures that are still dominated by desirable forage varieties.

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