The Blade

Creating an Awareness of Forages

Monthly
Newsletter
of the
Grey Wooded
Forage Association

August, 2018

Thistle Killers in Action

Details on Page 5

Message from the Chair

I mentioned last month to mark your calendar for August 10 for the presentation on soil health with Jim Gerrish from May, Idaho. I strongly suggest anyone interested in building or rebuilding their soil attend this event.

Following that, we have the opportunity through CARA to conduct 95 soil samples and analysis for members of the GWFA. The analysis will include physical and biological parameters such as active carbon, bacteria C:N ration and many others. The results will be added to the Alberta Soil Health Benchmark Database.

If you have any suggestions for locations to sample, please contact the office with details.

We were asked by the Food Water Wellness Foundation to provide a letter of support for a project they have applied for through CAP.

It is a multi-year project to quantify the value of grasslands in carbon sequestration for carbon offsets.

Hopefully grass farmers will get the same recognition and compensation as zero till grain farmers for carbon credits.

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

One quirky little fact that has always amazed me is how a two-bit bolt can bring down a massive and powerful machine. You have to watch only a couple of editions of *Mayday* to see how a sloppy weld or a plugged pitot tube can pull an airliner out of the sky with little or no warning. That scale of tiny versus titanic is underway at four test sites between Rocky Mountain House and Sundre, where intrepid summer student Erin Willsie and former GWFA staffer Devin Knopp have been checking on the progress of some tenacious little giant killers.

Willsie and Knopp have been investigating the progress of a specialized weevil whose larvae kill Canada thistles from the inside out. Adult weevils have been released in the test plots, where it was hoped that they would lay eggs and begin their murderous cycle. Willsie will have a report in this issue on how the project has been progressing and what results she and Knopp found at the test plots in mid-July.

Like the thistles they kill, stem mining weevils are an introduced species with a specific task. The Weevil Project is therefore a valid example of the work underway in search of environmentally sustainable solutions to fighting weeds and improving yields in our hayfields and pastures.

As promised last month, this issue of *The Blade* is wrapped around a theme of environmental sustainability – the broad spectrum of practices that help producers work with nature rather than simply mining the land.

We have pulled together stories from projects such as a University of California study looking at fungi rather than chemical herbicides and potential human applications for them.

Paul Watson from ARECA has contributed an article about the benefits of updating an Environmental Farm Plan, including the message that a strong show of stewardship sends to consumers.

Of course, if you are reading this issue early enough in the month, you still have time to check out Jim Gerrish's workshop on August 10, when he will deal with all the factors involved in achieving and maintaining healthy soil.

We would like to have all registrations in by the end of the day on August 7, but will have some walk-in seats available.

Please see our poster on Page 10.

You can contact our office to register, or go to Eventbrite.ca and search Talkdirt2me.

- Brenda Kossowan, acting manager

August 10, 9 am to 5 pm	**TALKDIRT2ME** soil health clinic with Jim Gerrish. Please see our detailed agenda on Page 3 and our poster on Page 12.
August 18	Open Farm Days at John Reid's place is CANCELLED due to dry conditions.
August 23, 7:30 am-4:30 pm	Clearwater County's annual West Country Ag Tour. See Page 14 for the poster and agenda

COMING UP

GWFA Director Profile

Greg Campkin

As I prepare to leave the oilpatch to start farming full time, I have realized how very little I know about managing land and raising cattle. I was working west of Sundre about 25 years ago when I noticed a "For Sale" sign on some land southwest of Sundre, along the Coal Camp Road and the Red Deer River. I had grown up on a farm in the Harmattan area, but my dad was working in the oilpatch and we ended up leaving the farm to move to the Jarvie area, north of Westlock. S

We built a place near a the bottom of a hill across from the river and my parents have since moved to an adjoining quarter. This allows my dad to help, along with the kids, while I was away working. A neighbouring rancher also helps with some of the heft lifting, like branding calves, so I can continue working to support the farm by increasing equity.

We started out slow, with a half dozen beef cows and slowly expanded to 125, but cut back to 80 head during the latest downtown in the economy. The plan is to hold a few more heifers back this fall and rebuild the herd back up to where it was before.

Typically, cattle pasture on an allotment between Deer Flats and Ya ha Tinda Ranch during summer, then come back home for the winter.

The allotment covers 30,000 acres. We grow about half the hay we will need ourselves and have a long-term contract with for the rest with a producer in the Westward Ho area.

What drew me to become involved with the Grey Wooded Forage Association was my need for more understanding of the complexities of farming grass on fragile land that has become depleted after years in production.

Parts of our place are very rocky, while higher areas are quite peaty.

Overall, however, it's typical grey-wooded soil that doesn't hold moisture; while being in a river valley in the foothills, our spring arrives late, our fall arrives early, and it's a lot colder at night than it is further east.

As I take the next steps toward farming full time, I have been picking the brains of people who have farmed these fields in the past and am also looking for new technology that might help me restore my land to its former splendour.

- Greg

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

09:00-12:00	Classroom Session at Caroline HUB (Kurt Browning Arena) - Creating excellent pasture from the soil up - 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.GREYWOODEDFORAGEASSOCATION.COM.

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

Fieldwork and Research in the Stifling Heat

By Erin Willsie, Programs Co-ordinator

July has been a productive month for projects between site inspections and field research. The projects that were the focus of this month were Operation Pollinator, The Weevil Project and the Alfalfa Project. It was a heavy work load, but I want to thank the cooperation of all the farmers involved that made my job as easy as it could be and those who helped me with my research, I appreciate it.

Thistles were sliced open to inspect damage by weevil larvae.

The first week of July was dedicated to the pollinator project where I visited our three sites chosen to help increase pollinator awareness.

This year, the yellow and white sweet clover was the dominant species throughout all three sites, followed by the red and Alsike clovers. One site had a large corner that was entirely Phacelia and crawling with bees, preferring it to the shoulder height sweet clover throughout the rest of the plot. All three plots have seen growth from the species present in the seed mix given to them in their first year. The project is in its second year and is achieving its goal of bringing awareness as well as aiding in the education of how to support pollinating species.

Alana Schamber, one of our participants, used the leftover seed from her site to make small packets to give away to students that attended her farm tours. I'm excited to see continuation of the growth of this project in the future.

This year is the second of a four-year project designed to learn about Stem Mining Weevils. Within our four sites they are split evenly between a monitoring and establishment protocol.

With the monitoring project, we wanted to see how long it would take for a single cup of 105 weevils to have a significant impact on a weevil population, in addition to whether the sites would succeed without necessitating more weevils.

The establishment project looks directly at how many weevils minimum will affect a thistle population in the least amount of time. In the future, the association is hoping that we can introduce weevils as a form of biological weed control in places where chemicals or other controls are not possible, such as riverbanks and near grazing areas.

The weevil project research was conducted in the middle of July; the timing of which was chosen to hopefully coincide with the preparation of the larvae burrowing so that during thistle dissections you can see actual larvae inside the plant. The weevils themselves don't kill the plant but when the larvae burrow into the soil to pupate the holes, they leave at the bottom of the stem near the ground and the hollowed-out stems leave the plant susceptible to natural sicknesses causing death. This year, we saw several larvae at the establishment plots and significant damage throughout all the sites to the vascular tissues of the thistles.

The Alfalfa Project is an ongoing project that has been going for around eight years. This project was created to compare different Alfalfa varieties to weed out discrepancies about whether older varieties are hardier and longer lasting than the newer ones.

The field was planted in strips length wise, and then half the field was grazed width wise so the plants could be compared for nutrient factors and grazing. After clipping, the plants are taken and the field is baled and used for feed by the farmers. Total production of both the alfalfa types has increased from last year specifically in terms of Lundgard Falcata and MV. I am excited to see the pulling together of the entirety of the data in the final report for the project as the results of this month's clippings are very promising.

Although this month has been very busy with fieldwork all the projects have shown strong data that have the opportunity to make a big difference in our agricultural futures.

A Slippery Slope for Carbon Taxes on Agriculture

Originally published July 30, 2018 by the International Institute for Applied Systems Analysis

New IIASA-led research has found that a single climate mitigation scheme applied to all sectors, such as a global carbon tax, could have a serious impact on agriculture and result in far more widespread hunger and food insecurity than the direct impacts of climate change. Smarter, inclusive policies are necessary instead.

This research, published in Nature Climate Change is the first international study to compare across models the effects of climate change on agriculture with the costs and effects of mitigation policies, and look at subsequent effects on food security and the risk of hunger.

The researchers, led by Tomoko Hasegawa, a researcher at IIASA and Japan's National Institute for Environment Studies (NIES), and Shinichiro Fujimori, a IIASA researcher and associate professor at Kyoto University, summarized outputs of eight global agricultural models to analyze various scenarios to 2050. The scenarios covered different socioeconomic development pathways, including one in which the world pursues sustainability, and one in which the world follows current development trends, different levels of global warming, and whether climate mitigation policies were employed.

By 2050, the models suggest that climate change could be responsible for putting an extra 24 million people at risk of hunger on average, with some models suggesting up to 50 million extra could be at risk. However, if agriculture is included in very stringent climate mitigation schemes, such as a global carbon tax or a comprehensive emission trading system applying the same rules to all sectors of the economy, the increase in food prices would be such that 78 million more people would be at risk of hunger, with some models finding that up to 170 million more would beat risk.

Some areas are likely to be much more vulnerable than others, such as sub-Saharan Africa and India.

There is a growing consensus that agriculture, one of the world's major greenhouse gas emitters, must do more to share the burden of carbon emissions reduction. The new research shows that without careful planning, the burden of mitigation policies is simply too great. All the models showed that deploying measures such as a carbon tax raises the cost of food production. This can be directly, through taxes on direct agricultural emissions, and taxes on emissions resulting from land use change, such as converting forest to expand agricultural land, and indirectly, through the increased demands for biofuel, which competes with food production for land.

The researchers stress that their results should not be used to argue against greenhouse gas emissions reduction efforts. Climate mitigation efforts are vital. Instead, the research shows the importance of "smart", targeted policy design, particularly in agriculture. When designing climate mitigation policies, policymakers need to scrutinize other factors and development goals more closely, rather than focusing only on the goal of reducing emissions. "The findings are important to help realize that agriculture should receive a very specific treatment when it comes to climate change policies," says Hasegawa.

"Carbon pricing schemes will not bring any viable options for developing countries where there are highly vulnerable populations.

Mitigation in agriculture should instead be integrated with development policies."

The researchers suggest, for example, schemes encouraging more productive and resilient agricultural systems.

The developing world's ruminant livestock herds *(Continued)*

What Weeds/Plants Can Tell Us

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

There are certain plant species on this planet that invoke a feeling of vexation upon seeing them growing places where they shouldn't be growing. The instinctive reaction is to find a way to kill these plants we commonly call "weeds" before they take over everything.

No doubt I understand the concerns folks have over seeing weeds in their pastures, fields, gardens or lawns. Yet there comes a time when a person may start asking, "Why are these albeit-unwanted plants even here?" possibly even going as far as wondering if there is actually a positive side to these plants.

According to Ralph Waldo Emerson, a weed is "…(a) plant whose virtues have not yet been discovered."

Weeds are, after all, plants too. But I contest that weeds, like all plants, have a lot to tell us, if we decide to listen to them.

While I am not able to divulge in the wide variety of beneficial characters that many weeds may have—and there are a large number of plant species that are designated as weeds, regardless if they are considered noxious or not—I would like to spend a little time showing you certain things that weeds may be able to tell us that you may have not known before.

Many plants that are the first to emerge when there is bare soil are actually Nature's way of covering herself. Soil that is bare is sensitive to eroding forces of wind, rain and sun. Weed seeds at the surface of this bare soil are quick to germinate and grow over these spaces. Their broad leaves cover the soil, protecting it until a more permanent cover, such as perennial grasses, takes over.

There is a number of weeds, primarily broad-leafed perennial weeds (such as Canada thistle, leafy spurge and dandelion), that have deep, extensive root systems that penetrate into the subsoil, breaking it up and thereby allowing less vigorous roots of other plants to penetrate further. As a result, these weeds may be a sign that the soil is compacted, particularly below the plow-pan layer. These deep roots that help break up the subsoil, and can effectively drill past this compaction layer, allow for better water infiltration and drainage.

A great many plants are excellent indicators of soil properties, including weeds. An interesting quote from Frederick Clements (1920), a U.S. botanist, explained it like this: "Each plant is an indicator. This is an inevitable conclusion from the fact that each plant is the product of the conditions under which it grows and is thereby a measure of these conditions. As a consequence, any response made by a plant furnishes a clue to the factors at work upon it."

Different plants are adapted to a wide range of environmental variables, and thus are only able to grow in locations where their needs are going to be met. In a word, weeds do actually care where they grow, even though they prove to be somewhat of an inconvenience.

All plants differ greatly in their degree of tolerance to changes in soil conditions; some have a narrow tolerance for one variable, yet a wide tolerance for others. Also, a lot of plants can be sensitive to several environmental factors all at once. For example, perennial sow-thistle and curly dock are indicators of wet areas, however docks tend to prefer acidic soils whereas the thistle prefers soils with high lime content.

Plants are also great indicators for soil type. Canada thistle, for example, often grows where there are heavy clay soils, and possibly even a hardpan beneath the surface. Absinthe wormwood, on the other hand, is an indicator for sandy or gravelly soils.

Weeds are also great at indicating past or current management practices. Many weeds will indicate that there has been heavy grazing or overgrazing; these plants will often take advantage of the areas opened up by animals (and the lack of grazing pressure on the plants themselves), and spread seed or rhizomes to these bare places, even if such spots are patches of grass continually kept short by animals.

Common tansy, absinthe wormwood and tall buttercup are weeds that come to mind that are excellent indicators of this.

Other weeds are mere indicators that there is low competition in the stand, and there is enough sunlight and warmth penetrating to the soil that they are able to germinate and grow. Hoary cress and flixweed are indicators of this.

While this is not a means to be advocating leaving the weeds to grow, it is merely a suggestion to possibly take a closer look at the weeds identified on your property and to better understand what their presence may indicate before you next consider how to get rid of them.

They may be the key to help you make good, maybe better management decisions in the future for your land, and your soil.

Potential Impact of Carbon Taxes on Farming

(Continued from Page 6)

produce three-quarters of the world's ruminant greenhouse gases, but only half of its milk and beef. Using efficient techniques and technology from the developed world would then simultaneously reduce greenhouse gas emissions, promote economic growth, reduce poverty (thereby improving health and living conditions), and improve food security. Another suggestion is complementary policies to counteract the impact of mitigation policies on vulnerable regions, for example, money raised from carbon taxes could be used for food aid programs in particularly hard-hit areas or countries.

"As agriculture is more and more directly associated with the discussion on global mitigation efforts, we hope the paper will show that differentiated solutions need to be found for this sector. As countries are all working at defining emission reduction pathways within the context of the Paris Agreement, it serves as a warning that other development objectives should be kept in mind to choose the right path towards sustainability," says IIASA researcher and co-author Hugo Valin.

West Country Ag. Tour

August 23, 2018

7:30am-4:30pm

Featuring

Clearwater County Cover Crop Trial Plots

Leitch Family Goat Farm
Production and marketing in the goat farming industry

Range Road Enterprises Ltd.
Demonstration of ATV/UTV logging and firewood processing equipment

Grizzly Bear Presentation
Korth Family Farm and their grizzly bear experience

Register early as space is limited and fills up fast.
403 846 4040
Registration deadline is August 17.

Cost is only $35 per person for coach bus travel, breakfast, lunch and lots of take home information.

West Country Ag. Tour Itinerary

7.30am-8.45am	**Breakfast at Dovercourt Hall**
9.15am-10.15am	**Clearwater County Cover Crop Trial Plots** Presentations from: Mark Cutts and Karin Lindquist from Alberta Ag. on the benefits of cover crops on soil quality and extended grazing. Performance Seed rep Greg Paranich to discuss seeding requirements.
10.45am-1.45am	**Amy Leitch Goat Farm**
10.45am-11.45pm	Everything you ever needed to know about managing and marketing goats. Presenters: Amy Leitch and family
11.45am – 12.45pm	**Lunch**
12.45pm-1.45pm	ATV/UTV Logging and Firewood Equipment Demonstration Presenters: Range Road Enterprises Ltd.
2.15pm– 3.15pm	**Grizzly Bears on the Farm** The Korth family will share their story of how a bear was captured on their farm after attacking their sheep. Chiara Feder- wildlife biologist with Alberta Agriculture and Forestry. Jim Duncan– local beef farmer co-existing with bears and wolves.
3.30pm– 4.30pm	**Dovercourt Hall for refreshments**

Western Livestock Price Insurance Program (WLPIP) Report

The 2018 sales season for WLPIP-Calf is in the books!
The sales season ended on May 31, and staff at AFSC were happy once again to provide producers with a risk management program for price fluctuations into the fall calf run.
Overall, this sales season, WLPIP insured approximately 184,000 head of calves in Alberta, which equals about 13.5 per cent of the eligible Alberta calf crop.
This year's total head insured was approximately a third below the 2017 insured calf total, but compared to other historical years, 2017 is an exception. For reference, 2018 sales were on a par with 2015 totals, and 25 per cent above 2016 totals.
As expected, May was the busiest month for purchases, accounting for 74 per cent of the total.
The top coverage option that was purchased throughout the year was $214, with the most frequent coverage level being $208. Similar to previous years, the most popular expiry is late October.

Livestock Welfare Engagement Project Survey

Facilitated by Alberta Farm Animal Care (AFAC), this collaborative project aims to support an accurate understanding of the animal welfare landscape in the province from the livestock industry's perspective. The Livestock Welfare Engagement Project survey is open to anyone in Alberta who is involved in animal agriculture.
Survey participants who fall under more than one category are welcome to complete multiple surveys. Alberta Agriculture and Forestry requested and provided funding for the project.
The survey closes October 31, 2018.
Contact: Melissa Moggy, AFAC 403-652-5111

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

Can ALUS make Rain Fall and Grass Grow? You bet! Well, Kind of . . .

By Ken Lewis, Conservation Coordinator, Red Deer County

As of the day of writing this (July 24), 2018 has been a relatively dry year, especially in the western part of Red Deer County. The latest precipitation map I saw from Alberta Agriculture (up to July 15) showed much of Red Deer County west of Highway 2, being in the "moderately low" to "low" categories, comparing this year's rainfall to the long term normal rainfall. Many of the producers I know have mentioned that rain has generally not been that cooperative this year.

This makes this year a great year for ALUS to make rain fall and grass grow…well…kind of.

Of course, a program can't make rain fall or grass grow. But, what a program like ALUS can do, is help you adopt management practices that helps your land capture the maximum amount of rain that falls, so that your grass can grow to its best potential.

A healthy pasture tends to have the following characteristics:

- dense cover of growing plants, often in multiple layers
- plants with deep, dense roots
- a good thatch layer
- soil with higher organic matter levels and higher porosity

All these characteristics help reduce water evaporation and run-off from the land surface, help the land store more of the water for a longer time, and help the plants access that water.

Changes in how you manage your pastures, can impact the characteristics listed above.

And ALUS can help pay for the costs of infrastructure needed to adopt new management practices.

This infrastructure can be things like fencing, alternative watering systems, alternative shelter, converting marginal crop land to permanent forage and more.

The ALUS Program can cover as much as 85 per cent of costs. On top of that, the ALUS Program can pay you as much as $40 per acre per year for the acres involved.

To find out more about how ALUS can help you adopt practices that allows your land to capture and use the rainfall we do get, please contact me anytime at 403-505-9038 or klewis@rdcounty.ca , and/or visit www.alus.ca .

An ALUS Project in Red Deer County, showing how the use of fencing and an alternative watering system to adopt new grazing management strategies, can help make the grass grow. The first picture (top) was the year the project started, while the second picture is this year. This stockpile of forage can be used in a drier year by the producer.

Gentle Reminder: **2018/19 memberships are past due.**
Please help support your organization and ensure you have full benefits of membership, including reduced costs for events and access to exclusive programs.
See the back cover for details.

Stepping off Campus - Not All Discoveries Occur in the Lab

By Clinton Brons

This point was driven home in July as the Gentec team once again stepped into the pasture to organize two field days in collaboration with the Foothills Forage and Grazing Association, whose geographic area spans much of south-western Alberta.

As was the case with 2017's Cow-Forage Field Day working with the Grey Wooded Forage Association team, the theme was the ongoing interactions and efficiencies that can be achieved by managing the forages, the cow herd and the interaction between the two. Participants picked up many unanticipated practical nuggets as part of the official agenda or over coffee between sessions as well as the expected information on the application of new technologies and/or the novel application of existing technologies.

You may recall that Gentec's 2017 collaboration with GWFA focused on the establishment, management, and winter hardiness of various forages (alfalfa, milkvetch, and sanfoin) as demonstrated with Murray Abel. This year, working with the Waldron Ranch Grazing Cooperative near Longview, Ranch Manager Mike Roberts provided perspective on the traditional grasses requiring minimal maintenance while maintaining much of their nutritional value throughout the winter. One highlighted message was that preventing fire and grazing are not natural, economical or sustainable. On the contrary, they result in reduced soil health, less nutritious feed for the cattle, and reduced grassland efficiency for carbon sequestration. Ed Bork of the University of Alberta's Rangeland Research Institute also touched on the carbon capture potential and environmental impacts of various grazing and production practices.

Other practical nuggets included details on how introducing a sheep herd turned a $15,000 per year bill to control leafy spurge into a separate profit-centre and did not impact the cattle stocking rate. Also discussed was the ranch's transition away from wood fenceposts and barbed wire to synthetic posts and two-strand electric fence. This option is less expensive, lasts longer, and is easier for wildlife to adapt to, which in turn is also much easier on the fence!

Gentec then to the Didsbury area for sessions hosted by Sean and Holly LaBrie (Difficulty Ranch) and Morrie and Debbie Goetjen (Whiskey Ridge Cattle Co.). Both operations talked of the challenges involved in raising cattle in hot, dry summers and cold, snowy winters leading to heavy reliance on cell, swath and bale grazing.

Their practical experience with respect to the cow-herd mirrors the increasing empirical evidence that is part of the EnVigour HX™ project; that fertility is the most important factor influencing the viability of the cow herd by a wide margin, and that significant benefits can accrue by managing hybrid vigour with the herd. Alberta Agriculture and Forestry's John Basarab and Gentec's Graham Plastow expanded on the production benefits and the associated profitability of hybrid vigour in greater detail.

Barry Irving came out of retirement to challenge us to rethink some of the things we think we know for sure, but evidence says otherwise. For example, producers commonly believe that cows won't eat shrubs—or will eat shrubs under duress but won't gain weight.

Using the results of a number of research projects, Barry showed that cattle will browse shrubs (aspen and others) by choice, that they can gain weight by doing so, and that knowing this gives the producer an additional option in managing how they feed their cattle (and the feed composition of their forage plots by limiting shrub propagation) by varying grazing intensity and stocking rates. Barry specifically declined to speculate on the degree of enjoyment experienced by the cattle observed in the shrub study.

Perhaps reflecting/reinforcing the age-old power of toys upon boys, Thompson Rivers University's John Church's presentation on the ability of drones to manage, monitor, and track animals from kilometres away through dense bush, day and night—*and* read individual ear tags from a height of 70-plus metres—was the one that had ranchers dreaming of flying above the trees.

Most importantly, we extend our appreciation to the cow/calf producers and the forage associations for allowing Gentec to see and hear first-hand the challenges and opportunities that keep our ranchers awake at night. Knowing the right questions to ask or answer produces better science from the researchers and better application from those who deliver the food to our plates, and for that we are thankful.

Visit https://livestockgentec.ualberta.ca or email lsgentec@ualberta.ca.

Three Ways Environmental Planning Can Boost Farm Finances

By Paul Watson, EFP Director, Agricultural Research and Extension Council of Alberta

According to the Network for Business Sustainability, companies who "improve their impacts on the environment" stand to increase revenues, as "customers will pay up to 10 percent more for products that are green…or ethical." Alberta farmers and ranchers are becoming increasingly aware of the value that environmental stewardship provides to a sustainable agricultural operation. There are financial benefits that accompany improved environmental stewardship, and without environmental planning, your farm may miss out on these chances to save money or even access new markets for your products. Producers who have invested the time into completing an environmental farm plan have seen their operations with a different perspective. This new knowledge is a powerful way to make your business more environmentally sustainable.

Access to Sustainable Agricultural Funding

An environmental farm plan can provide access to sustainable agriculture funding programs that can benefit their business. One example of this is the CAP program. With a current certificate of completion of a provincial EFP program, producers are eligible for stewardship funding. Producers can apply for funding to help improve their management of grazing, manure and livestock facilities, crop input and agricultural waste.

Reduce the Costs of Inputs

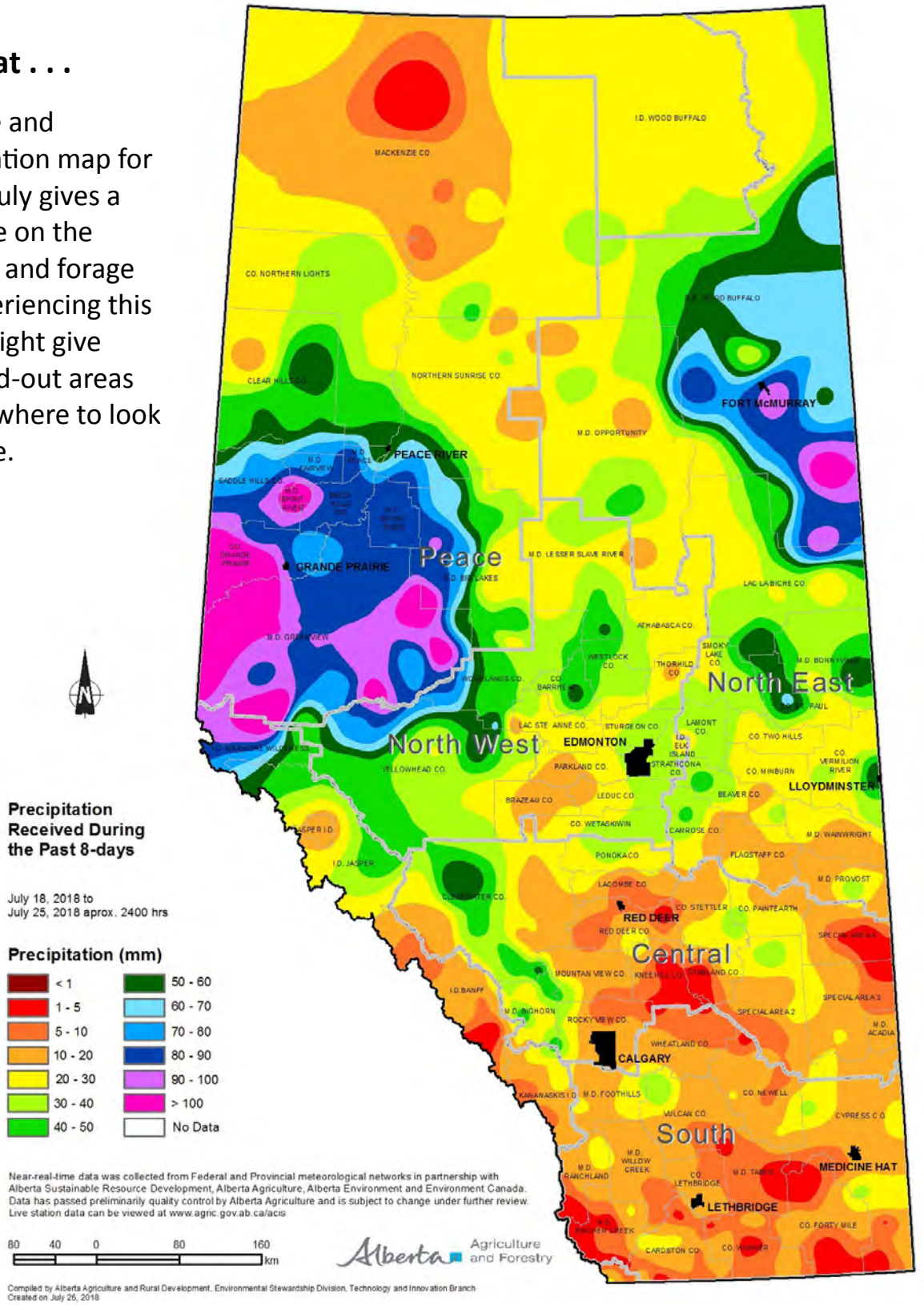
Improved environmental stewardship also offers the opportunity to reduce the cost of inputs. For example, preventing leaks in fuel tanks is an act of sustainability that helps to save on the cost of wasted fuel. AEFP offers information on the impact and importance of preventing contamination of surface and ground water sources: "A small leak of one drop per second, for example, can release about 900 litres (200 gallons) of gasoline into groundwater over the course of one year."

Sustainable Sourcing

Consumers want to know how their food is produced, and the agri-food industry is listening, giving producers a chance to capitalize on this demand. Food purchasers across Canada, including manufacturing companies and major restaurant chains, are more frequently requiring the products they use to be sustainably sourced. Commodity groups are already responding to this market demand, and a completed EFP plays a valuable role here. For example, all members of the Potato Growers of Alberta are required to complete an EFP, a step taken by the organization to meet the stewardship standards of major companies such as McDonald's and McCain's. By not making stewardship efforts known to consumers, there are valuable marketing opportunities both from a local and global perspective that Alberta producers could leverage. Alberta's agricultural producers have an opportunity to improve their environmental stewardship with the help of an updated EFP; by doing so, they can access new markets and funding opportunities, and save money in the everyday running of their farm or ranch. With sustainability becoming vitally important to many facets of the agriculture industry, an environmental farm plan helps producers to narrow in on specific issues and create an action plan that will improve stewardship and, in turn, reap financial benefits.

But it's a dry heat . . .

Alberta Agriculture and Forestry's precipitation map for the third week of July gives a graphic perspective on the conditions graziers and forage producers are experiencing this summer—and it might give those in the burned-out areas some ideas about where to look for hay and pasture.



Visit weatherdata.ca for additional maps and meteorological data

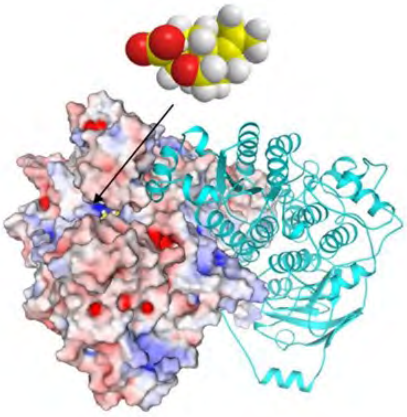
UCLA Explores a Natural Product with Potential as a Commercial Herbicide

Reprinted from the UCLA Samueli Newsroom, July 13, 2018

Bioinformatics approach used to uncover the weed killer could also be used to find new drugs for medications

A garden can be a competitive environment. Plants and unseen microorganisms in the soil all need precious space to grow. And to gain that space, a microbe might produce and use chemicals that kill its plant competitors. But the microbe also needs immunity from its own poisons.

By looking for that protective shield in microorganisms, specifically the genes that can make it, a team of UCLA engineers and scientists discovered a new and potentially highly effective type of weed killer. This finding could lead to the first new class of commercial herbicides in more than 30 years, an important outcome as weeds continue to develop resistance to current herbicide regimens.



An herbicide molecule (top), inhibits an enzyme (bottom) that plants need.

Using a technique that combines data science and genomics, the team found the new herbicide by searching the genes of thousands of fungi for one that might provide immunity against fungal poisons. This approach is known as "resistance gene-directed genome mining."

The study, which was published in Nature, also points to the potential for this genomics-driven approach to be used in medicine, with applications ranging from new antibiotics to advanced cancer-fighting drugs.

"Microorganisms are very smart at protecting themselves from the potent molecules they make to kill their enemies," said Yi Tang, the study's co-principal investigator and a UCLA professor of chemical and biomolecular engineering, and of chemistry and biochemistry. "The presence of these resistance genes provides a window into the functions of the molecules nd can allow us to discover these molecules and apply them to diverse applications in human health and agriculture."

For example, if a resistance gene that protects a microorganism from an anti-bacterial product is found, there's a possibility that the microorganism also has genes to produce that same antibacterial compound. That discovery could potentially lead to new antibacterial medicines.

The new herbicide acts by inhibiting the function of an enzyme that is necessary for plants' survival. The enzyme is a key catalyst in an important metabolic pathway that makes essential amino acids. When this pathway is disrupted, the plants die.

This pathway is not present in mammals, including humans, which is why it has been a common target in herbicide research and development. The new herbicide works on a different part of the pathway than current herbicides. A commercial product that uses it would require more research and regulatory approval.

"An exciting aspect of the work is that we not only discovered a new herbicide, but also its exact target in the plant, opening the possibility of modifying crops to be resistant to a commercial product based on this herbicide," said study co-principal investigator Steven Jacobsen, a professor of molecular, cell and developmental biology in the UCLA College and an investigator of the Howard Hughes Medical Institute. "We are looking to work with large agrochemical companies to develop this promising lead further."

To confirm the efficacy of the new herbicide, the UCLA team tested the fungus-produced product on a common plant used in lab studies called Arabidopsis. In experiments, the product killed the plants after they were sprayed with it. The researchers also implanted the resistance gene from the fungus into Arabidopsis genomes. The plants that had the resistance gene implanted in them were immune to the herbicide.

"The emergence of herbicide-resistance weeds is thwarting every herbicide class in use; in fact, there has not been a new type commercialized within the last 30 years," said Yan Yan, a UCLA chemical engineering graduate student who was a lead author of the paper. "We think this new, powerful herbicide — combined with crops that are immune to it — will complement urgent efforts in overcoming weed resistance."

The study's third senior author is Jiahai Zhou, of the Shanghai Institute of Organic Chemistry at the Chinese Academy of Sciences. Postdoctoral scholar Qikun Liu of UCLA and Xin Zang, a researcher at Shanghai Institute of Organic Chemistry, were lead authors along with Yan. Other authors of the study are Shuguang Yuan, Undramaa Bat-Erdene, Calvin Nguyen and Jianhua Gan.

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UCLA Professor Yi Tang

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