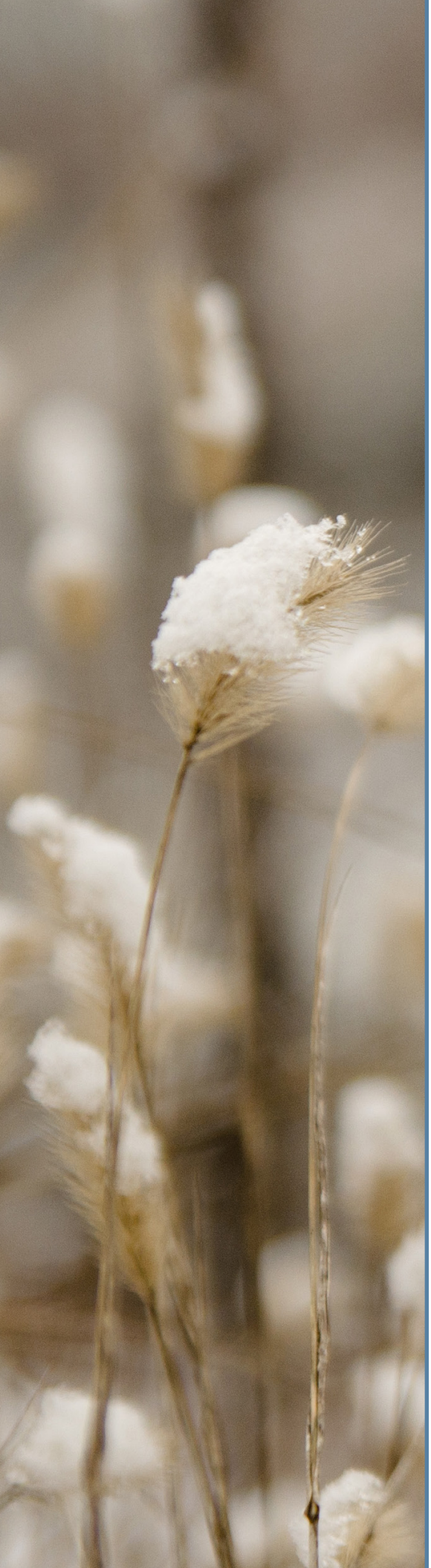

Over the Fenceline

Winter 2019

Battle River Research Group

BRRG Farmers Appreciation Night & AGM

March 27, 2019
4pm-9pm
Holden Arena Complex

$30/person

AGM

Steak Dinner

Speaker Topics:

Precision Planters on the Prairies
Clubroot Update

IN THIS ISSUE

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Thank You for Your Continued Support

The Weed Seed Bank - How to Prevent Unwelcome Deposits

Below the soil surface lurks the weed seed bank - the predominant source of weed pressure on current and future crops. Harry Brook, crop specialist at the Alberta Ag-Info Centre explains how the weed seed bank works and how to reduce its potency.

"You do not want to draw on this bank account," explains Brook. "It is a source of annual and perennial weeds that will wait for years before the right conditions come about, and then germinate to steal moisture and nutrients from your crop. The seed bank consists of freshly shed seeds from this year's weeds as well as older seeds that have persisted in the soil."

Brook says that of the many seeds in the soil seed bank, very few will ever result in adult plants. "Most will either die, decompose or be eaten by predators prior to germination. Seed predation has the greatest effect when weed seeds are left on the soil surface, as in zero tillage or perennial forage crops. Ground beetles and crickets can reduce weed seed emergence by five to 15 per cent. Weed seeds are also consumed by rodents and birds. Keeping the soil in permanent cover increases predation on weed seeds."

Causes of seed mortality - other than predation - are lethal germination and desiccation. Explains Brook, "Lethal germination takes place when the seeds germinate at too great of a depth, and seeds exhaust their energy and die before emergence. Kochia and

some other weeds can sense the depth of burial and limit lethal germination."

"Desiccation takes place when the seeds germinate, but the soil dries out after germination starts and before emergence. Dry seeds are very resistant to desiccation. If it stays dry, seeds can remain viable for hundreds of years. However, frequent and short term wetting and drying will increase weed seed losses due to desiccation. This occurs more often near the soil surface. In a research trial in Montana, wild oat seed losses increased from 55 to 88 per cent as soil moisture went from 6 to 24 per cent."

Seed dormancy prevents germination when conditions are otherwise conducive to seed germination. When weed seeds are dormant at plant maturity, it is called primary dormancy.

Called secondary dormancy, these seeds can also alternate between dormancy and not dormant due to environmental conditions. Says Brook, "Secondary dormancy prevents germination when the weeds cannot complete their life cycle within the time left before winter. It is regulated by seasonal soil temperatures."

"For most summer annual weeds that spring germinate, the winter cold breaks dormancy, allowing spring growth. Conversely, winter annual weeds require the summer heat to break dormancy and form rosettes in the fall. Seed dormancy is controlled by a variety of factors. Those can be immature embryos at maturity requiring time to ripen, hard impermeable seed coats preventing moisture penetration, or environmental factors for cyclical seed dormancy."

Brook says that changes in a cropping system will also shift the prominent weeds, altering what is in the seed bank. "Some seeds - like kochia and dandelion - will not survive more than a year or two while wild oats or redroot pigweed can last decades buried in the soil."

"Perennial forages in the crop rotation deplete the soil seed bank of annual weeds - primarily weeds with a short viability in the soil. It is most effective on kochia and grassy weeds like wild oats and green foxtail. Perennial forages are extremely useful in preventing additions to the weed seed bank. Research in Canada and the U.S. show rapid declines in the weed seed bank when no new seeds are allowed to enter the soil."

Another strategy that effectively reduces weed seed banks is chaff collection in annual crops. "Chaff collection during harvest can prevent up to 90 per cent of weed seeds from being added to the weed seed bank," he adds.

Position in the soil also has a marked effect on seed longevity. Says Brook, "Using zero tillage places the vast majority - up to 90 per cent - of weed seeds in the top four inches, or 10 cm, of soil. There, they are subject to wetting and drying cycles, stimulating germination. If weed seeds are prevented from going to seed, as in a haying situation, major weed seed can be reduced."

"Using cultivation, the majority of weed seeds are placed lower than four inches, or 10 cm, from the surface. The dormant seeds will then survive longer in the soil. It is vital to keep weeds from going to seed and adding to the seed bank."

"Herbicides are useful tools to combat weeds, notes Brook. "Don't forget to use some of the other tools out there to minimize weed pressure in the crop. Don't make large weed seed deposits to the soil, it is a 'gift' that keeps on taking."

For more information about the weed seed bank, contact the Alberta Ag-Info Centre at 310-FARM (3276).

Bring Calving Pens to Pasture

Setting up shelters with portable corral panels (temporary maternity pens) makes for a simple yet effective way to keep track of first-calf heifers when calving on pasture. *Photo: Sherri Grant*

Editor's Note: What works for beef producers? The Beef Cattle Research Council has asked a few Canadian beef producers about changes, production practices or new technology they've made or use that make a difference in their day-to-day management.

Good ideas can range from improving pasture watering systems and regularly testing winter feeds, to reducing costs during the fall/winter grazing period, to simple ideas that reduce the stress of calving out heifers, to more sweeping approaches on how to manage an intensive grazing system — all have a common objective to improve beef herd performance in sustainable farming systems," says the BCRC.

Here is one of those ideas a Canadian beef producer shared that help them produce more pounds of beef, reduce workload, improve overall efficiency and benefit cattle and the environment. And for more good information visit the BCRC website.

Managing calving heifers in remote locations
Sherri and Lynn Grant
Grant Ranch
Val Marie, Sask.

When it isn't practical to bring the heifers to maternity pens during calving season, you bring the maternity pens to the heifers on pasture. That's what the Grant Ranch in southern Saskatchewan has done for the past three calving seasons and it's an idea they wish they'd thought of sooner.

The idea was born in the spring of 2016, says Sherri Grant who along with her husband Lynn and brother-in-law Dean ranch near Val Marie in southwest Saskatchewan, just north of the Montana border. "We were trying a different program in 2015 and had synchronized and AI'ed a fairly large group of heifers." As the heifers started calving in early April 2016, the Grants were dealing with essentially a couple of good problems, calves were coming fast and furious. It was "raining" calves, but calving conditions also got a bit soggy as the clouds brought some much-needed rain.

As Sherri Grant wrote on the ranch blog at the time, "At the hub of this week though, it has been raining calves. We have averaged 12 calves per day in the last 10 days. We have a very busy maternity ward… Out of 230 heifers, we have had 50 per cent of the group calve with 117 calves."

The heifer-calving pasture is about 1-½ miles from ranch headquarters, so a bit of travel is involved to check on calving progress, and if something did need calving assistance, it wasn't easy to provide on pasture and took some organization if the heifer needed to be brought back to the home place. "The maternity pens were actually Dean's idea," says Grant. "We have windbreaks out on pasture for the heifers, so he suggested we take portable corral panels out to the calving pasture and set up maternity pens against the windbreaks."

So for the calving season of 2016 they set up two or three maternity pens against different sets of windbreaks over the heifer-calving pasture. Using steel pipe corral panels for the sides as well as a gate panel, each pen was a 12' x 24' configuration and bedded with straw.

"And it worked really well," says Grant. "It's not that a lot of them needed assistance but it was just much

easier to keep an eye on them, particularly at night. And it becomes even more important if you have cool, wet rainy or snowy conditions at calving time and you want to make sure that a calf has nursed and is up and going."

She also notes that period from birth until the calf is up and nursing is also an important time for usually first-time mothers to mother-up and bond with and know their calves.

The corral panel pens are set up against the wooden windbreaks. While they are used during the day, especially if the heifer needs assistance, they are particularly of value as evening and nightfall sets in. If they see a heifer is getting close to calving they herd it into one of the maternity pens and can check on it later.

"You can come back in a hour to check or just wait in the truck and the heifer is not going wander off on you," says Grant. "When they are out on the large calving pasture and especially when it's dark, they can be hard to find, or maybe you do find a heifer with a new calf, but then you might wonder is that her calf or did she steal a calf from someone else. So being able to move them into a maternity pen right on pasture, just reduces stress and provides peace of mind."

The first year, out of 117 head born during the first 10 days of the calving season, only seven per cent of heifers needed assistance at calving.

Once the heifer calves and the Grants have seen the calf up and nursing and looking vigorous, the pair is turned back out onto pasture. At the end of calving season, the corral panels are collected and used as needed during the grazing season. The pasture maternity pens worked so well the first year, the Grants have kept the system going each of the past couple seasons. They will have panel pens set up again for the 2019 calving season, even though heifer numbers are down to more usual 100-plus head this coming season. The main cow herd, ranging between 800 and 900 head, calves on open rolling pasture about 10 miles from the ranch headquarters. That herd is checked as well, but is pretty self-reliant and trouble free when delivering calves.

"Often invention is the mother of desperation," Grant says jokingly. "That first year we had a larger number of calves than usual, the calves were coming fast and the weather really wasn't co-operating so bringing maternity pens to the pasture really made it so much easier to manage."

Article from: Beef Cattle Research Council

Battle River Research Group

In 2018 BRRG:

- Had a total of **17** *extension events*

- Had an average attendance of **44** *people at their events*

- Had a total of **751** *people at their 17 events*

- Had **241** *farmers on their membership*

- Had **29** *small plot trials*

- **9** *Demonstration trials*

- **840** *Individual Research Plots*

Get Back to Basics to Fight Kochia

In recent years, kochia has become a real issue across the Prairies. Kochia loves hot, dry weather, and as a prolific seed producer, the tumbleweed-shaped weed can spread quickly. What's worse, kochia has a growing history of resistance, which can make it a tricky weed to manage. Agriculture and Agri-Food Canada research scientist Charles Geddes explains.

Kochia is a unique weed in a number of ways. There are certain things about its biology that allow it to thrive, especially in the drier regions of Western Canada. First of all, said Geddes, it's the first weed to emerge in the spring. "It emerges after 50 growing degree days," he said. "So most of the kochia population has emerged before almost all other weeds."

For this reason, a pre-emergence or pre-seeding herbicide application is very important for managing early seedlings. "But with that said, it also has what we call an elongated emergence periodicity, which means that it can emerge throughout the growing season up to the point that you do have kochia plants emerging after your in-crop or post-emergence herbicide application," he said.

To complicate matters further, kochia is saline and drought tolerant, which makes it perfect for those low-lying areas where crops struggle. In the absence of competition, each plant can produce up to 30,000 seeds. Its dispersal mechanisms mean that the weed can easily disperse to more productive areas of the field.

Kochia also has the potential for outcrossing, which means it can select for resistance quite quickly. The seed bank, however, is very short lived, which is unique in the world of weeds. Most seeds — about 90 per cent — lose viability within the first year. "But when you think about 10 per cent of 30,000 seeds per plant, you're still talking about 3,000 seeds per plant, which is still a lot that end up surviving that first year," said Geddes.

The way that the weed emerges makes it very difficult to find a management "sweet spot" in terms of timing. Most, however, emerge before seeding. Geddes recommends herbicide layering, so using pre- and post-emergent applications to best manage the weed. Post-emergent solutions are becoming quite limited due to resistance.

Herbicide resistance a growing concern

Herbicide-resistant kochia first came on the radar in Canada in the late 1980s when Group 2 herbicides were starting to see failure. Today, every kochia population is considered resistant to Group 2 herbicides.

The green plants in this low-lying saline area are kochia. In Alberta, 10 per cent of the kochia population is triple resistant, resistant to chemicals in Groups 2, 4 and 9. photo: Courtesy Charles Geddes, AAFC

In 2011, the first case of glyphosate-resistant kochia was found in Warner County, south of Lethbridge, Alta. A baseline survey in Alberta in 2012 revealed that about five per cent of kochia plants in the province were glyphosate resistant. The same survey was repeated in the fall of 2017, revealing that glyphosate-resistant kochia populations had increased from five to 50 per cent.

"So we're seeing very, very, very quick selection pressure for glyphosate resistance," said Geddes. "I was pretty surprised when I saw that. I didn't think it was going to happen that quickly."

A 2013 baseline survey in Manitoba uncovered two glyphosate-resistant populations. Fields were surveyed

again in 2018, but results won't be in until sometime in 2019.

"I'm almost certain that it has grown," said Geddes.

A 2013 survey in Saskatchewan revealed glyphosate-resistant populations in the southwest of the province. Geddes doesn't know what those numbers look like now. A new survey will be conducted this year.

"I'll suspect that we'll likely see something similar to Alberta, though," he said.
The resistance story doesn't stop there. The 2017 survey in Alberta confirmed a triple-resistance case in kochia. The weed showed resistance to Dicamba (Group 4, 18 per cent in total), glyphosate (Group 4, 50 per cent in total), and Group 2 (all populations). Triple-resistant population (Group 2, 4 and 9) levels are at 10 per cent in Alberta.

"What I'm really concerned about is we're seeing a shift in herbicide use to try to manage these glyphosate-resistant populations, and much of that as far as a pre-seeding option, we've shifted to use of Group 14s," said Geddes. "We haven't found Group 14 resistance in kochia yet, but that being said, it isn't something we've been focused on screening for." (Group 14 chemicals use aryl triazone, and include brand names like Aim, Blackhawk, Heat and Authority.)

"I think that's something we're going to have to do in the future because it's likely only a matter of time until we start seeing resistance to Group 14," he added.

Now that there's also resistance to Group 4, there will be more reliance on Group 6 for in-crop use, which also creates cause for concern.

"It's become obvious that we are not going to be able to spray our way out of managing kochia, meaning that herbicides are definitely not the only solution," said Geddes. "Using alternative herbicides definitely can help reduce selection pressure if used properly, but that's only part of the solution."

Solutions, said Geddes, might lie in the weak points of kochia's biological makeup. For instance, the relatively short-lived nature of kochia seeds could mean that better management could choke out populations, thereby lowering the number of populations that can return in subsequent years.

Kochia is also responsive to competition, so growing a competitive crop could help reduce viable seed production significantly. Using narrower row spacing will increase the speed at which the crop canopy closes. Higher seeding rates can aid in this as well.

Researchers are also looking into how to manage the low-lying, high-saline areas in the field where kochia seems to thrive. "Trying to decrease salinization of the soil could be an effective option in the long run because kochia really thrives in those saline areas and your crop really does not," said Geddes.
While this could be a good long-term solution, it will take several years to address. "I think a more immediate solution is seeding those unproductive areas down to a saline-tolerant forage mix, and having something there that also thrives in those saline areas that can compete well with the kochia population," he concluded.

Author: Melanie Epp
Columnist

Grainews

The kochia plant here being pollinated by this bee could well be resistant to glyphosate.

Photo: Courtesy Charles Geddes, AAFC

Up Coming Events

Soil Health & Cover Crops: Why, What, How?

Featuring: Kevin Elmy

March 7, 2019

8am-10:30am

Whistle Stop Golf Course
47258 Hwy 833, Camrose AB

Please Pre Register by March 4 at:
www.battleriverresearch.com/coming-events
or
Call: 780 - 582 - 7308

For Livestock Producers , Conventional Farming , Organic Farming & Everyone Inbetween!.

Topics Covered will Include:

- Soil Biology
- Soil Health
- Cover Crops
- Plus More!

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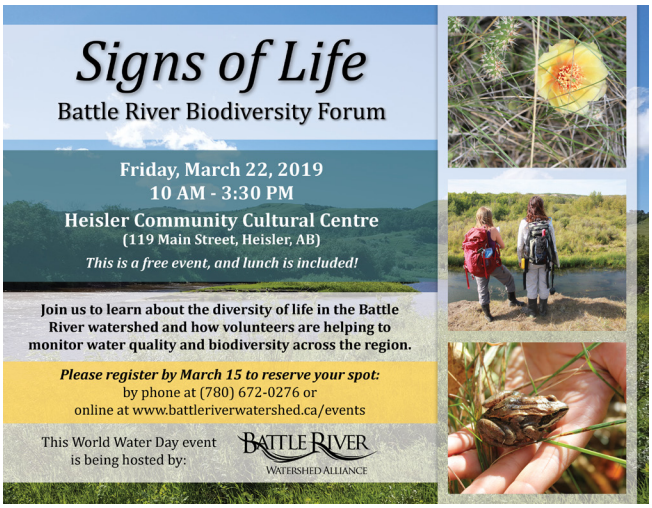

From the Ground Up!

with Greener Pastures Ranching & FBC

March 6, 2018
9:30am - 4:00pm

Please Preregister By: March 4
To Register:
www.battleriverresearch.com/coming-events
or Call: 780-582-7308

Cost $30
Includes Lunch

Whistle Stop Golf Course
47258 Hwy 833, Camrose, AB

Amber Kenyon - Farm Energy and On Farm Solar Funding
FBC - Tax Tips for Farm Businesses
Steve Kenyon - From the Ground Up
Steve will discuss: soil organisms, how plants grow, insects, nutrient recycling, grazing and fencing

Steve and Amber Kenyon run a custom grazing business "Off Grid" near Busby, Alberta, under the name of Greener Pastures Ranching Ltd. They currently run about 1200 head of livestock on 3000 acres of leased land with regenerative grazing management.

The Mission statement of Greener Pastures is "Economic and Environmental Sustainability for Generations" It is important to provide an enjoyable, profitable and sustainable business for future generations. The focus is to maintain an effective water cycle, carbon cycle, nitrogen cycle and mineral cycle. Our wildlife habitats and riparian areas need to be preserved. The health of our soils and our soil organisms needs to be understood and protected in order to ensure that our agricultural businesses remain profitable and sustainable.

Battle River Research Group | CAMROSE COUNTY | FBC We make life less taxing | Greener Pastures Ranching Ltd.

The business of farming.

Farm Succession Planning Information Session

A not-to-be-missed Information Session on key farm business issues

Join the Grant Thornton LLP agriculture team for a special Information Session. You'll hear important insights about the business of farming today that could benefit your farming operation tomorrow.

- Structure of the family farm
- Tax update and tips
- Protect your farm when its time for transition

Your farm, your future

Date:	**Tuesday, March 12, 2019**
Time:	5:00 p.m. doors open/registration 5:15 p.m. beef on a bun 6:00 - 8:30 p.m. information session
Location:	Strome Hall, Strome, Alberta
Tickets:	$10

RSVP:
Seating is limited. Secure your seat early. Contact Martina at Battle River Research Group at 780-582-7308 by March 5 or register online at: www.battleriverresearch.com/coming-events

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