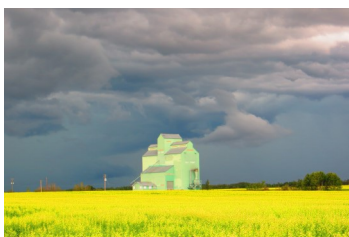


2017

Volume 8, Issue 2



Lakeland Agricultural Research Association



The Verdant Element

BRIX! WHAT'S IT ALL ABOUT

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You may or may not have heard of Brix, but it is a really important factor in the plant's health, and the nutritional benefit that it provides to you. Brix is the unit that is used to determine the sucrose content in the plant tissue. The higher the sugar content (carbohydrate), the healthier the plant which means: higher mineral content, oil content, and protein quality of the plant. The healthier the plant is, the better it is able to defend itself against pathogens (fungal and bacterial disease), frost damage (higher sugar, less water content) and insects (any plant with a Brix of 12 or higher will not be affected by insect pests). It also means better tasting and higher nutritional quality in the food that you are consuming. Lower Brix readings can indicate soil infertility or poor soil health (the microbes are not working to their potential and providing nutrients).

Brix levels will obviously rise while the sun is shining and the plant is busy photosynthesizing. That means that cutting hay should be done after the sun has been shining (full sunlight, not just after sunrise) for at least 2 hours to get the most potential nutritional benefit from your hay.

For centuries wine makers have been measuring and using the sugar content to perfect the flavor and determine the alcohol content potential of the wine. The higher the Brix, the higher the alcohol content potential. They use a refractometer to determine the Brix during the growing season so they can make soil amendments, before harvest (to help know when to harvest), and during the wine making process to determine final sugar content (and alcohol potential).

Typically when testing Brix levels you would sample the part of the plant that will be consumed when ripe, or take the most recently matured leaves. You would also try testing at the same time of day

Continued on page 2

Brix continued...

during the growing season. Brix is determined by using a refractometer which comes in two portable types of optical and digital. The refractometer measures the amount of refraction in a beam of light that passes through the plant sap. When looking into the refractometer, the reading sometimes shows a very sharp line and other times it can be very blurry. The sharp line indicates that the plant is lower in calcium and higher in acid, whereas a diffuse line will indicate that the plant is high in calcium and lower in acid. Higher calcium levels in the plant lead it to taste sweeter, regardless of the Brix level.

To use a refractometer:

- ◆ Squeeze the sap out of the plant. This can easily be done with a garlic press or similar instrument.
- ◆ Put a few drops on the prism surface, spread thinly.
- ◆ Close the prism cover.
- ◆ Point it towards a light source.
- ◆ Focus the eyepiece to read the measurements.
- ◆ Where the light and dark fields intersect is the Brix number.

To report prohibited noxious weeds call the Alberta Pest Surveillance System at :

310-APSS (2777)

The Brix number is equivalent to percent crude carbohydrate per 100 pounds of juice. By dividing the Brix number by 2 it gives you the actual amount of simple sugar.

Blue Green Algae are a unique group of bacteria (cyanobacteria) that have the ability to photosynthesize.

There are more than 100 species of cyanobacteria in Alberta, with many being able to out compete algae in a growing season. Many of Alberta's lakes are naturally nutrient rich to support cyanobacteria growth, but this can be exacerbated by extensive watershed development (industrial, urban and agricultural), and shoreline disturbance such as the removal of shoreline vegetation. Blooms are also weather dependent, so the occurrence, severity and persistence of the bloom can not be predicted .

When the cyanobacteria decompose, oxygen is often depleted from the water and ammonia is produced. Also, certain strains of cyanobacteria can produce nerve and liver toxins during decomposition, which can pose a serious health risk to humans and animals.

If you suspect cyanobacterial growth in your dugout that is used for animal consumption:

- Contact an Agricultural Water Specialist as soon as possible to determine if your cattle need to be removed from the source so treatment can be done.
- Provide an alternate source of drinking water for your livestock or pets if cyanobacteria are in your dugout until diagnosis is determined and the problem resolved.
- Proper identification of the algae must be made, and treatment recommendations must be provided by a Water Specialist so as not to cause harm to livestock or pets. Water analysis may be required.
- Cyanobacterial growths can lead to fish kills.

Additional Information:

- Toxins may remain in the water for up to a month after the death or treatment of the algae.
- Cyanobacterial blooms may not always be apparent as they may sink down into the water column at times.
- Do not irrigate or rinse edible crops with water that is suspected to have cyanobacteria in it, especially spray irrigated salad, leafy vegetables or strawberries.
- Do not enter the water if you suspect cyanobacteria are present. They can cause skin irritation, vomiting and diarrhea.



Contacts for water source professionals: Alberta Agriculture and Rural Development: 310- FARM (310-3276) – then ask for a Water Specialist

Wild Caraway

Pest Watch

Wild Caraway is a biennial species that produces a rosette the first year and a flowering stalk the second year (and sometimes a third year). It has a taproot with a black skin and white core. All parts of this plant are edible and is used in rye bread and some liquors.

The plant can grow in a wide variety of conditions, becoming invasive in many areas. The leaves are finely divided (much like carrots or yarrow), with stems that can grow up to 90cm tall. Flowers are typically white (can be pinkish) and grow on the tops of the stalks as a compound umbel.

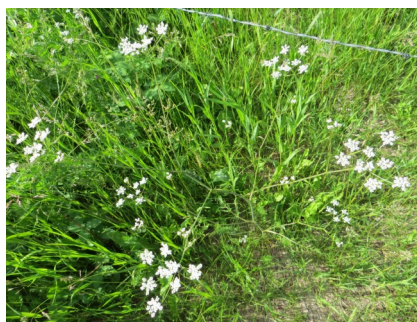
As this plant is not utilized by livestock for grazing, wild caraway can quickly replace vegetation in pastures. When located in hayland, it can be dispersed in baled hay.

Control options remain quite limited. Repeated cultivation before seed set or hand pulling pre-bloom can be effective. It will take several years to deplete the seed bank.



Mowing is not effective as plants will re-bloom below cutting height. No herbicides are registered for wild caraway.

More information can be found at abinvasives.ca



Riparian Health Assessment

The riparian zone is the interface between the upland and a water course. A healthy riparian area: traps and stores sediment; builds and maintains banks and shorelines; stores water; recharges aquifers; filters and buffers water; creates primary production and much more!

A riparian health assessment is a tool designed to evaluate the site and can provide a foundation to build an action plan and identify priorities.

If you would like a FREE Riparian Health Assessment conducted on your property or more information please call Kellie at 780-826-7260 or email sustainag.lara@mcsnet.ca

Black Knot

Black Knot is becoming more prevalent in many trees in the area. It is caused by the fungus *Apiosporina morbosa* and affects a wide variety of trees including: Mayday tree, apricot, Chokecherry, flowering almond, flowering plum, cultivated plum, Japanese plum, wild plum, Prunus hybrids, and many varieties of cherry (Black, Sand, Sour, Nanking, Amur, Mongolian, Pin, Korean, Dropmore). The disease is widespread throughout commercial, municipal, private and natural plantings. The infections spread rapidly, and very high amounts of black knot can result in the death of the tree.



The disease initially begins with a small green gall that will develop at a growing point or fruit spur. The gall will mature after 2-3 years into a hard, black 10-15 centimetre growth. The mature gall will produce a large amount of spores during the bloom period which results in a rapidly spreading infection. The fungus grows both internally and externally which results in the branch eventually dying.

According to Alberta Agriculture and Forestry, control of Black Knot includes:

- ◆ Removal of sources of inoculum (prevents population build up)
 - Prune out all knot-bearing branches during late fall, winter or very early spring when plants are dormant and knots are easy to see
 - Remove infected branches to at least 15-20 cm (6-8 inches) below knot. NOTE: It is preferable to prune an infected branch further back to an appropriate location, such as a healthy collar, rather than leave a stub
 - As a precaution, cutting blades should be cleaned and disinfected after pruning, if possible, especially if cuts have been made through obviously infected material
 - For knots on scaffold branches or trunks that can't be removed, cut away diseased tissue down to good wood and at least 1 cm (1/2 inch) beyond the edge of the knot
 - Failure to remove branches beyond the internal growth will result in re-growth of the fungus
 - **DISEASED WOOD MUST BE DESTROYED IMMEDIATELY** (burned, buried or removed from site). Diseased knots can produce and release spores for up to 4 months after removal. Proper composting can help to accelerate the breakdown of infected materials
- ◆ Ensure plants are healthy and free from stress (not a guarantee from disease)
- ◆ Regular monitoring
- ◆ Ensure adequate canopy ventilation through proper pruning
- ◆ Chemical control (preventative not curative)
 - Few choices available
 - Not usually recommended unless for valuable plantings, such as collections, orchards, arboreta or for severe infestations
- ◆ Other options may include use of more resistant selections, ensuring adequate buffer zones between plantings and wild stock, or potentially employing biological control products (limited)
- ◆ Consider hiring a trained professional for pruning activities. Find a Certified Arborist <http://www.isaprairie.com/>



ENVIRONMENTAL FARM PLANS

The environment is becoming a more prominent issue. It is a large factor in marketing agriculture and food products in today's global markets. Consumers are demanding more transparency and are demanding high quality and safe products. Reputation of food safety is critical to retain and gain access to domestic and international markets.

Environmental Farm Plans (EFP) provide a tool for producers to self analyze their operation and identify environmental risks, current standards, areas for improvement and also highlight what they are doing well.

Having a completed EFP allows producers to access different funding opportunities, such as the Growing Forward Stewardship Program. It is also useful in product branding that demonstrates specific environmental standards.

The EFP Process

An EFP can be completed through workshops or one-on-one session(s). The EFP first identifies the soil and farm site characteristics. Following this, the producer completes only the relevant chapters that apply to their operation; such as wintering sites, fertilizer, pesticides, crop management etc. Upon completion the EFP is submitted to a Technical Assistant for review. Once reviewed the EFP will be returned along with a letter of completion.

The EFP is a living document and should be reviewed and updated periodically.

If you wish to complete an EFP or have any questions regarding EFP please contact the LARA office at 780-826-7260

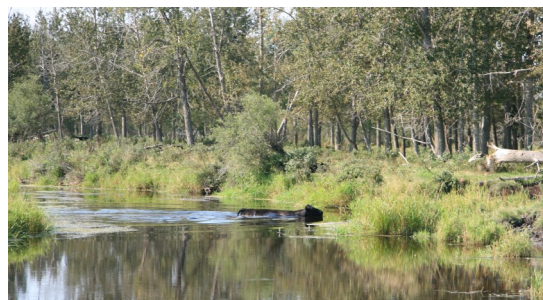


GROWING FORWARD

Growing Forward 2 provides programs and services to achieve a profitable, sustainable, competitive and innovative agriculture, agri-food and agri-products industry that is market-responsive, and that anticipates and adapts to changing circumstances and is a major contributor to the well-being of Canadians.

For assistance with any of the Growing Forward 2 programs please contact Kellie at LARA. For a complete list of available programs go online to: <http://www.growingforward.alberta.ca> Growing Forward is in its last year of funding before a new set of programs will be released next year. Programs that are currently accepting applications are very limited so please refer to the Growing Forward website for the most up to date information.

If you are interested in a particular program subscribe to the website for information as it will email you with any changes (or if the program is accepting applications).



Stuck in the mud? Consider an offsite watering system.

Recently in Saskatchewan over 200 cattle died due to dehydration and salt toxicity. Monitoring of your water sources is imperative for ensuring your livestock health and productivity. Most water sources are adequate for livestock needs, but can change quickly due to weather, or external factors. The following article is from Alberta Agriculture and Forestry Agdex 400/716-1

Water Requirements for Livestock

[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/agdex801](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex801)

Water is the main constituent of the animal's body, constituting 50 to 80 percent of the liveweight, depending on age and degree of fatness. An animal can lose almost all of its fat and about 50 per cent of its body protein and survive. However, the loss of 10 per cent of its body water can be fatal. Therefore, a successful livestock enterprise requires a good water supply. A good water supply is defined both in terms of quantity and quality of the water. A good water supply is important to the livestock manager because total water intakes are positively related to feed dry matter (DM) intakes.

Water sources

The four main functions of water in the body are:

- to help eliminate waste products of digestion and metabolism (feces of healthy cattle often contain 75 to 85 per cent water)
- to regulate blood osmotic pressure
- a major component of secretions (milk and saliva) as well as in the products of conception and growth
- in the body's thermoregulation as affected by evaporation of water from the respiratory tract and from the skin's surface

Cattle fulfil their needs for water from three major sources:

- free drinking water or snow
- water contained in feed
- metabolic water produced by metabolic activities

The first two are sources of major concern in the management of livestock. Because of the large variation in water intakes, an estimate of water intake of cattle should be made based on production factors, which affect water

intake. Water consumption requirements depend on factors such as:

- kind and size of animal
- rate and composition of gain
- pregnancy
- lactation
- type of diet
- level of dry matter intake
- level of activity
- quality of water
- temperature of the water offered
- surrounding air temperature

*Most ground
or surface waters
are satisfactory
for livestock*

Table 1 shows estimates of good quality water requirements of various classes of beef cattle in different physiological states and in different thermal requirements. Water intake from feeds plus that consumed ad libitum as free water is approximately equivalent to the water requirements of cattle.

Water quality

Water quality is important to livestock, especially with respect to the content of salts and toxic compounds. This is because the quality of water affects the quantity of the water consumed. Most ground or surface waters are satisfactory for livestock. When the drinking water for livestock is not satisfactory, it is most often due to excessive salinity.

Salinity is measured as the concentration of dissolved salts of various kinds. Other factors such as nitrate content, alkalinity or high levels of single toxic elements occasionally cause problems.

Table 1. Approximate total daily water intake of beef cattle*

Animal description	Intakes in liters for temperatures in Celsius (C)					
	4.4°C	10°C	14.4°C	21.1°C	26.6°C	32.2°C
Feeders and replacements 2 - 6 months	20.1	22.0	25.0	29.5	33.7	48.1
Feeders and replacements 7 - 11 months	23.0	25.7	29.9	34.8	40.1	56.8
Feeders and replacements 12 months and older	32.9	35.6	40.9	47.7	54.9	78.0
Bred heifers and dry cows	22.7	24.6	28.0	32.9	—	—
Lactating cows	43.1	47.7	54.9	64.0	67.8	61.3
Herd bulls	32.9	35.6	40.9	47.7	54.9	78.0

* Adapted from the Nutrient Requirement of Beef Cattle Update 2000, 7th revised edition. National Academy of Sciences – National Research Council.

Water samples for livestock consumption can be analysed to determine the water quality. A chemical analysis determines pH, total salt content (total dissolved solids), and minerals. A bacterial analysis indicates if water contains micro-organisms, such as bacteria. Water samples can be submitted to private laboratories for analysis for livestock consumption. If you are having nutritional problems with your animals, have your feed analysed. You may also want to have a chemical analysis of your water done to determine the levels of nitrates and various minerals such as, potassium, magnesium, sodium and calcium present in the water. Then, balance your ration for the total nutrient intake in the diet including the nutrients in the water.

Microbiology

Water may contain a variety of micro-organisms, such as bacteria, viruses, protozoa and parasite eggs. A coliform bacteria count of over 1/100 ml can cause scours in calves. A count of over 20/100 ml can result in diarrhea in cows and cows going off feed. Water chlorination removes harmful bacteria and other micro-organisms. Protozoa and enteroviruses are more resistant to chlorination than bacteria.

Salinity

All water contains dissolved substances. Most of these are ions of inorganic salts. The most predominant of these are calcium, magnesium, sodium chloride, sulfate and bicarbonate. Occasionally, the levels of salts are high enough to cause harmful osmotic effects that result in poor performance, illness or even death in animals forced to drink them (see Table 2). Various salts have slightly

different effects, but these differences normally are of no practical significance. While sulfates are laxative and cause some diarrhea, their damage to animals seems no greater than that of chlorides. In the same way, magnesium salts are usually no more of a problem than calcium or sodium salts. The effects of various salts seem to be additive, meaning a mixture of them causes the same degree of harm as a single salt of the same total concentration.

Some observations can be made relative to saline livestock waters:

- Increasing salinity may actually cause an increase in water consumption. Animals may initially refuse to drink the water due to the salty taste.
- At very high salt concentrations, animals may refuse to drink for many days. This is followed by a period where they drink a large amount at one time and become suddenly sick or die.
- Younger animals are more prone to harm from salinity than are older animals.
- Any factor causing an increase in water consumption such as lactation, high air temperatures or exertion increases the danger of harm from saline waters.
- Animals seem to have the ability to adapt to saline water quite well, but an abrupt change from low salinity to high salinity water may cause problems. A gradual acclimatization is tolerated.
- When animals suffering from the effects of saline water are given low saline water, they make a rapid and complete recovery.
- Salt is sometimes used in the feed to regulate feed intake. In this case special care should be taken to supply a low salt content water.



Table 2. Guide to the suitability of saline waters with various concentrations (ppm = mg/L) of total soluble salts (TSS)

Total dissolved solids (mg/L or ppm)	Rating
< 1,000	Electrical conductivity is less than 1.5. Excellent for any class of livestock.
1,000 - 2,999	Electrical conductivity is between 1.5 and 5. Satisfactory for all classes of livestock. May cause mild and temporary diarrhea in animals not accustomed to the high salinity.
3,000 - 4,999	Electrical conductivity is between 5 and 8. Satisfactory for livestock, but may cause temporary diarrhea and be refused by animals not accustomed to it.
5,000 - 6,999	Electrical conductivity is between 8 and 11. Reasonably safe for beef and dairy cattle, sheep, swine and horses, but avoid use for pregnant and/or lactating animals.
7,000 - 6,999	Electrical conductivity is between 11 and 16. Avoid using this type of water if possible. Probably unfit for swine. Older cattle, sheep, horses and even swine may subsist on it for long periods. This type of water is not recommended for pregnant, lactating and young animals, or older animals that are subject to heat stress.
> 10,000	Electrical conductivity is greater than 16. Not recommended for any class of livestock under any circumstances.

Nitrates

Nitrates need to be discussed together with nitrites. Nitrates are occasionally found in toxic levels in water. Nitrites are also found in water, but seldom at toxic levels. The presence of nitrates or nitrites in water often indicates contamination of the water supply with fecal material or seepage from a septic field. Nitrates themselves are not very toxic, but when reduced to nitrites, problems can develop. Nitrites that get into the blood stream convert the red pigment, hemoglobin, to a dark brown pigment,

methemoglobin. Hemoglobin is responsible for carrying oxygen from the lungs to other tissues of the body. Oxygen cannot be carried in the methemoglobin form. When about 50 per cent of the hemoglobin is in the form of methemoglobin, the animal shows signs of distress suggesting a shortage of breath. Above this level, respiratory distress may result in death. At 80 per cent or more, the animal usually dies from a type of suffocation. Table 3 categorizes the levels of nitrate in water.

Table 3. Guide to the use of waters containing nitrate for livestock

Nitrate content ¹ (ppm nitrate nitrogen)	Comments
Less than 20 ²	Nitrate levels above this level may be detrimental to poultry performance. Research evidence indicates that nitrate levels greater than 10 ppm may impact broiler performance as measured by poor weight gains, health problems or poor flock performance.
Less than 100	Experimental evidence to date indicates that this water should not harm cattle, sheep, swine and horses.
100 to 300 ^{3**}	Water containing over 100 mg/L of nitrate is a potential health hazard with feed containing high nitrates. When feeds contain nitrates, this water can add greatly to the nitrate intake making it dangerous. Ruminants are the most susceptible because bacteria in the rumen convert nitrate to the much more dangerous nitrite. Pigs are less susceptible because this conversion doesn't occur to the same extent.
Over 300 ⁴	This water, when fed with feed containing high nitrates, can cause typical nitrate poisoning in cattle and sheep. Its use for these animals is not recommended. This level of nitrate contributes significantly to salinity. Also, because experimental work with levels of nitrate nitrogen in excess of this are meager, the use of this water for swine, horses or poultry should also be avoided.

¹ Includes nitrite nitrogen.

² S. Wakins. Water quality and sanitation. Proceedings Poultry Service Industry Workshop, 2004.

³ Less than 443 ppm of nitrate or less than 607 ppm of sodium nitrate.

⁴ Over 1,329 ppm of nitrate or over 1,821 ppm of sodium nitrate.

In ruminant animals, bacteria in the rumen convert nitrate in the feed or water to nitrite, which can diffuse into the blood stream. Nitrate toxicity from water is unusual, but the combination of nitrates in feed plus those in water should be watched to avoid problems. The conversion of nitrate to nitrite is not a major problem with monogastric animals.

Alkalinity

Many and perhaps most waters are alkaline. Only in a very few instances have water samples been found to be too alkaline for livestock. Alkalinity is expressed as either pH titratable alkalinity in the form of bicarbonates and carbonates (see Table 4). A pH of 7.0 is neutral, below pH of 7.0 is acidic and above 7.0 is alkaline. Most waters have pH values between 6.8 and 8. At a pH of 8, water would be considered mildly alkaline. This also means that the water contains mainly bicarbonates and few carbonates. As the pH increases, the level of alkalinity rises. At a pH of 10, water is considered highly alkaline with carbonates present. Most waters have less than 500 ppm of alkalinity (assayed as calcium carbonate) and as such are not harmful. High levels of alkalinity can cause physiological and digestive upsets in livestock. The precise level that causes problems is not well defined. As a general rule, waters with less than 1,000 ppm are considered satisfactory for all livestock and poultry. Above that level it may be unsatisfactory. For adult animals little harm may occur at concentrations less than 2,500 ppm unless carbonates exceed quantities of bicarbonates.

Algae

Occasionally, heavy algae growth occurs in stagnant or slow flowing bodies of water. Some species of algae, mainly the blue-green algae, can under certain circumstances be toxic to livestock.

These single cell or chain-like groups of cells are free floating and green, blue-green or brown in colour. They commonly appear as small specks or "grass clippings" in

the water. The blue-green algae are single cell cyanobacteria that produce a microcystin toxin. The algae thrive in warm, stagnant water that is high in nitrogen and phosphorus. The largest release of toxin occurs when the algae dies. Cooler, rainy or windy weather can cause an algae kill. Early symptoms of poisoning are muscle twitches, scouring, photosensitivity and loss of co-ordination. If sufficient quantities of the toxin are consumed, paralysis and respiratory failure occurs rapidly. Animals are not able to breathe and suffocate to death within minutes. Thus, animals are usually found close to the suspect water source.

Removing animals from affected areas is the only sure method of preventing poisoning. Care should be taken to limit the growth of algae in water for livestock consumption.

Toxic elements

On rare occasions natural water may contain or become contaminated with certain toxic elements such as arsenic, mercury, strontium, cadmium or radioactive substances. While these may harm animals, the major concern is that they do not accumulate in animal products used for human consumption. Analyses for these elements are only done when there are good reasons to suspect their presence.

Interpreting water analysis

Water analysis results have been expressed in several ways. The interrelationships of the common ones are listed below:

- One part per million (ppm) means one pound per million pounds of water
- For all practical purposes milligrams per litre (mg/L), milligrams per kilogram (mg/kg) and parts per million (ppm) mean the same thing
- One grain per gallon is equivalent to about 17 parts per million

Table 4. Guide to the interpretation of levels of alkalinity in water

Alkalinity (ppm) (assayed as CaCO ₃)	Nature of alkalinity	pH	Comments
Less than 500	Mostly bicarbonates	6.8 - 8	Most water samples fall in this range and are not harmful.
Up to 1,000	Mostly bicarbonates	7 - 8	Considered satisfactory for both livestock and poultry.
Above 1,000	Carbonates present	8 - 9	May be unsuitable for livestock particularly young animals.
Less than 2,500	Carbonates present	10	May do little harm in adult animals, unless carbonates are present in excess of bicarbonates.

CARBON LEVY - FAQ FOR ALBERTA PRODUCERS

ALBERTA AGRICULTURE AND FORESTRY

What is the carbon levy?

- The carbon levy will be included in the price of all fuels that emit greenhouse gases when combusted. These includes transportation and heating fuels such as diesel, gasoline, natural gas and propane. It will not apply directly to consumer purchases of electricity.
- Starting January 1, 2017, the carbon levy will be applied to fuels at a rate of \$20/tonne of CO₂ emissions. One year later, the levy will increase to \$30/tonne.

To find out more about the carbon levy and how the funds will be used, refer to the [Climate Leadership Plan](#).

How will the carbon levy impact agricultural operations?

- Marked fuels used by farmers in farming operations (diesel, gasoline) are exempt from the carbon levy.
- Other fossil fuels such as natural gas, propane, heating oil and coal are not exempt from the carbon levy.

What can producers do to improve energy efficiency and lower the impacts of the carbon levy?

- A starter guide for anyone looking to do a basic assessment of their energy use and access some simple, low-cost ideas for reducing use of electricity, natural gas and diesel on the farm is available, see: [The First Steps to Energy Management: Save Energy and Money](#).
- Producers can explore options to further improve energy efficiency on their farms and for associated off-farm transportation, see: [Beneficial Management Practices: Environmental Manual for Crop Producers in Alberta - Energy Inputs](#)
- Opportunities to leverage provincial and federal funding to help farm operations reduce emissions and save on energy include an additional \$10 M invested from the Climate Leadership Plan to augment these Growing Forward 2 Programs:
 - [On-Farm Solar Photovoltaics \(PV\) Program](#) provides cost sharing for the installation of solar panel systems.
 - [Irrigation Efficiency Program](#) helps producers invest in new or upgraded low-pressure irrigation equipment.
 - [Accelerating Innovation Program](#) assists primary producers and agri-processors with the early adoption of new technologies or practices with potential for sector-wide impact.
- Alberta's carbon market also provides opportunities for revenue from carbon offset sales of voluntary management improvements that reduces or removes greenhouse gas emissions, such as conservation cropping, managing nitrogen fertilizers and feed efficiency in livestock, see: [Agricultural Carbon Offsets](#)

How will marked fuel exemptions to the carbon levy be identified?

- [Eligibility criteria](#) for both the carbon levy exemption and Alberta Farm Fuel Benefit (AFFB) program fuel tax exemption are the same.
- The AFFB program registration number will also be used for carbon levy exemption certificate.
- The carbon levy exemption is only on marked fuel (diesel and gas) used for farming operations. The levy will apply to propane, aviation fuel and heating fuel.

How will the carbon levy on non-exempt fossil fuels affect my operations?

- Since farm operations vary widely, the effect of the carbon levy will be unique to individual operations.
- Commonly used fossil fuels subject to the carbon levy are gasoline and diesel used for contracted transportation and hauling, and natural gas used for heating. The Alberta Climate Change Office has provided [a summary of the impact of the carbon levy on each type of fuel.](#)

More information on the Carbon Levy can be found at: [http://www1.agric.gov.ab.ca/\\$Department/deptdocs.nsf/All/faq16201](http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/All/faq16201)

A few pictures from our summer plot tours. Top left: perennial forage trial; top right: our regional variety trials; bottom right: Canola performance trial; bottom left: quinoa; centre: hemp demo.



Lakeland Agricultural Research Association

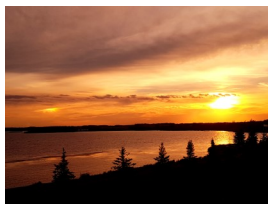
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Sustainable farming encompasses a wide range of practices and principles; combining environmental stewardship with profitability and ensuring that the family farm will be there for generations to come.



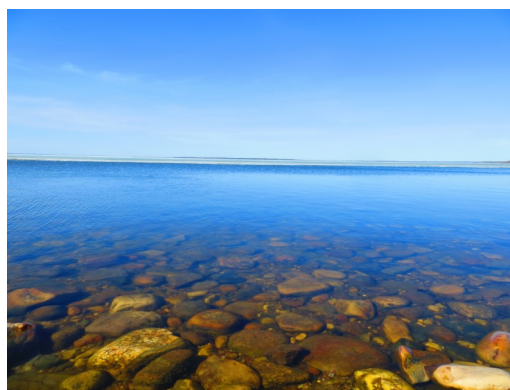
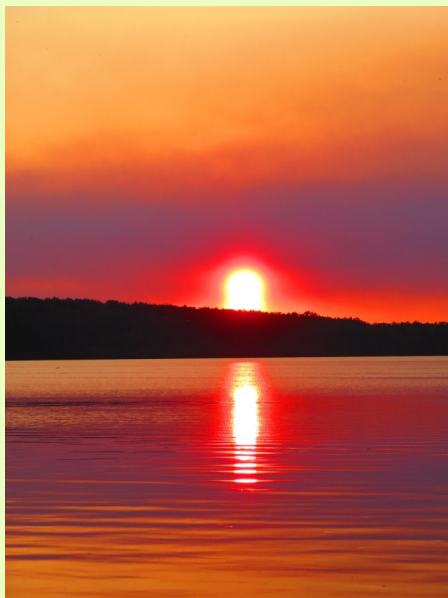
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ALBERTA LAKE MANAGEMENT SOCIETY CONFERENCE

September 29th and 30th in Lac La Biche

The ALMS Conference will be a great opportunity to learn about a vast array of lake topics including: lake research, shorelines, wildlife, stewardship and much more! The end of the conference will include field tours of local sights including the old growth forest on Alberta's only island park: Sir Winston Churchill Park.



WWW.LARAONLINE.CA

Registration is now open at the early bird rate of \$125.00 and available by visiting: <https://www.eventbrite.ca/e/alms-annual-workshop-2017-tickets-35920333685>

Join us for speakers, networking, and tours on September 29 and 30th! You can view more details on the ALMS website <http://alms.ca/2017-new-perspectives/>

Many labs can be used to sample dugout/surface water. Make sure you are using an accredited lab to get the best results possible. If you have questions about water testing contact Kellie at LARA