

2014

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Lakeland Agricultural Research Association



The Verdant Element

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HAPPY HARVEST

The end of the season is upon us and now is a great time to see if your inputs are paying off. Have you done anything different this year? Left any test strips where you can compare your yields? Is what you are putting in paying off?

Farming is becoming more about the margins and if you are applying specialty products, trying new varieties or changing your management practices, this is the time to see the results. Granted, the weather has been challenging this year with lots of rain in the beginning, too much heat during flowering causing blasting, humid weather that promoted excellent conditions for fungal diseases to stress your plants and unseasonably cold weather in the beginning of September; these will all impact yields and your bottom line. Watch for our annual research report to see what varieties yielded best in the Lakeland and the data from our input trials early next year to help you plan for 2015. Hope your harvest is successful and the bins are full before winter!



Water For A Lifetime

A Test of Your Well Water Can Protect Your Family and Your Property

Those who live in urban municipalities seldom worry about whether or not their water is safe to drink, because regulations are in place that require municipalities to treat and test water quality on a regular basis. For rural residents who rely on wells for their household water, access to an adequate supply of clean drinking water is not as simple as turning on a tap. Those who get their water from private wells are responsible for managing and maintaining their wells and ensuring their water supply is tested regularly and is safe to drink.



“Even though testing is free of charge for residential users through Alberta Health Services, we’re finding that some people aren’t testing their water,” says Debra Mooney, an environmental health consultant with Alberta



Health and an advocate for the Working Well Program. “People need to know what’s in their water. Some well water has high nitrate levels which can be harmful to small infants when mixed in their formula. Other harmful substances can also make their way into wells and since water quality can change over the lifetime of a well, regular testing is the only way to be certain that well water is safe for human consumption.”

Testing well water on a regular basis also provides a baseline of the water quality, which can be very important to a well owner if things go wrong. “Routine testing can pick up changes in water quality early on and help a well owner realize that certain maintenance procedures need to be done to

preserve water quality and increase the lifetime of a well,” says Jamie Wuite, Executive Director of Alberta Agriculture and Rural Development’s Irrigation and Farm Water Division. “A baseline is also important information to have when you suspect your water quality has been negatively affected by another party. If you never tested your water quality, it’s hard to prove that it has been negatively affected.”



Over time, land use changes or structural degradation of an aging well can change or affect water quality. Private well owners can’t take water quality for granted. Regular testing of well water is vital to preserve the health of rural families and to ensure that ground water remains safe for many generations to come.

Learn How to Manage Your Well

Online resources and free community-based workshops offered by the Working Well program provide well owners with the information and tools they need to properly care for their wells. For more information, including a fact sheet on taking water samples, visit the Working Well website at: www.workingwell.alberta.ca

Animal health and performance are superior when given access to clean water. Research has shown that when cows have the option of drinking out of a trough or along an unfenced creek, 80% of cows would use the trough. Access to clean water increases animal performance and has shown improved growth in yearlings by as much as 23%.

Picture to the right shows Himalayan Balsam growing in a flower bed at a town residence



Himalayan Balsam is a prohibited noxious weed, which means that you must eradicate them. They have the potential to take over native vegetation, forming a monoculture and destroying wildlife habitat and waterfowl breeding grounds. They can outcompete cattails, rushes and sedges in riparian areas and due to shallow roots allow for erosion and destruction of shorelines.

Himalayan Balsam is an annual, which grows at an impressive rate, achieving heights of 1 to 3 meters. It has a hollow bamboo-like stem with prominent ridges. When under stress, it can grow in a spindly grass-like fashion, flowering close to the ground. The leaves and stem are tinged reddish purple colour, with whorls of three leaves twirling up the stem. Leaves are lance shaped and have prominent veins and serrated edges. The flowers can come in a multitude of shades from white to pink to dark purple. Flowers are heavy with nectar and can attract bees away from native species. Seed capsules can contain up to 16 seeds and explode, shooting seeds up to 10 meters away, and can stay viable for seven years. An average sized plant can produce 700-800 seeds in total.

Control: Hand pulling works best but needs to be done early in the season before seeds form. Disposal by bagging and burning is recommended however for large patches this is ineffective. At Pigeon Lake they have used the “pick, break and drop” method which is pulling out the plant and breaking it apart a few inches above the roots and dropping them on drier lands where they dry out and die. After August, you should bag the tops to prevent seed dispersal. Some herbicides are effective, however sprayed flowering plants can still produce viable seed.

This is a species that was sold in greenhouses and can be found in many peoples gardens. If you see this weed it can be reported to your local Agricultural Fieldmen as it is listed in the Alberta Provincial Weed Act or phone the Alberta Pest Surveillance System at:

310-APSS (2777).

HIMALAYAN BALSAM



Example of how Himalayan Balsam can outcompete native riparian vegetation.



Hosts:

Trembling aspen, Swedish columnar aspen, tower poplar

Distribution and Disease Cycle:

Symptoms typically appear in midsummer. Spores are dispersed from April-June when rainfall is present and temperatures are around 18°C. Once infected, the fungus moves systemically within the leaf's vascular system, making it difficult to control.



Reddish brown/bronze leaves among healthy leaves
Photo credit: Manitoba Agriculture, Food and Rural Initiatives



Tower poplar planting infected with Bronze leaf.
Photo credit: Manitoba Agriculture, Food and Rural Initiatives

Symptoms and signs:

Leaf margins develop yellow, orange or reddish brown discolourations, which expand to consume the entire leaf. Often veins remain green while the remaining leaf tissue becomes discoloured. Depending on the host, all leaves on a singly shoot may exhibit symptoms of the disease or symptomatic leaves may be scattered throughout the crown of the tree. Eventually, leaves develop a bronze or dark reddish-brown hue, often remaining attached to the tree, rather than abscising in fall. As the disease progresses, the fungus will infect the stem and cause dieback after several seasons of infection.

Control:

Remove and destroy fallen leaves if possible. Prune to remove dead branches and increase air circulation; avoid dense plantings that can reduce air flow. Avoid using monocultures of susceptible species in mass plantings or shelterbelts which can accelerate disease spread.

Scouting trees early in the season and on a continual basis gives you the best chance to catch pests and disease early enough to eradicate or protect your valuable trees.

Pest Watch

Domestic Well Water Quality In The Beaver River Basin

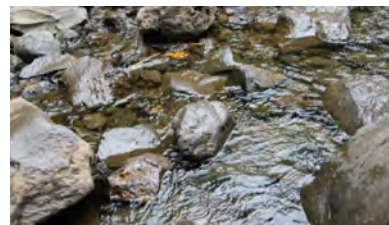
Alberta Health, Health Protection Branch

Under the framework of the Alberta *Water for Life Strategy* to ensure safe drinking water for all Albertans, Alberta Health initiated a domestic well water quality monitoring and human health assessment program in Alberta in 2009. The first project was completed in August of 2010 to overview the domestic well quality between 2002 and 2008 in all regions of Alberta. The Beaver River Basin region was selected for follow-up domestic well water quality monitoring and human exposure assessment in 2009.

Evidence of arsenic in well water had been gathered in a 1999-2000 in the Beaver River Basin region. In 2006 the maximum acceptable concentration for arsenic under the Canadian Drinking Water Guideline for Arsenic was reduced from 25 µg/L to 10 µg/L. Local residents continued to express concern about arsenic and more recently, uranium in the well water. Consequently, Alberta Health conducted this follow-up survey in order to provide more detailed information on domestic well water quality for well owners and assist them in making decisions as to how to improve well water quality.

The objectives of this follow-up survey include:

- Assessing long-term suitability of domestic well water quality for well owners by monitoring physical properties and chemical concentrations in raw and treated domestic well water samples and comparing the chemical levels to both aesthetic quality-based and health-based guidelines;
- Assessing exposure to chemicals relevant to human health in domestic well water by collecting information on drinking water consumption patterns and calculating daily chemical intake;
- Assessing human health risk from exposure to arsenic in drinking water by comparing exposure intake and health effect information in the literatures;
- Assisting well owners to improve well water quality by providing them with the information about well maintenance and water treatment strategies to domestic well owners; and
- Building information and better understanding of domestic well water quality in specific regions of the province.



The major findings are summarized below:

Untreated domestic well water

- Suitability of domestic water quality for human use by measuring pH, alkalinity, conductivity and TDS was similar in the Beaver River Basin region to suitability in other regions of Alberta;
- Aesthetic water quality by measuring iron, chloride and sulfate was slightly under average level in Alberta;
- Well water was very hard in the Beaver River Basin region compared to water classified as “medium hard or hard” in Alberta;
- The average sodium level was lower than average levels in other regions of Alberta; and
- The levels of fluoride, nitrate/nitrite, antimony, barium, boron, cadmium, chromium, lead, mercury, molybdenum, nickel, selenium, uranium and uranium were under the health-based guidelines for 95 to 100 per cent of raw water samples.

Continued on Page 6

Domestic Well Water Quality in the Beaver River Basin

For the full report on the Drinking Water Quality and Human Health Assessment go to:

<http://www.health.alberta.ca/documents/Well-Water-Beaver-Basin-2014.pdf>

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.

GROWING FORWARD

Growing Forward Stewardship Programs

Program Area	Eligible Costs	Cost Share
Riparian Area Fencing and Management	Permanent fencing (controlled access or exclusion): <ul style="list-style-type: none"> • Permanent barbed/electric fencing systems • Construction materials and supplies. NOTE: all materials must be new materials and not materials on hand • Labour and equipment will be paid at a 1:1 ratio to materials expenses. (NOTE: refer to section 7.4 in the Terms and Conditions); Purchase and planting of native trees and shrubs and/or native or non-invasive introduced species of grass and legumes; Seed and seeding operation for revegetation; Cultural weed control systems and mulch	70% to a funding maximum of \$50,000
Year Round / Summer Watering Systems	Deeply buried, shallow buried, or surface pipeline installation used to distribute water within a pasture and protect a water body/water source; Portable watering systems; Year-round watering systems; Troughs, stock tanks, plastic tanks (or similar water storage); Frost free nose pumps; Pumping systems; Power sources such as solar panels, windmills etc. And other electrical supplies; Plumbing materials	50% to a funding maximum of \$30,000
Portable Shelters and Windbreaks	Construction materials and supplies for portable windbreaks/shelters; In-kind labour (\$25/hour); Note: costs are eligible to a maximum of 120 feet per 100 cows	50% to a funding maximum of \$10,000
Wetland Restoration	Earthwork related to construction or plugging of old drains; Engineering consultant fees for design and construction; Re-vegetation costs (seed plantings etc.); Applicant's equipment use at custom rates; In-kind labour at set program rates (\$25/hour)	70% at funding maximum of \$50,000
Livestock Facility and Permanent Wintering Site Relocation	Construction costs to rebuild an equivalent facility or adequately sized facility in a more suitable location; Plumbing, electrical, fence lines, feeding areas, shelter/wind protection; Earthwork; Engineering design and fees (if applicable); Tear down and removal costs of the old livestock facility; Re-vegetation costs of the old site; Applicant's equipment use and in-kind labour	50% at funding maximum of \$50,000
Improved Pesticide Management	Low-drift nozzles and air-induction nozzles; Selectable nozzle bodies (hold 2-5 nozzles); Sprayer cones or shrouds; Chemical handling system with jug rinse; Sectional control operating system and hardware; Auto boom height operating system and hardware; Pumps designed specifically for chemical transfer from totes and barrels; Chemical meters	50% at funding maximum of \$10,000
Fuel Storage	Double wall fuel tanks that are ULC or CSA approved; Meters, hoses and auto shut-off nozzles; Electrical, connections and installation	30% at a funding maximum of \$3,000
Used Oil and Lubricant Storage	Double wall steel storage tank design expressly for the temporary storage of used oil and lubricants that have a ULC or CSA approved stamp or plate indicating it is for that purpose (ULC-652)	50% at a funding maximum of \$2,000
On-Farm Water Management	Wells (including test drilling, new pump and well casing, electroseismology test, disinfection of new well); Dugouts (including aeration, fencing and floating intakes); Dams (including intake and fencing); Spring Development; Water tanks/storage/cisterns for low producing wells or as part of a permanent water supply; Buried pipelines Special projects include: Specified water conservation measures (purchase and installation of water use meters, well depth meters for agricultural use of water, well decommissioning by a certified contractor, well pit conversions by a certified contractor; Tie-ins	Various funding levels, refer to the terms of reference

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.

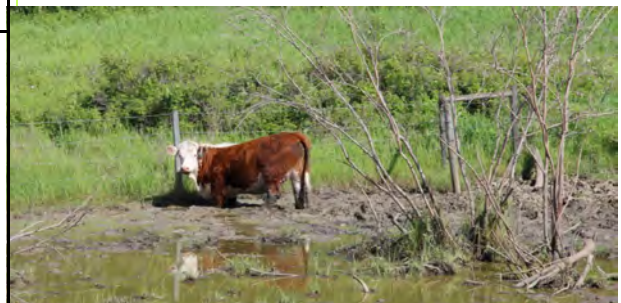
Having a completed EFP allows producers to access different funding opportunities, such as the Growing Forward Stewardship Program. It is also useful in product branding that demonstrates specific environmental standards.

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



Stuck in the mud? Consider an offsite watering system.

ENVIRONMENTAL FARM PLANS

ARSENIC REPORT CONTINUED FROM PAGE 4

Treated domestic well water

Treatment methods included using softeners, iron filters, reverse osmosis, distillers, activated carbon filters, and chlorinators;

Alkalinity, conductivity, TDS and bicarbonate were significantly removed by using a combination of treatment methods;

Hardness was significantly reduced after water treatment, and very hard water became soft water in 80 per cent of houses after using softeners; and

Sodium or potassium levels were significantly increased after using softeners in some houses, depending on the type of softening chemicals used.

Special issue: arsenic

Arsenic levels satisfied the health guideline value in 52 per cent of raw water samples and 71 per cent of treated water samples;

Arsenic levels did not significantly change between 1999 and 2009;

Arsenic levels were higher in the region than the average level in Alberta;

The major arsenic species in well water were inorganic arsenic III and V;

Arsenic levels were significantly reduced after water treatment, particularly by using reverse osmosis and distiller;

15 per cent of participants consumed water containing arsenic level greater than the health guideline level of 0.01 mg/L; and

A daily intake of arsenic from drinking well water for 19 participants who consumed water with arsenic level greater than 0.01 mg/L was averaged 0.0007 mg/kg body weight per day.



Human health assessment

79 per cent of participants treated domestic well water for household use such as using for daily drinking (70 per cent) and for cooking, food preparation, bathing/showering and laundry (over 90 per cent);

There may be an increase of potential health risk for cardiovascular health effects if private well owners consume soft water containing very low levels of calcium and magnesium, or very high levels of sodium and potassium resulting from using softeners for a long time; and

Potential health risk resulting from drinking arsenic-containing water at current measured levels was estimated to be low.

Recommendations are that:

Private well owners should be advised to test the well water quality regularly, particularly if the arsenic levels exceed the Canadian Drinking Water Quality guideline or sodium and potassium levels are too high;

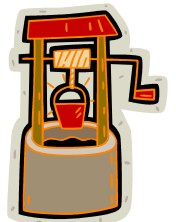
Private well owners should be encouraged to select efficient treatment methods or choose alternative drinking water sources to minimize exposure to arsenic via drinking well water as much as possible even though health risk resulting from drinking arsenic containing water was estimated to be low;

Private well owners should be encouraged to have appropriate maintenance of treatment devices to efficiently reduce the levels of chemicals including arsenic to satisfy the guideline values;

Private well owners should be advised to avoid drinking soft water for a long term by using softeners appropriately (i.e. for non-consumptive uses only) for example by installing a water pipe to bypass the kitchen tap water;

Private well owners should be advised how to access local public health officers to discuss well water quality, testing schedule, testing results, treatment methods, well maintenance and health concerns since they manage the well water quality by themselves;

Public awareness of improving the well water quality should be enhanced; and Various technical supports for private well owners should be provided by the experts in the fields of agricultural field engineering, public health inspection, and groundwater hydrochemistry.



OPTIMISTIC ACRES

Every Spring as the snow melts and you start getting antsy about getting seeding, you are busy with securing seed, fertilizer and making sure that your equipment is ready to go. The factor that we most often forget is geology, and the one that we have no control over is the weather. Sure you can pick your varieties to optimize your crops; choosing for date to maturity, height, lodging resistance, disease resistance and yield. And reasonably you want to go and seed as many acres as possible, however seeding into your wetlands and bordering areas may not be putting you as far ahead as you think.

For decades now, people have been encouraged to drain their wetlands and farm all their managed acres. It has only been in the last 15 or so years that wetland conservation has become a founded science and an emergent mindset. A riparian area is the margin between the upland and a water course. This area is influenced by water, both how and where it flows, and this influence is reflected in the plants and soil characteristics. This spring and summer many fields were showing evidence of seeding into these areas as many crops had a healthy stand of cat-tails growing in the fields. Granted, the rain this year was plentiful and the usually dry spots quickly filled with water and the aquatic vegetation returned. These riparian areas have a huge role in water quality, quantity and biodiversity. They provide eight key features: trap and store sediment; build and maintain banks and shorelines; store water; recharge aquifers; filter and buffer water; reduce and dissipate energy; create primary production; and maintain biodiversity.

Besides the environmental impact of farming these areas, introducing fertilizers and pesticides into your water table (both surface and groundwater because the two systems are connected); these expensive inputs and your seed are going to waste in areas that will not produce your crop. There is also the waste of your time and damage to your equipment when you get stuck in these wetter areas. Not to mention the frustration of driving your combine over some massive ruts created earlier in the season.

This point of this is not to say “don’t seed in your low lying areas”, but rather to make you aware of the cost to your operation and to the environment as well. Lets say that using a conservative estimated average cost of production for putting in a crop is \$250/acre. If 20 acres of what you seed goes underwater and starts producing cat-tails and water fowl instead, that is \$5,000 that you spent that will show no return. Not including your time and fixed costs such as machinery and land. Then there are the environmental impacts of adding nutrients and pesticides that are entering non-target areas. Farming these days requires the knowledge of your cost of production and to make the most out of already slim margins of profit. If your acres that you seeded optimistically are now swimming pools for wildlife, consider then avoiding these areas when spraying or top dressing additional fertilizer. We all hope that you get the most of your available acres, but being flexible and adapting to Mother Natures increasingly volatile behavior is key to surviving in this industry.



Lakeland Agricultural Research Association

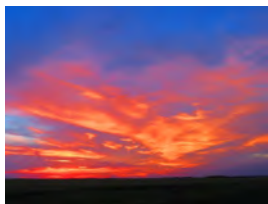
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Sustainable farming encompasses a wide range of practices and principles; combining environmental stewardship with profitability and ensuring that the family farm will be there for generations to come.



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Have you had your well water tested in the last two years? Have old unused wells on your property been properly sealed and decommissioned? Have you ever shock chlorinated your well? Do you know the age and depth of your well, or how it was constructed?

According to Alberta water specialist Ken Williamson, if you answered no to any of these questions, your groundwater supply could be at risk. Despite the fact that over 500,000 Albertans rely on groundwater for household use, few know that proper water well construction, siting, and maintenance can help protect your well from contamination.

To ensure the safety of your water well, you should also know how far your septic system is from your well. Septic tanks should be regularly pumped and inspected. You should also disinfect your well on a regular basis.

It is also important to regularly test and document the quality and quantity of water from your well. By keeping good records you can see how water quality and well performance has changed over time. Proper well maintenance and operation can save you costly repairs and ensure your well water yields are sustained over many years.

If you'd like to find out if your groundwater is at risk and learn what you can do to protect your well, **attend a free water well management workshop** being hosted by LARA, and presented by the Working Well Program, with technical expertise from Alberta Agriculture and Rural Development, and Alberta Environment and Sustainable Resource Development on **November 27 in Lac La Biche**. This hands-on, informative workshop is designed to help water well owners better understand and manage their precious groundwater supplies.

Participants will learn about a variety of water well construction, siting and maintenance topics including:

- 1. Setbacks:** Alberta legislation requires minimum setbacks between water wells and contamination sources such as livestock pens, septic systems, manure piles and chemical and fuel storage. Shallow wells and wells located in gravelly or sandy soils are at higher risk of contamination and may need greater setback distances or special protective measures.
- 2. Landscaping:** The ground around a water well should be mounded and landscaped to ensure that surface water does not run towards and pool around the outer casing of the well.
- 3. Eliminating well pits:** In the past, well pits were installed to provide a frost free location for the pressure system. Provincial regulations now prohibit the construction of wells pits as they increase the risk of contamination to groundwater and can be a deadly safety hazard. A licensed water well contractor should be hired to upgrade a well in a pit.
- 4. Water well drilling reports:** Licensed water well contractors are required to submit drilling reports to Alberta Environment and Sustainable Resource Development. This report includes important information that will help well owners manage and protect their wells.
- 5. Single Aquifer Source:** Constructing a well so it draws water from more than one aquifer might increase the gallons per minute, but it also puts groundwater at higher risk. A single aquifer completion eliminates intermixing of water bearing formations with different water qualities and prevents aquifer depletion.
- 6. Water sampling:** Well owners should do a standard coliform bacteria test twice a year (more often if the well is less than 50 feet deep) and a routine chemical test every two years.



WORKING WELL WORKSHOP

To attend this event please pre-register - so we can help you look up drilling reports for your well - by calling the LARA office at: 780-826-7260

WORKING WELL
Clean water.
Well protected.

NEW BMPs Covered by Growing Forward 2

- ◆ Shelterbelt Establishment
- ◆ Sectional Control for Seeding and Fertilizing Equipment
- ◆ Grain Bag Plastic Rolling Equipment