



# Nutrient Management

SUMMER 2016

- New logo and name but the same great service -

## Heavy precipitation influencing summer norms

Who could have guessed that at the beginning of summer we would see rainfall for much of July? In fact if I recall correctly, we saw little to no rainfall after the first week of July last year. Which put our grazing land in quite a predicament this year. This past spring I was very skeptical whether we would be able to put animals out on the range land. I know many folks deferred spring grazing, in hopes that we would get some rainfall to help forage development and as luck would have it, July was a great month for forages and weeds.

On page 2 and 3, scentless chamomile is brought to your attention and we have also added the Provincial Pest Monitoring link to help you determine which insect pests are where and at what thresholds. The Growing Forward 2 (GF2) Program has been running for the past 3 years and I thought it would be good to let you folks know where the programs stand.

The main message when it comes to GF2 Programs is that the GF2 On-Farm Stewardship Program has already accumulated a long queue of applicants, about \$800,000 requested over the current budget. The program will continue to be open until they reach a queue equivalent to next year's allocated

budget. If extra funding becomes available then applicants in the queue could still be processed this fiscal year, if they do not receive any extra funding then all applicants in the queue will be funded out of next year's budget.

Currently the Confined Feeding Operation (CFO), On-Farm Energy Efficiency, and Solar programs all have sufficient funding. The GF2 On-Farm Solar PV program has reopened. All required documentation –and related information sheets – is available on the GF2 program webpage.

The CFO stewardship team has been working towards a revised application for the CFO program. Until now, they have been using a generic application applicable to all program activity codes. To help receive more information, the Team has revised the single application into Activity Code specific applications. They have gone from two applications (producer and commercial manure applicator) to ten applications. Each are tailored to a specific activity code and the associated requirements of the code. These applications are now available on the CFO Stewardship website.

Page 4 has more detail for the On-Farm Energy Efficiency program. I have received at least 10 calls

since March in regards to building farm shops and this is under the On-Farm Energy Efficiency program. Give this some consideration if you are thinking about building a shop or any farm buildings.

I have also included a needs assessment for my program on page 5. This is a very important part of my Sustainable Agriculture Program. Basically, this gives producers in Lethbridge County the opportunity to let us know if we are going in the right direction. Keep in mind that this type of funding should deal with nutrient management and water quality/ quantity issues. Please get in touch with me and let me know what you think.

Most producers in the County have a dugout for their water source. I think it is important to understand the biology of a dugout and what needs to be done when water quality diminishes. On page 6 and 7 we discuss the key components for a healthy dugout. Keep in mind that the On-Farm Water Management Program can help fund aeration equipment, which has been proven to improve dugout water quality.

The Confined Feeding Operations Extension Services ad is on page 8. If you are in need of technical expertise give the folks in your area a call.

*Have a great summer!*

### Lethbridge County Agriculture Service Board

#100, 905-4th Avenue South Lethbridge, AB, T1J 4E4

Phone: 403-732-5333 Picture Butte ■ Fax: 403-732-4328

**Gary Secrist**  
Agriculture Fieldman

**Dwayne Rogness**  
Rural Extension Specialist (RES)  
403-380-1598

**Terry Mrozowich, ASB Foreman**  
**Kevin Virostek, Foreman/Weed Inspector**





## Alberta Insect Pest Monitoring Network

If you are wondering about what insect pests are active or are soon to be active, have a look at the Alberta Insect Pest Monitoring Network – Alberta Agriculture and Forestry website. The link is below.  
[www1.agric.gov.ab.ca/\\$Department/deptdocs.nsf/All/prm13779](http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/All/prm13779)



[abinvasives.ca](http://abinvasives.ca)  
[info@abinvasives.ca](mailto:info@abinvasives.ca)

Last Updated January 2014

Provincial Designation:  
Noxious

# Scentsless Chamomile

*Tripleurospermum perforatum* syn. *T. inodorum*

continued From page 2

## Control:

**Grazing:** Scentsless chamomile is generally unpalatable to grazers and its seeds can survive digestion. Invasive plants should never be considered as forage.

**Cultivation:** Late fall and early spring tillage will control rosettes. Frequent, shallow tillage can help exhaust the seed bank by repeatedly destroying germinating seedlings. Equipment must be cleaned after.

**Mechanical:** Mowing can prevent seed production but plants will re-bloom below the cutting height. Hand-pulling can prevent spread into new areas and is effective on small infestations. Pulled plants should be burned or bagged and sent to the landfill. Burning infestations that have finished blooming can prevent seed spread.

**Chemical:** Aminopyralid (alone or in a product mix with 2,4-D or Metsulfuron-methyl), Chlorsulfuron, Clopyralid (alone or in a product mix with MCPA), Dicamba, Glufosinate ammonium, Hexazinone, Picloram, MCPA (in a product mix with Bromoxynil), Metsulfuron-methyl and Tribenuron-methyl (in a product mix with Thifensulfuron-methyl) are registered for use on scentsless chamomile. Always check product labels to ensure the herbicide is registered for use on the target plant in Canada by the Pest Management Regulatory Agency. Always read and follow label directions. Consult your local Agricultural Fieldman or Certified Pesticide Dispenser for more information.

**Biological:** A seed-head feeding weevil, *Omphalapion hookeri*, and a gall midge, *Rhopalomyia tripleurospermi*, have been released in Alberta.



[abinvasives.ca](http://abinvasives.ca)  
[info@abinvasives.ca](mailto:info@abinvasives.ca)

# Growing Forward 2 On-Farm Energy Management



I have talked to a lot of producers lately who were wondering if there is a program out there that will assist with the construction of farm buildings.

Yes, yes and yes, the Growing Forward 2 On-Farm Energy Management program is a great resource to ensure that your farm buildings are energy efficient. Many of the applications I have assisted with have been farm shops but that is not to say barns are not included. This program is only for farm buildings and to be eligible you must be a producer with a \$10,000 farm commodity or livestock production income. For most of the eligible items the program will pay for 35% of costs up to \$50,000. Items like building wall insulation, ceiling insulation, under-slab or foundation insulation, additions to existing insulation and energy efficient windows, all have R-Value requirements for funding.

Some eligible items are construction projects that install high-efficiency equipment from the program's Funding List, retrofit projects that improve the operation's energy usage per unit of production and installation of submeters to monitor on-farm electricity and/or natural gas usage.

The program also covers 100% of the cost for each applicant's first three submeters.

For most of the Growing Forward 2 programs you must submit the application before funding is approved. If you were one of those folks that constructed a farm building and you would like to see if there is any funding available, I have good news because this program is retroactive to April 1, 2013 and as long as you adhere to the eligibility list, there is funding.

You can submit an application to the On-Farm Energy Management Program complete with quotes for

any equipment you are looking to purchase. Just go to the website ([www.growingforward.alberta.ca](http://www.growingforward.alberta.ca)) to fill an application. For more information you can contact Loretta Orr at 780-427-3819.

I can also answer questions about the program and of course will assist with applications if needed. Contact me, Dwayne Rogness, at 403-380-1598 for more information.






# LETHBRIDGE COUNTY RURAL EXTENSION *Needs Assessment*

This needs assessment is an opportunity for producers to offer input to help Lethbridge County ensure producers can remain environmentally sustainable. The Lethbridge County Agriculture Service Board Rural Extension Specialist (RES) Program delivers environmentally sustainable agriculture information to the producers in Lethbridge County. The intensive nature of our agriculture industry requires that the RES deliver nutrient management information, water

quality strategies and riparian/wetland management strategies to ensure our producers are able to remain environmentally sustainable. To do this we offer Environmental Farm Plan education and collaborate with local researchers to evaluate beneficial management practices that are effective in Lethbridge County. Workshops and tours are used to highlight research projects and producer participation. Active involvement on local agriculture committees helps

to keep informed of coming events and concerns. All of these activities align with the conditions to receive funding for this program.

We are looking for input from producers in order to continue helping them remain environmentally sustainable. Please take the time to answer the questions below and return this to the Rural Extension Specialist – Dwayne Rogness.

**Phone – 403-380-1598**

**Email – [drogness@lethcounty.ca](mailto:drogness@lethcounty.ca)**

1. Have you contacted the Lethbridge County Rural Extension Specialist (Res) to get agriculture information before? If so what for?
2. What agricultural information would you like to see on the Lethbridge County website, in the Ag Service Board Nutrient Management Newsletters, workshops and tours?
3. In regards to Nutrient Management how can the extension program help you understand your nutrient responsibilities?
4. If you do not have a formal nutrient management plan, what are the barriers for implementing one?
5. Biosecurity is a major concern regarding producing and marketing agricultural products. Is this an area where the RES could help producers?

6. Considering the need to align with funding opportunities, how can this program help increase the sustainability of your farming operation?

Rate the following from 1 to 6 in order of their importance to you.

- \_\_\_\_\_ Nutrient management
  - \_\_\_\_\_ Soil Conservation
  - \_\_\_\_\_ Water quality/quantity
  - \_\_\_\_\_ Sensitive area protection such as riparian and wetland management
  - \_\_\_\_\_ Biosecurity
  - \_\_\_\_\_ Renewable Energy
- 

# Biology of a Dugout . . .

## - Nutrients and sunlight are key components

Aquatic organisms take up residence in the dugout in the first year or two after the dugout is constructed. Nutrients and sunlight are the key components for algae/plant growth in dugouts. Contributing nutrients are phosphorous and nitrogen. The sources for these are: fertilized fields, poorly managed manure and sediment.

In the first year or two following the construction of a dugout, aquatic organisms quickly take up residence so that after a few years the dugout begins to behave like other standing bodies of water.

Algae are tiny organisms that live in a wide range of aquatic environments (actually microscopic and join together to form colonies that become visible to the eye). Although there are many types of algae, the most common types are referred to as green algae and blue-green algae.

Blue-green algae or cyanobacteria are classified as bacteria, not algae, since their genetic material is not organized in a membrane-bound nucleus. They are similar to algae in that they have chlorophyll and use the sun as an energy source for photosynthesis. Unlike algae, though, cyanobacteria produce substances that are extremely toxic, capable of causing serious illness or death if consumed.

### Telling Them Apart

Scoop a handful of the bloom with your fingers spread slightly apart. Let the water drain through your fingers and examine what remains in your hand. If long, stringy masses are left dangling from your fingers, it is a filamentous form, and most likely a bloom of green algae.

If after straining through your fingers all that's left are a few bits sticking to your skin, it's a planktonic form and most likely a cyanobacterial bloom. When cyanobacterial blooms are very large they tend to form solid looking clumps.

A slight swishing with the hand should break up the clump. Caution - Wash your hands with soap and hot water following the test.

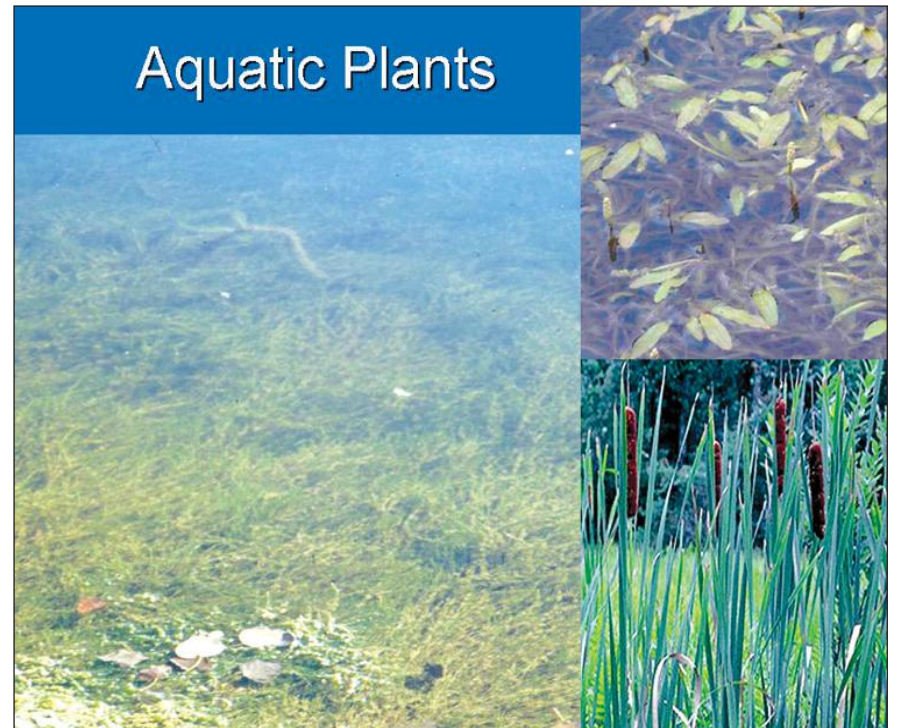
This is not a fail-proof method of identification – algae and cyanobacteria are best identified by a qualified person using a microscope.

There are other living organisms in the examples of a healthy mix of aquatic plants.

The large round leaves are Nymphaeoides (water lily or lily pads), the medium sized leaves are Ludwigia (water primrose) and the small plants are floating duckweeds.

Occasionally duckweeds are mistaken for algae. Duckweeds are identified by the tiny white root that hangs from their lower surface into the water.

Duckweeds are beneficial plants that remove phosphorus from the water. They do not produce blooms characteristic of algae although they can sometimes grow to cover entire water surfaces.



### How do algae grow?

- ◆ Algae and aquatic plants take up phosphorus and nitrogen in the water and require sunlight for photosynthesis
- ◆ Algae are first to respond to changes in water quality (i.e. changes in nutrient concentrations, pesticides)
- ◆ As organisms die, excess organic matter accumulates in the bottom of the dugout creating energy for the algae.

### Light

- ◆ Light penetrates the water and is absorbed and transformed into heat (usually in the first metre)
- ◆ The depth of light penetration depends on how clear the water is.
- ◆ In shallow water, light is also absorbed by the bottom sediments, resulting in heat being released.

Light is absorbed/scattered by water, dissolved and suspended compounds.

Algae and aquatic plants tend to thrive in specific zones. Algae are most commonly found in the open water zone, along with some free-floating plants, specifically in the euphotic zone.

The euphotic zone is the column of water in which sufficient light exists for primary production. It is often defined as the zone from the surface to a depth at which there is 1% of the amount of light at the surface.



### Aquatic Plants

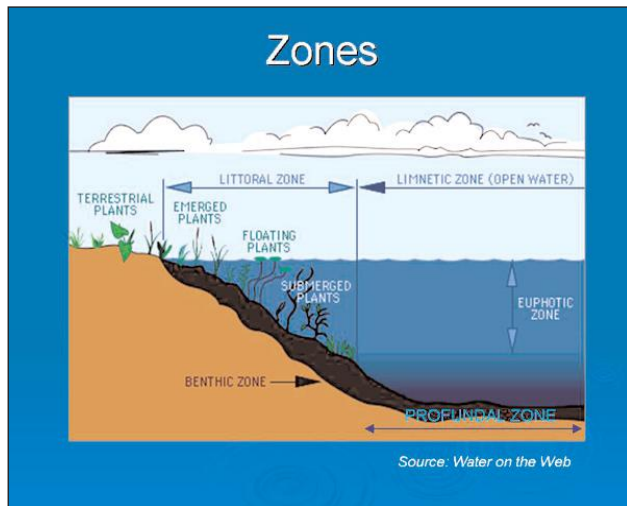
There are 2 other types of aquatic plants or macrophytes (besides floating): Submerged (eg. Ceratophyllum – coontail, Potamogeton richardsonii - Richardson's pondweed) and Emergent (eg. Typha – cattails)

- Algae are eaten by microscopic animals called zooplankton, which float in the water.
- Freshwater shrimp – primary food is plant material and blue-green algae.
- Daphnia (water fleas) – ingest unicellular algae and bacteria.
- Snails feed on algae which grow on rocks, sticks and other plants, Larvae of insects.
- Fish such as sticklebacks and fathead minnows are the common fish.

# Biology of a Dugout . . .

**- Nutrients and sunlight are key components**

◆ Continued from Page 6



## Zones

Algae and aquatic plants tend to thrive in specific zones.

Algae are most commonly found in the open water zone, along with some free-floating plants, specifically in the euphotic zone.

The euphotic zone is the column of water in which sufficient light exists for primary production. It is often defined as the zone from the surface to a depth at which there is 1% of the amount of light at the surface. Often estimated as 2x Secchi disk depth.

Some algae will be attached to plants, rocks and sediment.

Macrophytes tend to be found on the side-slopes (in the littoral zone), starting with emergent plants closest to shore and ending with submerged plants.

The most striking difference between dugouts and natural ponds is that dugouts are much deeper, with steeper side slopes. Because the littoral zone is relatively small, dugouts tend to have fewer aquatic weeds and more suspended algae than natural ponds.

Different phyla of algae tend to dominate at different times of the year, corresponding to temperature, light and nutrient availability.

Silica (sand or quartz) is a major structural element in the cells of the diatom group of algae. These algae use dissolved reactive silicon (Si(OH)<sub>4</sub>) to build a "frustule" or "glass wall" that surrounds the cell.

At concentrations of less than 0.5 mg/L in the water, diatoms will be limited in growth and hence out competed by other algae groups.

For a bloom to occur, an abundance of existing cells/colonies must be present throughout the water column. Typically, in order for photosynthesis to occur, cyanobacteria and algae must occupy the upper layers

of the water column that are illuminated by sunlight.

However, strong water currents generated by major wind events may circulate or entrain planktonic organisms and animals such as algae and cyanobacteria from the upper illuminated layers into the underlying layers void of sunlight.

To counter the effects of these turbulent conditions, many species of cyanobacteria produce gas vesicles that allow them to regulate their position in the water column.

Thus cyanobacteria produce an abundance of gas vesicles allowing them to rise up through the water column towards the surface where photosynthesis can continue.

This gives cyanobacteria a competitive advantage over less buoyant algae for sunlight. If sudden calm conditions immediately follow lengthy turbulent periods, the cyanobacteria no longer must counter the forces of downward water currents.

However, these organisms are unable to remove excess gas vesicles quick enough and as a result, continue to rise to the surface and essentially become stranded at the surface. Consequently, the formation of a surface bloom occurs.

## Algae Blooms

◆ Large blooms of algae can clog intakes and filtration equipment

◆ When blooms die, often objectionable odours are produced as a result of oxygen depletion and decay processes

◆ Blue-green algae produce substances that are extremely toxic that are capable of causing serious illness or death if consumed

## Summary

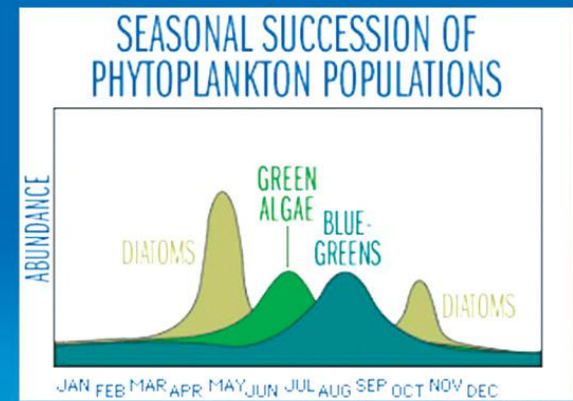
This article briefly describes the biological processes in a dugout. There is much more to a dugout than digging a hole in the ground and waiting for runoff to fill it. The biology of a dugout is one of many considerations that need to be understood in order to have a clean, secure source of

water. The addition of aeration helps prevent taste and odour problems in the water by avoiding anaerobic conditions. Aeration also helps prevent the release of phosphorus from sediments. This limits algae growth and reduces the amount of plant material which will ultimately die and decompose.

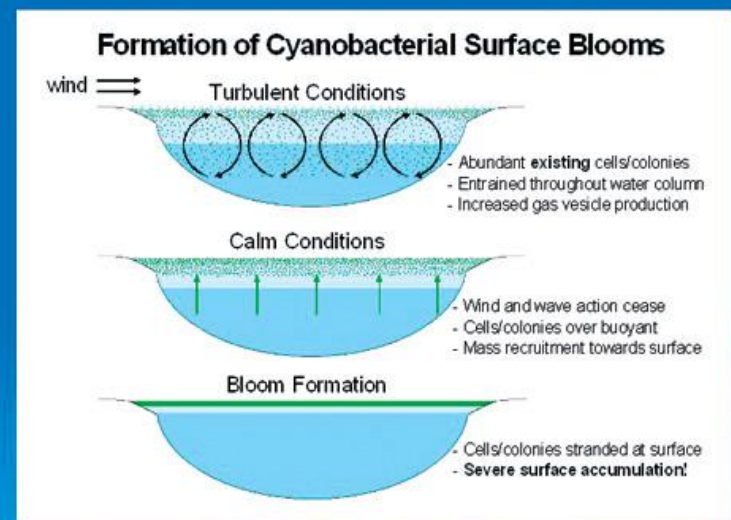
For more information please contact your Alberta Ag. Info Centre or give Dwayne Rogness a call at the County of Lethbridge office, 403-732-5333.

Acknowledgements to Joe Harrington and Jeff Printz for the information

## Seasonal Cycles – Phytoplankton (Algae)



## Understanding Cyanobacterial (Blue-green Algae) Blooms



Source: Ron Zurawell

# Confined Feeding Operations (CFO) Extension Services

“ To reach your nearest CFO Extension Specialist, dial 310-FARM, contact them directly or call your local NRCB office. Dial 310.0000 to be connected toll free. ”

**CFO Extension Specialists**  
Deanne Madsen, Morinville  
780.939.1218

Chris Ullmann, Red Deer  
403.755.1475

Cody Metheral, Lethbridge  
403.381.5885

**NRCB Offices**  
Lethbridge: 403.381.5166  
Red Deer: 403.340.5241  
Morinville: 780.939.1212  
Fairview: 780.835.7111

Alberta



CFO Extension Specialists with Alberta Agriculture and Food (AF) provide technical expertise to livestock producers, consultants, municipalities, and other interested parties. CFO extension services ensure Alberta's livestock industry grows in a competitively and environmentally sustainable manner.

Working in cooperation with the Natural Resources Conservation Board (NRCB), Approval Officers and Inspectors, AF CFO Extension Specialists provide clients with information and tools to support the NRCB application process. They also provide clients information on the regulatory requirements of the Agricultural Operation Practices Act (AOPA) and other relevant legislation.

## What services are available?

Extension services are available to anyone requiring information about the technical requirements and application process for existing, new and expanding CFOs in Alberta.

For producers and their consultants, additional services will be provided specific to the application process.

Extension staff assist clients with the following:

- Assist with determining if a permit is required.
- Understanding the application process and regulatory requirements.
- Collecting information to determine potential site risks and initial site evaluation.
- Providing information on management options to meet regulatory requirements and address potential site risks.
- Directing clients to information and tools to help complete the application process.

## Referral service

CFO Extension Specialists can refer clients to people with other areas of expertise to help them make decisions about their operation.

## How can services be accessed?

AF CFO Extension Specialists provide services across the province and are located in Morinville, Red Deer and Lethbridge.