

Full Dugouts Create Questions on Quality!!

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FORAGE

As one drives through the Peace region, there is one thing that is definitely noticeable and not something that has been all that common over the past few years, dugouts are full! With all the moisture that the area has received in the past few months, dugouts have been filled and in some cases are overflowing. With the excitement of an ample water supply, the question then becomes: **Does this affect the water quality and if so, how and what do I do?**

Causes affecting Water Quality

Runoff water tends to bring dissolved and suspended substances that reduce water quality. These substances include: disease causing organisms; pesticides; plant nutrients/fertilizers; decomposed plant material and algae; fuels, solvents and paints; suspended sediment; and soil minerals. Runoff from feedlots, pastures and cropland to which manure has been used as fertilizer may contain harmful bacterial contaminants. Fecal matter can also be introduced into water sources due to wildlife, birds and rodents. Therefore, surface water is highly susceptible to bacterial contamination, especially when added to by flood waters or during years that experience high rainfall events. Dugouts that are located in line with runoff will find that the water quality will deteriorate more quickly and more often, than those dugouts that do not allow for runoff to flow directly in.



Certain conditions will cause an algae bloom. Such developments in dugouts can cause many issues including: production of toxins in the water; water turbidity/cloudiness; development of tastes and odors; clogging of filters; ineffective disinfectant treatments; formation of toxic chlorination byproducts; and fluctuating oxygen levels between day and night which can be harmful to fish.

However, not everything green is algae. It may be a plant called Duckweed, which can actually be beneficial to dugout water quality due to its ability to remove phosphorus and nitrogen from the water and filter any unwanted matter that may be present in the water. In addition, it can block sunlight, out compete algae and reduce evaporation loss. At first look it may be difficult to determine the difference between algae and Duckweed, but Duckweed is an oval shaped plant that floats at the surface of the water and is the smallest flowering plant, which at maturity, depending on species, can range from 2mm to 20mm in diameter. It basically looks like leaves floating on the water, whereas algae can be characterized by long filaments and threads of cells attached together. Duckweed, however, still requires management, which can be done by making sure that the dead and decaying material is removed from the dugout, generally achieved by dragging floating timber booms across the surface toward the shore.

Health Risks to Livestock & Humans

The major concern with algae blooms, specifically blue-green algae, is the production of cyanobacteria. Some are capable of producing toxins that can damage the liver, nerves, lungs and hearts of livestock. These bacteria float near the surface of the dugout and can accumulate at the edge through the action of the wind. When livestock drink from the side, or water is pumped from near the surface, they can consume large amounts of the bacteria, which in worst case scenario, can result in death. Cyanobacteria's greatest proliferation occurs when the water is warm and has a high concentration of nutrients, especially phosphorus. It can be difficult to distinguish between harmless green algae and cyanobacteria, therefore it is suggested to use extreme caution when there is any sort of algae bloom. Once a cyanobacteria bloom has occurred, there is little that can be done to correct the problem. The best way to reduce the risk is to manage the dugout so that these favorable conditions that produce large populations do not develop.

EVENTS

Feed Grain & Forage Opportunities Conference

Nov 22 - 23 @ Strathmore Travelodge

Topics include:

- feeding system changes
- DDGs & byproducts
- Round bales to corn silage
- Wintering sites & nutrients
- Beef marketing strategies

Individual \$140

Farm Unit \$250

Student \$100

Banquet \$30

Contact: CARA

1.403.664.3777

Environmental Farm Plan

If you are interested in completing your plan please call so we can set up workshop dates and locations.

Growing Forward Assistance

There are still dollars to be found under the **3 Stewardship Programs** and the **Long Term Water Management Plan**.

Are you interested in receiving our newsletter electronically. Please send your email address to jborduzak@gprc.ab.ca

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Not all types of contaminants or algae are responsible for such severe health issues, but they can have a major impact due to the compound's abilities to disrupt and alter vitamin/mineral absorption and interact with other dietary nutrients, potentially making them less available to the animal.

Not only can poor water quality have a direct effect on the health and production of livestock and humans, it can also reduce the ability of the water to be delivered to the appropriate drinking source. This occurs due to a build up of particulate matter or bacteria and may result in the delivery system becoming corroded and inefficient.

Water Testing

If you suspect that your water has been contaminated, it is a good option to get it tested. There are numerous lab testing facilities around the province that have the ability to detect many different compounds. These compounds can range from pesticides to herbicides. However, these tests can be very expensive and likely only beneficial if you strongly suspect contamination.

Treating Water

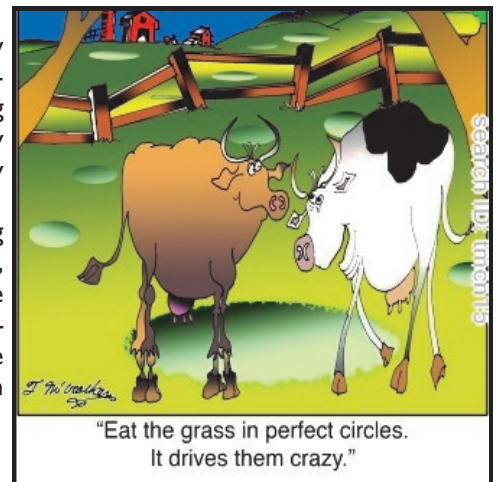
Treatment of dugouts must identify and work with the natural biological and chemical processes occurring in the dugout. There are many different approaches to treating dugout water, but for simplicity, the most common ones have been discussed. Copper can be used to control cyanobacteria, but not brown or green algae. Copper sulphate, also known as Bluestone, is the most commonly used chemical used to treat dugouts. However, if the treatment seems to be ineffective, do not repeat or increase the dose. It is best to treat at the beginning of the bloom to achieve the best results. Be sure to wait a minimum of two weeks before using the water as this allows sufficient time for any cyanobacteria to dissipate.

Using hydrated lime (calcium hydroxide) is another common practice used when treating dugouts. It has been shown to be more of a long term control approach compared to using copper sulphate which tends to be more of a short term control. However, extreme caution should be used when utilizing this treatment method. This is because hydrated lime is extremely corrosive resulting in the necessity of wearing appropriate safety equipment. **When using any treatment method, be sure to follow the labels correctly and if there are questions, follow the advice of a water specialist.**

Aeration can also help in minimizing a decrease in water quality. By aerating the dugout (winter & summer) and increasing the amount of oxygen present in the water, the amount of plant nutrients that are released from surrounding sediments is decreased, the chance of a blue-green algae bloom is reduced and there is less likely the development of any taste or odor problems.

In addition, developing a system to control water flow into the dugout may be good to implement if it is possible and practical to do so. This can aide in directing potentially contaminated flood waters and runoff away from the dugout, which will help to reduce water quality degradation.

In general, farm dugouts provide good quality drinking water for about the first five years. Following this time, as sediment accumulates and dugouts become more shallow, water quality decreases and algae growth becomes more prevalent. Therefore being able to manage a dugout to the best of one's ability will help maintain and possibly extend the life of that particular dugout.



"Eat the grass in perfect circles.
It drives them crazy."