

WINTER WATERING FOR LIVESTOCK

March 2002

WINTER WATERING

Good quality water is essential to every successful livestock operation. Animals that are provided with good quality water tend to have improved health and increased weight gain.

This **Water Quality Matters** publication provides information about the impacts of direct access livestock watering on water quality. It also recommends some of the best management practices to improve water quality and winter watering.

PROBLEMS ASSOCIATED WITH DIRECT ACCESS WATERING DURING WINTER

For years, producers have been watering cattle and other livestock throughout the winter months by cutting holes in the ice. Even though livestock receive water, there are a number of long term problems associated with this watering practice. Livestock death by drowning or exposure can be a significant problem. Losing an animal through the ice results in considerable profit loss, as well as enormous stress on the animal if it should survive.

A long term problem associated with direct access winter watering is poor water quality. Manure loading is common in and around water sources. This problem is more evident in winter. As the ice melts in the spring, animal excrement introduces disease-causing organisms such as bacteria, viruses, and parasites into the water. Excrement

BEST MANAGEMENT PRACTICES

Sustainable agriculture requires that soil and water quality be maintained. Some farm practices have the potential to cause environmental harm, which may affect rural and urban areas alike. Many of the potential negative impacts of farming can be greatly reduced by the use of *Best Management Practices*. These are agricultural practices that reflect current knowledge about conserving soil and water without sacrificing productivity.

Water is continually cycling. The water that we use has been used before. Producers and consumers, rural and urban people, and the public and private sectors are all responsible for using water wisely to ensure that the resource is maintained for others. **Best Management Practices** are one way for the agricultural sector to help preserve water quality.

also introduces nutrients into the water, which in turn can cause excess algae and plant growth during summer months. Some cyanobacteria, often mistakenly referred to as 'blue-green algae', produce toxins which can be fatal to livestock when ingested in large quantity.

Another problem is trampling, browsing, and the subsequent destruction of the vegetation along transition zones near water. Animal traffic can also cause serious damage to the side slopes of dugouts and stream banks, destroy riparian areas, and result in increased sediment loading in the water.

THE ESSENTIALS OF A REMOTE WINTER WATERING SYSTEM

A winter watering setup will differ from location to location. The main objectives when choosing a location are access, distance from the source water, elevation, and shelter.

The creation of an elevated mound around the wet well is recommended. This gently sloping mound will act as an insulator and aid in the prevention of frost build-up. Another benefit of a mound is to assist with surficial drainage. During thaw events that occur in late winter and spring, having an elevated watering location will ensure a dry, clean, safe watering site. Settling of the soil around the wet well may also occur. Having an elevated mound will prevent depressions around the watering point.

During the summer, water near the surface of a dugout contains 50 to 75% less turbidity, colour, and odour. A floating intake system is recommended to remove the best quality water from the source. Prior to winter, the float is lowered below the expected ice level by means of a nylon or steel line threaded through an anchor that is located on the bottom of the dugout. Water flows by gravity from the dugout, through the intake, and into the wet well.

Personal preference, reliability, herd size, remoteness, and site location all contribute to the overall cost of a system.

Some of the considerations in designing a system include:

- optimum pumping rate
- distance between pump and outlets
- height difference between outlets and source
- maximum daily water requirement

With this information, equipment suppliers will be able to provide guidance for equipment selection and sizing.

Choosing a suitable location for a remote watering system is critical. When siting, it's important to ensure that drainage around the wet well doesn't run back into the water source (dugout, stream, etc.). As well, the wet well should be placed at least 5 - 10m away from the edge of the water source.



This practice can lead to animal safety and water quality concerns

ALTERNATIVES

Most winter watering systems available on the market today have a common setup. The main components are an intake line, wet well, power source, and pump. Every system has its strengths and weaknesses.

There are several different types of winter watering systems available. Descriptions of a few of the most common types follow:

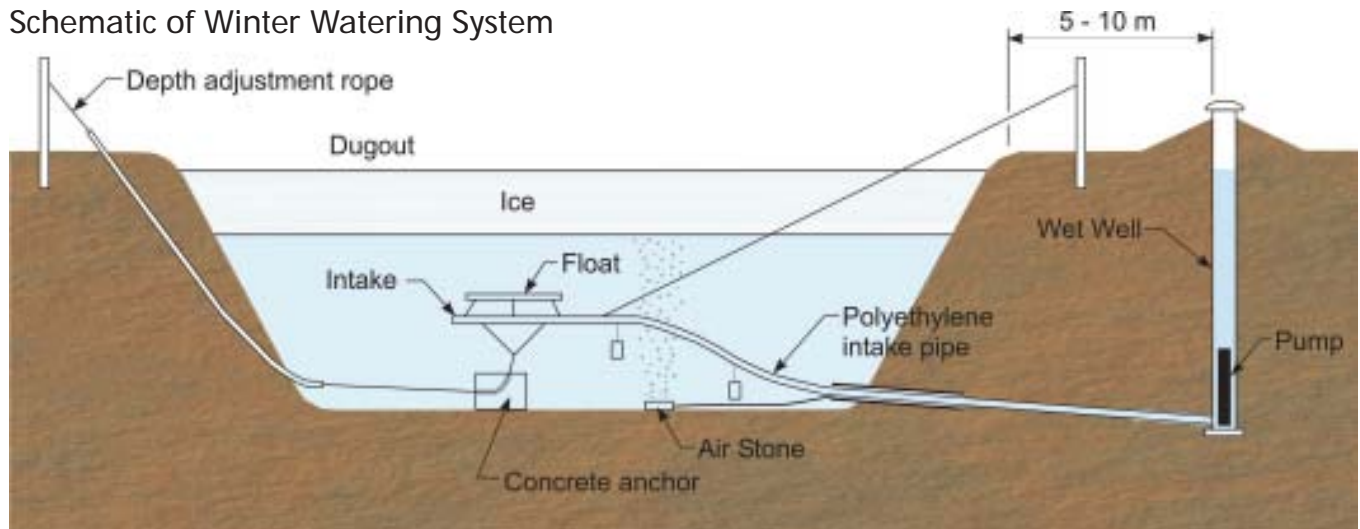
Door Switch

This system is set up directly over the wet well. Located on the hinged door is a switch which activates the pump. When an animal reaches the watering trough, it must push open the door slightly. The switch then activates the pump which is located near the bottom of the wet well. Water is



Livestock activate the pump through a switch located on the door frame. A self draining basin returns water to the wet well

Schematic of Winter Watering System



For detailed information contact Alberta Agriculture or see www.agric.gov.ab.ca/agdex/700/16b34.html

then moved up to the trough. Situated near the back of the trough is a screened overflow return line. The water level in the trough is regulated by the height of the overflow return line. A time delay is built in to avoid pump cycling. The pump will run for a preset time after the door is closed. This allows the second animal to follow and receive a drink of water. After the animals have finished drinking, the pump shuts off. A series of small drain holes are located at the base of both the discharge and overflow return lines. These holes allow the water to drain back into the wet well so that no water remains in the trough to freeze. Producers who use this type of system have found that livestock will adapt to it in a couple of days.

Motion Detection

This system uses a motion sensor to activate the pump. Construction of a 64 cm (25") diameter round trough makes this setup unique. The trough is double walled and fits on top of a 61 cm (24") culvert or wet well. Water is pumped into the trough through the bottom. The water level rises in the basin to a set of overflow holes that return excess water back into the wet well. These holes are located near the top edge of the trough to prevent overflow onto the ground. The pump will run as long as there is motion within the range of the motion detector. To prevent the pump from starting and stopping, a delay is built in to allow the pump to continue running for a preset time. This delay allows the next animal to approach the basin and get water before the pump shuts off. Water remaining in the basin returns to the wet well through the bottom of the



This motion detection watering system pumps water into a basin as livestock approach

trough so that no water remains in the basin to freeze. Motion detection systems are adaptable to a variety of setup configurations.

Air Circulation

This system pumps water from the wet well into an insulated, doughnut-shaped trough. A small air compressor operates continuously to prevent the water from freezing. The compressor draws warm air from the wet well and injects it near the access hatches and float switch. The float switch signals the pump when the water level is low to keep the trough full. Cattle drink water through access hatches in a fitted, insulated lid that sits atop the wet well.

There are a few benefits to the air circulation system:

- no water returns to the source
- this system takes advantage of the ground's natural warmth, therefore no additional heat is required
- the addition of air improves the water quality
- there is more than one access hatch, so more than one animal can drink at a time

On extremely cold nights all but one of the access hatches may have to be covered to prevent heat loss.

All of these systems can use solar energy. Solar energy is an efficient, environmentally friendly, relatively inexpensive way of providing power to remote locations. Where available, a standard power connection is preferable.



This water system circulates water (by air or water) in an insulated trough

THE BIG PICTURE

It's important to provide good quality water to livestock. There are a number of reasons why producers should consider a remote winter watering system. They include: improvements in water quality and herd health and safety, reduced manure hauling costs, and extended grazing seasons.

By adapting these new technologies and best management practices in day to day operations, producers can work towards an environmentally friendly livestock industry.

For more information about remote watering systems and cattle see the following **Water Quality Matters** publications:

"Alternatives to Direct Access Livestock Watering" and "Water Quality and Cattle".

For further information on rural Prairie water quality and treatment technology:

- read other publications in PFRA's **Water Quality Matters** series;
- visit the PFRA Website at www.agr.gc.ca/pfra
- read Prairie Water News available from PFRA, or on the internet at www.quantumlynx/water; or
- **contact your local Prairie Farm Rehabilitation Administration Office** (PFRA is a branch of Agriculture and Agri-Food Canada).

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FUNDING: Strategic support and funding for this project has been provided by the Canada-Saskatchewan Agri-Food Innovation Fund (AFIF).

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