



Alternate Livestock Watering Systems for Pastures and Feedlots

Improve your production - Enhance your environment

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INTRODUCTION:

Various options exist for producers to improve the way livestock receive water in their pastures or feedlots on Prince Edward Island. Watering systems vary between the inexpensive, but require more management by the producer, to the more expensive, but require less management by the producer. Watering livestock in the winter also provides many more challenges. Because each farm is unique, watering systems must be tailored specifically for the producer, livestock, geographic location, and topography.

This fact sheet introduces some options available when considering an alternate watering source for livestock.

WATER SYSTEMS FROM ON-SITE OR NEARBY WELLS:

Installing a watering system from an on-site or nearby well can often be the most flexible, reliable, and cost efficient system available to producers, especially when dealing with large herds. PEI producers are installing well systems with piping distances as far as 3,500 feet. Selection of the proper pipe size will reduce significant pressure loss due to friction,

but typically it ranges between $\frac{3}{4}$ of an inch to 1 $\frac{1}{4}$ inches in diameter. If the watering stations are at an elevation lower than the well itself, then the positive gravity flow effect will allow selection of a smaller pipe size to the tanks. The positive gravity flow effect also reduces the demand of the pump to lift or push water. Water lines can either be buried underground or run over the top of the ground. If the lines are not buried below frost depth, it is recommended to drain the lines in the fall.

For outdoor winter feeding areas, energy free or energy efficient bowl technologies have made water available year round for livestock.

Well systems are especially recommended for pastures with intensive grazing management in place. Water can be made available to each paddock, reducing the distance for livestock to walk. Cattle will eat and drink more and be more productive as a result. Quick connect couplings make it easy to use only one water tank by moving the tank to other hydrants within the pasture system.

GRAVITY FLOW SYSTEMS:

Gravity flow systems do not require any type

of pumping equipment to supply livestock with water. Simply if the site has sufficient elevation difference along the length of a water source, a length of pipe alone can supply a stock tank with a continuous flow of water. A second length of pipe would return the overflow water back to the stream.

If a site is suited for a gravity flow system, then installation will be easy. A typical spring flowing out of a side hill is usually an ideal location. It does become more difficult to install a gravity flow if:

- a) the stream banks are significantly higher than the stream or spring, or
- b) the stream or spring has a minimal grade (less than 1 percent) as the pipe becomes more susceptible to air locking.

However when these systems are installed and functioning, they work relatively trouble free, with practically no maintenance required.

BILGE PUMPS:

The bilge pump system involves a marine sump pump placed directly into a stream or pond and a 12-volt battery power source. Bilge pumps are capable of pumping water to a stock tank at a rate of between 2000 and 3700 gallons per hour. The bilge pump operates when the water level drops triggering an electric float switch. The power source is generally a 12-Volt battery, such as a car or marine battery, but some bilge pumps can run on a 110-volt power line.

The strength of this system is its low cost, portability, and ability to water large numbers of livestock. As well the simplicity of the system makes any maintenance a quick and inexpensive process.

The main disadvantage is the charging of a

battery every six or twelve days. Farmers generally have two deep cycle batteries to alternate between the bilge pump and a battery charger.

Because it is a sump pump the float switch supplied with the bilge works backwards to what a producer would need for a stock tank - the pump would be turned on only when the tank is full. Innovative producers have been able to install a second float mechanism to reverse this action. Others have purchased a proper float switch from aquaculture suppliers.

PASTURE PUMPS:

Over the past 9 years, pasture pumps have become quite common. These pumps are very easy to install, can be easily moved from one location to another, and are adaptable to many situations. They can lift water about 27 feet vertically and pump it out 125 feet horizontally. They will work in ponds, streams, or springs - basically anywhere with at least 4-6 inches of water at all times.

They are operated by the cow pushing its nose against a lever which primes the pump and delivers about a litre of water into the bowl section. One pump is said to be adequate in supplying water to 30 head. However field studies have shown that this number will vary depending on the pasture size and design, as well as the size and kind of animal. In a small field, or one that is being strip grazed, one pump can accommodate a larger number of animals, especially beef cattle who consume much less water than dairy animals.

Because only one animal can drink at a time with pasture pumps, these may not be recommended in large pastures. On large pastures watering tends to become a social event as the whole herd follows the lead. Even with one pump to 25-head, animals may

become aggressive waiting for water, and may return to graze with little or no water consumed. When water is close to the pasturing area, watering becomes an individual function. Several pasture pumps can be used in tandem, compensating somewhat for large herds or long walking distances. These pumps are not recommended in most circumstances for calves as they are unable to operate them. These pumps have worked out well with heifers however.

SOLAR WATER SYSTEMS:

Solar water systems use the power of the sun to charge or operate a 12-volt pumping system. A water reservoir, in addition to the stock water tank, has been used by farmers as a back up during occasional periods of extended cloud. The power stored in the batteries also assist during these periods. Other components include solar panels, pump, and electric float switch. Most solar system suppliers can custom design watering systems.

Solar systems are an attractive option when herd size warrants the investment and the pasture is in a remote location. Their popularity on PEI may increase as technical assistance becomes more available and as technology improves.

HYDRAULIC RAM PUMPS:

Hydraulic ram pumps have been used for pumping water since the 18th century. Hydraulic ram pumps use the premise of falling water and a water hammering effect to pump a portion of this falling water into a stock water tank. For each foot of water drop, the pump is capable of lifting water 10 feet. The pump can be either located in the stream or along the stream bank. These systems have been winterized for year round watering.

The hydraulic ram pump will pump with small

bursts of water at approximately 25 to 100 compression per minute. As a result the pumping rates are slow and a water reservoir, in addition to the stock water tank, is recommended.

Proper installation and tuning of a hydraulic ram pump is critical. Installation is by trial-and-error. As a result the installation will require more time than other watering systems will. In recent years some producers on PEI who tried the ram were unsuccessful installing these systems properly, while others were very successful. These pumps can offer practical and reliable service but require an appropriate location, good system design and proper installation.

SLING PUMPS:

A relatively new type of pump available for livestock watering is the sling pump. Water is pumped using an Archimedes Screw principal (analogous to how an auger moves grain uphill). This pump is ideal for use in streams with a minimum depth of 16 inches. The speed of the moving water turns a cone shaped pump, enabling it to move 1,000-4,000 gallons per day. The manufacturer claims that the pump will lift or push water 20-70 feet vertically and up to a mile horizontally. Power for these pumps comes solely from the speed of the water in a stream or river. These pumps only have one moving part, a swivel coupling, making it mechanically reliable. It is rather new to the Maritimes, so there is a lack of technical support and evaluation for these systems. Only one PEI producer has tried the sling pump, but he was unsuccessful installing it as his site was not suitable.

FINANCIAL ASSISTANCE:

Financial assistance is now available from the *Agriculture and Environmental Resource Conservation (AERC)* program at a level of

66% of total eligible costs. Costs can include items related to installation of fences, watering systems, and livestock stream crossings. Contact: Patsy Reardon (902) 894-0340.

TECHNICAL ASSISTANCE:

Technical assistance regarding watering systems, stream crossings and fencing components is available from the PEI Soil and Crop Improvement Association.

PLEASE CONTACT:

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