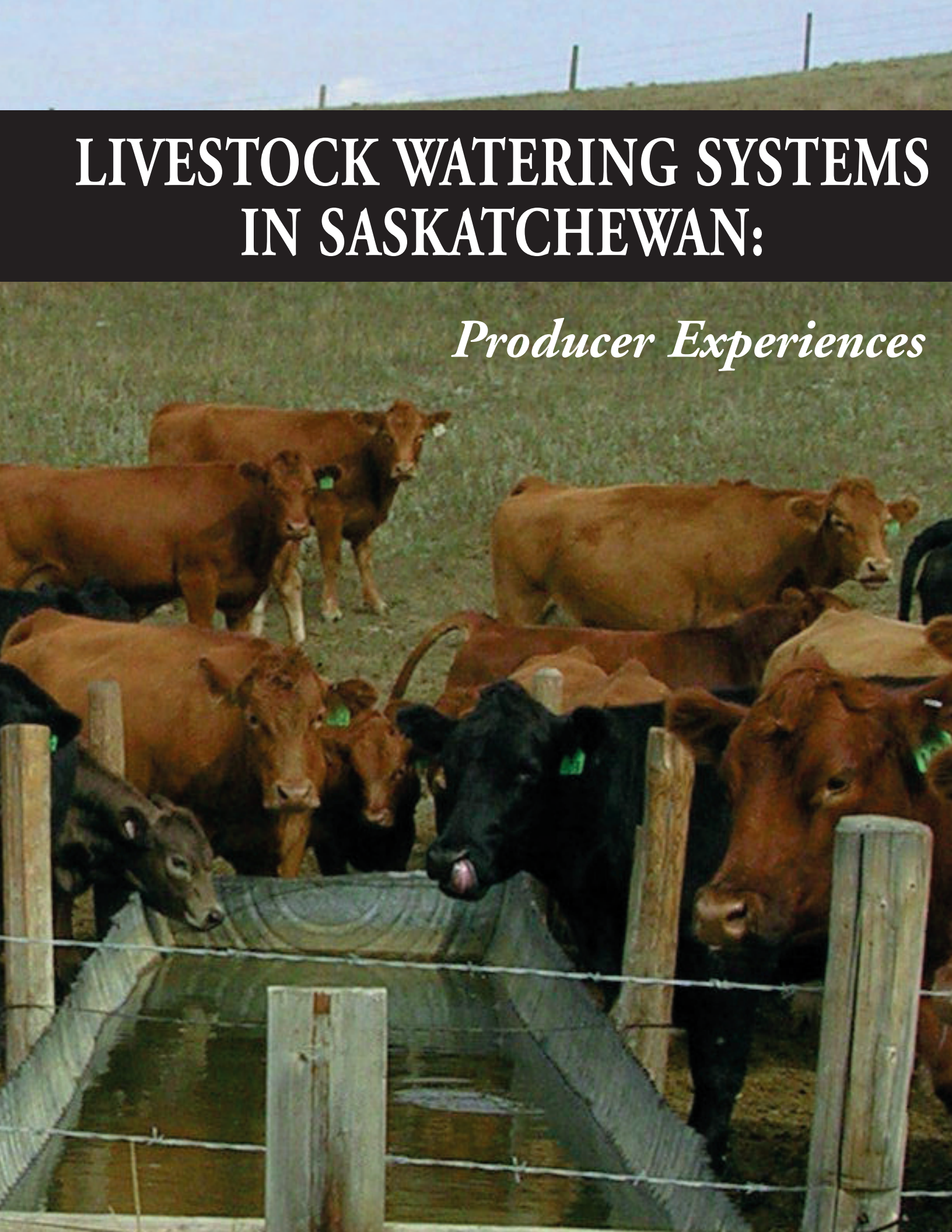
LIVESTOCK WATERING SYSTEMS IN SASKATCHEWAN:

Producer Experiences



Foreword

Livestock Watering Systems in Saskatchewan:
Producer Experiences
by
Tara Mulhern Davidson and Stacey Gulka

Having adequate supplies of high quality water for livestock is essential for successful livestock operations in Saskatchewan. Many producers use wetlands or dugouts as their main water source for livestock watering. Often these areas have increased animal pressure leading to heavy impacts on the shorelines that can reduce water quality.

Providing clean water can improve livestock health and at the same time help maintain the health and productivity of riparian and upland habitats. Studies show that by providing alternate watering locations, producers can improve weight gains of their animals and improve the profitability of their livestock operation.

Every livestock operation is different and every producer has to deal with unique challenges associated with the operation and management of their herd to achieve sustainable economic and ecological goals. As more and more producers look to make improvements to how livestock are being watered throughout the year, they begin to ask questions about the best options for them. Information on the following questions can be found in this document:

1. What are some of the things that I need to consider when deciding on a watering system?
2. What are some examples of alternate watering systems?
3. What type of system will fit my water source?
4. How will I power my system?
5. What are the size requirements I need to consider?
6. What type of infrastructure will I need to invest in?

This document was developed to provide livestock producers with actual examples of livestock watering systems that producers in Saskatchewan are using. Each example is unique in some way. There are many examples of livestock watering systems across Saskatchewan. However, this document provides a small sample of systems that producers are using to help achieve their economic and ecological goals.

We thank all the producers who have participated in developing this document by sharing their time and experiences in developing alternate watering systems for their livestock operations.

Daryl Nazar, Project Coordinator
Ducks Unlimited Canada

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Content Compilation
This directory was compiled by Tara Mulhern Davidson, Prairie Farm Rehabilitation Administration (formerly employed by Saskatchewan Watershed Authority in partnership with Ducks Unlimited Canada) and Stacey Gulka, Saskatchewan Watershed Authority (in partnership with Ducks Unlimited Canada). Both Tara and Stacey were hired through funding from Agriculture and Agri-Food Canada's Greencover Canada Program to deliver the project entitled "Range and Riparian Stewardship in the Missouri Coteau". Daryl Nazar (DUC) was the project coordinator. Ducks Unlimited Canada and Saskatchewan Watershed Authority have also partnered to provide funding for this project. Producer stock watering projects and descriptions were adapted from on-site visits to producer operations and producer testimonials.

Project Reviewers
Bob Springer PAg - Saskatchewan Watershed Authority
Tom Harrison PAg - Saskatchewan Watershed Authority
Jeremy Brown PAg - Saskatchewan Watershed Authority
Paul Chomos - Saskatchewan Watershed Authority
Ross Macdonald-PAg - 98 Ranch Inc.
Michel Tremblay PAg - Saskatchewan Agriculture and Food
Lorne Klein PAg - Saskatchewan Agriculture and Food
Tara Mulhern Davidson AAg - Prairie Farm Rehabilitation Administration
Ron Moss PAg - Prairie Farm Rehabilitation Administration
Dale Regnier - Prairie Farm Rehabilitation Administration
Michael Champion PAg - Ducks Unlimited Canada
Stuart Cairns –PAg Ducks Unlimited Canada
Duane Hill –PAg Ducks Unlimited Canada
Daryl Nazar PAg -Ducks Unlimited Canada

Most importantly we would like to extend our appreciation to all landowners who offered their time and explanations during the various stages of developing this directory.

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Canada

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Livestock Watering Systems – Beneficial Management Practices

Good quality water for livestock is critical. Traditionally livestock have relied on direct-access water sources, such as creeks, dugouts, sloughs or dams. However, there are several important reasons to consider developing an off-site watering system on your farm or ranch:

WATER QUALITY

- Healthy riparian areas are able to filter and buffer substances from run-off that may negatively affect water quality. Since water is the single most important factor in livestock daily nutrition, it is important that the riparian area is able to perform this filtering function. Water quality parameters such as total dissolved solids and mineral levels should be monitored. A bacterial analysis is used to assess the presence of micro-organisms that may be harmful to livestock. Chemical analysis is used to assess the mineral content of the water source, this includes total dissolved solids, major ions, heavy metals, and trace ions. Information on the safe levels of each of these parameters for livestock water sources is available at:

  www.agriculture.gov.sk.ca/Livestock_Water_Quality

SUSTAINABILITY

- Water is a precious resource on the prairies. Protecting your water source and insuring its future sustainability is perhaps the biggest benefit you can gain from establishing an off-site water system. Developing a stock water system will not only benefit man-made stock water sources such as dugouts and dams, but will help protect natural stock water sources, such as creeks, rivers, springs, and sloughs.

Riparian areas perform many important ecological functions, including bank maintenance and groundwater recharge. These functions increase the stability and reliability of the water source. Riparian areas can also be an important source of forage for cattle and other livestock, as well as provide crucial wildlife habitat for many prairie species. Riparian areas and other water sources are essential to producers and should be managed to ensure their sustainability.

Extending Seasonal Flows

- Extending the supply and quality of a water source at times of heavy run-off. Heavily impacted water sources may not last long into the grazing season, and water flows can slow or even stop in some situations.
- Reducing the need to frequently clean-out dugouts.

  By pumping water into a trough, livestock will spend less time in a dugout and "tramping in" is less of a problem.

IMPROVED ANIMAL PRODUCTION

Improved animal gains

- There are many studies demonstrating that weight gains are better on cattle that drink water from an off-site water system than directly from the water source. Better weight gains equal a better bottom-line!

Improved herd health

- Producers often find that herd health improves when cattle are not directly accessing water, and diseases such as hoof rot and mastitis are reduced dramatically.

GRAZING MANAGEMENT

Animal Distribution

- Moving and strategically placing water systems to improve livestock distribution on a pasture.

  Example: A shallow pipeline that enables water to be pumped into areas of a pasture where cattle had previously been reluctant to graze.

Flexible Grazing Plans

- Allowing some flexibility to use pastures at different times of the year or as part of a grazing rotation

  Example: A portable trough system that can be moved from pasture to pasture.

PLANNING AN OFF-SITE SYSTEM:

There are a few things to consider when planning an off-site water system:

- What is the source?
    - o Creeks, springs, sloughs, and rivers are natural riparian areas and can be excellent sources of stock water.
    - o Dugouts, dams or wells are human-made stock water sources and require capital investment. These sources are important in areas and pastures where water is not naturally present. Wells provide water where surface water is not available.

- What type of system?
    - o Pipelines (shallow or deep)
    - o Pump (submersible or surface)
    - o Gravity fed
    - o Spring development
    - o Access ramp

- What type of infrastructure?
    - o Specialized energy equipment (solar panels, wind chargers, batteries, windmill)
    - o Pipe
    - o Trough or water bowl
    - o Fencing or stock panels
    - o Gravel or sand to provide a base around trough
    - o Specialized well equipment (cribbing, pumphouse)
    - o Storage tanks
    - o Herd expansion potential and required infrastructure

- How to power the system?
    - o Solar
    - o Wind
    - o Electricity
    - o Gravity
    - o Animal Power
    - o Stream flow
    - o Fossil Fuels

- Size Requirements?
    - o Storage capacity
    - o Type of animal watering (Cows with calves or without? Yearlings? Sheep?)
    - o Maximum number of cattle that will require water from this system
    - o Distance and height/lift from water source to trough

- Season of Use?

  Off-site watering systems can be equipped to function throughout the year regardless of the weather. In the winter months, your system may require some important equipment or maintenance to keep it from freezing. Winter systems can be functional by preventing water troughs from freezing using several methods:
    - o Insulated troughs with limited surface water exposed
    - o Propane heaters, or another source of heat, which prevents water from freezing
    - o Circulating water, which continuously moves water throughout the system to prevent freezing
    - o Wet wells, which work by using the heat from the ground to keep a system thawed
    - o Drain-back mechanisms, where all water drains back into the water source if it's not consumed by the animal

One of the most important factors in implementing a stock water system is making sure that the system has ample storage capacity and that it is checked regularly. Producers may want to think of a back-up water supply in the event that there is a system malfunction. Planning ahead will help to ensure that livestock will have a steady supply of water, which can become critical in the summer months.

There have been many changes in water systems throughout the past decade. Reliability and affordability are the two biggest changes in many of today's water systems. The movement from steel-based products to polyethylene-based products has made systems lighter, easier to handle and relatively maintenance free. Many producers have come up with new ideas to provide water for their livestock to fit their needs. Innovative systems have been developed, and existing systems have been revamped, to suit budget and animal requirements. In many cases, producers have developed systems using every-day inexpensive recycled materials, common on many farms, to create a low-cost but effective stock water source. This guide has been developed to display some of these producer innovations from throughout Saskatchewan.

Bryce Bringedahl
Minton, Sask.

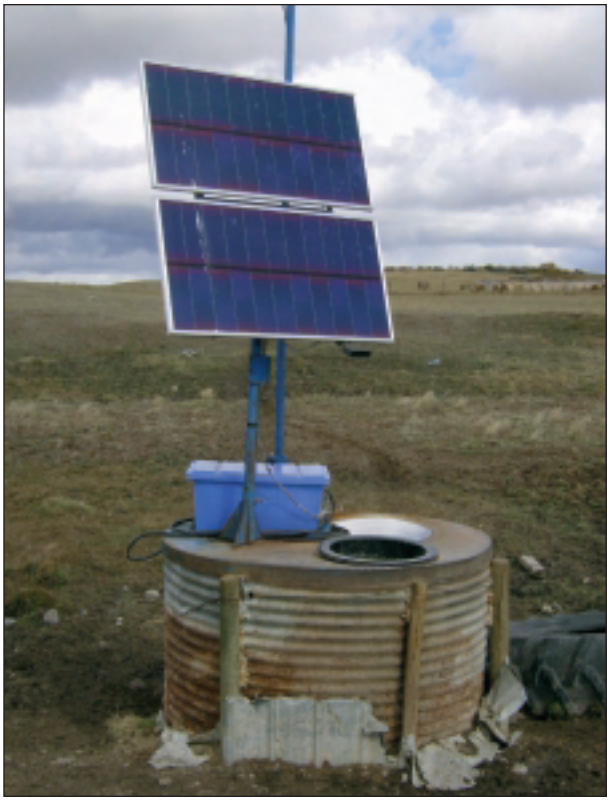
Water Source: *Well*
Power: *Solar and wind*
Accommodates: *250 head of cattle*
Feature: *Drain back system*
Season of Use: *All season*

Type of System: Winter wet well powered by solar and wind energy

System Description: Bryce's system consists of a 6 x 20 foot culvert with 15 feet of perforated casing. The water bowl consists of a double walled tub that fills from the middle. The pump is turned on by a motion detector. After putting the system in, Bryce had trouble with the wet well freezing so he simply wired three plastic drums together and hung them under the water bowl inside the casing. The smaller area for water to rise within the drums kept the water from freezing by utilizing the warmth from the ground and the water. Bryce has had no problems since.

Benefits: The hybrid system Bryce installed allowed him to get his cattle out of the yard and relieve some of the pressure on his well. He has now been able to winter calves while rejuvenating his pastures with manure and winter feeding.

Comments: Bryce says that if he were to do it again, he would have the water pumped from a dugout as a reservoir into the wet well and a pipeline trenched out from his wet well to accommodate more troughs.



A view of the inside of the wet well showing the arrangement of the plastic drums

Tip: *Reduce the air space within a wet well to make better use of the geothermal heat released by the water*

Larry & Evelyn Roosen
Antelope, Sask.

Water Source: *Well*
Power: *Wind*
Accommodates: *130 cows*
Feature: *Propane heater*
Season of Use: *Winter*

Type of System: Winter wind powered pump/float propane system

System Description: After losing cattle every year through the dugout ice, Larry and Evelyn decided to develop a safer watering system. There was no power available at the winter water location so the Roosens dug a well near a spring and placed a 6 x 8 foot building over the well. The building was insulated and sheeted. A wind charger provides power to two six volt batteries that run the submersible well pump. Water is pumped from the well into a stock water trough that is located half inside and half outside the building. The water that sits in the trough is heated by a propane heater to prevent freezing.

Comments: During the winter months Larry figures the unit uses approximately 100 lbs. of propane per month. The system had a few bugs with the propane heater, but provided water for 130 head for three winters. Their cattle learned to stagger their drinking times and adapted well to the set-up. The cost of propane is one downfall of the system; however the Roosens find the system fairly low maintenance otherwise. A modification they would suggest is to put a lid on the enclosed half of the trough so that moisture and condensation did not accumulate within the building. They installed a vent in the well house to help expel the moisture within the building, but the vent froze up when the temperature got cold. Larry also suggests having an extra battery to charge the system if necessary.

Propane tanks and windmill system.

Half of trough is accessible to cattle and half is enclosed inside building

System components inside shelter

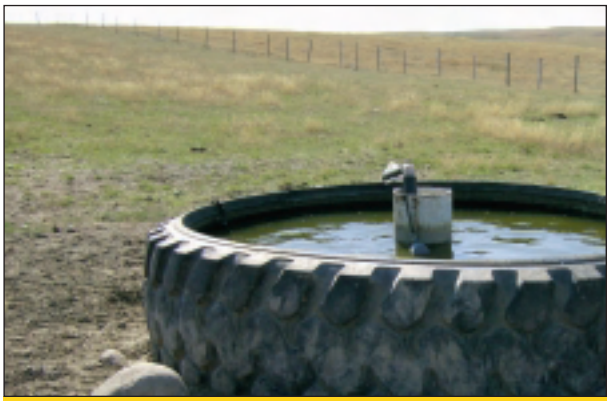
Dennis Rude
Lake Alma, Sask.

Water Source: *Dugout*
Power: *Windmill*
Accommodates: *120 head of cattle*
Feature: *Storage tank*
Season of Use: *Summer*

Type of System: Windmill

System Description: Dennis has harvested wind energy for the past 15 years with his summer windmill. Power generated by the windmill is used to pump water from a dugout. The water is then fed into a 1440 gallon holding tank which gravity feeds from the tank into a trough located approximately 100 feet from the dugout and system.

Comment: Dennis believes that there is no need to change something that works as he has had no significant problems with the system since establishment. When asked why he decided to utilize a windmill system he relayed "there wasn't solar power back in '88 when I put this system in and I haven't had any problems with it so why change it?"



Trough

Windmill, holding tank and pipeline

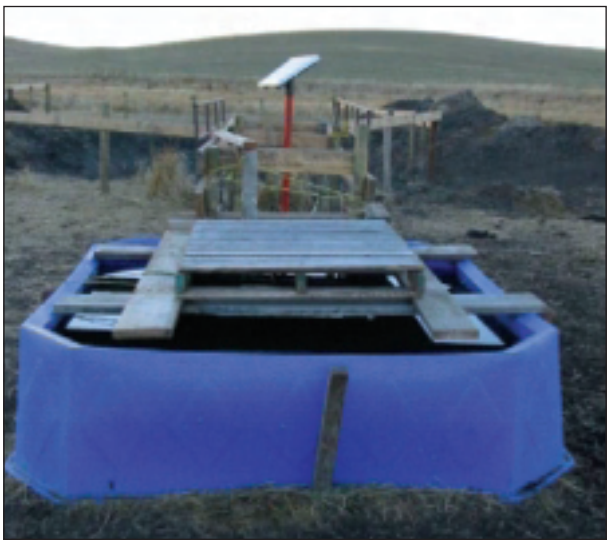
Tip: *Having a water storage tank as a back-up can prevent problems if the pump system stops running.*

Brian Cornelson
Herbert, Sask.

Water Source: *Dugout*
Power: *Solar*
Accommodates: *35 cow-calf pairs*
Feature: *Drain back set up*
Season of Use: *Summer*

Type of System: Summer solar system

System Description: Brian dug a small dugout that he fenced to prevent the cattle from directly accessing the water. He built a solar watering system using a floating pump to draw water from his dugout through a 1.5 inch water line into a stock water trough. Concerned that his cattle could damage parts of the float system, Brian created a structure on top of the trough using a wooden pallet and some rough lumber that allows the cattle access to the water, but nothing else. The cattle were also restricted from accessing the solar panel and electrical components by surrounding the equipment with corral panels. The system can be used up until freeze-up, as any water that is in the pipe continuously drains back into the dugout.



Pallets and stock panels used to keep cattle away from system components.

Comments: The system has allowed him to have more flexibility with his grazing management and the potential is there to use this system at multiple locations throughout the grazing season. He also feels the system could comfortably provide water for up to 50 pairs.

Tip: *Drain-back mechanisms can help prevent freezing in the fall, but it is important to reduce contamination risks by draining the pipe only.*

Todd & Dennis Erickson
Central Butte, Sask.

Water Source: Dugout
Power: Solar
Accommodates: 80 cow-calf pairs
Feature: Under road waterline
Season of Use: Summer/Fall

Type of System: Solar powered pump system

System Description: The Ericksons decided to set up two remote water systems on their operation. At one site, the water line was buried at a depth of 2 - 3 feet to carry water from a dugout to a 600 gallon tank across the road, using a solar water pumping system. At the second site, water is again pumped from a dugout using a solar pumping system, however, at this location the water line is situated above ground. This site provides a source of water for animals in many different pastures and is used into the fall. The systems are able to provide water to 80 cow-calf pairs out of each 600 gallon trough.

Water source

Comments: The Ericksons have a couple of suggestions for this type of system. They wish they would have moved a single trough around to each system, rather than setting them in place permanently. They also recommend that the troughs are placed at a distance from the fenceline in order to prevent pressure on the fences, which leads to calves getting out.

Trough and supports

Tip: *Anytime water needs to be moved from one quarter to another it is important to check into the proper procedures for doing so and whether or not a permit must be issued. Contacting your local Saskatchewan Watershed Authority office to guide you in the right direction when planning water pipeline systems.*

Dwayne and Karen Fettes
Gladmar, Sask.

Water Source: *Dugouts*
Power: *Solar*
Accommodates: *200 cow-calf pairs*
Feature: *Wooden slats around troughs*
Season of Use: *Summer*

Type of System: Portable solar system

System Description: When Dwayne implemented this system, it featured two galvanized steel troughs, one for the cows and a shorter trough that allows the calves easy access. A gravity feed system is used as additional storage. There are wooden planks surrounding the troughs to prevent cattle from standing in moist and mucky areas. The system pumps water from dugouts through blue collapsible line. The pump is powered by solar panels. The connections, electrical workings, and pump, is fenced out with a portable electric fence to avoid damage. The rest of the dugout is not fenced; however it easily could be by connecting the electric fence to the battery with an adaptor. The cattle generally stay away from the dugout, preferring instead to drink fresh water from the troughs.

Comments: Following installation of this system in 2000 some modifications have been made. The holding tank on Dwayne's system was white, which promotes algae growth, so the new system now has a larger yellow holding tank and plastic trough. He hasn't had any excessive algae growth since. Dwayne has also incorporated a rigid 1.5 inch hose on the system to reduce friction for easier pumping.

Overall set-up

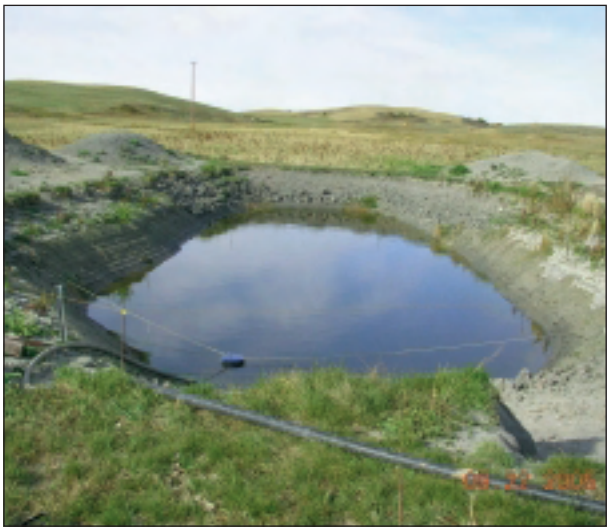
Tip: *Galvanized steel troughs, though durable, are fairly heavy to pull in a portable system. Newer, lighter polyethelyne troughs are handy in portable systems.*

Paul Fradette
Radville, Sask.

Water Source: *Dugouts, springs*
Power: *Solar*
Accommodates: *150 cow-calf pairs*
Feature: *Silage bunker water trough*
Season of Use: *Summer*

Type of System: Portable Solar water system

System Description: Wanting to improve the poor livestock distribution in his pastures, Paul decided to develop several smaller dugouts in his pasture in addition to the one that he had been utilizing. With funding from Saskatchewan Watershed Authority, Ducks Unlimited Canada, and the Canadian Adaptation and Rural Development in Saskatchewan, he implemented a solar watering system mounted on a trailer to pump water from his new dugouts into a trough that's made from an old silage bunker. The trough is lowered to the ground in the spring to allow calves to drink out of it. The water from the pipes drains back into the dugout to prevent freezing later in the year. The dugouts are electrically fenced, powered by the solar panels, and Paul leaves one end of the fence open so the cattle can drink from the dugout if they choose.



Benefits: Paul prefers the smaller sized dugouts as his source of water because there is less water loss through evaporation, and trampling isn't an issue. The system has allowed Paul to achieve a rotational grazing system with more uniform livestock distribution and provide the cattle with a clean source of water that will be sustainable.

Tip: *When using a portable trailer system it may be beneficial to fence the trailer in with the dugout as cattle will rub on the trailer and possibly cause damage.*

Blaine Lohse
Beaubier, Sask.

Water Source: *Well*
Power: *Solar*
Accommodates: *50 – 100 cow-calf pairs*
Feature: *Gravity feed storage tank*
Season of Use: *Summer*

Type of System: Portable summer solar system

System Description: Cattle distribution was a problem on the Lohse ranch, so Blaine's solution was to dig a well in a previously under-utilized portion of his pasture and install a solar water pumping unit on this well. The 30 foot well yields approximately 70 gallons/minute. He built a drill-stem fence around the well cribbing to prevent the cattle from damaging the well and the area around it. A portable solar water system pumps water from the well into a large storage tank which then gravity feeds into a small trough for calves and a large trough for cows.

Benefits: This system has helped to prevent contamination of the water sources that the cattle were directly accessing before the system was implemented.

Blaine has noticed that the cattle have performed well, and water quality improved and is more reliable using this system.

Comments: Blaine says, "I'd recommend this system to anybody," saying he wouldn't want to allow direct access to a dugout again. If Blaine could change one thing on the system, he would have made the system a permanent water station, as opposed to a portable one as the system has stayed at the same site for the entire grazing season. Saskatchewan Watershed Authority, Ducks Unlimited Canada, and the Canadian Adaptation and Rural Development of Saskatchewan provided Blaine with some funding to complete this project.

Well, protected by a sturdy enclosure

Tip: *Wooden planks placed at the base of a portable system will keep the cattle up out of moist and mucky soils which can alleviate hoof rot problems.*

Murray & Selena McGillivray
Radville, Sask.

Water Source: *Dugout*
Power: *Solar*
Accommodates: *100 cow-calf pairs*
Feature: *L-shaped dugout*
Season of Use: *Summer*

Type of System: Solar pump system

System Description: With the help of the Prairie Conservation Action Plan and the Saskatchewan Watershed Authority the McGillivrays established a solar system that pumps water from a large dugout into a permanent trough that was created by cutting a long culvert in half. The trough is supported by posts on either side, and is low enough so that calves are able to drink easily. The dugout is L-shaped to provide extra water storage capacity, and access to the dugout is prevented by the installation of a one-wire exclusion fence.

Benefits: The system has been in place for over five years and in that time, the dugout banks have significantly revegetated, improving the sediment trapping and filtering capabilities of the area.

Comments: The McGillivrays find the system to be practical and reliable, checking it once every three days. They would, however, make some minor modifications if they were developing it again. When installing the one-wire exclusion fence, they would place it even further from the dugout banks to allow for further protection and vegetation regrowth.

Tip: *Arrange the angle of your solar panels to capture the most sunlight possible. The angle will need to be changed depending on the season of use.*

Jeff Nergard
Bengough, Sask.

Water Source: *Dugout*
Power: *Solar*
Accomodates: *170 cow-calf pairs*
Feature: *Homemade battery box*
Season of Use: *Summer*

Float system

Tip: *Place your trough in a location where the topography naturally slopes away from the dugout, to prevent manure from draining back into the source.*

Type of System: Remote solar powered system

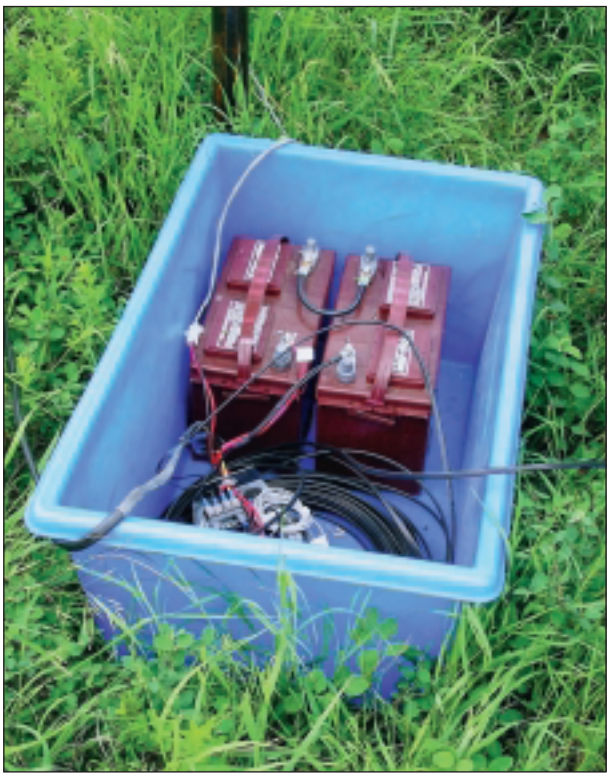
System Description: With help from the Prairie Conservation Action Plan, Nergard developed two remote solar water stations. Each system consists of a floating submersible pump which moves the water from the source, in this case a dugout, to a trough located up on the banks. Although Jeff didn't fence his dugouts out, he's noticed that the cows prefer drinking water from a trough and spend minimal time in the dugouts. The off site water system has helped to extend the life of the dugouts, as well as prevent animal health problems such as foot rot.

Comments: One modification that Jeff made to the system was building a box in which to store the batteries to prevent excess weathering. After seeing the positive effects of his first two water systems, Jeff has purchased an additional system to further meet the needs of his herd. After many seasons of use, Jeff still highly recommends implementing solar water systems, feeling they have positively enhanced his cattle herd, pastures, and dugouts.

Clem & Mina Sanden
Craik, Sask.

Water Source: *Dugouts*
Power: *Solar*
Accommodates: *180 cow-calf pairs*
Feature: *Drain back system*
Season of Use: *Summer/Late Fall*

Type of System: Portable summer/fall solar system



System Description: The Sandens have fenced off their dugouts and now pump water from the dugouts into a 300 gallon portable trough using solar energy. The system is designed so that the water drains back into the dugout when the pump stops, thus preventing freezing and making it a useful system even into late fall.

Benefits: The Sandens have noticed an improvement in the health of their animals from the constant supply of fresh water and have also noticed that their dugouts regenerate and maintain seasonal flows since implementing the system.

Comments: The Sandens have been happy with the results of this system and are now contemplating improving their water supply in other pastures, this time by utilizing a shallow pipeline.

Tip: *Portable light-weight troughs can be modified slightly by developing a sturdy rack around the edges to prevent the trough from collapsing.*

Dean Simonson
Dinsmore, Sask.

Water Source: *Wetland*
Power: *Solar*
Accommodates: *45 cow-calf pairs*
Feature: *Floating pump to move water from a wetland*
Season of Use: *Summer*

Panels and pump, situated at edge of marsh

Type of System: Solar powered pump from a wetland

System Description: After converting land susceptible to erosion to perennial cover, Dean needed to develop a watering system to utilize a nearby wetland for a cattle watering source. Dean used a floating submersible pump to move water through a 2 inch line into a large trough. This watering point can water two of his three different paddocks that form a rotational grazing system. The project has allowed Dean to develop a potentially fragile area of land into a functional, stable source of grazing for his cow herd.

Comments: One challenge Dean has faced with the system is to prevent wildlife damage to electrical connections and wires.

Tip: *There are many different sources of financial assistance for developing systems, as they are recognized as an important aspect of water conservation efforts. Partnerships with SWA, DUC, and/or the completion of an Environmental Farm Plan are potential methods of obtaining partial funding for a water system.*

Khris, Chrissy, & Stuart Webb
Pangman, Sask.

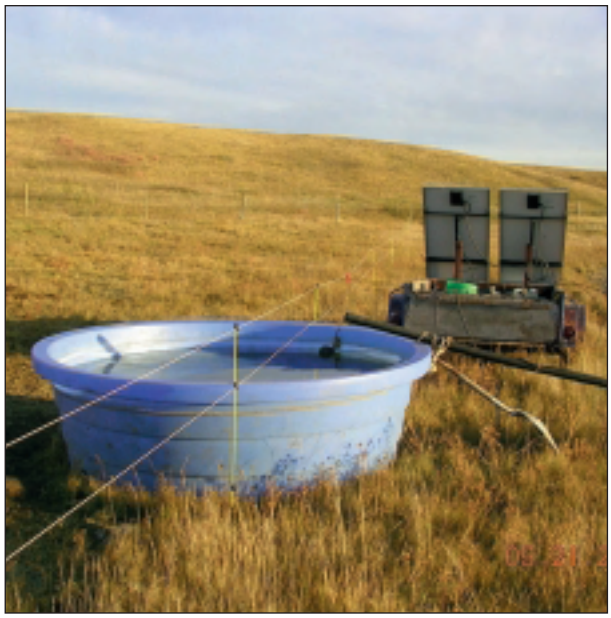
Water Source: *Dugout*
Power: *Solar*
Accommodates: *200 pairs or 300 yearlings*
Feature: *System moves with the herd*
Season of Use: *Summer/Fall*

Type of System: Portable summer solar system

System Description: The Webbs have implemented a solar water system which pumps water from a dugout through a 2 inch pipe, into a water trough. This portable system is able to move with the cow herd throughout the entire grazing season. The system is designed to complement the rotational grazing management that the Webb's use on their ranch, as the solar system can provide water for up to nine paddocks at one water site. The system has proven reliable, however it is checked often and the cattle can rely on dugouts in the event that the system isn't working. Recently the Webbs have installed additional storage tanks for a reserve source. The Webbs place an electric fence around the trough at each location to prevent cattle from accessing the micro-switch float and solar panels. The solar panels are used to power the electric energizer.

Comments: The system has worked well since its implementation in 2001, and Khris notes that one of the most important features of the system is the regulator, which ensures the batteries are properly charged.

Portable trailer and trough



Tip: *When pumping water from a dugout or dam, cattle should have emergency access to the water source in the event that the system fails.*

Kevin & Colette Wilson
Tugaske, Sask.

Water Source: *Well*
Power: *Solar*
Accommodates: *50 cow-calf pairs*
Feature: *Concrete pads around troughs*
Season of Use: *Summer*

Type of System: Solar powered pump water system

Concrete pad around troughs provides stable, dry footing

System Description: In 2000, Kevin and Colette dug a 100 foot well in a location that was central to all paddocks. Due to the remote nature of the well, they installed a solar pump that draws water from the well and into two 400 gallon troughs. They poured a cement pad around the troughs to allow for stable, dry footing while the animals are drinking. The water system pumps around two gallons/minute and is able to support up to 50 cow-calf pairs. Cattle are allowed access to the water by alleyways that lead in from each paddock and the solar system is fenced out to prevent damage by the cattle.

Comments: The Wilsons have encountered only one small problem when the system was implemented, but this was quickly alleviated when two more panels were installed. All in all, the Wilsons have been very happy with their system and are actively developing new water sources in other tame pastures which will allow for further rest of their native prairie and help to protect their vital water resources.

Tip: *Many water systems can be modified to include dispensers for anti-bloat products such as livestock detergent.*

Daryl & Linda Wiles
Ogema, Sask.

Water Source: *Dugouts*
Power: *Solar*
Accommodates: *60 cow-calf pairs*
Feature: *Elevated storage tanks*
Season of Use: *Summer*

Type of System: Portable solar watering system

System Description: Partnering with the Saskatchewan Watershed Authority, Ducks Unlimited Canada, and the Canadian Adaptation and Rural Development in Saskatchewan program, the Wiles installed a portable solar watering system that can be easily moved around the pastures as the cattle move. The system draws water from the dugouts using a floating submersible pump. The water is pumped first into a trough and once full continues to pump water into an elevated storage tank located above the trough. The storage tank serves as a back-up and prevents the pump from cutting in too frequently when a lot of cattle are drinking at once. Since implementing this system, Wiles have noticed an improvement in their herd health as well as an improvement in water quality.

Comments: The Wiles have suggested that lower troughs would be useful so that calves have easier access. The Wiles fence off all, or portions, of their dugouts while this system is in use.

Floating pump

Tip: *Troughs made of light-coloured material reflect, rather than absorb heat, and are effective for summer use.*

Simonson Farms, Elmer & Faye, Daryk & Bonnie Dinsmore, Sask.

Water Source: *Surface Water*
Power: *Solar*
Accommodates: *140 + 40 cow-calf pairs*
Feature: *Custom-built trailer*
Season of Use: *Summer*

Type of System: Portable Summer Solar System

System Description: The Simonsons have been gradually seeding their cropland to perennial grassland and establishing tame pasture that they manage in a rotational grazing system. In order to accomplish this, they needed to develop a reliable water source throughout their paddocks. Partnering with Ducks Unlimited Canada and the Saskatchewan Watershed Authority the Simonsons developed a portable, solar stock water system that can pump water from any surface location, such as a dugout or slough. The solar system consists of a floating pump that pumps water into two 400 gallon troughs. These troughs can accommodate up to 140 cow-calf pairs, and a third trough, can be added to accommodate an additional 40 pairs. The entire system is situated on a custom-built, portable stand constructed of square-tubing and wooden slabs, and can be pulled from one paddock to another.

Comments: When getting the trailer and stand built, Daryk comments that they "may have gone overboard" with the reinforcement, but adds that you do want a sturdy unit if you are moving it on a regular basis.

Trailer features adjustable wheels

Tip: *Mount solar panels directly to the portable stand to keep them up and away from livestock activity.*

Gayland Panko
Moose Jaw, Sask.

Water Source: *Spring*
Power: *Solar*
Accommodates: *350 cow-calf pairs*
Feature: *Tire float system*
Season of Use: *Summer*

Type of System: Solar and gravity flow water system

System Description: In 2004, with the help of the Saskatchewan Watershed Authority, Ducks Unlimited Canada, and the Canadian Adaptation and Rural Development in Saskatchewan program, Gayland and his family decided to turn his existing watering system into an energy- and labour-efficient solar watering system. Using a spring with excellent quality water as the source, the Pankos pump the water into a 1250 gallon holding tank before it gravity feeds into a trough through collapsible blue line. There are four solar panels to charge the system and it generally takes 1.5 hours to fill up the holding tank. The system was designed with a lot of ingenuity, and features the use of recycled material, keeping costs low. The highlight of the entire system is the float setup which regulates the flow of water from the holding tank. At the one end, a tire floats in the trough and is connected to a vertical metal bracket. This bracket is joined to a board situated at a 90° angle which pinches the collapsible hose closed when the trough is full. This portion of the trough is fenced out with electric wire to prevent the cattle from interfering with this unique set-up. The trough and the trailer were materials that the Pankos had on hand when they were developing this system.

Comments: There is one limitation with the system in that it only functions before freezing due to the above ground water lines.

Collapsible pipe

As the water level increases, the tire floats up, pinching off the water supply

Solar panels and holding tank

Murray & Selena McGillivray
Radville, Sask.

Water Source: *Dugout*
Power: *None*
Accommodates: *40 cow-calf pairs*
Feature: *Cobble rock access ramp*
Season of Use: *Summer*

Type of System: Stabilized access point

System Description: The McGillivrays implemented an access ramp for their cattle to obtain water from a newly developed dugout. By installing an access ramp with a fence around the rest of the dugout they have allowed their cattle to utilize the water in the dugout, but limit the amount of time that they spend directly in the water or on the banks. They constructed an access ramp using cobblerock as the base, with a rail fence located on both sides of the ramp. The cobblerock allows the cattle to have solid footing when they enter the water source which is preferable to a soft mud base.

Access points can be developed using rail fences, stock panels, electric fence, or conventional barbed wire fence

Tip: *An access ramp is an economical way to provide water out of a dugout while protecting the banks from soil erosion.*

Kirk Newton
Chaplin, Sask.

Water Source: *Dugout*
Power: *None*
Accommodations: *50-70 cow-calf pairs*
Feature: *Access point allows for vehicle passage*
Season of Use: *Summer*

Type of System: Stabilized Access Point

System Description: After seeing how his cattle struggled to drink from the wet banks surrounding his dugout, Kirk partnered with Ducks Unlimited Canada to create a stabilized access point on his dugout. Ducks Unlimited built up the access point with rocks and gravel and Kirk fenced out the banks of the dugout on three sides and fenced through the dugout on the fourth side. In doing this, Kirk created an access point for the cattle to drink from and was able to protect the rest of the dugout from direct access.

Benefits: This access point project was a way to keep the cattle from getting stuck in the dugout and helps to preserve the sustainability of the dugout by not allowing them to track up the sides and shores. The system has also made traveling past the dugout easier for Kirk as he is now able to access his other pastures with his truck by driving over his access point

Access point

Tip: *Water quality in dugouts can greatly improve when the banks are able to revegetate and act as a filter for runoff sediment and other contaminants.*

Dugout

Shoreline of access point.

Michael & Tamela Burgess
Big Beaver, Sask.

Water Source: *Well*
Power: *None*
Accommodates: *400 calves on the gravity feed and 500 cows on the winter system*
Feature: *Fibreglass frost free water bowls*
Season of Use: *All season*

Type of System: Gravity feed system and frost free water bowls

Well

A view of the well and a nearby fiberglass all season water trough, partially buried

System Description: The Burgesses have developed an energy free water system on their ranch. The main water source for most of their ranch consists of a 14 foot deep large diameter well casing dug into a spring in the side of a hill. The water from this well flows with enough pressure to supply water to seven stock water bowls, a yard hydrant, and provide water to the main level of their house. The Burgesses also use fiberglass frost free water bowls operating on a pump fed system. Water enters the frost free bowl from 1.25 inch lines that are all buried at a depth of 8-9 feet to prevent any problems with freezing. A float valve that is located inside the trough and away from cattle access regulates the water flow The water carries enough heat from the ground to prevent it from freezing when it enters the bowl. The water bowls are heavily insulated and partially buried which helps to prevent freezing.

Comments: Because there is no water circulation, Michael suggests cleaning the bowls out once a year. If winter conditions are severe and the water begins to freeze, Michael installs a floating heater to keep the water open.

Tip: *To prevent freezing, it is very important to meet the required number of cattle that the system can handle in order to ensure regular turnover of the water.*

Wayne Crawford
Willow Bunch, Sask.

Water Source: *Spring*
Power: *None*
Accommodates: *230 cow-calf pairs*
Feature: *Overflow diversion pipe*
Season of Use: *All season*

Type of System: Spring development

Tire trough system

System Description: When developing his spring fed system Wayne dug until he reached coal then laid a culvert lengthwise, and connected the culvert to a pipeline through a hole made in the culvert. The water accumulates in the culvert and runs out the pipeline into the troughs. Crawford uses three 600 gallon troughs and the spring runs into these troughs at about 8 gallons/minute. In his tire trough system the water enters the trough through a 3 inch pipe. The trough has a center steel pipe casing that stands about 6 inches above the highest water level. There is a pipe extending out the side of the center casing at full water level. When water reaches the height of this pipe, the water runs back into the center casing and drains out an underground pipe to a run off area away from the trough. This overflow pipe allows Wayne to divert water away from the trough, keeping the area dry where cattle stand to drink. Crawford also has a second spring fed trough that features a steel basin. This system does not have an overflow diversion pipeline, rather excess water trickles out the top of the tub.

Comments: Crawford has had no significant problems with the systems. Sometimes the tire trough spring system cannot keep up to the cattle's watering needs, but it is rarely a problem as there are other water sources in the pasture such as other runs and springs. He has also implemented two more spring development systems that utilize weeping tile and crushed rock to accumulate water instead of the culvert. In Wayne's area the water is very high in iron and he feels that eventually the culvert will rust out. He feels the weeping tile and crushed rock system is the preferred method to prevent the rust damage.

Overflow diversion

The inflow pipe is protected by a short plank fence

Raymond & Robert Prefontaine
Lisieux, Sask.

Water Source: *Spring fed wet well*
Power: *None – gravity fed*
Accommodates: *280 cows*
Feature: *Rail car water trough*
Season of Use: *All season*

Type of System: Gravity feed system

Inflow pipe and trough

System Description: With some planning assistance and site engineering from PFRA, brothers Raymond and Robert Prefontaine developed a gravity flow system that utilized water from an existing 8 foot well cribbing located near a spring. They installed 500 feet of 3 inch high density polyethelyne water line in a down-grade from the well to a trough. The trough holds approximately 250 gallons and was made by cutting the last 2 feet off of the end of a rail car. The Prefontaines installed a cement pad around the waterer to stabilize the system and provide solid footing for the cattle. The trough is situated at an elevation approximately 5 feet lower than the well and when the water reaches a certain level in the trough, it overflows into another 3 inch high density water line. This overflow line discharges the water into a seasonal water run located 500 feet away from the trough. The water is constantly moving into the trough which prevents it from freezing.

Comments: The system is low maintenance, requiring few inputs. The only modification that Raymond would suggest if someone were installing a similar system would be to incorporate a larger trough with more capacity.

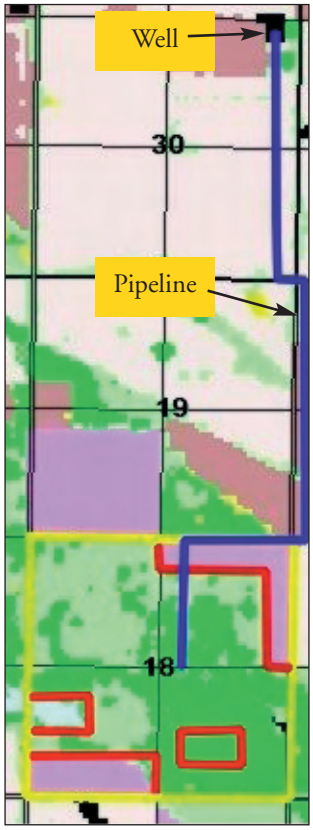
Overflow pipe.

Tip: *Troughs can be made from many different materials, including recycled machinery tires, fuel tanks or even cutting the end off a rail car.*

John Aitken
Eyebrow, Sask.

Water Source: *Well*
Power: *Electricity*
Accommodates: *120 cow-calf pairs*
Feature: *Over 3 miles of pipeline*
Season of Use: *Summer*

Type of System: Pasture pipeline



System Description: In 2002 John developed a water pipeline that extended 3/4 of a mile from the well at his farm to a centralized position in his pasture. Pleased with his first project, John partnered with the Saskatchewan Watershed Authority in 2004 and trenched three additional miles of pipeline that connected onto his original pipeline. The water first runs from his home well into a cistern in the barn, where a pressure tank is located. From the barn, the water is pumped into the line which has two different watering stations that can accommodate portable troughs. John has two portable troughs that can collectively hold approximately 1,000 gallons. This project allowed John to divide his two larger fields into five smaller ones, separating the tame grass from the native prairie.

Benefits: John is now able to manage his tame and native pastures as separate parcels, allowing the health of his native pastures to improve. As John is able to better utilize his tame grass, he is able to defer grazing on his native prairie until September.

Comments: John feels that moving and maintaining the water system can sometimes be a daunting task, however the cattle now stay out of the wetlands and dugouts and he has more control over his grazing management.

Tip: *A producer should check with their local Rural Municipality when trenching across, through, or under road allowances.*

Paul Hofer
Rose Valley Colony, Assiniboia, Sask.

Water Source: *Dugout*
Power: *Electricity*
Accommodates: *110 cow-calf pairs*
Feature: *Equipped for mass medication*
Season of Use: *Summer*

Type of System: Power pasture pipeline

System Description: Paul had experienced an increase in foot rot in pastures where the cattle had direct access to dugouts. He also dealt with a shortage of water in dry years. As a solution, he developed a power operated pipeline system that is low maintenance and highly reliable. Paul's system provides water to cattle spread over seven paddocks and 340 acres and he believes the system could handle up to 500 head. Power is used to bring water from a dugout up to a pumphouse where it is diverted one half mile east and west through a 1.5 inch high density pipeline. The pipeline then branches to reach troughs located in seven different paddocks. The pipeline is equipped with a medication system, allowing Paul to easily mass treat using the water line. Paul runs this system from May to October, at which time he blows out the lines with air pressure.

Trough, stabilized with posts

Comments: Paul experienced very few problems when establishing the system. Paul found that his first suction line had pin holes in it and his system was losing its prime. After replacing the suction hose, his problem was solved.

Tip: *It is important to blow out pipelines in late fall to prevent the pipeline from freezing and splitting.*

Jarrod and Tammy Klassen Central Butte, Sask.

Water Source: *Well*
Power: *Electricity*
Accommodates: *140 cow-calf pairs*
Feature: *Portable 600 gallon tank*
Season of Use: *Summer*

Type of System: Pasture pipeline

System Description: Seeking a stable source of water, the Klassens ran 7400 feet of shallow pipeline from the well in their yard out to various pastures, setting up five different water stations along the way. They purchased a portable 600 gallon trough with a float which they were able to move easily from station to station. One water station can provide a source of water for several paddocks, reducing the number of times the trough has to be moved.

Benefits: Providing a steady supply of water to their tame pastures throughout the spring and summer has allowed Klassens to defer grazing their native prairie until the fall.

Comments: Very pleased with the results, the Klassens are considering expanding the pipeline, to better serve the needs of their expanding herd and land base. The Saskatchewan Watershed Authority, Ducks Unlimited Canada, and the Canadian Adaptation and Rural Development in Saskatchewan program helped to fund this project.

Establishing water stations in key locations maximize the number of paddocks that can be serviced

Tip: *Off-site watering systems are efficient, handy, and environmentally beneficial, but none are 100% reliable. It is suggested that when a watering system is implemented a back up system is also available if the primary system fails. Developing a large capacity water storage system may be a worthwhile investment. If you don't have a back up system in place, it is important that the system is checked daily to ensure proper functioning.*

Andy & Jacqui Martynook
Dunkirk, Sask.

Water Source: *Well*
Power: *Electricity*
Accommodates: *35 cow-calf pairs*
Feature: *Garden Hydrant Connection*
Season of Use: *Summer*

Type of System: Summer pipeline

System Description: The Martynooks developed a shallow pipeline water system with help from the Saskatchewan Watershed Authority. The pipeline is connected to a hydrant that runs off of the farm's pressure system located in their house. The pipeline is 1500 feet long, trenched 18 inches deep, and carries water to a trough located in the middle of their pastures. When the cattle are grazing, the Martynooks leave the hydrant running and a float valve in the trough regulates water flow. The rolling topography provided some challenges for trenching; however they haven't had any problems with the system as long as they drain it properly before freeze up. They also have release valves located at the high spots along the pipeline to prevent air locks in the system.

Comments: The only thing the Martynooks would change is designing the trough so that it can water two separate herds simultaneously.

The pipeline is connected to the water source through a simple garden hydrant connection

Tip: *When trenching a shallow pipeline through different elevations, locate and mark release valves to prevent air locks.*

Tom & Joanne McKee
Killdeer, Sask.

Water Source: *Dugout*
Power: *Gas powered pump*
Accommodates: *250 cow-calf pairs*
Feature: *Defective fertilizer bins as water storage*
Season of Use: *Summer*

Type of System: Gravity fed pipeline system

Two different trough types used on the gravity feed pipeline

System Description: The McKees implemented an innovative project on their operation for the purpose of distributing water throughout their pastures. Tom uses a high pressure gas powered pump to pump water from a dugout through a quarter mile of pipeline to the 11.4 thousand gallon refurbished hopper bottom bins. Tom optimized his pumping speed by pumping the water into the tank from the bottom instead of making the pump push the water to the top of the bin. From the bin the water is gravity fed back through separate pipelines to troughs available in five different paddocks. The bins used in the system cost around $6000 each and the strong tire troughs that Tom uses run about $1000. The system fills troughs at a rate of 70 gallons/minute and Tom has had no problems with the system since establishment.

Comments: This system has made the McKee's operation a little more hassle free. Tom turns the pump on for approximately three hours every couple of days to fill the hopper. In extreme heat he must fill the hopper every day. Tom has developed another system similar to his first. Tom decided to put tombstone feeders around his troughs on the second system to prevent the cows from moving the troughs when they get low or pushing in calves. At the end of the grazing season Tom opens the ends of the pipeline and lets the water drain out, he doesn't blow the line out and hasn't had any problems with water freezing in the pipeline.

Brad Dunn
Ogema, Sask.

Water Source: *Dugout or well*
Power: *Gas powered pump*
Accommodates: *45 cow-calf pairs*
Feature: *Recycled fuel tank trough*
Season of Use: *Summer*

Type of System: Summer gravity feed system

System Description: Brad has been fencing his dugouts and pumping water into troughs for years. He first started using a gas-powered motor to pump water into a holding tank mounted on a portable stand. The water is gravity fed into 250 gallon troughs, which Brad has created from recycled fuel tanks. Two or three times per week Brad needs to start his pump to fill the holding tank. Looking for a less labour-intensive alternative water system, he recently partnered with Saskatchewan Watershed Authority to develop a portable solar watering system that works in a similar manner, using source water from dugouts or a well.

Comments: When Brad used to allow his cattle direct access to the dugout, it was costly as he needed to re-excavate his dugouts on a frequent basis. Since fencing his dugouts and developing off-site watering, Brad has reduced maintenance costs while improving water quality for his cattle.

Since fencing the dugout, the banks have revegetated with riparian plants, such as cattails and sedges. These plants are critical in filtering nutrients and sediment during runoff.

Tip: *It is very important to monitor watering systems, especially when they are initially set up.*

Simonson Farms, Elmer & Faye, Daryk & Bonnie Dinsmore, Sask.

Water Source: *Well*
Power: *Electricity (pipeline) & Gravity (from tanks into trough)*
Accommodates: *50-300 pairs depending on size and quantity of troughs*
Season of Use: *Spring, Summer, early Fall*

Type of System: Pipeline with Gravity Flow Troughs

System Description: The Simonsons have been gradually seeding their cropland to perennial grassland and establishing tame pasture that they manage in a rotational grazing system. In order to accomplish this, they needed to develop a reliable water system that would accommodate their moving cattle herd. Working with PFRA, the Simonsons established 16 km of 1 and 2 inch shallow pipeline sourced from a well at their farmyard. There are several branches off the pipeline in various pastures to which they can connect two 1300 gallon water tanks. These water tanks are elevated and mounted on a drill stem skid-frame which can be pulled from paddock to paddock. Water is stored in these tanks and flows into portable stock water troughs by gravity.

Comments: Simonsons empty the water tanks and pull the stand to the next pipeline hook-up with a truck when needed. "The hook up is a simple Banjo style coupler and we like to use skids on the tanks because it's simple to hook up and go. We are fortunate also because all of our land is connected."

Holding tank and stand, featuring skids for portability

Tip: *When using a gravity flow system, it is important to have enough storage capacity if all animals come in to drink at once, or during periods of hot weather.*

Neil & George Alexander
Avonlea, Sask.

Water Source: *Dugout/Wet well*
Power: *Cattle operated*
Accommodates: *120 cow-calf pairs*
Feature: *Relies on geothermal heat*
Season of Use: *All season*

Type of System: Frost free nose pump

System Description: To utilize some of their newly developed pastures, the Alexanders partnered with the Saskatchewan Watershed Authority, Ducks Unlimited Canada, and the Canadian Adaptation and Rural Development in Saskatchewan to develop a remote watering system. The Alexanders decided to install a frost free nose pump that draws water from a nearby dugout. The frost free nose pump is situated on an insulated well casing that is connected to the dugout by a 2 inch pipe. The cow pushes the pump with her nose, which activates the piston pump located within the well, working on the same principle as old fashioned hand pumps. The system remains frost-free, due to the ground heat, as well as a small drain hole which allows excess water to drain from the suction pipe when the cattle stop drinking.

Benefits: By using the cow as the power source, the input and maintenance costs to keep this system running are very low.

Comments: This system requires some time and training for the cattle to get used to using it.

Tip: *Manufacturers usually have suggested tips and tricks to follow when training animals to obtain water from systems like these and others.*

David Blanchard
Moose Jaw, Sask.

Water Source: *Dugout*
Power: *Solar*
Accommodates: *125 cows*
Feature: *Motion detector pump system*
Season of Use: *All season*

Type of System: All season solar powered pump and wet well

System Description: Partnering with the Saskatchewan Watershed Authority, Ducks Unlimited Canada, and the Canadian Adaptation and Rural Development of Saskatchewan, David developed a solar-powered watering system that pumps water from a dugout into a wet well. Water is then pumped from the well into a winter water bowl that has a drain back mechanism that prevents the water from staying in the bowl and freezing. The pump runs on a motion detection sensor, so the pump starts when there is animal movement at the water bowl. The pump shuts off when the animals leave.

Benefits: The watering system is located on higher ground in the pasture, which prevents the cattle from congregating in the nearby dugout and ravine in the pasture. This area is susceptible to spring flooding so keeping cattle out of these low areas during the winter prevents a lot of excess livestock waste and nutrients from traveling downstream in the spring. There is also less risk of cattle falling through the ice while trying to obtain water from a dugout.

Comments: There are a few modifications that David would make to the system. He would like to develop a better stand for the solar panels to prevent them from moving in the wind and would attach a second water bowl to the same system, allowing more animals to water at once. David has experienced some problems with the motion detector remaining activated and draining the dugout from which it was operating. Also, if cattle are milling around the bowl, but not drinking, the pump will cause the water to over flow from the bowl, causing ice to build around the system in the wintertime. David suggests that a solar system operating on a motion detector would be a good system – if it is possible to check the system every day. It is unfeasible for David to check their system daily and he has since installed electricity to ensure the reliability of their system.

Jack Laturnus, Waldorf Ranch Bethune, Sask.

Water Source: *Well*
Power: *Pressurized water line*
Accommodates: *up to 400 cows*
Feature: *Insulated plastic design*
Season of Use: *All season*

Type of System: Thermosink© winter water system

System Description: Instead of trenching power out to his pasture site, Jack decided to purchase Thermosink© watering bowls which only require a pressurized water line to operate. The system consists of two insulated drinking cylinders located on either side of a central column, all approximately 8 feet long. The system is buried 7 feet underground. Water enters the central column through the pressurized line attached near to the bottom of the column. A float system and shut off valve are located in the central column on a pitless adaptor. Both drinking cylinders hold 60 gallons of water each and can provide water for up to 200 head. The water continuously circulates between the central column and the drinking cylinders, which prevents freezing. Each drinking cylinder has a removable tapered bowl which the animals drink from. The drinking cylinders sit 12-18" above ground which prevents dirt and manure from running into the cylinders.

Benefits: Jack has liked the system so much he has recently installed another. He likes the fact that there are no parts to rust and the system is simple to maintain. The system can be used through all seasons, so there is an added flexibility to the pasture area and cattle can graze this pasture at different times of the year.

Tip: *Use screws to secure the removable tapered drinking bowls to the drinking columns as well as the lid on the centre cylinder to prevent cattle from removing them and causing damage. Construction shelters around the system can prevent the area from blowing full of snow which can lead to freezing.*

A view of the tapered bowl sitting within the drinking cylinder

Glen Ekert
Wapella, Sask.

Water Source: *Well*
Power: *Pressurized water line*
Accommodates: *300 cow-calf pairs*
Feature: *Insulated culvert well casing*
Season of Use: *Early spring/late fall*

Type of System: Frost free water bowl with pressurized pipeline

System Description: Glen wanted an energy efficient winter watering system so he opted to install a frost free water bowl utilizing a pressurized pipeline system. Glen trenched in a water line to a 12 inch culvert wrapped in silver housing insulation. The frost free bowl sits atop the culvert which extends 8 feet below the actual trough. The system is able to produce about 10 gallons a minute and the insulation keeps the system from freezing up at reduced temperatures. Glen had power run to the water bowl as a back up so a heater could be put in if the system froze up. So far the system has not frozen, but Glen has yet to use the system through the entire winter. Glen's current grazing plan does not call for the cattle to be in this particular area all winter, it is an off site system for early spring and late fall grazing. The system is shut off after use and a stop and drain system causes the water in the pipeline to drain back. Water can be drained from the water bowl via a plug in the water bowl.

Tip: *It's important to provide stable footing for livestock when watering from troughs. This is especially critical in winter, when ice builds up around the system. Concrete pads, heavy lumber, or even gravel and sand can provide a secure foundation for a trough.*

Kurt Fiechter
Ceylon, Sask.

Water Source: *Spring*
Power: *Solar with propane heat*
Accommodates: *110 cows*
Feature: *Propane heated water bowl*
Season of Use: *All season*

Type of System: Solar winter water system

System Description: When Kurt was looking for a winter water system, he took contamination risks into consideration. With the help of the Saskatchewan Watershed Authority, Ducks Unlimited Canada, and the Canadian Adaptation and Rural Development in Saskatchewan, he opted for a solar winter water system that didn't allow the bowl to drain back into his water source. Kurt was able to pump water from a spring using solar power into a well. The system holds 60 gallons of water warmed by a small propane flame contained underneath the bowl approximately 4 inches from any side walls. A submersible pump is set within the well casing which pumps the water up to the bowl. Since the water does not drain back from the bowl, the flame is necessary to keep it from freezing. There is 8 inches of insulation surrounding the entire system.

Comments: Kurt's only suggestion would be a larger capacity system. He feels that when a large group of cattle are coming to drink the bowl does not refill fast enough.

Propane tank for bowl flame

Tip: *A well-placed rail fence can protect a system and its components from cattle activity while still allowing access for maintenance.*

Jack & Steve Gunter
Val Marie, Sask.

Water Source: *Well*
Power: *Pressurized water line*
Accommodates: *210 head of cattle*
Feature: *Circulation system*
Season of Use: *All season*

Type of System: Thermosink© winter water system

System Description: The Gunters purchased two double bowl Thermosink© systems after fluctuations in their water source caused watering problems for their cattle. Gunters opted for the double unit because they felt it was worth the extra cost. The double unit is worth around $1500, while the single unit is worth around $1200. The double system is comprised of two polyethelene cylinders acting as water storage tanks with tapered drinking bowls set in the top. There is a central column that contains a pitless adapter and float system. These cylinders are all around 8 feet long, hold 61 gallons per cylinder, and are surrounded by insulation. The tubes are buried 7 feet underground with 12-18 inches exposed above ground. Water is constantly self -circulating within the holding tubes to avoid freezing. The system works on a pressurized pipeline system. In the Gunter's case the water is trenched 1500 feet to the system from a well at the yard site. Each water system is able to accommodate 200 head of cattle, so with two double bowled systems the Gunters are able to provide water to 400 head if needed.

A view of the tapered bowl when it is removed from the cylinder

Benefits: The system has yet to freeze up and it requires no energy to operate. The Gunters haven't had a single problem with the system since they installed it.

Comments: The Gunters suggest that the system is exposed above ground at least 12" so that run off or debris cannot make its way into the system.

Float in centre column

Tip: *Lids should be made for the watering bowls on a Thermosink© system when it is not in use to keep curious rodents and birds out of the water bowls.*

Don & Beth Simeniuk
Killdeer, Sask.

Water Source: *Wet well*
Power: *Electricity*
Accommodates: *up to 300 cow-calf pairs*
Feature: *Recirculation system*
Season of Use: *All season*

Type of System: All season well pump

System Description: After relocating their corrals to higher ground, Simeniuks decided to develop an all season watering system. They dug in a 25 foot well cribbing and connected it to an already existing dugout using a 2 inch water line with a screened intake. Inside the cribbing is a submersible pump on a pitless adaptor that pumps water into a 1000 gallon stock water trough through a water line that is buried below the frost. The system is designed to withstand winter temperatures and has an insulated plywood cover over the trough to prevent freezing in the winter. Water is continuously pumped into the trough, causing constant agitation of the water, thus preventing freezing. There is no float on the system, so excess water drains back into the well through an overflow line that is also buried at a depth of 8 feet. This system runs on electricity and provides water year-round for the herd. The water trough is only 2 feet high, easily allowing calves access to the water.

Comments: Don notes they have switched to a bigger pump with a bigger intake to prevent organic matter from plugging the system and they would like to eventually install a sewer pump.

Tip: For year-round watering systems, use a shallow trough which easily allows young calves access to water.

Water enters trough constantly which agitates water surface, preventing freezing

Wet well

Kelly Wall
Borden, Sask.

Water Source: *Well*
Power: *Electricity*
Accommodates: *150 head of cattle*
Feature: *Culvert trough*
Season of Use: *All season*

Type of System: Electrified pump/float system

System Description: Kelly Wall decided to bring in electricity for his winter water system. He developed an electrical pump/float system in his shallow well. Kelly decided to trench from the well to a nearby bank and installed a 20 foot culvert horizontally within the bank to collect water. The bank acts as an insulator for the culvert. The completely enclosed culvert emerges from the bank at one end to expose a 2 foot square access point. The cattle are able to drink from this area. The well provides approximately 7-8 gallons of water per minute.

Cattle access hole.

Comments: Kelly has had no trouble with the system since he installed it but feels that he could be watering more livestock from this system. There has been some fine tuning over the past 15 years, but nothing costly. Kelly says the ground provides enough insulation to keep the culvert thawed most of the winter, but when it gets really cold he throws in a heating element to make sure the system doesn't freeze.

Tip: *When power is available, have a heating element handy to put in troughs when weather becomes very cold.*

Culvert in bank

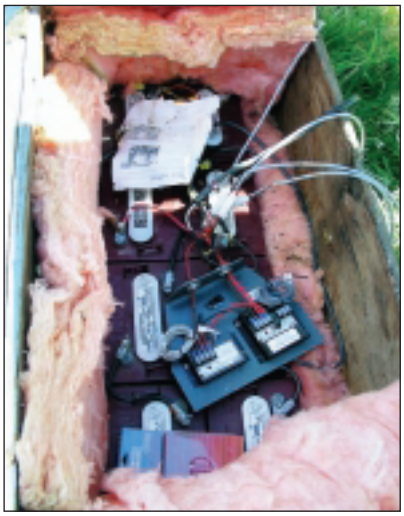
Shawn Griffin
Elbow, Sask.

Water Source: *Well*
Power: *Solar*
Accommodates: *up to 300 head*
Feature: *Drain back mechanism*
Season of Use: *Winter*

Type of System: Solar winter water system

System Description: Wanting to give their native pastures a rest by turning them into fall and winter fields, Shawn Griffin and his partner Julie developed a winter water system to fit this plan. They chose to bore a 70 foot well and install a 4.5 inch well casing, drawing water from the well into a winter water trough using solar power. The system allows excess water to drain back into the well, thereby preventing the water pipes from freezing. The floor, sides, and lid of the trough are insulated, and the cattle can drink from three inverted drinking tubes. Each drinking tube accommodates 100 head of cattle, and the tubes allow a very small amount of exposed surface area from which animals obtain water, again to prevent freezing. The batteries are also kept in an insulated plywood box, and the whole system, except for the trough, is surrounded by stock panels to prevent the cattle from damaging the system. Shawn and Julie still allow their cows open access to the three dugouts that are in their wintering field, however the animals prefer to drink out of the trough. They check their system every other day, and find that the only maintenance it requires is to change the angle of the solar panels from time to time.

Benefits: This simple, practical system takes less than a day to set up and it allows Shawn and Julie to defer grazing on their native pasture, reducing their wintering costs and providing their cattle with a clean water source.



Drinking tubes

Tip: *In the off-season, panels may be used for many applications on a ranch, to obtain maximum use of this capital investment.*

Lorne Klein
Francis, Sask.

Water Source: *Dugout*
Power: *Gas powered pump*
Accommodates: *80 elk*
Feature: *Plastic trough liner*
Season of Use: *Summer / Early fall*

Type of System: High volume water trough

System Description: Lorne used plastic sheets to create a high volume water trough for his elk operation. The length and width of the trough is 14 x 24 feet. It is 2.5 feet high, and holds approximately 5250 gallons. This equates to approximately 4500 working gallons, as he doesn't let the water level get too low before re-filling. A producer would never want less than 4 inches of water in this type of trough. Too little water can cause the liner to lift in windy days, increasing the chance of a tear. Otherwise, the liner lasts for years, assuming no calves jump into the trough and puncture it. Lorne uses a 2 inch gas pump to fill the trough and a full trough usually lasts his animals a week, even in high temperatures.

Comments: Lorne's trough allows him to continue grazing later into the fall than he otherwise would. He is able to use the trough even after it starts to freeze at night. He says that the trough will accumulate up to 1 inch of ice on the surface and still thaw during the day. When the trough accumulates around 2 inches of ice overnight Lorne discontinues use of the trough. Lorne has had no major problems with the system but says that he would not build the exact model again. He feels there are easier ways to build a similar effective trough. Although the trough was relatively cheap Lorne mentioned that it took many man hours to build it. He suggests an easier method that involves putting poles into the ground, nailing planks to the inside of the poles, then lining the planks with the silage liner. A disadvantage of this type of trough is that it is not portable. Lorne notes that it would take days to dissassemble this trough and move it.

Tip: *With this type of system, water should be left in the trough throughout winter to maintain the liner and system in place. When using high volume water troughs, it is important not to let water levels get too low. "Working gallons" refers to gallons the cattle consume before the trough should be refilled.*

Doug and Jackie Hines Saltcoats, Sask.

Water Source: *Dugout*
Power: *Gas powered pump*
Accommodates: *500 yearlings*
Season of Use: *Summer / Early fall*
Feature: *20,000 gallon capacity*

Type of System: Ultra High volume water trough

System Description: Doug used some common materials to create a high volume water trough for his yearling grazing operation near Saltcoats, SK. The Hine's graze 2000 yearlings and needed a low cost way to supply a high volume of water to their cattle who all want to drink at the same time. Their solution was to line a wooden trough with a hay tarp. The yearlings are kept in groups of roughly 500 head and rotationally grazed through numerous pastures. The length and width of the trough is 28 x 42 feet. It is 2 feet in height and holds approximately 20,000 gallons. Doug fills the trough with a 2 inch gas pump.

At the time of construction the hay tarp cost $250 and Doug estimates that the balance of the materials cost roughly $500.

Comments: Doug's trough could be used fairly late in the year as the high volume of water would be fairly resistant to freezing. Some ravens poked some holes in the top of the tarp that has required some maintenance but other than that the trough has been largely trouble free. The hay tarp was laid directly on the dirt with only some minor leveling required before construction. Overall, it has proven successful as a low cost method of supplying a large quantity of water in a remote location.

Agencies & Organizations That Can Provide Information & Assistance on Riparian Areas & Riparian Management

Agriculture and Agri-Food Canada – PFRA
408 CIBC Tower
1800 Hamilton Street, Regina, SK S4P 4L2
Phone (306) 780-5070
Website www.agr.gc.ca/pfra

Agriculture and Agri-Food Canada
PFRA Shelterbelt Centre
P.O. Box 940, Indian Head, SK S0G 2K0
Phone (306) 695-2284
Toll Free 1-866-766-2284
Website www.agr.gc.ca/pfra/shelterbelt

Agriculture and Agri-Food Canada – PFRA
P.O. Box 1150, Watrous, SK S0K 4T0
Phone (306) 946-8720

Agriculture and Agri-Food Canada – PFRA
1410 A Caribou Street West
Moose Jaw, SK S6H 7S9
Phone (306) 691-3370

Agriculture and Agri-Food Canada – PFRA
Room 121, 9800 Territorial Place
North Battleford, SK S9A 3N6
Phone (306) 446-4050

Agriculture and Agri-Food Canada – PFRA
615 Railway Ave
Weyburn, SK S4H 0A9
Phone (306) 848-4488

Agriculture and Agri-Food Canada – PFRA
P.O. Box 1748, Melfort, SK S0E 1A0
Phone (306) 752-4442

Agriculture and Agri-Food Canada – PFRA
1011 – 11 Innovation Blvd.
Saskatoon, SK S7N 3H5
Phone (306) 975-4693

Agriculture and Agri-Food Canada – PFRA
P.O. Box 130, Melville, SK S0A 2P0
Phone (306) 728-5790

Agriculture and Agri-Food Canada – PFRA
P.O. Box 1420, Rosetown, SK S0L 2V0
Phone (306) 882-4272

Agriculture and Agri-Food Canada – PFRA
L.B. Thompson Place
Gate No. 2, SPARC, Airport Road
P.O. Box 1088, Swift Current, SK S9H 3X3
Phone (306) 778-5000

Agriculture Canada – PFRA
P.O. Box 155, Gravelbourg, SK S0H 1X0
Phone (306) 648-2214

Agriculture and Agri-Food Canada – PFRA
P.O. Box 430, Maple Creek, SK S0N 1N0
Phone (306) 662-5520

Agriculture and Agri-Food Canada – Canada-Saskatchewan Irrigation Diversification Centre
901 McKenzie St. South
P.O. Box 700, Outlook, SK S0L 2N0
Phone (306) 867-5400

Ducks Unlimited Canada (Saskatchewan Provincial Office)
P.O. Box 4465, 1030 Winnipeg Street
Regina, SK S4P 3W7
Phone (306) 569-0424
Website – www.ducks.ca

Ducks Unlimited Canada (Saskatchewan Offices)
202 1301 101st St.
North Battleford, SK S9A 0Z9
Phone (306) 445-2575

P.O. Box 2139
Highway #3 West
Melfort, SK S0E 1A0
Phone (306) 752-2791

603 45th Street West
Saskatoon, SK S7L 5W5
Phone (306) 665-7356

P.O. Box 670, 77 1st Street NE
Wadena, SK S0A 4J0
Phone (306) 338-3677

P.O. Box 1299
Highway #16A West
Yorkton, SK S3N 2X3
Phone (306) 782-2108

P.O. Box 727
Meadow Lake, SK S9X 1Y5
Phone (306) 236-6662

P.O. Box 250
Highway #123
Cumberland House, SK S0E 0S0
Phone (306) 888-2149

Saskatchewan Environment
3211 Albert Street
Regina, SK S4S 5W6
Phone 1-800-567-4224
Website www.se.gov.sk.ca

Saskatchewan Forage Council
P.O. Box 1715
Outlook, Sk., S0L 2N0
Phone 1-306-966-2148
Website www.saskforage.ca

Saskatchewan Soil Conservation Association
P.O. Box 1360
Indian Head, SK S0G 2K0
Phone (306) 695-4233
Website www.ssca.ca

Saskatchewan Stock Growers Association
Box 4752, Main Floor, Canada Centre
Ipsco Place, Regina, SK S4P 3Y4
Phone (306) 757-9499
Website www.skstockgrowers.com

Saskatchewan Wildlife Federation
9 Lancaster Road
Moose Jaw, SK S6J 1M8
Phone (306) 692-8812
Website www.swf.sk.ca

Saskatchewan Watershed Authority (Head Office)
111 Fairford Street East
Moose Jaw, SK S6H 7X9
Phone (306) 694-3900
Website www.swa.ca

Saskatchewan Watershed Authority (Regional Offices)
Northeast (Nipawin)
P.O. Box 2133
201 – 1st Ave East
Nipawin, SK S0E 1E0
Phone (306) 862-1750

Northwest (North Battleford)
402 Royal Bank Tower
1101 – 101st St
North Battleford, SK S9A 0Z5
Phone (306) 446-7450

Southwest (Swift Current)
P.O. Box 5000
350 Cheadle St West
Swift Current, SK S9H 4G3
Phone (306) 778-8257

Southeast (Weyburn)
P.O. Box 2003
110 Souris Ave
Weyburn, SK S4H 2Z9
Phone (306) 848-2345

East Central (Yorkton)
2nd floor, 120 Smith St East
Yorkton, SK S3N 3V3
Phone (306) 786-1490

Saskatchewan Watershed Authority (Other Offices)

Regina
Suite 420 – 2365 Albert St
Regina, SK S4P 4K1
Phone (306) 787-0726

Saskatoon
330 – 350 3rd Ave North
Saskatoon, SK S7K 2H6
Phone (306) 933-7442

Prince Albert
P.O. Box 3003
800 Central Ave
Prince Albert, SK S6V 6G1
Phone (306) 953-3537

Useful Publications and Websites

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Notes