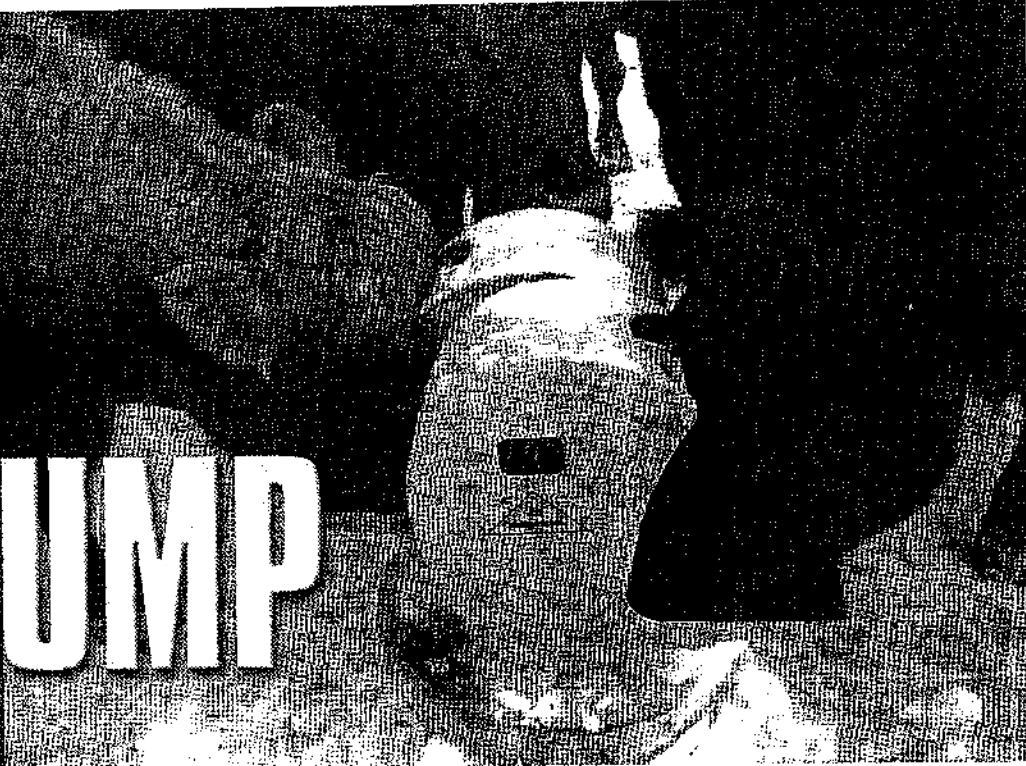


The FROST-FREE NOSE PUMP

By Heather Smith Thomas



Cold weather can present challenges for watering cattle, especially in areas with no access to electricity. Jim Anderson, at Rimbey Alberta (northwest of Calgary), solved this problem by creating a system in which cattle pump water for themselves from shallow wells, ponds or pressure systems—water that never freezes up even at 40 below zero.

Anderson's innovation is a piston pump, like the old-fashioned well in which a person works the handle up and down to lift water. "We modified this so cattle could use their nose to push a lever. This operates the piston pump by raising and lowering the piston in the cylinder," he explains.

"Like the old-fashioned hand pump, we have a 3 inch cylinder down inside the well. This captures enough geothermal heat from the ground, and contains that heat all the way to the surface, to keep the water in the pipe from freezing up," he says.

The waterer is a small basin on the top end of a vertical culvert, with a lever that can be pushed by the cow's nose. The culvert has 2 feet above ground level, going down to whatever depth is required to make use of ground water or water from the bottom of a pond or dugout nearby. Water from a pond is piped horizontally underground to the bottom of the culvert, where it then rises to the same level as the pond surface—but will not freeze. A buried collection tank from a spring would work also. A regular well can be used,

as long as the water level comes up to within 50 (and preferably 30 or less) feet from the surface. The nosepump can be adapted for an existing well if it meets these criteria. On a drilled well, each nosepump requires about 2 gallons per minute to water a herd of cows.

"Some ranchers use large pipes, but the typical installation is a road culvert at least 24 inches in diameter, set in the ground at least 20 feet. The 2 factors that determine how much geothermal heat you'll gain is how deep you go, and how big a diameter pipe you take to that depth. The bigger the pipe, the more opportunity for heat to rise, to keep the water pipe in the center warm enough," explains Anderson.

Kip Panter, who works for the USDA-ARS Poisonous Plant Research laboratory in northern Utah, has cattle on his ranch at Franklin Utah and has been using a nosepump for 2 years. "A creek runs through my place and NRCS has been working to help ranchers get their cattle away from streams. They have a cost-share program and I met with them to see what the possibilities might be on my place. They were willing to do a 75-25 percent split, and also had information on nosepumps. They asked if I'd be willing to be a test case for one of these," says Panter.

"I put in the pumps, following Anderson's instructions. The NRCS paid 75 percent, and my labor to install them was my 25 percent of the deal," he says. This watering system is a good way to provide an alternate source of

clean, fresh water for cattle, away from riparian areas.

"These pumps work great and are fantastic. It doesn't take cattle very long to figure it out, but Jim Anderson told me, 'Don't stand around and watch them trying to learn, because it will drive you nuts. Just fill the pan, so they know that's where the water is, and go do something else for awhile and then come back to see how they are doing.' I filled it a couple times and walked away, and when I came back one cow had figured it out and she was showing the rest of them how to do it," says Panter.

"Anderson recommended always having one cow that knows how to use it, whenever you put in a new group. I've never worried about that. They smell the water and know it's there and they figure it out very quickly," says Panter.

"I check the pump every 4 or 5 days in winter, just to make sure it's working, but it always is. One time I noticed the cattle weren't drinking very well, and discovered that a cow had backed up to it and defecated into the pan, but that's the only time I ever had to clean the pan. Since the water coming in is always clean, and the pan is empty except when cattle are actively using it, the pan stays clean. You never have moss or algae in summer and no water left in it to freeze in the winter," he says.

"It's very strong and robust. I built my own lids out of steel and bolted them on. I've had 2000-pound bulls using them and they've rubbed on them and

played with them and never hurt them. These pumps are really foolproof."

Anderson recommends a concrete pad around the culvert to prevent groundwater contamination and to keep livestock traffic from making a hole around the pump or driving frost down to a level that might cause freezing. Panter put a 20 by 20 foot concrete pad around his pumps, so cattle are never standing in mud. "The pad is 4 inches thick, but I also put a 3-inch insulated

Styrofoam piece underneath it, on top of a gravel base. This is a good way to insulate the ground around the pump. I've never had to clean the concrete. The cattle mess on it once in awhile, but most of the time they just come drink and then leave. My pumps are about 200 feet away from their feed source, and they defecate while they're traveling to the water and don't leave manure around the pump," he explains.

"I modified my pumps a little from what the instructions said regarding making them frost-free. I didn't drill the

little drain hole as far down on the pipe as they recommend (to be below frost line)." This leaves the water pipe empty down to that level except when cattle are actively pumping water. Having the hole higher makes it easier and quicker for cows to pump the water because it's already closer to the drinking basin.

"Instead of having the drain hole so deep, I put a second (larger) culvert around the outside of the first one, with insulation between. My drain hole is down only 3 feet, which means cows can get water as soon as they start pumping. Our winter temperature gets down to 25 below zero sometimes and they never freeze up," says Panter.

His pumps are located near a creek. "The groundwater is near the surface. I had a backhoe come in and we dug a 20 foot hole—as far as the backhoe would dig—and put a perforated culvert down the hole and filled around it with gravel. The groundwater feeds it and is always there, even though the creek almost dries up in late summer." The creek may freeze over in winter, but water in the pump culvert never freezes.

"I've gone through 2 winters and 3 summers and I haven't had any problem with the pumps. I've had as many as 40 head of cattle on a pump. Some ranchers have 80 or more on one pump and they do fine. Mine is a single basin, but you can make it double so more cattle can drink at once. I have 2 pumps, but I have them set up in different paddocks. The cattle don't hang around the water source; they just go get a drink when they want and there's no crowding," says Panter.

Anderson has one customer who put 4 pumps on a single 24-inch culvert and has 450 cattle watering on the same well. The thing most people like about the pumps is that you don't have to depend on anything but the cows, letting them water themselves; you don't need human labor, electricity, wind, or solar power. If a cow is thirsty she pumps her own water.

One of his first customers was Mike Possenroth, who has 200 cows near Bentley, Alberta. "We were the first one to install a nose-pump drawing water out of a dugout. Jim and I were talking about the pumps, and at that time he hadn't tried one using a dugout, but thought it would work if someone was willing to try it, so we did," says Possenroth.

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Before he installed the nose-pump, he was watering from a dugout, but not letting the cows drink from it in winter. It was fenced off, because he didn't want them to drink through holes chopped in the ice—which was always a risk for a cow falling through the ice and drowning. So he'd drill a hole in the ice every day with an ice auger, then use a gasoline engine to run a generator to run an electric pump. He'd pump water from the dugout into bathtubs for the cattle.

He'd fill the gas tank on the generator and knew it would run for exactly 2 hours and 14 minutes, recalls Anderson. "He'd let it run and go do other chores, constantly keeping track of what time it was—because if you let it run too long and run out of gas at 30 below zero, everything would freeze up. He was really married to those cows. So we put a nose-pump in for him and he was so pleased and excited about what it did for him."

His nose-pump is about 50 yards from the fenced-off dugout. "We positioned it where the ground sloped away so that runoff can't run back into the dugout," says Possenroth. "We dug the hole and put the upright culvert in it, with the water line hooked onto it. We backfilled the hole as we went toward the dugout, laying the pipe in the trench. As we approached the dugout, the backhoe made the last swipe and we flopped the pipe down into the water and buried it. We went back to the culvert, and there the water was," he says. The water came up the pipe to the same level as the surface of the pond water.

"Many people are using dugouts now; they make the dugouts and put the trench and pipeline in before the water collects. That would be easier because you wouldn't have to worry about the water as you are digging the trench. You

have time to set the pipe exactly how you want it," explains Possenroth.

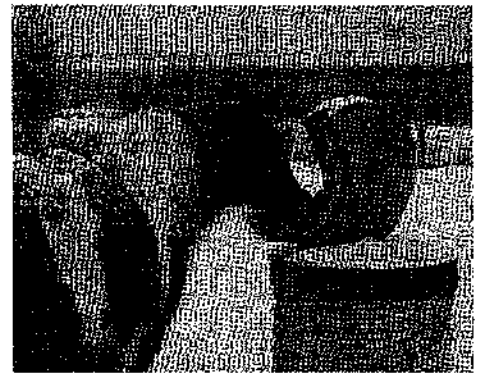
It's a good way to always have clean, fresh, safe water for the cows. You can keep cattle out of the pond or dugout. "The grass is tall on the banks and works as a filter system for runoff in the spring. Ours is just filled with runoff, collecting from the hills around it. This is usually enough water to serve the cows' needs in the winter, and for quite a bit of the summer, too. We mostly use this pasture in winter, with as many as 150 cows. In summer there may be only 30 or 40 in that pasture because the others are scattered out in other places," he says.

"It's a very good invention. We don't need to have electricity. It saves time and money. Solar pumps and panels add up to a lot of money, and can have lots of trouble. There are always things that need to be replaced. The nose-pump is relatively cheap in comparison, and basically trouble-free. It's entertaining to watch the cows pumping water. Any new cows stand around and watch, and figure it out quickly," he says. Possenroth has had his nose-pump now for 10 years, with no problems, even in 40 below zero.

David and Diane Woodward raise cattle near Melita, Manitoba, where winters are very cold. "We've used a frost-free nosepump for 3 winters and the cows do all the work themselves; this is the most reliable way to provide water," says David.

"Our pump is sitting on a 30-inch well crib that's 30 feet deep. The well has limited capacity—about 2 gallons a minute—but our installation creates 700 gallons of storage and with the nosepump we are able to water 130 cows during winter," he says.

"The only problem we've ever had is if it's really windy and cold, because it's out in the open. Occasionally the basin freezes up. When cows are using it, however, you can tell if it's working



without actually checking it, because they really bang it. As long as you can hear it, you know it's working. When it's really cold and windy I check it more closely to make sure there's no ice build-up, especially first thing in the morning. If there is a little ice, it only takes about 5 seconds to clear it away. You can give it a whack with a rubber mallet, clean the ice out, and it's good to go again."

The Nosepump Also Works For Horses

Several of Anderson's customers are horse owners. "Horses are not as aggressive with their noses as cows are, and have to be taught to use the pump. They are also not as strong as a cow and this limits the amount of vertical lift that will work for them. They can't utilize a very deep well," explains Anderson.

Kyla Jansen has one of the largest riding stables in northern Ontario, Canada and 32 horses. She gives riding lessons and offers public trail rides and overnight camping trips. She had serious challenges watering horses during cold weather, and 3 years ago she installed a frost-free nose pump. "I hope to put in another one this year, for another paddock, where I keep my stallion, since I have to haul water to him every day from my parents' place, which is about 2 miles away. Where I live, I don't have electricity, and the nose pump is the only source of water for my horses in winter," she says.

"I never have any problems with it, and my horses always have water. Once in awhile, however, the horses don't drink all the water in the little bowl after they pump it full. Horses are curious and like to play with it, and may pump more than they need. If water is left there it can freeze overnight, so I check it every day. If it freezes, I have a rubber mallet and all I have to do is tap the side of the bowl and it cracks the ice into tiny pieces. Two big scoops with your hands and it's cleaned out and ready to go again."



Where she lives it can get down to 40 below zero. "The first year I put in the nose pump, we installed it right before winter and my horses didn't have a chance to figure out how to use it before the cold weather. But they can smell water, and two horses checked it out right away. Within 2 months those horses had taught all the rest how to use it. I have a miniature pony with them, and even he was able to pump water," she says.

"If I get a new horse I try to show him the water. I fill up the bowl so he can drink, and stand behind the bowl and pull the lever back myself—and then let it go so it bangs against their nose." The horse realizes that getting water involves use of the nose.

"The first time, the horse may jump back in surprise. After 2 or 3 times, however, they figure it out. I have a few that don't use their nose, however. They grab the lever and push it with their teeth. My smaller ponies do this a lot because they are not as tall and don't have the strength to push down with their noses. Some of the bigger horses also grab the paddle with their teeth and shove on it to get their water," says Jansen.

The water source is a nearby pond that's fenced off so the horses can't get to it. She didn't want them trying to drink in the pond, especially during winter when they might fall through the ice. This was the main reason she got the frost-free nose pump. "The pond is very deep, and if they try to get water and fall through, I would lose them. For safety, and environmental purposes, my pump is 50 feet away from the pond," she explains. The water comes through a pipe installed near the bottom of the pond, traveling horizontally to service the nose pump. Water comes up the culvert a ways (equalizing with the level of the pond, but not freezing), and is easy for the horses to pump!

"I can't say enough good about the nose pump. I have 30 horses in one paddock together using one pump, and have no issues at all. The initial cost is the only expense. It pays for itself in a couple years. I don't have to haul water, I haven't had a pump freeze up, and I don't have an electric bill. There are no worries, because I know my horses always have water, and it's always fresh, clean water," says Jansen.

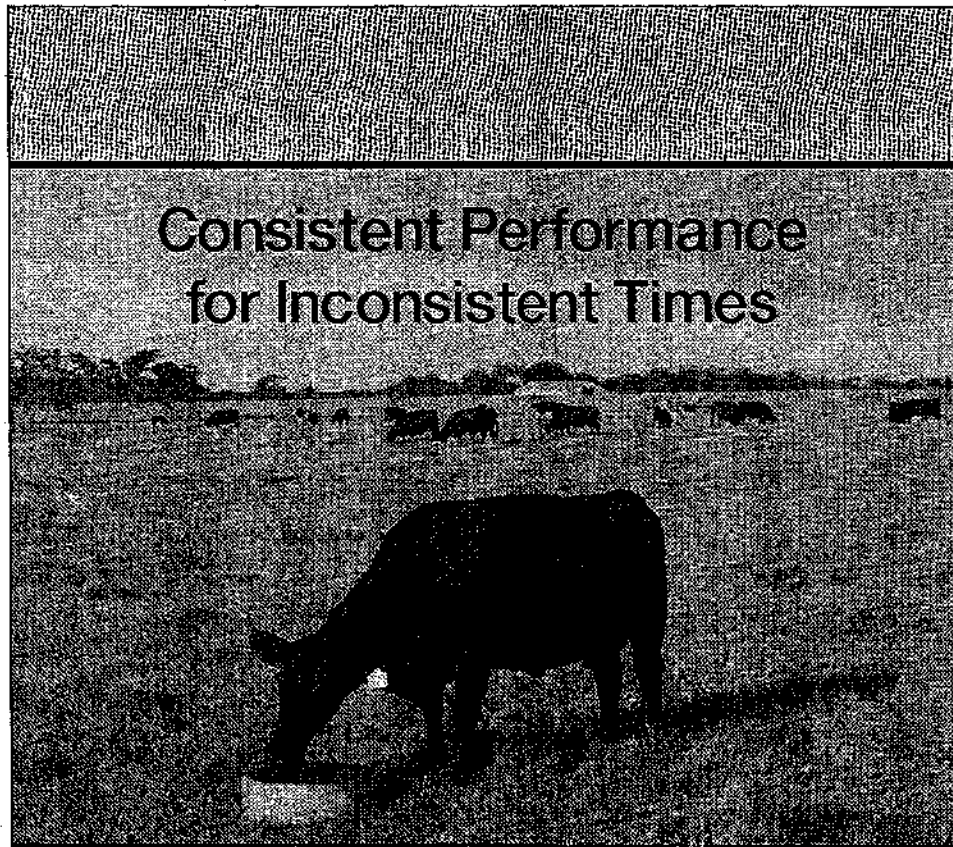
"I was skeptical about this type of system at first, because horses have very sensitive noses, compared to cattle. When the pump arrived, I said to my dad, 'They are never going to be able to push that paddle!' But they have no problem."

She says it can be humorous watching them use it. "The herd has a hierarchy and the dominant ones always drink first. The others wait in line and take their turn. Some of them drink together. The miniature pony stands beside his best friend and that horse pumps it full

for him and then the pony gets his drink, and his friend pumps it again."

For more information, call Andersons at 403-843-6740 or 866-843-6744 or check their website at www.frostfreenosepumps.com

Kyla Jansen also welcomes any questions from horse owners and says they can call her at 705-368-0921



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