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Watering Systems for Cattle Ponds

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The availability of sufficient quantities of clean water is often overlooked on beef cattle farms. Various livestock watering systems have been developed, but many require access to water lines that are expensive to install. However, most producers have ponds on their properties that can be used for livestock watering. This document describes two watering devices that can be used for either watering cattle directly from ponds or within close proximity.

General Considerations

Allowing cattle unlimited access to ponds is not ideal from an animal health and environmental perspective. Cattle may loaf in ponds and transfer internal parasites as a result. Foot rot is a common problem of animals lingering in ponds, because softened hoofs are easily damaged and become infected with fusobacteria. One of the more important diseases advanced through the microclimatic conditions around ponds is leptospirosis. Fever, anorexia and possible calf abortions are possible symptoms of leptospirosis. Coccidiosis, caused by a protozoan parasite, may cause acute diarrhea, weight loss and death of animals.

Pond water may also have increased nitrogen or phosphorus levels that may stem from runoff or direct manure deposits. High nutrient levels can result in increased algae and weed growth with the associated reduction in environmental and cattle drinking water quality.

Appropriate pond management helps prevent negative health effects and negative environmental effects, such as erosion of banks and sediment intake, that could render the pond unusable in the long term. Prolonged unlimited presence of livestock around ponds can result in destruction of fish habitat, reduction of pond volume and lost cattle grazing time.

Watering Systems Design

For many producers, ponds are the only way to provide water for livestock, especially cattle. Two examples of pond-watering devices that are cost-effective, relatively easy to install and used by several Arkansas beef producers are described.

Floating Fences: Establishing a watering access to a pond is usually done in conjunction with fencing the entire pond to avoid negative environmental impacts. Further, fencing around the pond helps prevent bank and bottom damage due to cattle traffic. Since a pond is used to intercept runoff, efforts should be made to avoid manure contamination through

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incoming waterways, spillways and shorelines. Ideally, ponds should be fenced except the section assigned as cattle access for watering. An example for the watering access is depicted in Figure 1. While the exclusion material used depends on what is available, utilizing high-tensile electric wire is a cost-effective solution given the durability of the material and ease of removal. It is a good idea to place the pond exclusion fence at least 12 feet away from the shoreline to provide for vehicle access in case of required pond maintenance or recreational activities. This buffer area also helps maintain vegetation that may filter occurring runoff and provide habitat for wildlife.

The preferable material for a floating fence as shown in Figure 1 is PVC or other rust-resistant material. Plastic pipes are easy to cut to the desired length and are easily connected to the required shape and length. The pipes should be sealed so they don't accumulate water. The electric wire placed on top of the pipe should rise approximately 20-30 inches above the water surface. The material used may be high-tensile wire to obtain a high level of reliability and durability. Agriculture consultants from the Noble Foundation in Ardmore (Oklahoma) reported that a floating fence width of 20-50 feet is sufficient

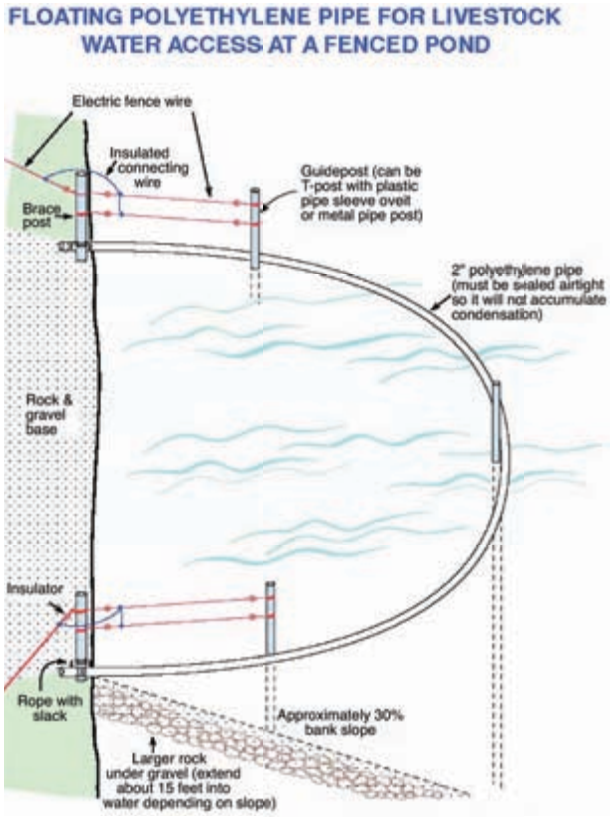

Figure 1. Possible design of a floating fence. (*Source: M.D. Porter and C.K. Ly. 1997. Samuel Roberts Noble Foundation, Ardmore, Oklahoma*)

for most situations. Twenty feet appeared to be appropriate for a small herd of cattle, while 40 feet is considered sufficient for 200 cattle.

The bottom of the pond at the access point should have a slope of about 30 percent and should reach far enough into the pond so that a minimum water depth of 5 feet at the end of the slope is always maintained, even under drought conditions. The lower end of the slope should be laid with 6-12 inches of rock covered with gravel to maintain a firm base below the water access area. It is also a good idea to install a rock and gravel base in front of the water access to prevent cattle from standing for prolonged periods of time and to avoid development of runoff gullies. The rock and gravel material used for this purpose should feature angular shapes so they will interlock and provide a firm base. In general, the more solid the entire floating fence construction, the longer it will last.

Tire Tanks. Tire tanks can be connected to existing water lines, but they can easily be constructed next to ponds or any other water source and thus provide a watering alternative that will protect the pond structure. The general design of a tire tank is displayed in Figure 2. Large machinery tires are the basis of tire tanks, and used tires are usually given away.

To start with the process, the sidewalls of the tire are cut out to provide openings for the water access. For that reason, it is advisable to use tires without steel belts. Due to the thickness of most heavy-equipment tires, cutting the sidewalls may take a substantial amount of time and may require additional cutting blades. Reciprocating saws are commonly used for cutting the sidewalls. Friction between tire and blade can be a problem, but wedges to reduce binding may help. During cutting, blades may be cooled with a small, steady flow of water to prevent overheating. Removing the beads from old tires can be physically demanding and time consuming; thus, setting aside a specific time for cutting several tires at once may be the most efficient approach. Also, since power tools are involved, attention should be given to safety around the work area.

After cutting, tires should be cleaned thoroughly to remove chemicals such as ethylene glycol or calcium chloride. These compounds are anti-freezing agents used when tires are filled with water to increase traction of machinery.

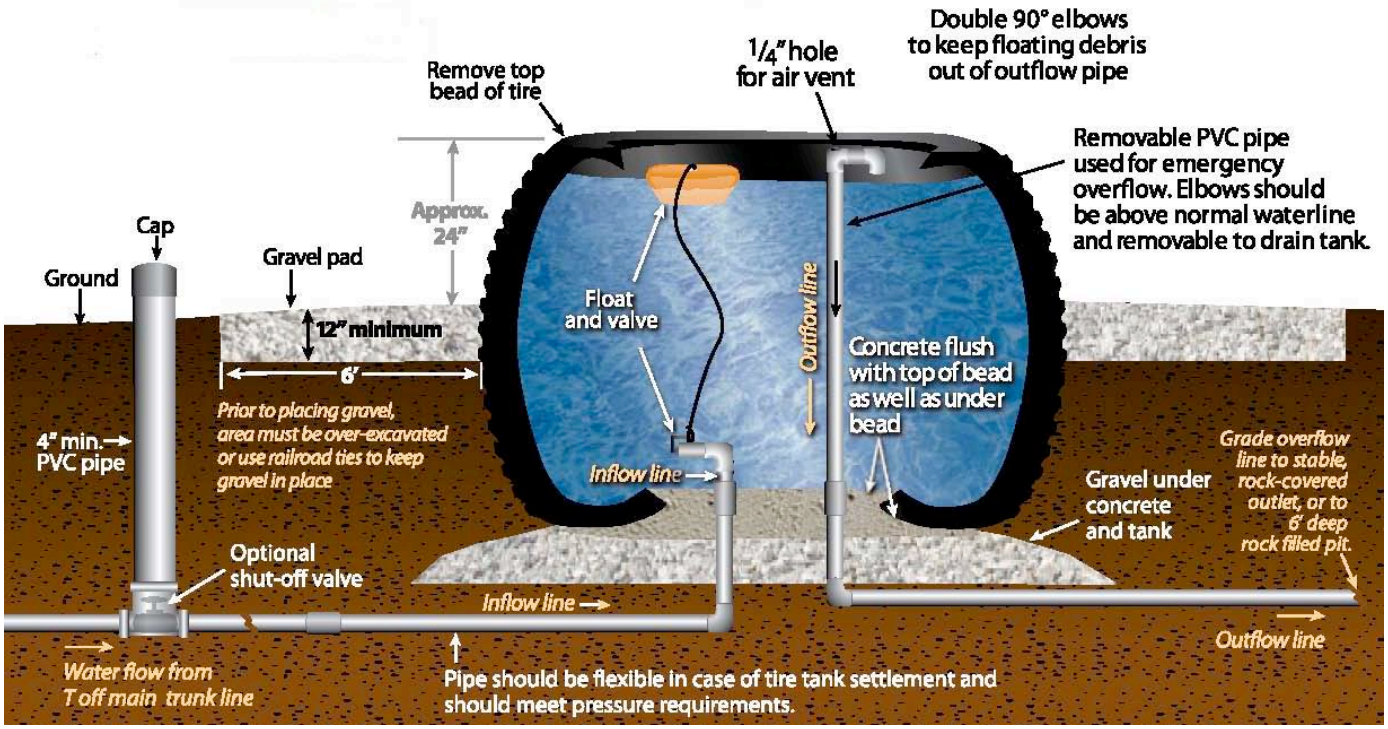

Figure 2. Design of a tire tank. *(Source: USDA-NRCS. 2006. Watering systems for serious graziers <http://www.mo.nrcs.usda.gov /news/images/Watering%20Systemslow.pdf>. Last accessed October 6, 2009.)*

The tires should be placed on a gravel pad, either placed half into the ground or placed directly on the existing ground. The gravel helps drain spilled water and keeps the area from becoming muddy. In addition, these gravel pads may prevent cattle from lingering too long around tanks. When possible, perforated pipes below the gravel pads that drain excess water away from the pad should be considered. Water access pipes are to be installed before tires are placed and equipped with a filter. For gravity flow situations, pond outlets should be placed low enough so that water flow from the pond down to tire tanks is always maintained. Pipes that run through the concrete up into the tire should have some extra inches of length that can be cut later to the desired dimensions. An overflow, as indicated in Figure 2, should be considered as a way to keep the area around the tank as dry and as mud-free as possible.

After tires are placed in the correct location, the bottom will be sealed with concrete so that the concrete is poured both under the center area of the tire and is flush with top of the bottom bead. A float and valve need to be installed to automatically regulate water levels in the tire. In these watering devices, water remains cool due to a favorable water volume-to-surface ratio even during hot days.

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