Livestock Watering
FACTSHEET

BRITISH COLUMBIA
Ministry of Agriculture and Lands

Order No. 590.306-1
January 2006

# SUMMER LIVESTOCK WATER TROUGHS

**This Factsheet outlines options for basic outdoor livestock water troughs used in non-freezing conditions.**

## General Trough Conditions

There are numerous types, sizes and makes of troughs built to suit livestock in non-freezing conditions. When selecting a trough, consider the following points common to all installations:

- the capacity must be suitable for the livestock size and numbers to be watered
- the physical size must be suitable for the type of animal - combination troughs are available for mixed livestock operations such as cattle and sheep etc.
- the flow capacity must be suitable to ensure a water filling rate fast enough that livestock do not have to line up to drink - check that the inlet (valve, pipe, etc.) does not limit flow
  (points detailed in Factsheet #590.304-1, ***Livestock Water System Design #1***)
- the construction must withstand the abuse of animals and the weather - look for galvanized and stainless steel components with a strong basic frame
- it should be easy to clean and routine maintenance should be straight forward - check that replacement parts are available locally
- it should accommodate the supply and overflow piping arrangement chosen whether a series, parallel, or flow-through

For information on the trough pictured above, see Factsheet #590.306-3, ***Rangeland Livestock Watering Trough***. For winter use troughs see Factsheet #590.307-3, ***Winter Outdoor Livestock Watering***.

## Siting Water Troughs

On-farm locations may be dictated by such restrictions as electrical supply for heated troughs. Otherwise, choose a location that provides good livestock footing, that will drain well and, if possible, is protected from wind.

For troughs on extensive cattle grazing areas (such as rangeland), site according to the terrain using the following guidelines for the distances cattle will walk to water:

- on rough terrain - 400 to 800 m (1/4 to 1/2 mile)
- on rolling terrain - 600 to 1200 m (3/8 to 3/4 mile)
- on level terrain - 1200 to 1600 m (3/4 to 1 mile)

These are forage-to-trough distances. Trough spacing can be up to twice these distances, i.e., on rolling terrain, troughs could be spaced from 1200 m (3/4 mile) to 2400 m (1½ mile) apart and cattle would have no greater distance to walk to water than 600 to 1200 m (3/8 to 3/4 mile). Also consider other site factors such as time of year, size and age of livestock, desire to reduce use of watercourses, etc. when locating troughs.

## Supply & Overflow Piping

Summer troughs are usually a simple design, used only during the frost-free period of the year, and filled automatically from a pressured supply and float-controlled valve.

**Supply Piping.** The pressured supply line may be plumbed to:

- supply one trough (with a valve to start and stop water flow)
- supply more than one trough in parallel (each trough supply line is teed-off the main supply line so all have supply line pressure)
- supply more than one trough in series or "flow-through" (water flows from one trough to the next, to the next, etc – only the first has supply line pressure – the rest have pressure due to the elevation differences between troughs)

**Overflow Piping.** Overflow water, due to valve leakage, etc., should be plumbed away to prevent muddying at the trough, taking it to a 'natural drainage' area or constructed rock pit at least 15m (50 ft) away.

## Water Level Control

There are three basic ways to control the trough water level:

- a float-controlled **valve** (flow is set by a floating ball controlling the inlet valve)
  - commonly the valve and float are mounted at the top edge of the trough
  - or, the valve mounted on the trough bottom and the float on a chain
- a float-controlled **switch** (flow from a pump is electrically switched on/off)
  - typically a floating ball containing a mercury switch
- an overflow **stand pipe** (flow is constant with level set by overflow pipe height)
  - installed to prevent debris from entering the overflow (see Figure 2, page 3)

**Lever Arm Float Controlled Valves.** Simple toilet-type float and lever arm valves are commonly used and generally quite effective (picture left). Valves are sometimes supplied with troughs, if not consider high-quality, high-capacity plastic or brass valves. The extended float arm and float must be protected. When selecting and installing float-controlled valves consider the following:

- is the valve flow rate capacity sufficient to quickly refill the trough and prevent livestock lining up or pushing at the tough to access water?
- will the float close against the supply line pressure? - larger floats and longer float arms can be used as line pressure increases
- can the float be protected against damage by livestock?

Source: Hudson Valve Co.

**Enclosed Float Controlled Valves.** These are available as a single plastic unit which threads onto the supply line. One type has an enclosed float (picture right); another has an internal float that activates a diaphragm to open and close the supply (picture left). This latter type can close under pressures to 140 psi, beyond the normal limits of float/lever arm valves. Under dirty water conditions they may require cleaning.

**Submerged Float Controlled Valves.** These are installed inside the trough at the bottom with a chain from the lever are to the float. As long as the trough is not allow to go dry, this arrangement provides for protection for the valve and any livestock contact with the float ball should not cause damage as the chain offers flexibility. Two variations are a standard float valve with chain (picture left) and commercial valve with cable connection (picture right).

## Float-Controlled Trough

Figure 1, below, is a typical float controlled trough:

- the supply pipeline is only shallow buried for summer use
- the supply line may be to this trough only or teed from a multi-trough supply
- the float-controlled valve flow rate is sized to suit the recovery rate required as determined by livestock type and numbers
- protection is installed around the float to prevent damage by livestock - can vary from a post and rail guard fence to welded in place steel plate
- an overflow line is provided should the float valve fail - this line is directed away from the immediate trough area to prevent mudding
- a "bird and critter" escape is installed to ensure wildlife will not become trapped and drown, contaminating the water
- for details refer to Figure 5 in Factsheet 590.306-3, ***Rangeland Livestock Water Trough***

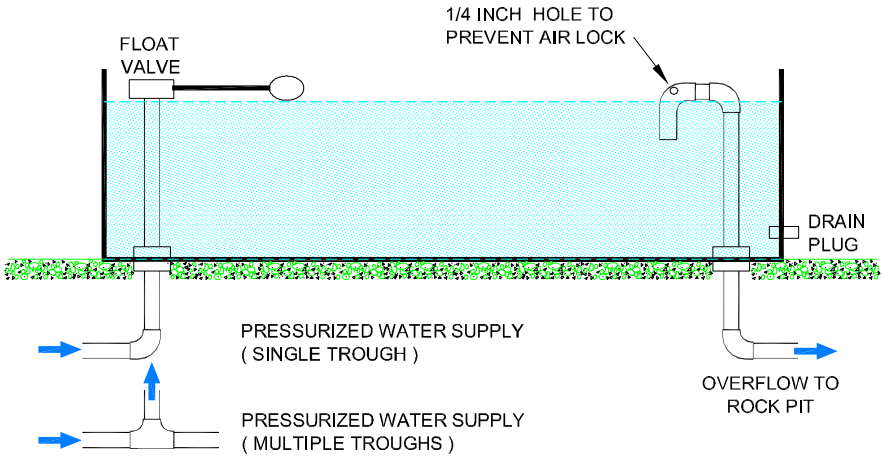


**Figure I** **Float Controlled Trough**

## Flow-Through Trough

Figure 2, below, is a typical flow-through trough that has level control features different than the float-controlled trough:

- water is continuously flowing through the trough (hence “flow-through”)
- the level control is set by the outlet pipe height
- the outlet draws water from below the water level keeping out debris
- an air bleed hole is drilled in the outlet elbow to prevent air locking
- must have a water supply that has the flow capacity
- often used as a “pressure break” trough in gravity-pressured systems

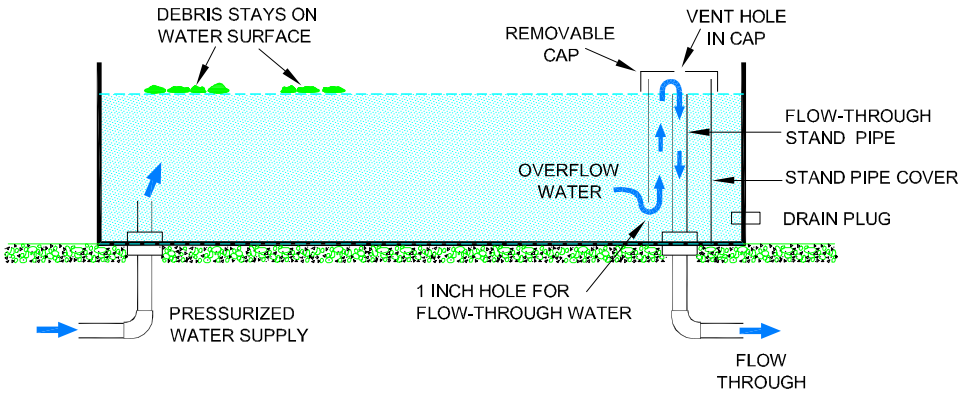


**Figure 2** **Flow Through Trough**

## Rubber Tire Trough

A farm-built trough using a ‘retired’ tractor or large equipment rubber tire provides a low-cost, strong trough, one that can even resist some freezing. A poured concrete base, a screened inlet / outlet, and some backfill around the tire complete the trough. Figure 3, below, illustrates this trough and Figure 4 is a sketch of its construction showing an alternative method of keeping floating debris out of the flow-through stand pipe.

**Figure 3 Rubber Tire Trough with Protection for Inlet and Outlet**

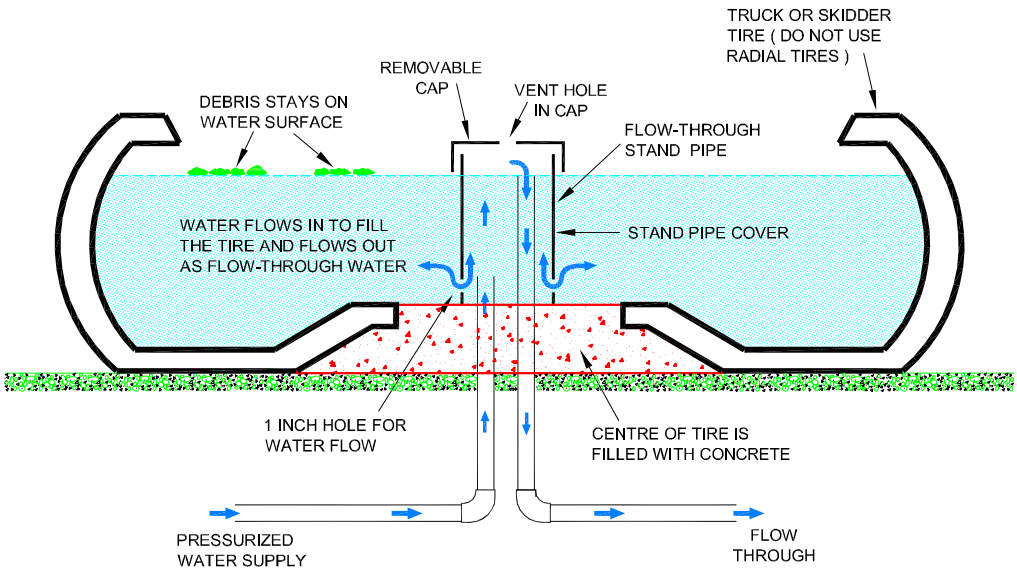


**Figure 4 Rubber Tire Trough Construction**

## Other Points

**Drains.** Troughs used for seasonal periods should have drains installed for frost protection. These should allow both the supply line and the troughs to be drained. Polyethylene pipe can be frozen without damage as the plastic will expand, however this is generally a poor practice. Fittings may crack and repeated freezing may cause failure of pipe connections.

Energy-free troughs that have no heat source for frost protection may also require drains should they be taken out of service during the winter months.

**Wildlife Considerations for Troughs.** Many livestock water troughs may be used by wildlife, including birds and small animals. On some Crown cattle grazing areas, the stockman may wish to provide improved access to the water as well as add some safety features. Some considerations for wildlife use and safety are:

- provide a "bird and critter" escape to allow animals a safe exit should they become trapped in the trough
- provide wildlife "ladders" to allow easy access to the trough
- place troughs at approximately 50 cm (20 in.) high to allow young animals access
- use troughs that are no greater than 50 cm (20 in.) deep to guard against drowning of young animals which may fall into the trough
- place a safety barrier to prevent accidental entry into the trough

**System Installation.** For details on the many points of a good system installation, see Factsheet #590.306-2, ***Installing Summer Livestock Watering Systems.***

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