Livestock Watering Systems

Mark Kennedy
Kennedy Grassland Services, LLC
Houston, MO

Water is generally the MOST limiting factor in maintaining the flexibility of a grazing system.

Water deficiency will reduce animal performance more quickly and more severely than any other nutrient (feed and/or mineral).

You must be able to deliver adequate amounts of quality drinking water, at the right location, to have a successful grazing system.

Watering Behavior

- Cattle will come to water 2 to 5 times daily.
- Cattle will drink for 1 to 4 minutes at a time.
- Cattle can drink at a rate of about 2 gallons per minute.

Consumption Rates

Water Consumption Rate Per Adult Animal
(gallons per head per day)

Livestock	Avg. Maintenance	Hot Weather
Beef Cow	8 – 12	20 – 25
Milking Cow	20 – 25	30 - 40
Sheep & Goats	2 – 3	3 – 4
Horse	8 – 12	20 – 25

Water Requirements Vary Based On ....

- Age
  - Mature cows = 3-5 lbs water / lb DMI
  - Calves = 5-7 lbs water / lb DMI
    - *Calves are much more selective regarding water quality.*

Water Requirements Vary Based On ....

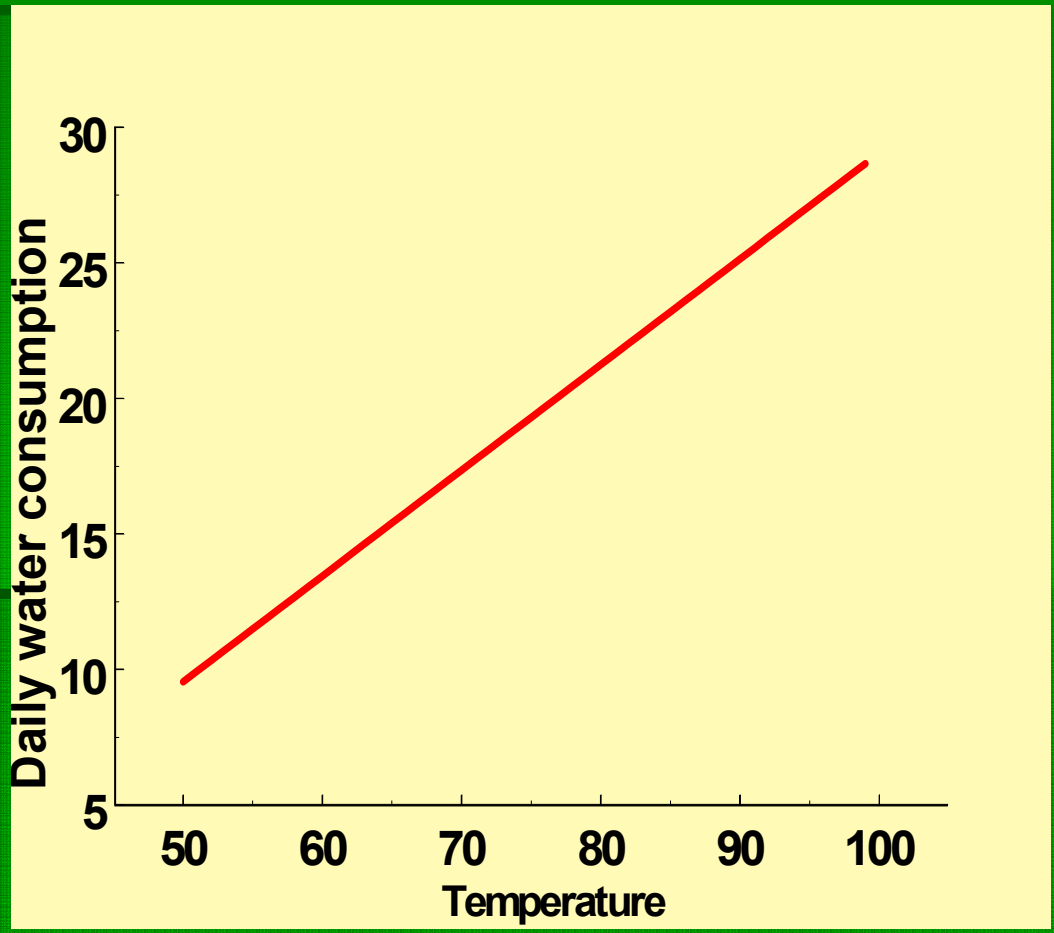
- Stage of Production
  - Lactation
    - Water intake will increase by about 3 gal / gal of milk produced.

Water Requirements Vary Based On ....

- Breed
  - *Bos taurus* > *Bos indicus*
  - High milk breeds > Low milk breeds

Water Requirements Vary Based On ....

- Ambient temperature
  - The higher the temperature, the more water the animal will consume.



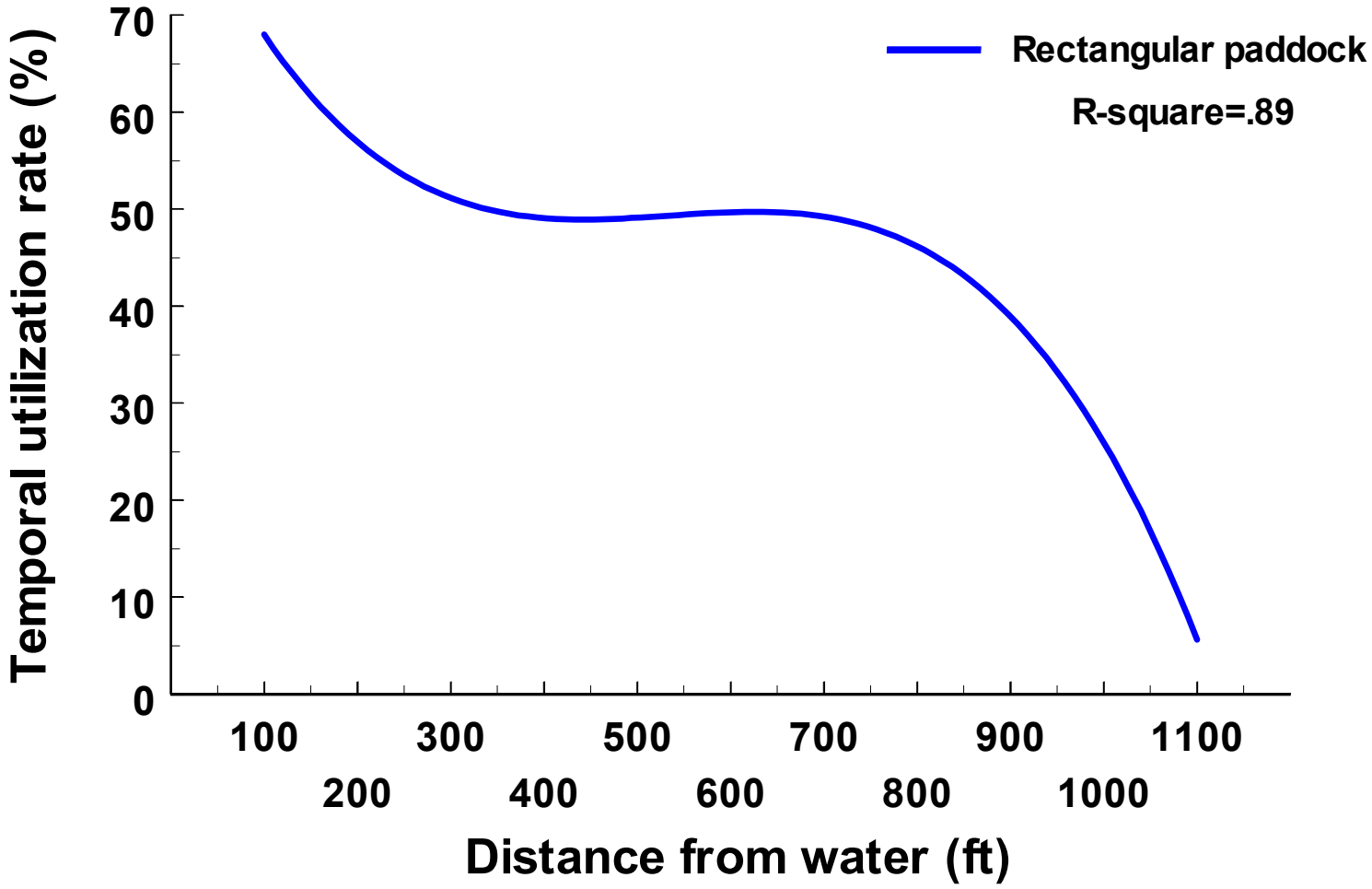
Water Requirements Vary Based On ....

- Moisture Content of Feed
  - Pasture at 80% moisture contains 4 lbs of water / lb of forage dry matter.
  - Therefore, a cow consuming 25 lbs of DM is also consuming 100 lbs (16 gallons) of water.

Water Requirements Vary Based On ....

- Travel Distance to Water
  - Cattle with water within 600 to 800 feet drank 15% more than cattle walking > 1000 feet to water.

Figure 1. Impact of distance from water on temporal utilization rate in rectangular 10 acre paddocks.



Livestock Watering Patterns

- Tend to drink “socially” when:
  - Traveling farther in larger paddock.
  - Should have tank space for 10% of the herd and a flow rate sufficient enough to water the herd in 20 minutes.

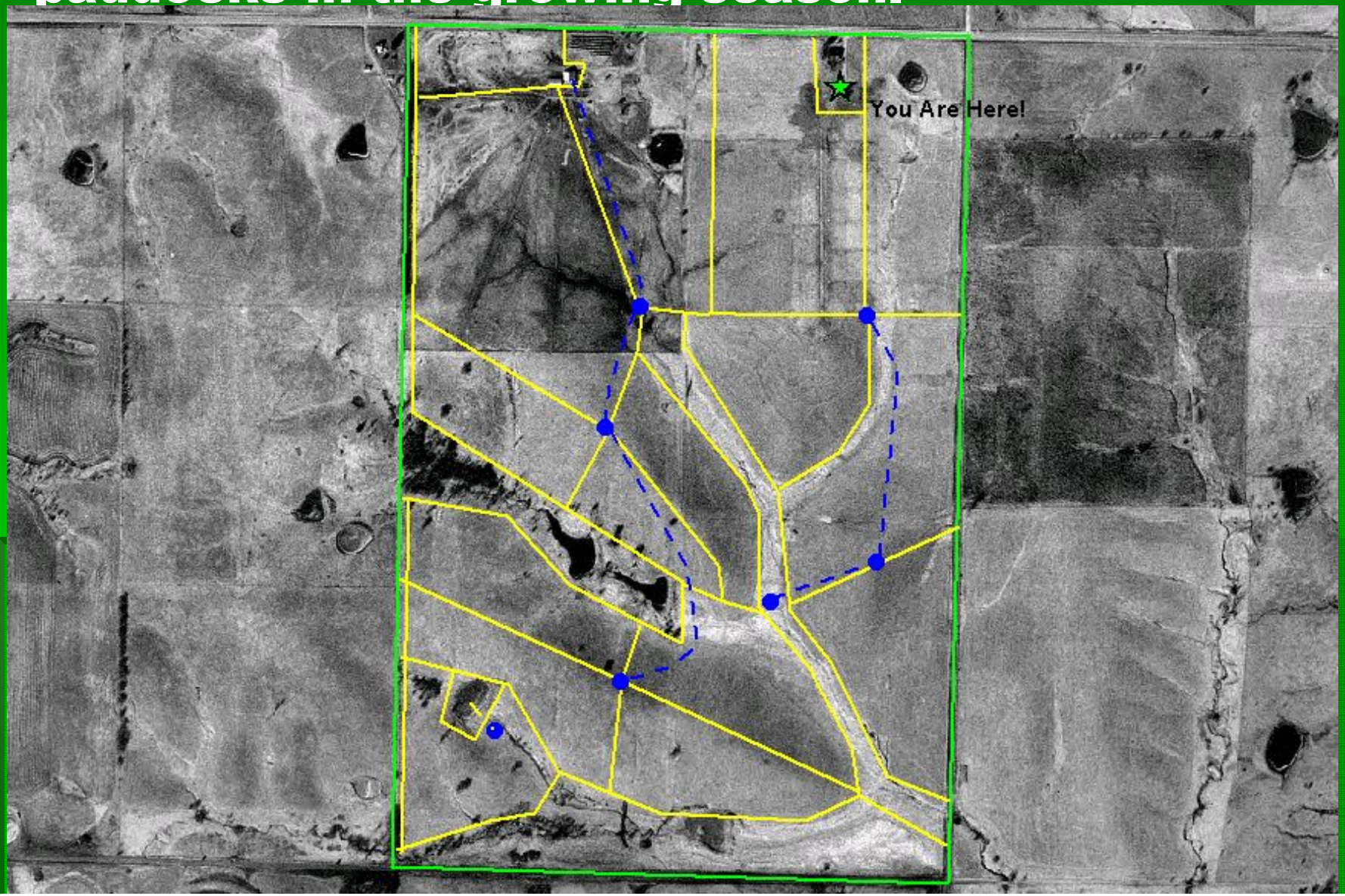
Livestock Watering Patterns

- Tend to drink “individually” when:
  - Less than 10 acres or 1/8 mile or less to travel.
  - Can usually get by with smaller tank and less flow this way.

Goal

- Livestock should not have to travel more that 800 feet to water.
- Water in EVERY paddock.
- Maintain water quality in streams, springs, and ponds.

As few as possible permanent “winter” water sites. Can use portable systems to serve paddocks in the growing season.



Typical Water Sources

- Pressure Systems from Well
- Ponds
- Springs
- Creeks

Creeks and Ponds

Problems

Solutions

Electric Water Gap

Installing Pipes into Ponds

This can get expensive!!

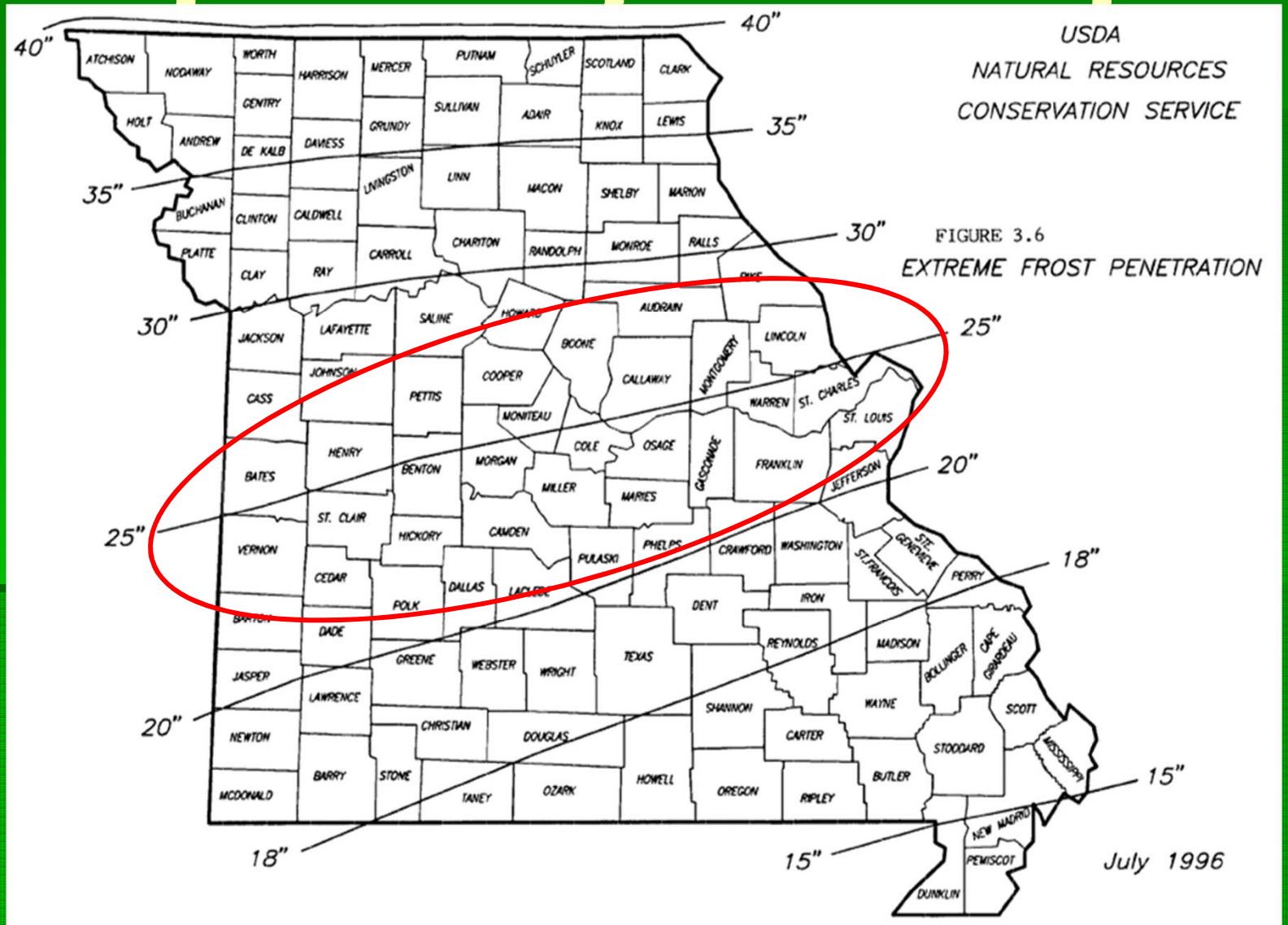
The pipe is supposed to be out farther in the pond!!

Wells and Pipeline

Pipeline

- Pipe needs to be buried below frost line. (See next slide)
- Bedding to protect pipe may be needed.
- Pressure test line prior to backfilling trench.

Required Pipeline Depths



Shut-off Valves

- You can never install too many shut-off valves.
- Need to have one at each tank so that it can be shut off and drained when it's not in use.

Hydrants

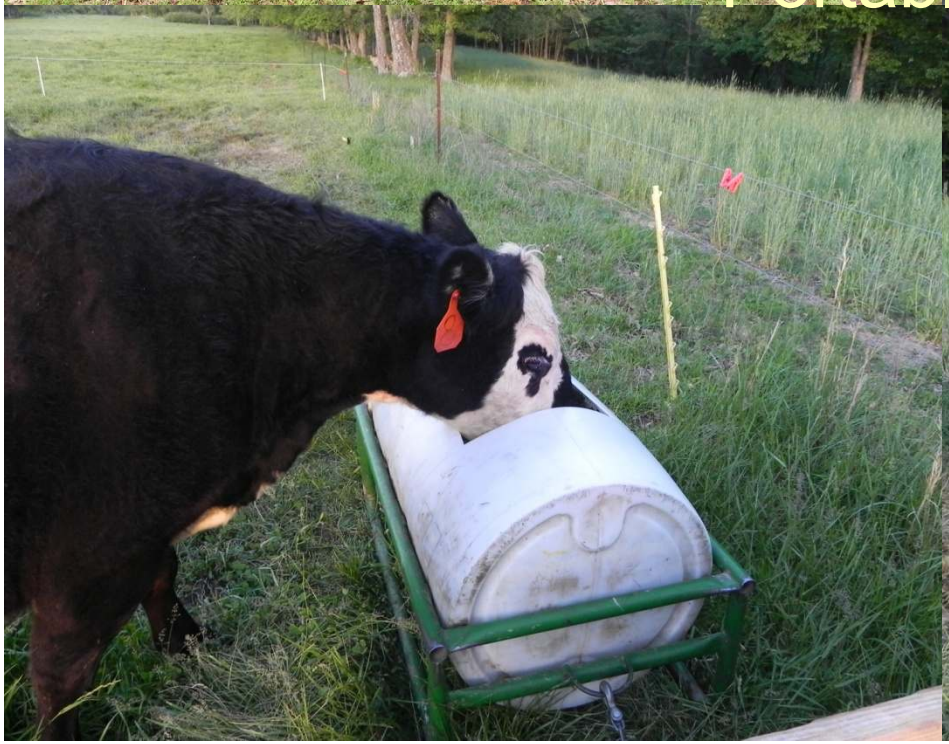
- Add flexibility to system.
- Inexpensive and easy to install.
- Can water multiple paddocks with hose and portable tank.

Proper Installation of Hydrants

Quick Connect Couplers

Above Ground Waterline & Couplers

Portable Tanks




?
Portable Tanks

Portable Tanks are *PORTABLE TANKS!*

Has this tank ever been moved?

5 days of grazing

Freeze Proof Waterers

- Use heat from the sub-soil to stay ice free.
- Proper installation is critical.
- Animals must be using the waterer to stay ice free.
- Shut-off and drain when not in use.

Installation

Installation

Installation

Installation

Other Freeze-Proof Waterers

Other Freeze-Proof Waterers

Other Freeze Proof Waterers

Other Freeze-Proof Waterers

Concrete Freeze-Proof Waterers

Always be sure to place gravel around the front of your tanks.

Other Permanent Water Facility Alternatives

Tire Tanks

Cutting the Tire

Installation of Tire Tank

Installation of Tire Tank

Tire Tanks

Tire Tanks

Tire Tanks

Pads Around Tanks

- Gravel
  - Min. 6’ out from tank
  - Use large gravel (1 ½” – 2”)
- Concrete
  - Min. 2’ out from tank
  - Min. 5” thick w/ reinforcement

Fiber Blankets for Gravel Pads

Geotextile and Geowebbing

Spring Developments

- Springs and seeps can be developed for livestock water if they have adequate flow.
- They need to have fall so that they can be gravity fed to the tank site.

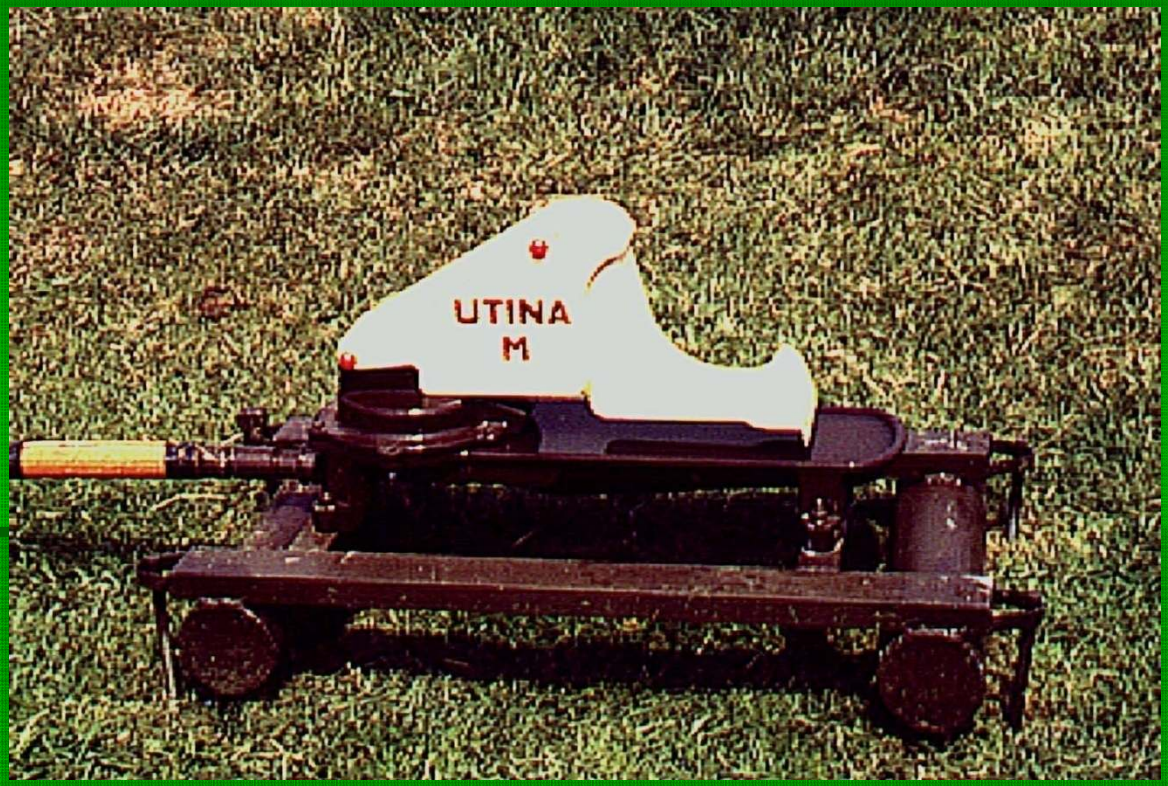
Spring Developments

- Springs are excavated to locate the vein and back filled with gravel.
- The collector is placed and covered with gravel and then soil.

Spring Development

Ram Pumps

Nose Pumps



Solar Pumps

Algae Control