

WATER SYSTEMS FOR GRAZING LIVESTOCK

Many times the availability of water determines where we pasture livestock or influences our ability to manage our pastures to optimize harvest efficiently. Water is an essential nutrient for livestock rations. How and where we provide water can impact the success of our grazing systems. Water needs and water resources are unique to each operation so every water system is customized to fit the situation. New technologies and ideas are rapidly becoming available that increase our options for providing water. It is also crucial that we consider the impact of our traditional systems, "cows in the creek," both on the environment and the quantity and quality of water available to our grazing livestock.

How much water do we need?

Daily water needs are highly variable depending on ambient temperatures, pasture quality and production cycle of animals.

Dairy cow	20-25 gal/day
Beef cow	15-20 gal/day
Yearling cattle	10-15 gal/day
Horse	10-15 gal/day
Ewe	2-3 gal/day

These daily requirements will rarely be exceeded, but cool weather and succulent feeds will often cut these requirements to one half or less.

Sources of water

One of the first challenges when planning a water system is to make sure we consider all the possible water source options. It's sometimes more cost effective to develop other sources of water rather than just digging in pipe from the homestead well.

Water Sources

Surface creeks
 ponds
 reservoirs
 springs
 swamps

Development Techniques

fenced concrete access
gravity piping to tank
drain tile accumulation to tank
buried catchments
Hydro Ram pump
solar pumps
cattle/horse operated nose pumps

Water Sources

Pump operation

Wells drilled
 jetted
 driven

livestock-operated nose pump
 windmill
 solar
 gasoline/diesel
 electric

Delivering the water

We know how much water we need and we now have a supply of water so the next step is to deliver the right amount in the right amount of time. What kind of grazing system you have plays an important role in tank sizing and recharge rates. Livestock in intensive controlled grazing systems with water in each paddock tend to drink in small groups or even one at a time. This means we can use a small tank 20-100 gallons as long as we have a flow rate that provides total water needs per day in 4 to 8 hours. If livestock have to "travel" to water as in continuous grazing systems or even in paddock systems with only one source of water, tank size should be 1/4 of total daily needs and refilling of tank should take 1 hour or less.

These guide lines are useful as a starting point when you plan your water system. There's lots of options such as using larger tanks and slower flow rates. Combinations of systems can also be used, i.e., well water around the farmstead, a pond or creek for some pasture areas, and even hauling water for the special situations or areas.

Pipe Sizing Guide

<i>Gallons Per Minute</i>										
Pipe Diameter	Pipe Length									
	100'	200'	350'	500'	750'	1000'	1500'	2000'	3500'	1 mile
1/2"	4	3	--	2	--	--	1	--	--	--
3/4"	8	8	6	5	4	3	--	2	--	1
1"	13	13	10	8	7	6	5	4	3	2
1 1/4"	23	23	21	19	15	12	9	8	6	4
1 1/2"	30	30	30	26	22	19	15	12	9	7
2"	50	50	50	50	43	37	29	25	18	15

Putting the System Together

Samples:

40 Beef cows - continuous graze - water tank 500 ft. from well

40 cows x 20 gal/day = 800 gal/day

minimum tank size = 1/4 of 800 = 200 gal

tank refill rate 200 gal ÷ 60 min = 3.3 gal/min

pipe size from well to tank = 3/4"

60 Dairy cows - intensive graze - water in each paddock - last tank 1500 ft. from well

minimum tank size = 20-25 gal.

flow rate = 1500 gal ÷ 4 hours (240 Min.) = 6.3 gal/min

pipe size from well to tank = 1 1/4" or combination of

3/4" at tank plus 1" plus 1/4" from well

Other Combinations:

Make sure your pump has the capacity to deliver the needed gallons per minute especially if you're serving more than one need, i.e., home, barn, and pasture. You also may need to check the recharge capacity of your well, especially if you're adding extra animals. When developing surface water supplies, contact your SCD for technical information and potential cost sharing programs.

Summary

Getting water to livestock on pasture will take planning and some monetary investment. Before you reject the needed water system investment, consider the potential for improving your pasture harvest potential.