Practical Sizing of Rain Harvest Systems in Marion County

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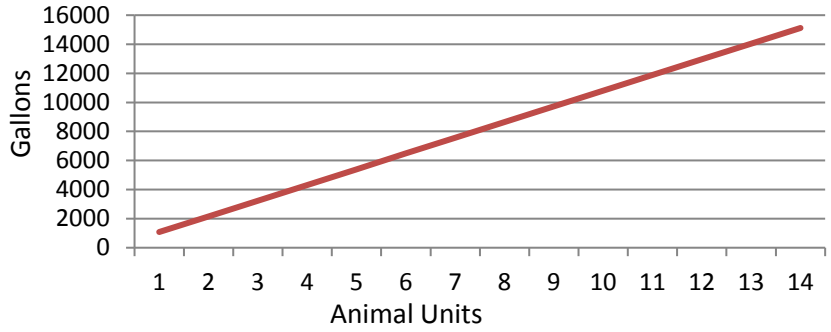
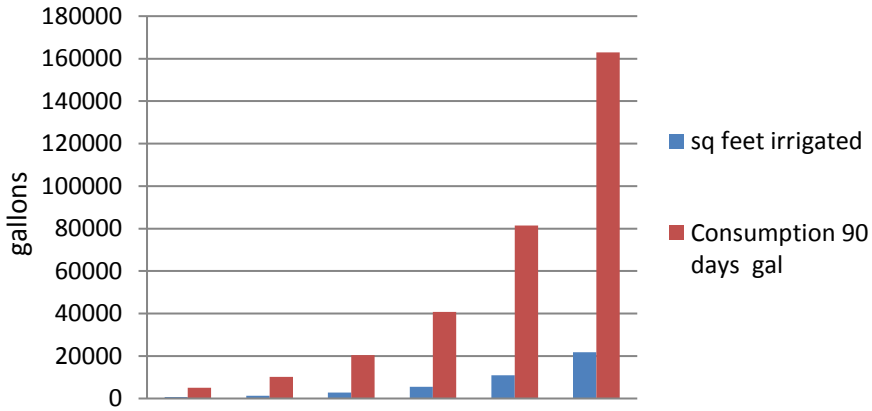
Livestock or Wildlife Watering: Consumption assuming 12 g/day per Animal Unit (A.U.). With average water storage projects costing up to $1/gallon for installed tanks and piping, storing large amounts of water can quickly become costly. Most of the projects we've assisted with come in costing between $1,000 and $10,000. Marion SWCD staff may be able to assist you in finding some help to fund a water catchment system. A 10,000 gallon system could supplement up to about 9 Animal Units (1,000 lb) during a 3 month drought (July- Sept). Dairy animals require nearly double the water. Small wildlife guzzlers can be sized much smaller, say 500 to 1,000 gallons, for misc. small animals, and will attract wildlife to an area if there is no other water source within ¼ mile.



Irrigation: Sprinkler Irrigation is not practical using a Rain Harvest system unless you have an artificial pond or huge tank (high expense). Drip Irrigation systems of vegetables or landscape plants using a soaker hose is practical only for very small plots (less than 1,000 sf). A pressurized system or raised water tank to achieve pressure adds to project cost. Assuming 1 inch/week, to apply an inch of water to one square foot of lawn, it takes approximately 0.62 gallons of water. A 1,000 sq feet plot of grass would then require roughly 620 gallons of water per week. If this resident was interested in having a rain water catchment system facilitate their summer irrigation needs, they would need a 7,440 gallon system to supply three months of water (July- Sept). Vegetables, trees, and other crops would typically require more than 1" per week, closer to 2", making a rain harvest system generally cost prohibitive.

Acres equiv.	sq feet irrigated	Consumption 90 days gal
1/64th	680	5,086
1/32nd	1,361	10,180
1/16th	2,722	20,361
1/8th	5,445	40,729
One quarter	10,890	81,457
One half	21,780	162,914



Sizing a System: Water Supply

How much water can be collected?

Oregon allows its resident to legally store stormwater run-off from roofs for potable drinking water or to be used for watering. Depending on the end use of the water, different filtration systems may be needed. One of the first steps when planning to implement a rainwater catchment system is to calculate how much water is available for collection and to identify the intended uses of the water once collected. Most residents have ample roof square footage to fill any size tank due to the average annual rainfall we receive (38 to 60+ inches, depending on elevation). Besides the direct benefit of the water use, there are also small benefits (depends on storage capacity and season of application) in reducing stormwater runoff and increasing groundwater recharge.

The following is a simple formula for calculating how much water can be collected from a roof:

Roof Area x Annual Rainfall x 0.46 = Gallons of Water Per Year

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Example: 1,000 square foot roof (20'x 50') x 40 inches/year x 0.46 = 18,400 Gallons

Average Rain Fall Amounts in Salem

Month	Average Rainfall	Month	Average Rainfall
January	5.9 inches	February	4.5 inches
March	4.3 inches	April	2.4 inches
May	1.9 inches	June	1.3 inches
July	0.6 inches	August	0.8 inches
September	1.6 inches	October	3.0 inches
November	6.3 inches	December	6.8 inches

Other considerations?

Your plan to utilize rain harvest water will dictate many additional design considerations.

- Design: tank placement and type (underground, above ground, materials, permits, design, ascetics, connecting multiple tanks inline).
- Water Quality: screening, debris removal, first flush diverter (highly recommended, many designs to help store only clean runoff). Mosquito prevention.
- Water Quality: Algae prevention in tank (use painted, or opaque materials, UV resistance)
- Water Quality: Filtration (if water is used for potable water, or even livestock, consider different filter systems). Also maintenance solution to prevent sedimentation buildup in tank.
- Roof material (from least recommended, wood, to ceramic tile, most recommended)
- Collection system: gutters and downspouts (materials, sizing, slope)
- Conveyance: piping system (PVC, whether a wet or dry system)
- Water Quantity: Overflow for bypassing tank in times of excess water. Inlet and outlet designs. Use of stored water in emergencies (Fire dry hydrant, backup water supply)
- Innovative: home use of gray water (using rainwater to flush toilets, etc.) Calculate the amount of water you consume for different uses and explore conversion to graywater where applicable.
- Pumps, pressure tanks, etc. for utilizing water where gravity system isn't good enough.