



# RAINWATER HARVESTING

Before deciding the idea of capturing rainfall off your roof is an idea that is all wet, consider the amount Mother Nature offers

*By Tony Hoch*

**W**hy capture rainwater? It certainly isn't for everyone, but two reasons jump to mind in rural Wyoming: water quality and water availability.

Rainwater is free, comes directly to you, and is of the highest quality possible for naturally occurring water.

If you live in a clayey, shaley, Wyoming intermountain basin without an ample river or stream nearby with its associated floodplain aquifer, there may be pretty poor water quality in the well. This type of water, which can have high salinity or high total dissolved solids, can

make growing plants difficult. In such instances, we routinely recommend people not try to grow anything but highly salt-tolerant shrubs in living snow fences. In other cases, folks who have no well water available must haul water for all of their uses. When faced with such a limited resource, growing trees or gardening usually have a much lower priority than daily household activities such as cooking and washing.

## **Investigate Before Diving In**

Capturing rainwater can seem attractive; however, some thought should be given to how this will work before you dive in.

I have played around with 55-gallon rainwater barrels under gutters at my house in town to water my garden and decided it wasn't worth the bother. A small barrel doesn't hold that much water, AND when it's raining you don't need a rain barrel, AND when it's droughty there's no water to fill it.

However, last fall I went to a conference in arid New Mexico and saw what is possible in areas much drier than our average 5 or 6 inches of rain per growing season (May to September) in Laramie. I also talked to a friend with experience in building proper cisterns and have watched



hundreds of gallons overflow onto the ground at my office because our catch barrels are too small. My conclusion: rainwater harvesting can be very effective once you understand how much water flows off a roof in a rain event and you prepare to catch it all.

### Bucketloads of Water Falls during a Storm

Calculating how much rain you can capture is eye-opening. First, determine the area within the dripline of your house or barn. The dripline of the house is the outermost overhang of a roof. For example, a 30-foot by 50-foot (1,500 square feet) house whose roof hangs out 2 extra feet on all sides will have an effective rain

catching area of 34 feet x 54 feet or 1,836 ft<sup>2</sup>. Note that it doesn't matter how steep the roof is – all that matters is the area covering dry ground. Let's use this modest house and a barn with about 5,000 ft<sup>2</sup> within the dripline (about 60 feet x 80 feet) for our examples.

You also need to know how much water you might potentially need to handle. I have been gathering monthly precipitation numbers from the National Weather Service website for our valley (<http://www.nws.noaa.gov/climate/>) since 2002, so I have a pretty good idea of what is possible here. We know an inch or half inch of rain may fall in one outburst then nothing for weeks.

### How to Calculate Rainwater Amounts

Let's look at how much water runs off the roofs of our example house and barn in a 1.2 inch (1/10 foot) gully-washer rainstorm. For the house, 0.1 foot multiplied times a 1,836 ft<sup>2</sup> area is 183.6 cubic feet.

If there are 7.48 gallons/cubic foot, then the house produces 183.6 ft<sup>3</sup> x 7.48 gal/ft<sup>3</sup> = 1,373 gallons. For the barn: 5000 ft<sup>2</sup> area x 0.1 ft of water x 7.48gal/ft<sup>3</sup> = 3,740 gallons or a total of 5,113 gallons.

This is probably the high end for a single event in Wyoming but should give an idea of the size of cistern needed to store it. In dry Laramie, we have been averaging 1 inch to 1.5 inches of monthly rainfall in the growing season months May-September. In the worst-case scenario of only 0.2 inches of rain in a month, our two buildings would still yield about 1,000 gallons of super high-quality rainwater, which would be plenty to water a garden or get some trees and shrubs going.

The selection, building, placement, and any regulation of cisterns warrants another article. I hope this article has you thinking about the scale of water catchment and what is possible.

**Tony Hoch** is director of the Laramie Rivers Conservation District, and we're pretty sure he is hoping for much wetter roofs this year than he saw last year. He can be reached at (307) 721-0072 or [www.lrcd.net](http://www.lrcd.net).



## RAIN REFERENCES

Great references on this topic are *Rainwater Harvesting for Drylands and Beyond*, Volumes 1 and 2, by Brad Lancaster, Rainsource Press, Tuscon, AZ (approximately \$25 to \$30 or check your local library). Volume 1 is available at <http://bit.ly/vol1rainwater>.