

RAINWATER HARVESTING

- Rainwater harvesting at the Water Conservation Garden
 - Active rainwater harvesting (using cisterns, tanks, and barrels)
 - This garden subsists solely on stored rainwater.
 - Plantings using water: Currently there are four 4 x 8 raised beds (Alpha, Beta, Dr. Pepper, and a control bed), several wine barrel gardens, and a native pollinator garden.
 - Water collection and storage: There is a 1,500-gallon water tank up the hill that receives rainwater that flows down the slope, into the concrete swale (v-ditch), and is pumped by a solar-powered pump, up the hill and into the water tank. There are six 55-gallon barrels that catch the runoff of the shed's roof. And a few more 55-gallon barrels next to the swale.
 - 1,500-gallon water tank
 - 6 - 55-gallon rain barrels behind the shed
 - 3 or 4 55-gallon barrels next to the swale
 - 2 - sub-irrigated beds with 225-gallon reservoirs
 - 1 - sub-irrigated bed with 80-gallon reservoir
 - Control bed: One of the 4 x 8 beds is not sub-irrigated. It is currently being watered by a gravity-fed barrel system. Since the bed requires 20 gallons per week in July, we add 10 gallons twice a week and just allow it to flow through a gravity drip system.
 - Other sub-irrigation methods we're demonstrating
 - Clay-tipped glass bottle holders
 - Buried clay vessels (ollas)
 - Planters with built-in water reservoirs
 - ANNOUNCE stock tank workshop July 12
 - Stock tank is approx. 3 1/2' long x 1 1/2' wide x 2' tall
 - We'll build a sub-irrigation bed in the stock tank
 - Using milk crates and 3" drainpipe, we'll have 11.4 gallons reservoir
 - Water requirement May through September: 65 gallons
 - Expected water requirement in sub-irrigated tank: 47 gallons (72% of water need)
 - All the tanks, barrels, and beds are full of water by late December or early January.
 - Water stats
 - 2023: Alpha bed: 1.5 gallons of supplemental water



- 2024:
 - Alpha bed: 40.5 gallons of supplemental water
 - Beta bed: 46 gallons supplemental water
 - Dr. Pepper bed: 48.5 gallons of supplemental water
- Whereas each of these beds would have required 410 gallons of piped-in potable water during the 4 months of June, July, August, and September, we ended up only adding less than 50 gallons of water
- Statement: High water tables support high-water plants
 - Think about the streamside plants such as California Buckeye, Big-leaf maple, white alder, various species of willows, and Redwoods
 - So, it follows that a water table that's captured and sustained at a level available to plant roots can provide for veggies in planter beds.
 - Veggies are high-water plants. But when grown in sub-irrigated planters, that raise the water table, they become
- Now imagine the property where you live
 - Is it flat or sloped?
 - Does rainwater just pass through during storms, or does it collect somewhere?
 - Is it forested, or largely open?
 - Where does the water go that sheets off the roof?
 - Does it collect at the foundation of the house?
 - Has it been directed by downspouts into the garden?
 - Has it been channeled directly out the gutter?
- Where can you use these or other rainwater harvesting methods in your own garden?

LOW-WATER PLANTS

- California is a low-water-plant state
 - In the regional, state, and federal parks in CA, you'll see mostly low-water plants.
 - Unless in a riparian area, or the understory of a forest
 - Show bar chart stressing that low-water plants are taken care of purely by rainfall in even the deepest drought years
 - Rainfall and plant water requirement are both measured in inches. That makes it easy to plot one on top of the other to see if rainfall alone can provide for plants.
 - Advantages of using rainfall instead of potable
 - It's free
 - It's unregulated
 - There are no chemicals in it. Our water has fluoride and chloramine in it.
 - We've planted low-water native plants here to attract pollinators to the garden.
- Other low-water plant strategies
 - Lawn replacement programs of the water districts
 - Water all plants as if they were low water and give extra warm-up water from the house to the plants that complain loudly.



- Reduce the run times on all irrigation zones by 10%.

MULCH

- Uncovered soil is naked, hungry, thirsty, and running a fever.
- What kind of mulch?
 - We're sitting right on top of it!
 - Freshly chipped arborist wood chips
 - The absolute best choice
 - Fresh, uncomposted chopped tree-trimming chips
 - AKA arborist chips
- Where can you get it?
 - Local tree company - go directly through them
 - Use an online service that connects you with a local tree company
 - Chip your own prunings
 - Collect your prunings and hire a chipping service to come and chip them for you
- Bark mulch (not recommended)
 - It's best not to use bark mulch, as it breaks down really slowly, is hydrophobic, and doesn't have the beneficial properties that arbor chips do
 - Unfortunately, much of the available commercial mulch is bark mulch or shredded construction wood or pallets
- Three of the most important benefits of mulch
 - Protects against drought AND deluge
 - In drought it acts like a lid reducing the water that's allowed to escape from the soil
 - In drought it increases the water-holding capacity of the soil
 - In deluge it absorbs the torrential downpours that would otherwise cause erosion.
 - A common mulch used for stormwater management is composted wood mulch (AKA BWM biotreatment wood mulch)
 - It turns the landscape into a compost factory
 - Tell them about neighbor's wood chip pile
 - It turns the landscape into a water-storage container that rivals any cistern, tank or barrel you could find.
 - This is known as passive rainwater harvesting
 - WCG: 4816 sq. ft.
 - Stores natively 1,204 gallons
 - With 3 inches of mulch - stores 2,208 gallons more
 - This area, from the sidewalk to "there" (back right bed to the square pile of stuff, which is 36 feet on Google Maps) = a landscape "water tank" that can hold 3,412 gallons). This is called passive rainwater harvesting
- More benefits of mulch
 - Lowers the plant water requirement by at least 25%
 - Show graphic of monthly water requirements



- Rainfall alone takes care of the water needs of low-water plants 7 ½ months out of the year.
- The rain falls at a time when the plants don't need much water. The challenge is how do we hold onto that water?
- Put a lid on it!
 - Reduces weeds
 - Moderates soil temperature
 - Feeds the biological life of the soil - the micro and macro-organisms
 - Minimizes the need for fertilizer
 - Suppresses soil-borne diseases
 - Mends and restores hydrophobic and compacted soils
 - Improves soil structure
 - Invigorates failing plant material
 - Contributes to sequestering of carbon
 - Prevents erosion
 - Increases water infiltration rate
 - Promotes more and stronger plant roots
- Mulch used at WCG
 - Arborist chips
 - Straw in the raised beds
- Compost can be used as a mulch, but it's so finely textured that it can promote weeds.

CONCLUSION

Call to Action - What can you do?

Build a sub-irrigated planter. Remember, we'll be holding a hands-on workshop to convert a galvanized steel stock tank into a sub-irrigated planter on July 12th.

Conduct an experiment!

- Pick an area of the landscape
- Order a load of chipped tree trimmings
- Saturate the whole area completely, then turn off the irrigation to the area
- Apply a layer of mulch 4 inches deep to the area
- Check the moisture level now and then with a moisture meter

Graphics and resources next pages

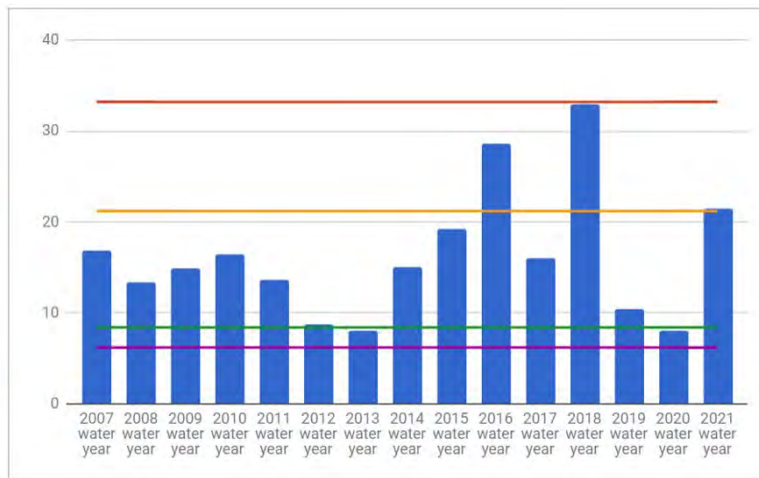


High water

Moderate water

Low water

Low water/mulch



Turf, redwoods, birch, some dogwoods, etc.

Maples, Magnolia, citrus, most roses, etc.

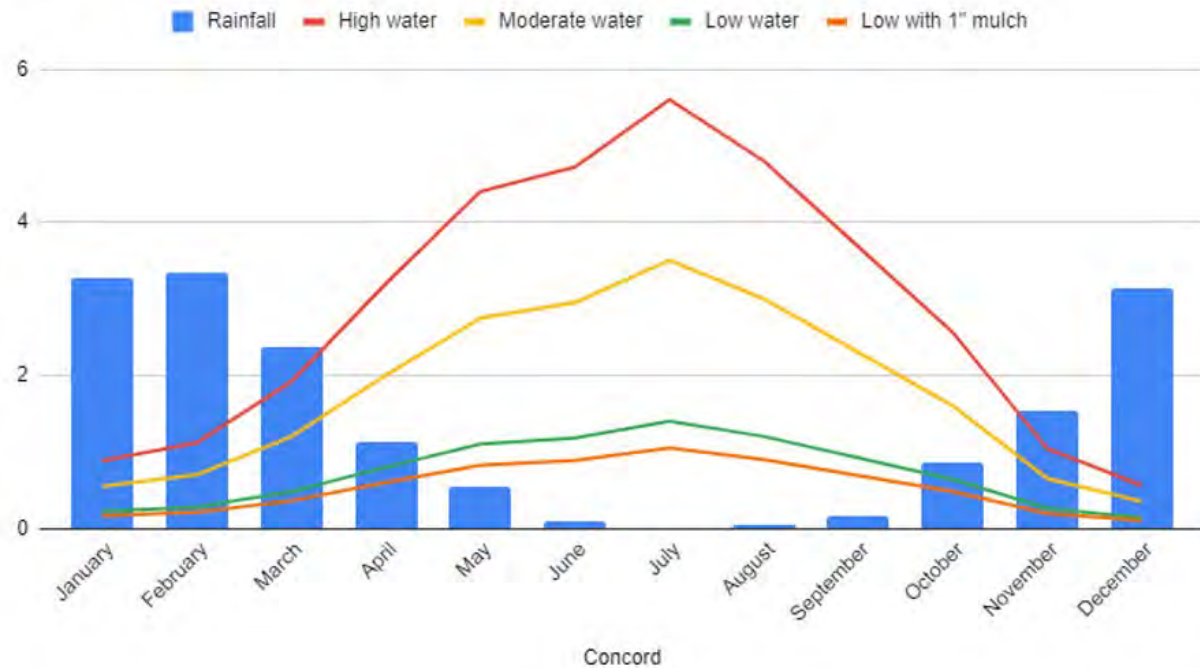
Many natives, lavender, fig, Salvias, Rockrose, etc.



UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

UC Master Gardener Program

Monthly Rainfall and Plant Water Needs - Concord



UNIVERSITY OF CALIFORNIA
Agriculture and Natural Resources

UC Master Gardener Program
Contra Costa County

Resources

Contra Costa County Master Gardeners YouTube Channel - relevant videos

Water in Your Garden - Taking Control <https://www.youtube.com/watch?v=L5OhvWNXf8>

The Magic of Mulch <https://www.youtube.com/watch?v=W28fWlgypwY>

Landscaping with California Natives <https://www.youtube.com/watch?v=2BIg6-C-SsI>

Find the water-use value of plants

WUCOLS - Water Use Classifications of Landscape Species <https://ccuh.ucdavis.edu/wucols-db>

Calscape - Find California plants that best suit your area

<https://calscape.org/search>

Water Conservation Garden web page <https://ucanr.edu/site/uc-master-gardener-program-contra-costa-county/richmond-low-water-demo-garden>

Richmond Low Water Demonstration Garden web page <https://ucanr.edu/site/uc-master-gardener-program-contra-costa-county/water-conservation-garden>

How Much Water app – how much water do plants need in any California city <https://waterwonk.us/how-much/>

Irrigation scheduling app <https://www.valleywaterscheduler.com/>

Passive rainwater harvesting manual https://www.berncogov/public-works/wp-content/uploads/sites/76/2023/05/Passive-Rainwater-Harvesting-Guide_webLR.pdf

