

**Creating resilient and sustainable  
mojave desert communities**

**For more information go to  
[transitionjoshuatree.org](http://transitionjoshuatree.org)**

The "How To" instructional booklet series (C)2015 by Geoff Fennell and Jill Giegerich



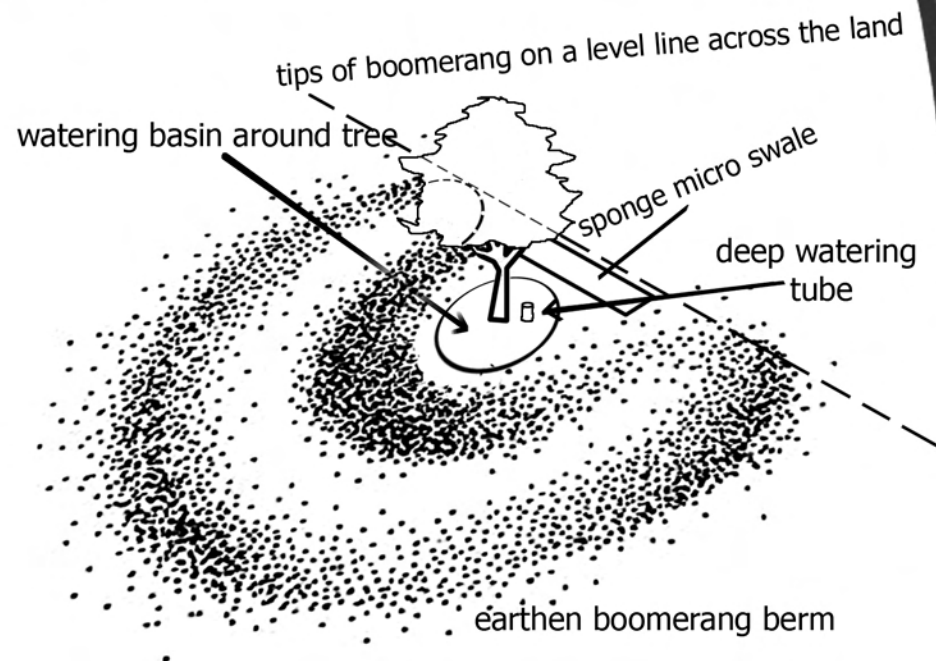
**Transition Joshua Tree  
Permaculture Team**

It's time to treat water as THE all important elixir of life. In the Morongo basin, our water comes from underground aquifers that are thousands of years old. For the most part, these aquifers no longer recharge naturally. Aquifers are precious resources that need to be protected for future generations. Permaculture is an artful design method that works with the patterns of nature to regenerate ecosystems. Water harvesting and water conservation are important aspects of the permaculture way of life. These techniques help us to reduce our use of aquifers.

## Here are SOME tips to get you Started:

2. Plant only desert adapted, drought tolerant plants. Choose trees that have several functions such as food production, pollinator attraction, nitrogen fixation and/or useful wood for tool or fire production. The native Honey Mesquite tree is a great choice for all these reasons. Its dried pods can be ground into a highly nutritious flour that can contain up to 15% protein, is gluten-free and a great blood sugar stabilizer.
3. Mulch all trees. Fill your trees' water well basins with no less than 6" of mulch. This will greatly reduce soil moisture loss from evaporation. Some possible mulches are straw, leaves, sticks, palm fronds. Rocks are one of the best desert mulches. Observe the way that desert seeds sprout all along the edges of rocks because moisture is being held in the ground.
4. Learn how to water your desert trees. Most people over-water. Put in deep watering tubes to promote deep strong tap roots. Desert trees prefer infrequent deep watering, rather than frequent, light surface watering. In time, your desert trees' roots will reach the water table and should no longer need irrigation. Use a 2' moisture probe while establishing young trees, This will take out the guess work and save water.
5. Learn more about water harvesting. A good place to start is by reading "Water Harvesting for Drylands and Beyond" by Brad Lancaster.
6. Learn more about permaculture. Start by reading "Introduction to Permaculture" by Bill Mollinson.
7. Using grey water correctly to irrigate has the potential to save you a great deal of water. Learn more about this by reading "Creating A Grey Water Oasis" by Art Ludwig.

## BUILD a BOOMERANG BASIN

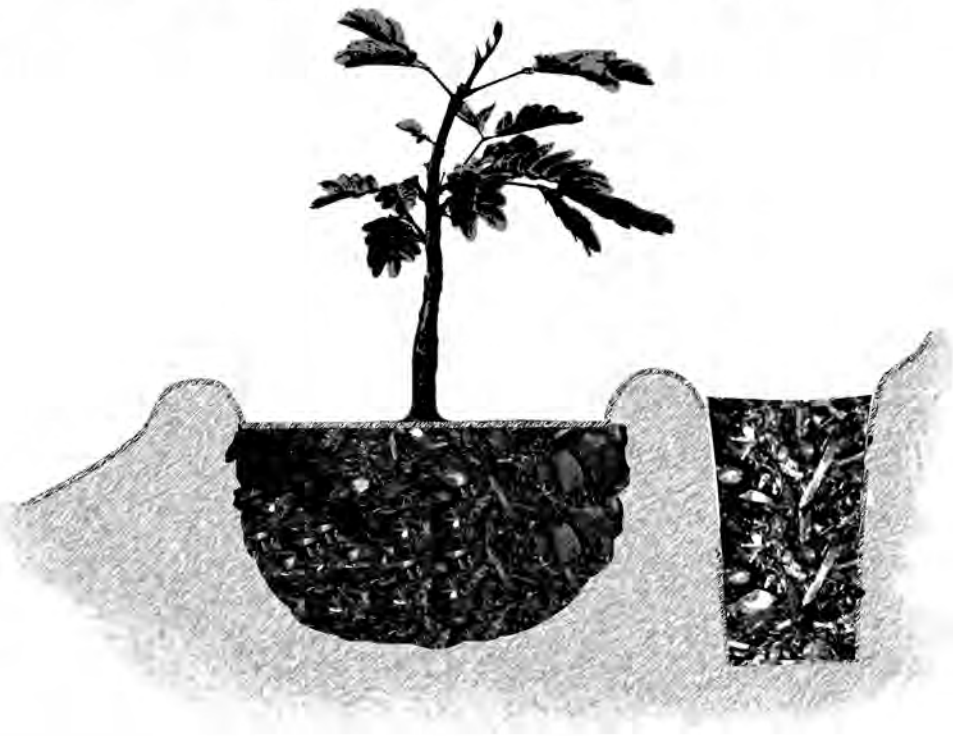


**Boomerang basins are a great way to capture rain run-off into your tree basins. It doesn't often rain but when it does, huge amounts of water can start to flow down the land. If you position the tips of your boomerang on a level line with the contour of your land, then water will flow evenly into the boomerang basin. Any overflow will spill out evenly at the boomerang tips. Other boomerangs can be positioned below to capture the overflow.**

**Tip: place a sponge micro swale on the uphill side of the tree's watering basin for extra hydration, (see "Build a Sponge Micro Swale" in this booklet).**

# BUILD a SPONGE MICRO SWALE

for newly planted or existing young trees.



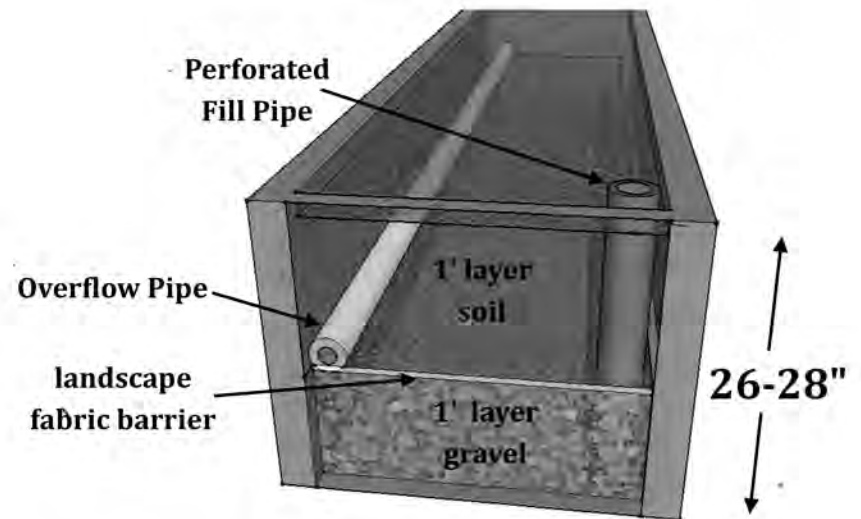
## Sponge Micro Swale Instructions:

1. Right next to and on the uphill side of your tree's watering basin, dig a trench approximately 2 to 3 feet long, 1 foot wide and 1 foot deep.
2. Pack the swale with layers of mulch such as cardboard, straw and/or dead leaves.
3. Do this in layers, fully soaking each layer with water and stomping it down flat. Layer right up to the ground surface with the last layer being straw. Weight this down with tree limb trimmings or some rocks.
4. You have just created a sponge that will provide moisture to your tree for months to come without re-watering. Any water flowing down the land in a rain event will re-soak the sponge. You can also water this sponge yourself when it dries out.

# BUILD a WICKING BED

for growing vegetables.

Wicking beds use far less water because there is no surface water evaporation.



## Wicking Bed Instructions:

### Simplified instructions for making a wicking bed:

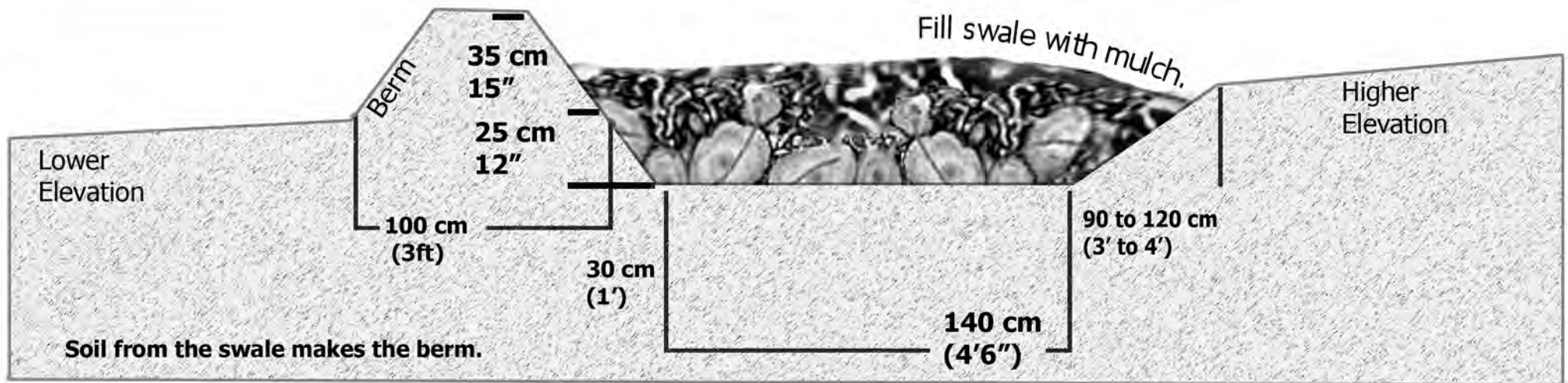
1. Create or buy a watertight growing box with the right dimensions (the inside space should optimally be between 26-28 inches deep and can be as long and wide as needed to fit the space and accommodate the gardener's reach). See the article link below for more on how to make this.
2. Place a perforated fill-tube (a weeping tile would work great) so that it runs along the bottom of the entire length of the bed and then curves up vertically to just above the top of the box. This tube will stick up above the soil line.
3. Fill the bottom of the box with a one foot layer of gravel.
4. Lay a separating layer of shade cloth or landscape fabric over gravel.
5. Install an overflow pipe running the length of the bed with holes along the bottom where it sits on the fabric layer.
6. Fill with a one foot layer of good quality garden soil.
7. Water down the fill pipe until it trickles out through the overflow pipe.
8. Plant seedlings, apply mulch to cover bare soil, and water from the top a few times until the plants are established and moisture from below is successfully wicking up and keeping the plants hydrated.

For more in-depth how-to instructions on building wicking beds check out this link:  
<http://permaculturenews.org/2011/06/20/from-the-bottom-up-a-diy-guide-to-wicking-beds/>

Illustration and instructions by Damian Lester.  
Check out Damian's blog at [damianlester.wordpress.com](http://damianlester.wordpress.com)

# BUILD A SWALE

# FOR ARID LANDS



**Swales are shallow trenches dug “on contour”. This means that they follow a level line along the topography of the land. Any water flowing down the land during a rain event will fill the swale evenly and sink into the land making it possible to then grow desert trees and other vegetation along the berm and in the swale. If your land has been scraped of all vegetation, this is a good method for regenerating the ecosystem.**

**Never dig a swale without first checking to make sure there are no desert tortoise burrows in the area. Check up to 50 feet out in all directions from the proposed swale.**

**Never scrape land to build a swale!**

**Always design an overflow outlet for a swale. Building large scale swales is a serious undertaking so it’s important to fully understand the principles before you undertake this kind of project.**