

## CUT INTO THIRDS AND GIVE TO FRIENDS

A Vision - Wendell Berry

If we will have the wisdom to survive,  
to stand like slow-growing trees  
on a ruined place, renewing, enriching it,  
if we will make our seasons welcome here,  
asking not too much of earth or heaven,  
then a long time after we are dead  
the lives our lives prepare will live there,  
their houses strongly placed  
upon the valley sides, fields and gardens  
rich in the windows. The river will run clear,  
as we will never know it,  
and over it, birdsong like a canopy.  
On the levels of the hills will be  
green meadows, stock bells in noon shade.  
On the steeps where greed and ignorance  
cut down the old forest, an old forest will  
stand, its rich leaf-fall drifting on its roots.  
The veins of forgotten springs  
will have opened.  
Families will be singing in the fields.  
In their voices they will hear a music  
risen out of the ground. They will take  
nothing from the ground they will not return,  
whatever the grief at parting. Memory,  
native to this valley, will spread over it  
like a grove, and memory will grow  
into legend, legend into song,  
song into sacrament.  
The abundance of this place,  
the songs of its people and its birds,  
will be health and wisdom and indwelling  
light. This is no paradisal dream.  
Its hardship is its possibility.

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## **Composting Recipe:**

1. Good composting depends on correct layering, enough air circulation and enough moisture. It's not rocket science but it does help to understand the basics. You can use a compost tumbler or just make a pile right on the ground.
2. First put down a layer of brown, dead material (carbon). This can be dead leaf, cardboard, straw, cut-up dead palm leaves, newspaper, shredded paper.
3. The next layer is green, living material (nitrogen). These can be cuttings from your garden and kitchen scraps. Eggshells are fine, just crunch them up first. Coffee grounds are good too. Some meat and oil are ok in a tumbler but not on the ground because it will attract insects and animals. Ratio of carbon to nitrogen should be about the same. This ratio can vary depending on your information source. Again, it's not rocket science.
4. Next a light layer of aged horse manure. It should be at least a year old.
5. Continue on with this layering until you have filled your tumbler about 3/4ths full or your ground pile is high enough to still be easy to turn over. In between adding layers to your on the ground pile, you can cover with a weighted down cloth tarp to hold moisture (not plastic, you want the air circulation to be unimpeded). About once a week wiggle a pitchfork into and all around the ground pile to aerate it. Your tumbler can be turned once a day or once a week depending on how quickly you would like it to work. More turning equals faster composting. Speed of composting also depends on the weather.
6. Keep your compost moist but not soaked. It should feel damp like a wrung out sponge.
7. In about a month turn your ground pile over so that the bottom is now the top. Turn again in another month.
8. Your compost is ready when it looks like sweet smelling earth!

## **Seed Balls for Desert Ground Cover Restoration**

### **Seed Mix for Joshua Tree, California (1 oz of each)**

#### **Native Wild Flowers:**

Abronia Villosa – Sand Verbena  
Baileya Multiradiata – Desert Marigold  
Salvia Columbariae - Chia  
Sphaeralcea Ambigua – Desert Mallow  
Eriogonum Fasciculatum – California Buckwheat

#### **Native Grasses:**

Achnatherum Speciosum – Needle Grass  
Achnatherum Humenoides – Indian Rice Grass

Seeds can be purchased from The Theodore Payne Foundation (online) or gathered locally. Gather responsibly so that you don't take all the seeds from any one plant.

A number of these plants will also provide food for the Desert Tortoise.

### **Landers, California Seed Mix:**

All of the above minus Desert Marigold and Needle Grass

#### **Seed Ball Recipe:**

5 parts dry red clay (Laguna Clay Co. – can order online)

Do not use white or grey clay. Both have a mineral content that inhibits germination.

2 parts compost

1 part endo-mycorrhizae inoculum soil

This soil can be gathered from underneath local native shrubs such as Mormon tea, Wolfberry, Desert Broom, alkali Goldenbush, and California (aka Eastern Mojave) Buckwheat. These soil microbes are very sensitive to light so be sure to store the soil in a light proof container. Best to use this soil as soon as possible after digging it up. **Thanks to Ken Lair for this info.**

½ part seed mix

1. Put all together in a bowl and mix thoroughly with hands.
2. Slowly add water while mixing by hand until small balls form that will hold together. Don't make too wet.
3. Pinch off small pieces and roll into balls with your hands. Balls should be about the diameter of a penny.
4. Place each ball on cardboard and let dry for 48 hours.

If you use a level ice cream scooper per part than this will make approximately 50 balls.

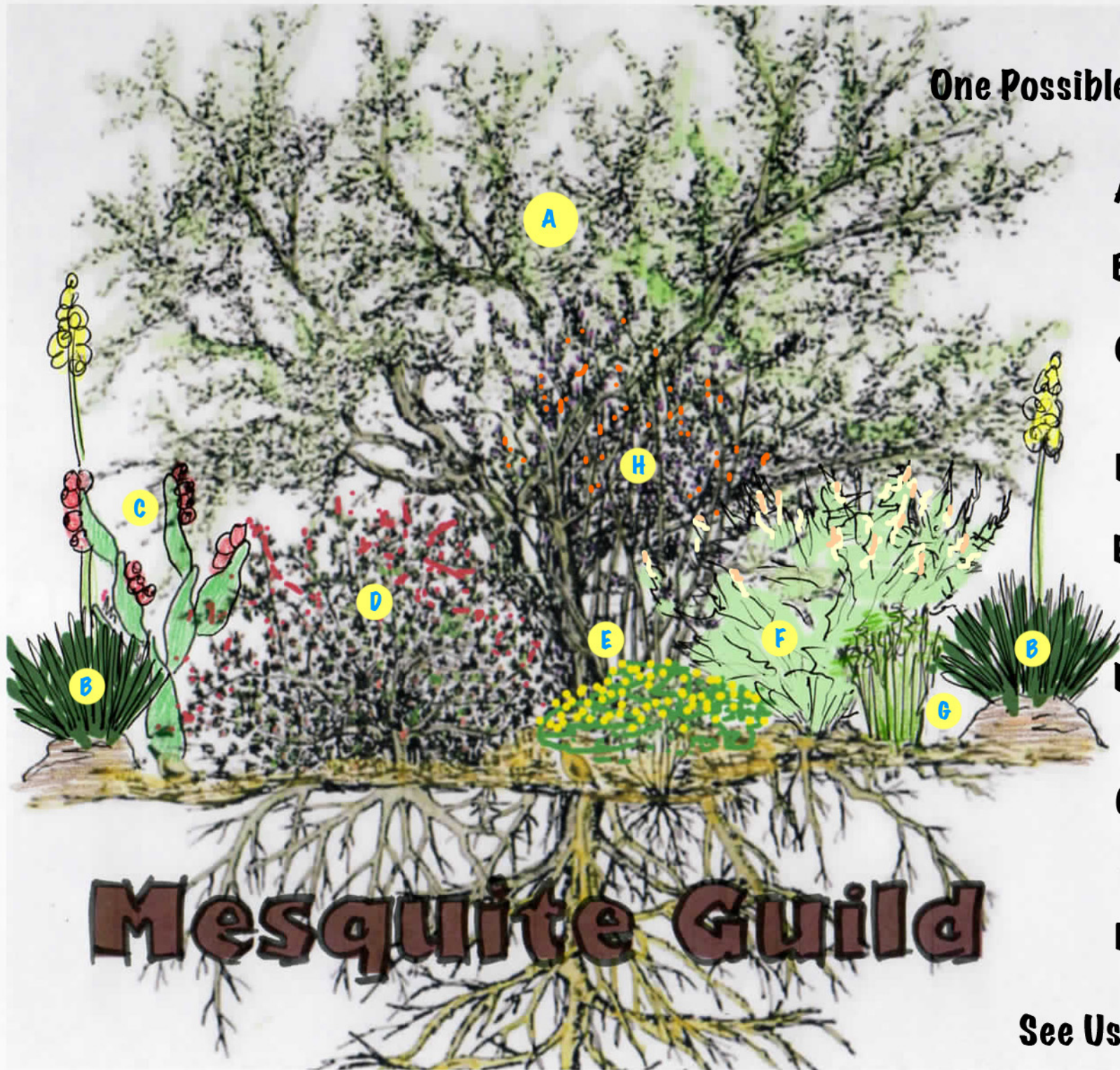
**Broadcasting the seed balls:**

The beauty of seed balls is that you can put them out on your land at any time of year and that they do not require irrigation. The seeds will be protected from wind and insect and animal predation until the right amount of rain comes to dissolve the balls and begin germination. The dissolved ball itself provides a kickstart of nutrients for the seedlings. To further help with the kickstart, dig small, shallow basins (approx. 6" diameter, 2 " deep) in the soil and place a single ball in each basin. This can be done very quickly with a garden hoe. The basins will help collect and hold moisture during a rain. Put the balls at least 10' apart. Desert plants need room.

This is not a quick fix. You are working with nature and nature takes its own time. Practice patience.

**To take land restoration one more step, identify invasive plants that may be growing on your land and pull them out before seeds set. As long as there are no seeds you can drop the plant right on the ground for mulch.**

## One Possible Mesquite Guild



**A - Mesquite Tree**

**B - Banana Yucca**

**C - Prickly Pear Cactus**

**D - Chuperosa**

**E - Turpentine Bush**

**F - Four Wing Saltbush**

**G - Western Mugwort**

**H - Wolfberry**

# Mesquite Guild

**See Use List**



#### A – Mesquite

- Nitrogen fixer
- Pollinator attractor
- Windbreak
- Forage for animals
- Migrating bird attractor
- Highly nutritious flour made from ground pods
- Sweet pods make excellent molasses
- Tools and furniture from wood
- Excellent firewood
- Many medicinal uses

#### B – Banana Yucca (*Yucca Baccata*)

- Major food source – the stalk and the blossoms
- Leaves provide fiber for cordage but Mohave Yucca was mainly used by indigenous people to make rope. Soap also made from the leaves.

#### C – Prickly Pear (*Opuntia Lindheimeri*)

- Highly nutritious fruit
- Young new paddles can be sliced and eaten
- Forage for animals
- Groundcover that suppresses grass and controls evaporation

#### D – Chuparosa (*Justica Californica*)

- The Diegueno tribe was known to suck the beautiful bright red flowers for their sweet nectar.
- Pollinator attractor
- Hummingbird attractor
- Groundcover that suppresses grass and controls evaporation

#### E – Turpentine Bush (*Ericameria Laricifolia*)

- Beautiful flowers
- Ground cover, keeps soil moisture evaporation down
- Wildlife attractor
- Groundcover that suppresses grass and controls evaporation.

#### F – Four Wing Saltbush (*Atriplex Canescens*)

- Nutritious flour made from seeds
- Forage for animals
- Soap made from leaves
- Medicinal uses
- Groundcover that suppresses grass and controls evaporation.

#### G – Western Mugwort (*Artemisia Ludoviciana*)

- Used as a ceremonial plant by many indigenous American tribes
- Said to be a dream potentiator if put under one's pillow at night
- Dried leaves make excellent tinder for fire making
- Many medicinal uses but contains the toxin Thujone so must be prepared knowledgeably.

Spreads vigorously. Especially good groundcover that suppresses grass and controls evaporation.

H – Wolfberry (*Lycium Fremontii*)

Edible fruit - our native Goji berry

Forage for animals

Bird attractor

Groundcover that suppresses grass and controls evaporation.



# The Eight Principles of Successful Rainwater Harvesting

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## 1. Begin with long and thoughtful observation.

Use all your senses to see where the water flows and how. What is working, what is not? Build on what works.

## 2. Start at the top (highpoint) of your watershed and work your way down.

Water travels downhill, so collect water at your high points for more immediate infiltration and easy gravity-fed distribution. Start at the top where there is less volume and velocity of water, and it is easier to manage.

## 3. Start small and simple.

Work at the human scale so you can build and repair everything. Many small strategies are far more efficient than one big one when you are trying to infiltrate water into the soil.

## 4. Spread and infiltrate the flow of water.

Rather than having water erosively runoff the land's surface, encourage it to stick around, "walk" around, and infiltrate into the soil. Slow it, spread it, sink it.

## 5. Always plan an overflow route, and manage that overflow as a resource.

Always have an overflow route for the water in times of extra heavy rains, and where possible, use that overflow as a resource.

## 6. Create a living sponge.

Maximize living and organic groundcover to create a living sponge so the harvested water is used to grow more resources, while the soil's ability to infiltrate and hold water steadily improves.

## 7. Do more than just harvest water.

Maximize beneficial relationships and efficiency by "stacking functions." For example, berms can double as high and dry raised paths. Plantings can be placed to cool buildings in summer. Vegetation can be selected to provide food.

## 8. Continually reassess your system: the "feedback loop."

Observe how your work affects the site—beginning again with the first principle. Make any needed changes, using the principles to guide you.

*Principles 2, 4, 5, and 6 are based on those developed and promoted by PELUM—the Participatory Ecological Land-Use Management association of east and southern Africa. Principles 1, 3, 7, and 8 are based on my own experiences and the insights gained from other water harvesters.*



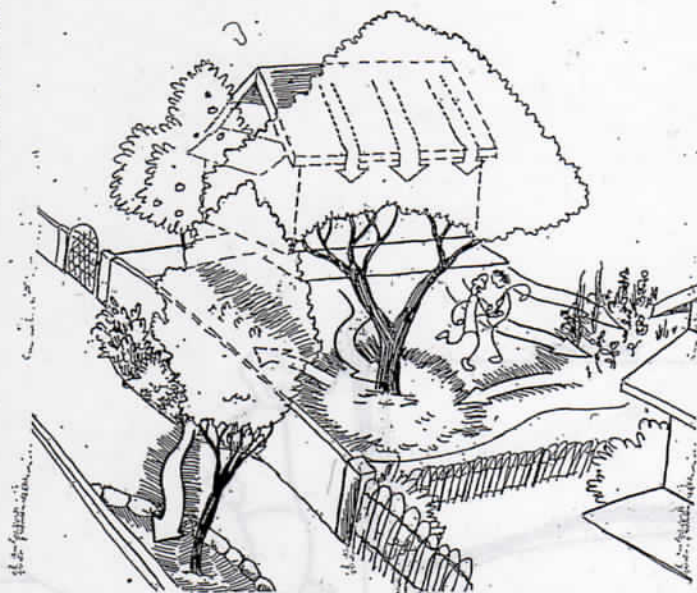


Fig. A2.8. Celebrating completion of a water harvesting landscape

## THE A-FRAME LEVEL

The A-frame level (fig. A2.9) is even simpler to construct than the bunyip water level. No tubing or water is needed, and you can use it all by yourself. An A-frame level can be used to find a contour line on the landscape, but unlike the bunyip, you cannot measure the elevation differences between two points at different levels, nor can you measure the slope of the land. It does come in very handy for marking the line on which to construct contour berms and for checking to see if the two ends of a boomerang berm are level.

The A-frame level is made of three poles or sticks tied or fastened together to form a capital "A" (thus the name). A weighted string is hung from the top of the "A" like a plumb bob. When both "feet" of the "A" are level with one another the weighted string will hang alongside a center line marked on the horizontal stick of the A-frame. If the two feet are not level with one another, the string will hang to one side or the other of the center mark, depending on which foot of the A-frame is lower.

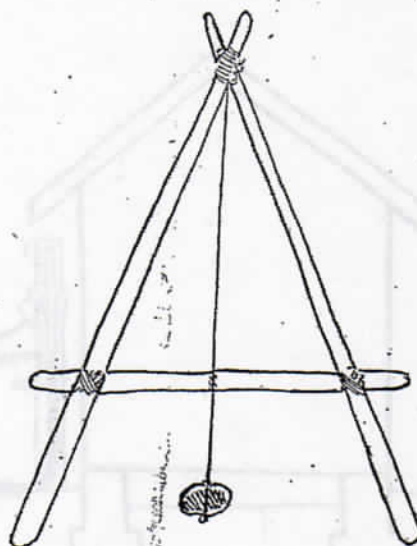


Fig. A2.9. A-frame level

## WHAT YOU NEED TO MAKE AN A-FRAME LEVEL

- 3 straight poles, pipes, sticks, or something similar. They must be long enough so that the top of the "A" is about as tall as you are and the feet of the "A" are at least 3 feet (0.9 m) apart. The feet can be closer together, but the narrower the "A" the longer it will take to mark a level contour line on a slope.
- Rope, cordage, nails, or screws to securely fasten the poles, pipes or sticks together at 3 points
- A piece of string about 4 feet (1.2 m) long and a weight of some sort (stone, horseshoe, etc.) to tie to one end of the string
- Marker, knife, or paint

## HOW YOU MAKE AN A-FRAME LEVEL

Lay your three stakes, poles, or sticks on the ground in the form of a capital "A." Tie or screw the three stakes together in the three points where they touch. This is a great opportunity to live out your Boy Scout or Girl Scout knot-tying fantasies with clove hitches and lashing! Make sure all bindings are tight so



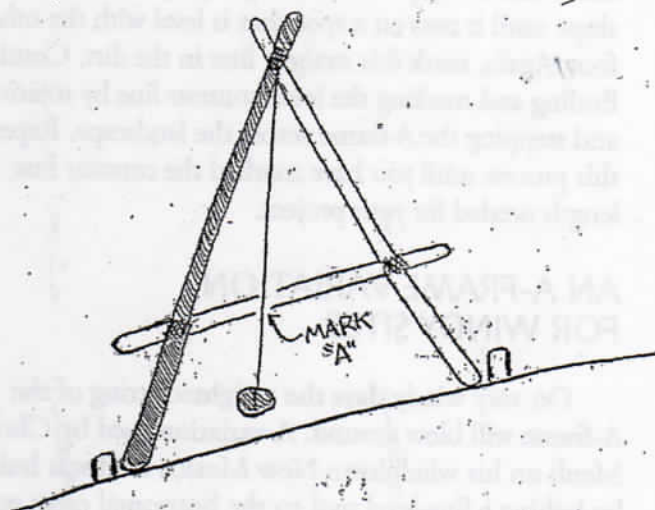


Fig. A2.10. Calibrating the A-frame, step one

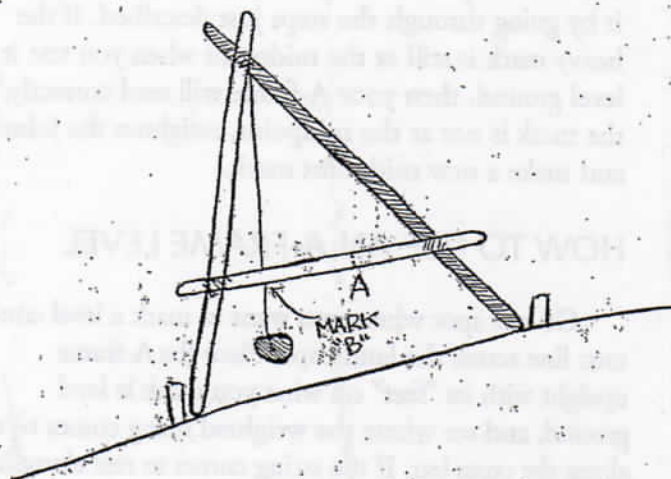


Fig. A2.11. Calibrating the A-frame, step two

that your A-frame level won't come apart and the joints don't loosen, as that would result in inaccurate readings.

Once bound, set the A-frame upright and tie one end of the string to the top of the "A." Tie the weight to the other end of the string. The heavier the weight, the less likely it will get blown around on a windy day. The weighted end of the string should hang below the cross stake (the stake parallel with the ground). To make the center mark on the cross stake, place the feet of the upright A-frame on a section of unlevel ground, so one foot of the A-frame is a little higher than the other. When the weighted string comes to rest in a spot alongside the cross stake of the A-frame, lightly mark that spot (fig. A2.10).

Now, mark the two points where the A-frame is standing on the ground. Lift the A-frame, rotate it, then set it back down with the "feet" switching places. When the weighted string again comes to rest alongside the cross stake, lightly mark that spot (fig. A2.11).

Now you have two marked spots on the cross stake. Permanently mark the midpoint between these two spots on the cross stake (fig A2.12).

From now on when the weighted string comes to rest alongside this permanent mark you will know the two feet of the A-frame are standing on two points level with one another.

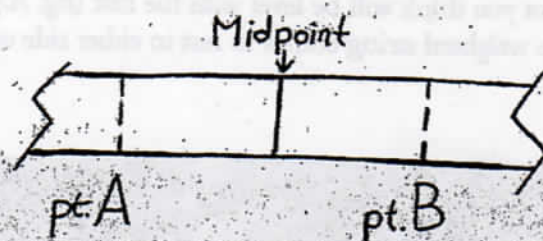


Fig. A2.12. Calibrating the A-frame, final step

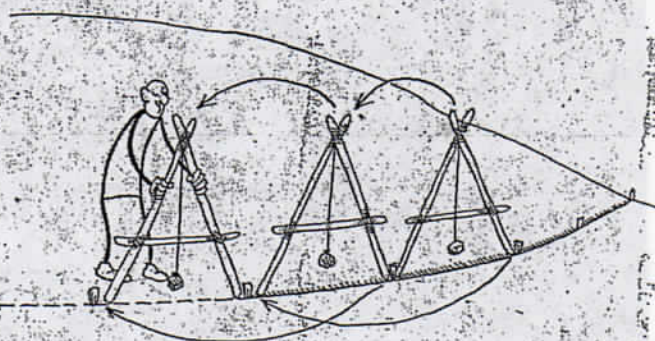


Fig. A2.13. Using an A-frame level, finding and marking a level contour line



## Recipes For Locally Harvested Foods

### HOW TO CURE RIPE (BLACK) OLIVES WITH BRINE

1. After picking the olives, discard any that are soft.
2. Score each olive along the side with a knife.
3. Submerge the olives in a brine consisting of 1/2 cup of Kosher Salt to 1/2 gallon of water.
4. Change the brine weekly.
5. After about 8 weeks, begin to taste the olives for curing. Eventually, the bitterness will be leached out by the salt.
6. Jar the olives in fresh brine (boil the jars and lids for 10 minutes to sterilize).
7. Into each 1/2 gallon of new brine mix 1 tsp of Citric Acid (obtainable from Health Food Stores).
7. Optional but very desirable—After the olives and the brine, into each jar put 1 Tbl of Olive Oil and 4 Tbl of Red Wine Vinegar.

### RICH MUFFINS WITH SCREWBEAN MESQUITE

(Generally, use 1/2 cup of Mesquite Flour to 1 1/2 cups of regular Flour in any recipe that calls for 2 cups of flour. The possibilities for adapting mesquite flour to standard recipes are endless).

Ingredients: 6 Tbl of room temperature butter; 3/4 cup of sugar; 1/2 tsp of salt; 3 tsp of baking powder; 1 1/2 cups of all purpose flour, 1/2 cup of mesquite flour; 2 eggs; 1/2 cup of milk

1. Preheat oven to 400. Grease a 12 or 24 muffin tin.
2. Cream butter and sugar with wooden spoon or mixer.
3. Mix together the salt, baking powder and flour.
4. Beat the eggs into the milk.
5. By hand, alternate mixing the flour mixture and the milk/egg mixture into the butter/sugar mixture, until batter is lumpy, not smooth, and thick but moist. Add a little milk if too dry.
6. Spoon batter into muffin tin. Bake 10-15 minutes for mini-muffins and 20-30 minutes for regular size muffins, or until an inserted toothpick comes out clean.
7. Remove from oven and let rest for 5 minutes before removing from tin. Serve warm.

Go to <http://www.desertharvesters.org/> to learn how to harvest and process Mesquite pods.

### NOPALES (STRINGBEAN) CASSEROLE

Nopales (Cactus Paddles) taste like tangy string beans. This recipe adopts that.

Nopales are available in the supermarket three ways: spines on, spines off or cut into chunks.



To de-spine, hold nopales with tongs and cut off spines with a sharp knife. Then cut off around the edge.

Some people don't like their texture, which is like okra. One way to handle that is to roast them in little pieces on a baking sheet with some drizzled olive oil, salt and pepper, at 375 for 20 minutes —the gooeyness bakes off. They can then be tossed in a salad, etc. Another way is to cook them in a casserole, where their texture melts into the surrounding juices—this recipe.)

Ingredients: 2 slices of high-quality sandwich bread, torn into quarters; 2 Tbl of unsalted butter; 2 Tbl of grated parmesan cheese; 6 medium garlic cloves, minced or pressed; 2 tsp of all purpose flour; 1/8 tsp of red pepper flakes; 1 tsp of minced fresh thyme; 1 1/2 lbs of nopales, cut into stringbean shapes; 1-1/2 cup of vege or chicken broth; 1/4 cup of jarred pimento, cut into small pieces; and about 5 sundried tomatos packed in a jar, cut into small pieces.

1. Process the bread in a food processor to fine crumbs, about 10 1-second pulses.
2. Heat 1 Tbl of the butter in a 12 inch (pref nonstick) skillet over med-high heat.
3. When melted add the breadcrumbs, and cook stirring frequently until golden brown, about 3-5 minutes.
4. Transfer to a medium bowl and add 1/4 tsp of salt, 1/8 tsp of pepper, and the grated cheese.
5. Wipe out the skillet. Add remaining 2 Tbl of butter, the garlic, and 1/4 tsp of salt.
6. Cook over medium heat, stirring constantly, until garlic is golden, about 3-5 minutes.
7. Stir in flour, red pepper flakes, thyme and nopales.
8. Add the broth and increase the heat to med-high.
9. Cover and cook till nopales are partly tender, but still crisp at the center, about 4 minutes.
10. Uncover and add the pimentos and sundried tomatos.
11. Cook, stirring occasionally, until nopales are tender and sauce has thickened slightly, about 6 minutes.
12. Off the heat, adjust the seasonings with salt and pepper to taste.
13. Transfer to a serving dish and sprinkle evenly with the bread crumbs. Serve.

### **Prickly Pear Cactus Fruit Ice Cubes**

Cactus fruit usually ripens in late August through September in our area. With long handled barbeque tongs, pull-twist the fruit off the paddles. Ripen fruit should come off easily. Place all in a wheel barrow. With a long handled stiff broom, roll the fruit back and forth. This will knock off most of the big spines. Cover the fruit with water, swish with broom and drain (use the water to irrigate some plants!). Package the fruit in large zip lock bags or other containers. Freeze for at least 2 weeks. Freezing changes the composition of the fruit so that when thawed, they are soft and mushy. Thaw when ready to use. Slit each one open on the side and place several at a time into a cheesecloth-lined colander. Press with potato masher. Pour liquid into ice cube trays and freeze. Add cubes to juice and Smoothies. Also makes killer Margueritas.



**Recommended Books:**

1. Introduction to Permaculture – Bill Mollinson
2. The Permaculture Handbook: Garden Farming for Town and Country – Peter Bane
3. Gaia's Garden – Toby Hemenway
4. Tending the Wild; Native American Knowledge and the Management of California's Resources – M. Kat Anderson
5. Rainwater Harvesting for Drylands and Beyond, Vol. I and II – Brad Lancaster
6. Create an Oasis with Greywater – Art Ludwig
7. Gathering the Desert – Gary Paul Nabhan
8. Tree Crops; A Permanent Agriculture – J. Russell Smith and Wendell Berry
9. Medicinal Plants of the Desert and Canyons West – Michael Moore
10. Native Plants for Southwestern Landscapes – Judy Mielke
11. Native Gardens for Dry Climates – Sally Wasowski and Andy Wasowski
12. Temalpakh; Cahuilla Indian Knowledge and Usage of Plants – Lowell John Bean and Katherine Siva Saubel
13. Growing Food in a Hotter, Drier Land: Lessons from Desert Farmers on Adapting to Climate Uncertainty—Gary Paul Nabhan

**Informative Links:**

<http://www.desertharvesters.org/>  
<http://ca.water.usgs.gov/mojave/>  
<http://transitionjoshuatree.org/>  
<http://mindinthesand.blogspot.com/>  
<http://www.harvestingrainwater.com/>  
<http://www.omick.net/>  
<http://beantreefarm.com/>  
[http://www.permaculture.org/nm/images/uploads/waterharv\\_traditions.pdf](http://www.permaculture.org/nm/images/uploads/waterharv_traditions.pdf)  
<http://permacultureprinciples.com/principles/>

**Sun Ovens:**

[Urban Homestead Solar Oven](#)

<http://www.sunoven.com/>

Local Sunoven distributor - Buck Buckley, 760 819 1299

**Recommended Water Tanks:**

[Bushman tanks at Hydro-scape in Palm Desert](#)

Local Bushman distributor - Buck Buckley, 760 819 1299

**Local Green Products;**

Solstice Eco Building Supplies in Joshua Tree – 800 542 0728 (Nicholas Holmes, Architect)

Grateful Desert - <http://gratefuldesert.com/>, 61695 29 Palms Highway, Joshua Tree, 760 366 8333

## ↓ HOW TO MAKE A WORM BIN ↓

①

CUT THE BOTTOM OUT OF A SMALL PLASTIC CONTAINER. PUT IT INSIDE A 5 GALLON BUCKET. IT SHOULD BE AT LEAST 5" HIGH.

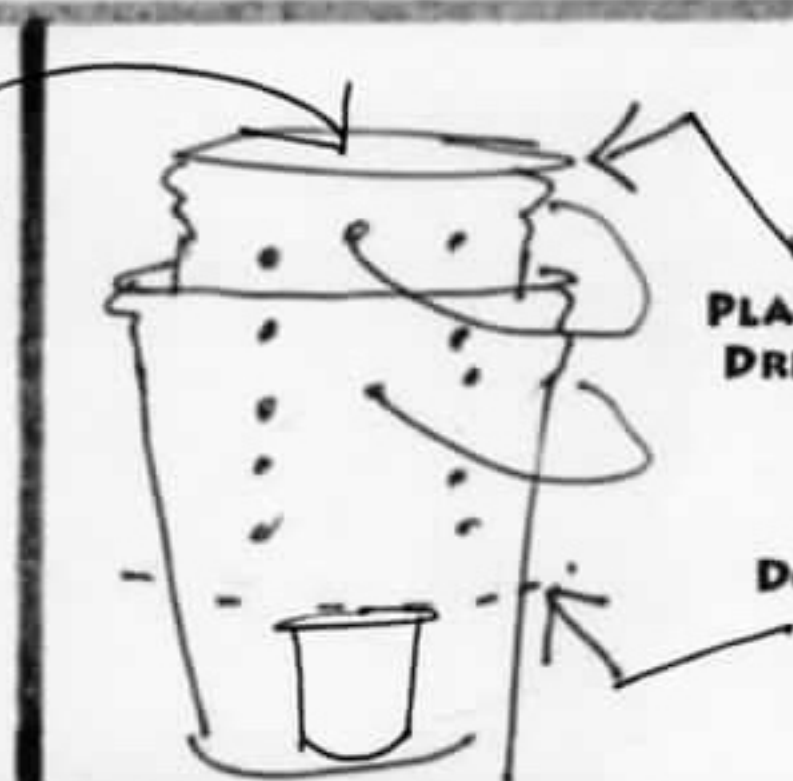


**DRILL ABOUT 10 1/4" HOLES  
IN THE BOTTOM OF A  
SECOND 5 GALLON BUCKET.**

②

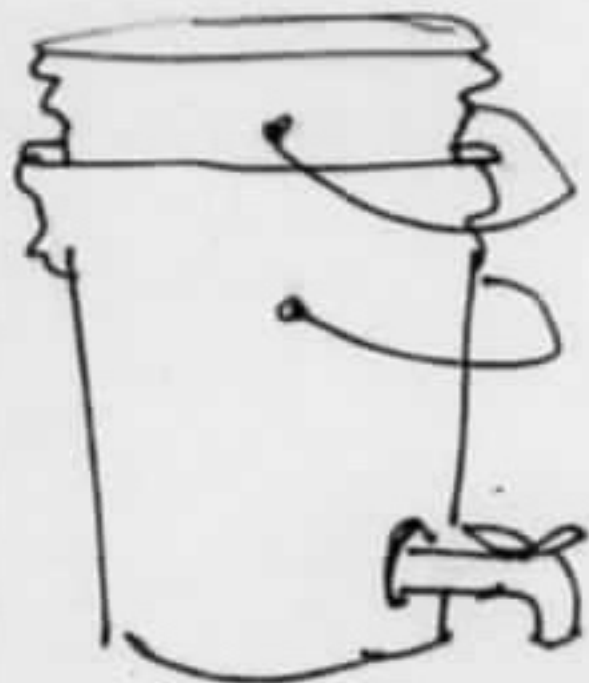
**PLACE ONE BUCKET INSIDE THE OTHER.  
DRILL 1/8" HOLES ALL AROUND AND  
THROUGH BOTH BUCKETS.**

**DON'T DRILL BELOW THE BOTTOM OF THE INSIDE BUCKET.**



3)

**ATTACH A SPIGOT WITH A RUBBER WASHER TO THE VERY BOTTOM OF THE OUTSIDE BUCKET.**



id →  (4)

④

**FILL TOP BUCKET HALF WAY WITH WET SHREDDED PAPER AND SOME AGED HORSE MANURE (NOT NEW MANURE - TOO HOT!). PUT IN WORMS. PUT IN SOME VEGGIE SCRAPS. ADD A LITTLE SOIL.**

**KEEP YOUR WORMS MOIST AND WELL FED  
THE MOISTURE WILL MAKE ITS WAY DOWN  
TO THE BOTTOM BUCKET. DRAIN IT  
OCCASIONALLY FROM THE SPIGOT.  
WATER YOUR VEGGIE GARDEN WITH IT.  
IT'S EXCELLENT FERTILIZER.**

