



Hydrate: Your Food
Use rain tanks to support your vegetable garden



1



Learning Objectives

1. Define rain tanks and list their benefits.
2. Calculate rooftop runoff and determine appropriate sizing of rain tanks.
3. Match tank capacity to plant needs.

2



3



Definition and Importance

Also called a cistern

“A reservoir or tank for holding water, especially for catching and holding rainwater for use.

- 1913, A.C. Cotter, w:*Catholic Encyclopedia*, “Wells in Scripture.”

“Their extreme necessity is attested by the countless number of old, unused cisterns with which the Holy Land is literally honeycombed.

- en.wiktionary.org/wiki/cistern

4

Rain Tanks through History

EL JADIDA, MOROCCO
ISTANBUL, TURKEY, INDIA
11TH – 16TH CENTURY
THOMAS JEFFERSON



5



Passive vs. Active Water Harvesting

Passive: land contouring (basins, swales, berms). Requires little maintenance but cannot store water long-term.

Active: greywater, rain tanks. Requires active use of system but gives more control.

- Tanks allow collection across many rain events and storage during dry months.

6

<p>Active Storage of Rainwater</p>	<ul style="list-style-type: none">Reduce groundwater reliancePreferred water choice of plants – no chlorine, saltRelatively clean and soft water sourcePromote healthy soilsLong-term investmentEnergy savings/cost savings
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7

	<h1>Types of Rain Tanks</h1>
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8



9



10

Rain Barrels vs. Rain Tanks

- AVERAGE 50-GALLON CAPACITY
- ONLY CAPTURE A PORTION OF RAINFALL EVENTS
- CAN MEET SOME PLANT WATER NEEDS
- GENERALLY LOWER COST
- “TRAINING WHEELS”
- CAPACITY 300 – 1,000 GALLONS OR MORE
- CAN HOLD AN ENTIRE SEASON’S RAIN
- CAN COVER A MAJORITY OF PLANT NEEDS
- PART OF A COMPREHENSIVE WATER HARVESTING SYSTEM

11



Stacking Functions of Tanks

In addition to the benefits we’ve seen, rain tanks can also function as:

- Noise/privacy shield
- Trellis
- Art!
- Others?

12



Rain tanks as works of art

13

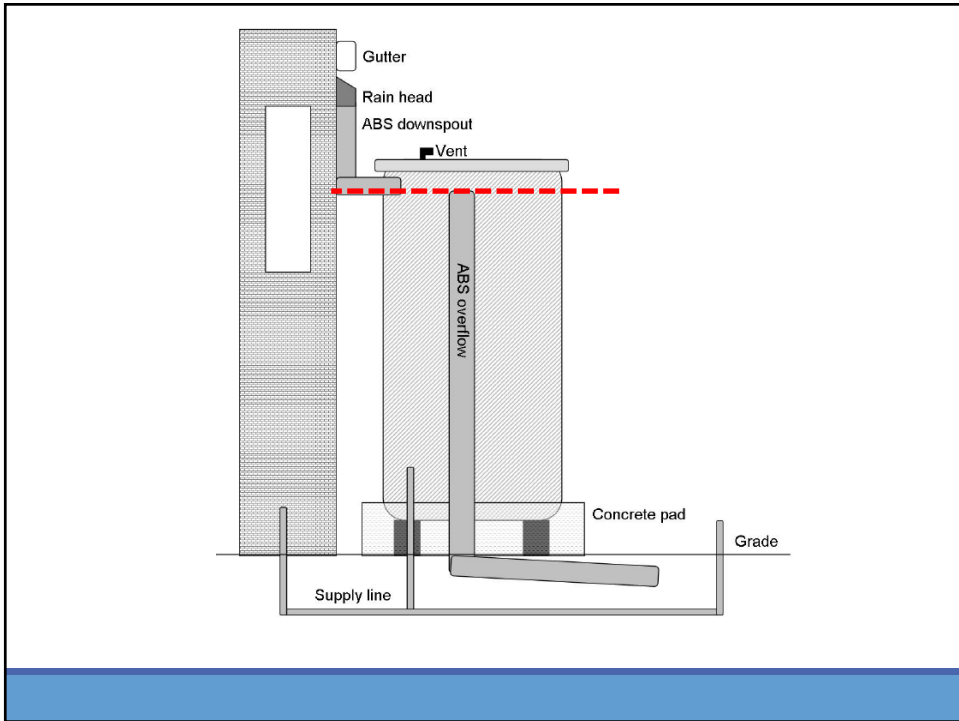


To aspire to...

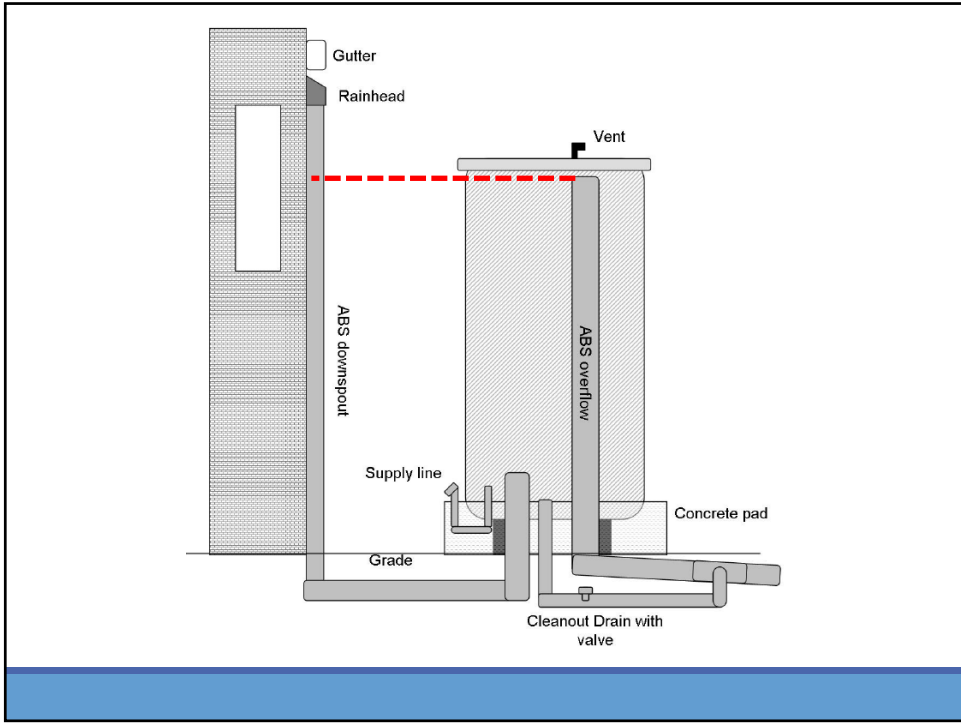
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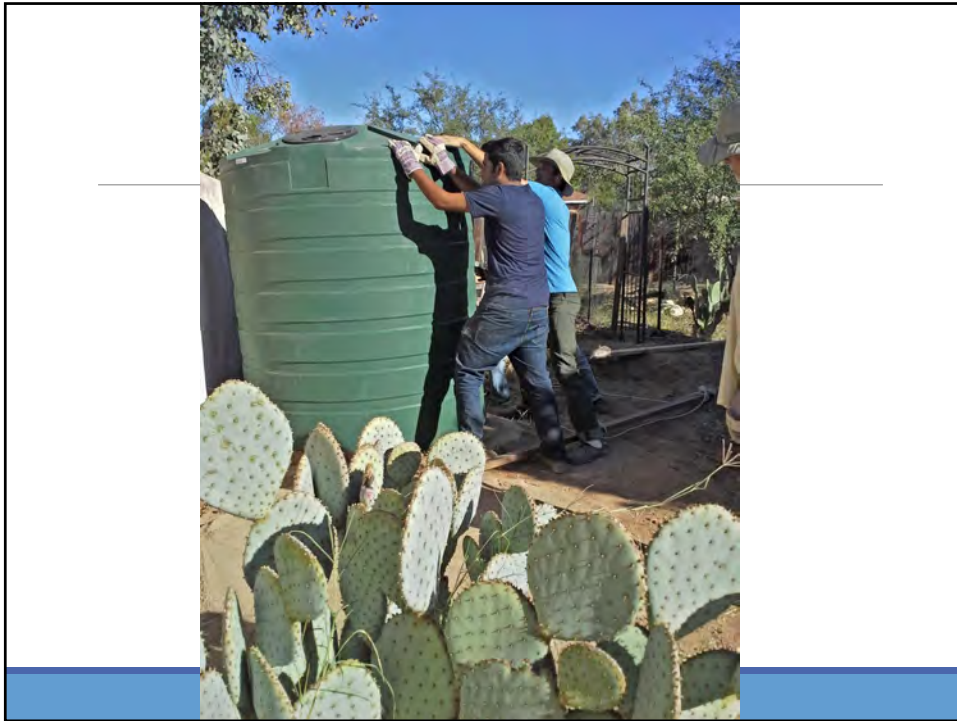
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21



22



23

Critical Features

- Water tight
- Light proof
- Vented
- Mosquito proof
- Critter proof
- UV resistant
- Planned overflow



April 2011

24



25



26



27

Maintenance

Inspection:

- Check for leaks or wet areas
- Check and clear debris from gutters and downspout, and downspout tubes are well secured
- Check overflow outlet, clear out any debris
- Check to be sure adult mosquitoes do not have access
- Empty first flush after each rainfall event
- Clean out bottom sediment layer if needed (only if >3-4" sediment layer)

Winter Preparation:

- Insulate all supply pipes and fixtures which contain water.
- In colder climates if the tank itself is not buried or insulated properly then the tank and supply lines may need to be drained completely to prevent freezing.

28



29

Capture events from multiple storms – cumulative rainfall over a period.

Aim to capture rainfall from the entire monsoon or winter rain season = ~4 inches

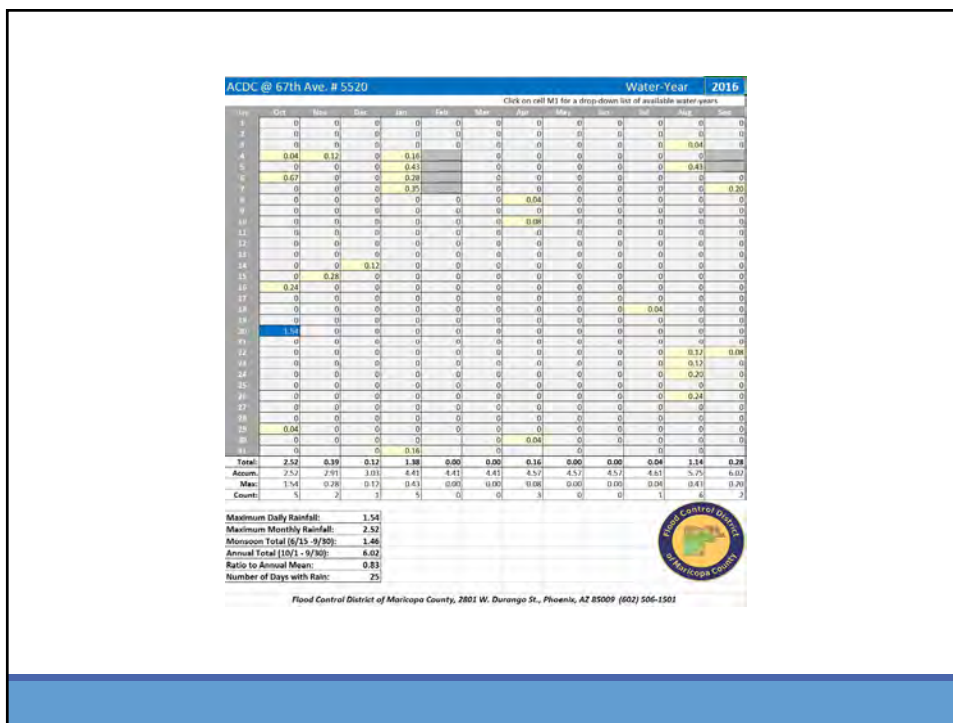
- A tank that captures 1" of rain – good
- A tank that captures 2" of rain – better
- A tank that captures 3-4" of rain – best?

Tank sized based on catchment area

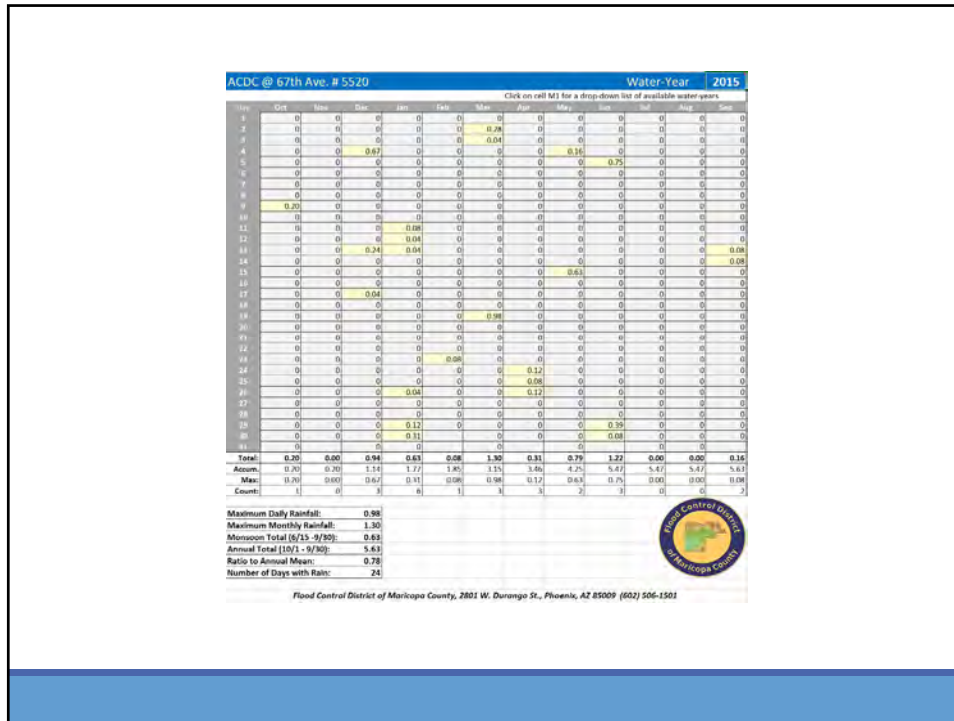
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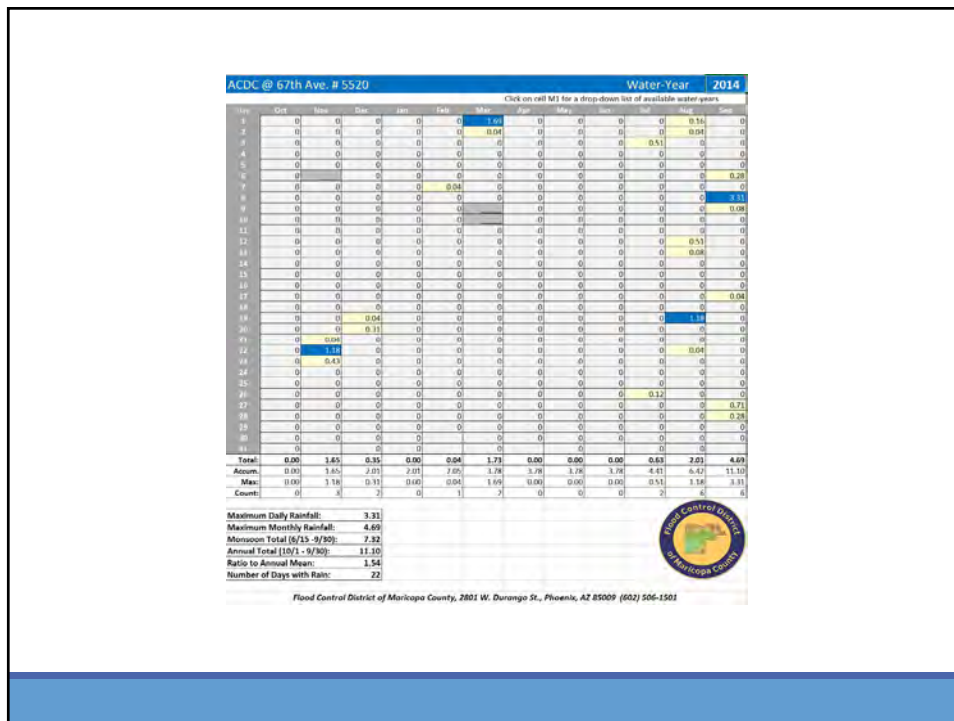
31



32



33



34

Source: Rooftop runoff

Activity: Calculate your rooftop runoff from 1", 2", 3", and 4" of rain.

Formula: Square feet of roof x 0.623 x runoff coefficient x inches of rain

Example: Cindy Cistern has a 1,500 square foot home with an asphalt shingle roof and she wants to capture 4" of rain in her cistern.

Answer: $1,500 \times 0.623 \times 0.9$ runoff coefficient x 4" of rain = 3,364 gallons of water.
Ambitious!

She will compromise on two 1,500 gallon cisterns – one on each side of her home.

35

Match tank to plants' needs

Tanks may not cover the entire need of backyard gardens, but they can help greatly reduce the need for municipal water sources.

Activity: Calculate the annual water need for your garden.

Formula for vegetable garden: Square footage x 40

Example: Gardener Greg has a 5 x 10 garden.

Answer: $5 \times 10 \times 40 = 2,000$ gallons per year

Complete answer: $2,000 / 2 = 1,000$ gal *per season*

April 2011

36

<p>Calculate Discrepancies</p> <p>April 2011</p>	<ol style="list-style-type: none">1. How many gallons of rainwater can your cistern(s) hold per rain season?2. How many gallons of water do your veggies need per season?3. How much water will be needed that the cistern cannot provide?4. How will you provide this water?5. OR, if there is excess water, what can you use it for?
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37

<p>Cistern Placement</p> <p>April 2011</p>	<p>Activity: Draw cisterns into your site plan (started in Week 1).</p> <p>Based on placement of gutters, human use/access, and stacking functions, where in your yard is the best spot to place your cistern(s)?</p>
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38

Site Plan
(from Week 1)

- Property lines
- House
- Other permanent structures (storage sheds, pool, driveway, sidewalks, etc.)
- Existing trees and shrubs
- Mark direction - North, South, East, West

39

Questions?

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40

Thank You!!!



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