

WATER CONSERVATION

Drip Irrigation

Ollas

Rain Barrels

Thank you

Cheryl Simmons

Peggy Conrad

Zena Hartung

Kathleen Burns

Jenny Parker

Greg Freistadt

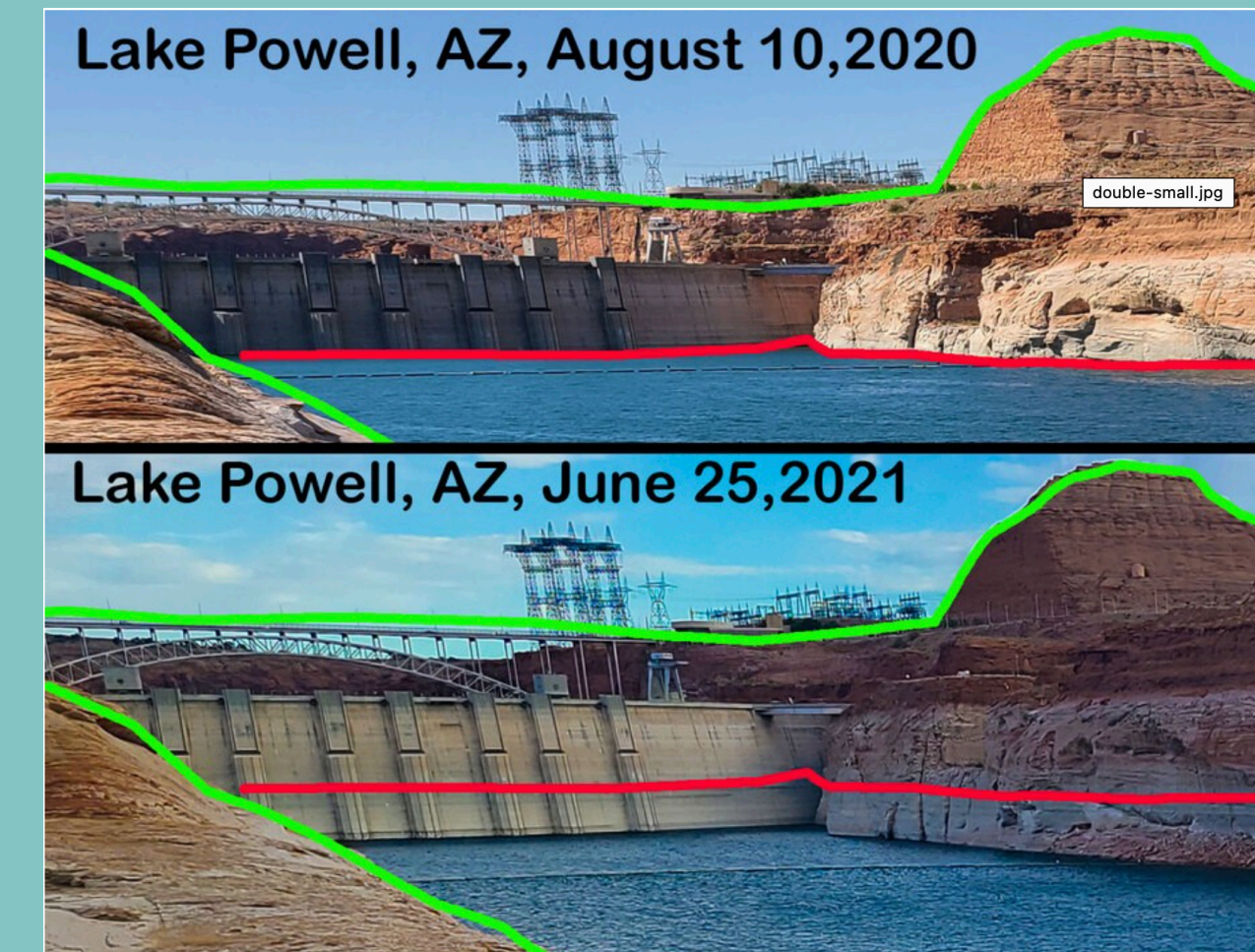
Jodi Prout

Carly Lilly

Jean Leffingwell

WATER CONSERVATION IN GARDENS AND LANDSCAPES

We must plan future landscapes and home gardens for more efficient water use.

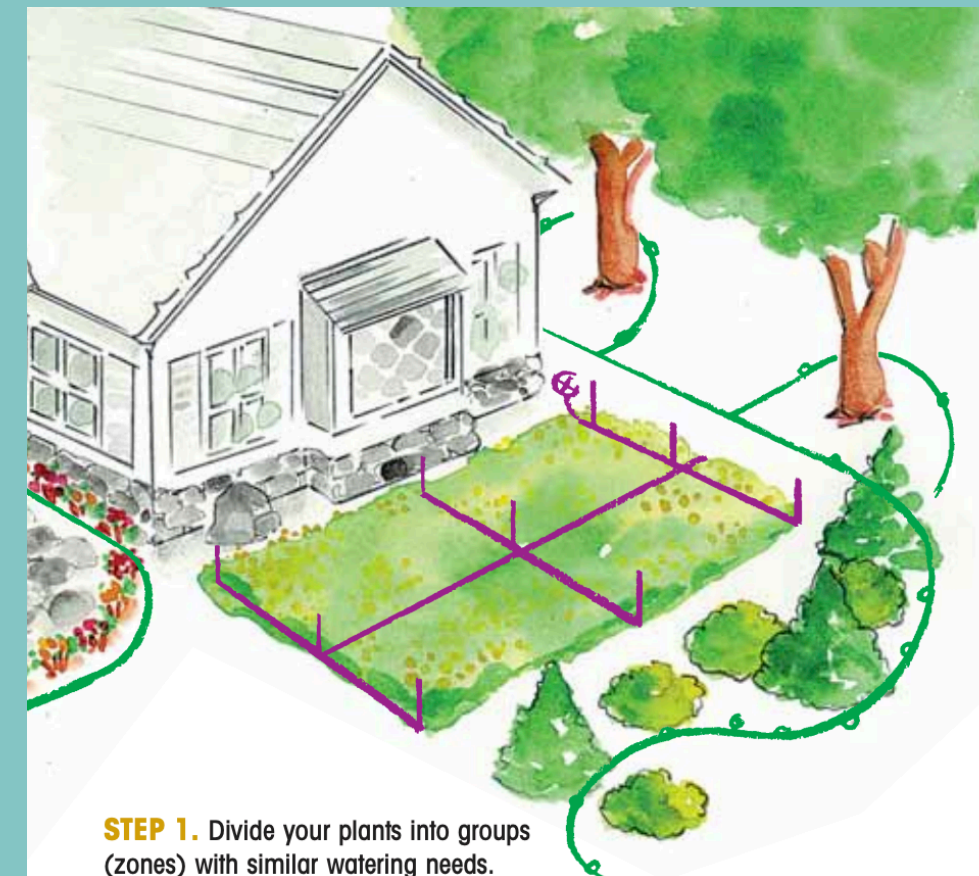


30 Foot Drop in 10 Months

One solution is Drip Irrigation

Why Drip?

- Simple DIY
- Direct to the roots
- Saves water
- Limits evaporation
- Limits weeds
- Allows control of micro climates to address plant needs



Why Not?

- Maintenance is required when plastics crack in the winter
- Minerals can clog drippers
- Breaks in the tubing can be caused by
 - Mowers, Trimmers, and Aerators



ULTRA SIMPLE SOLUTION - DRIP TUBE OR DRIP TAPE

Drip Tube



Pre spaced holes in inches



Buy the hose, attach to a spigot



Pre-Assembled 5/8" (.700) x 50' Coil of supply tubing



Generally used in straight runs

Drip Tape



DONE

BUILD A MORE VERSATILE SIMPLE SYSTEM



Hose End Faucet Connector



Backbone Branching



Emitter Options



1/2" Hose End Clamp

PUNCH A HOLE

Pay attention to labels to save time & money



Black Poly Tubing = 1/2 " black - 50 or 100 ft rolls



Spaghetti Tubing = 1/4 " black - 50 ft coil

Punch Tool



Add an Emitter to the hole in the black poly



Emitters have barbs



1/2 GPH



1 GPH



2 GPH

Control the flow at the backbone

Attach to Water



3/4" hose thread for the spigot

3/4" Hose Thread x 1/2" (.620-.630) compression swivel adaptor



1/2" hose clamp

Backbone
Emitter
Hose connector
End clamp



Simple and Done

Spot Watering

Add 1/4" tubing



- 1 BASIC! Attach a length of 1/4" tubing to the emitter on the poly backbone



Direct to the plant

- 2 Get Fancy! Attach a length of 1/4" tubing to the emitter on the poly backbone

Add a Bug cap

Add a stake



Try Another Type of Connector

Use a straight barb connector

Add 1/4" tubing and then a T barb



Add a bubbler emitter



Go wild!



Bubbler on a spike

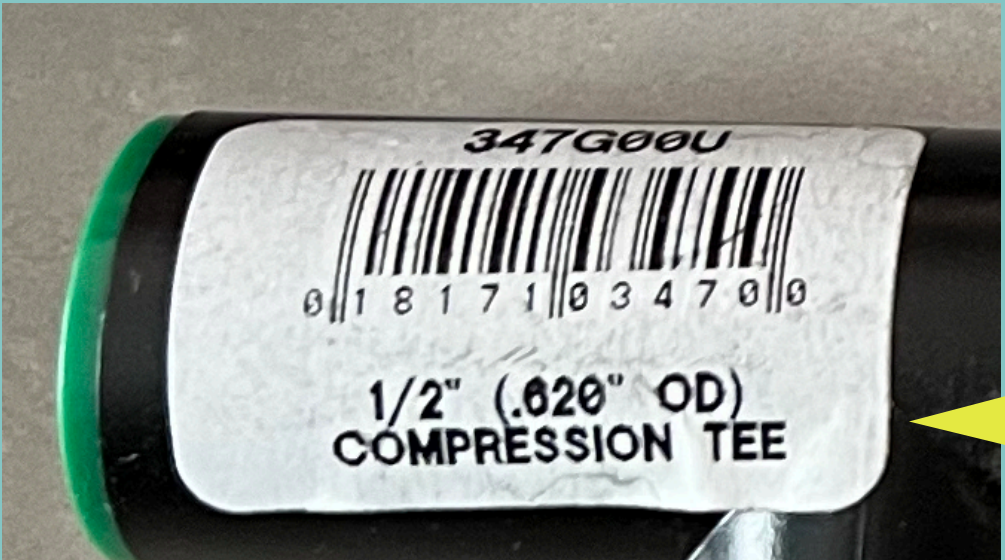
1/4" tubing with bubblers

Connections

Compression Fittings

Female / Female

Rain Drip



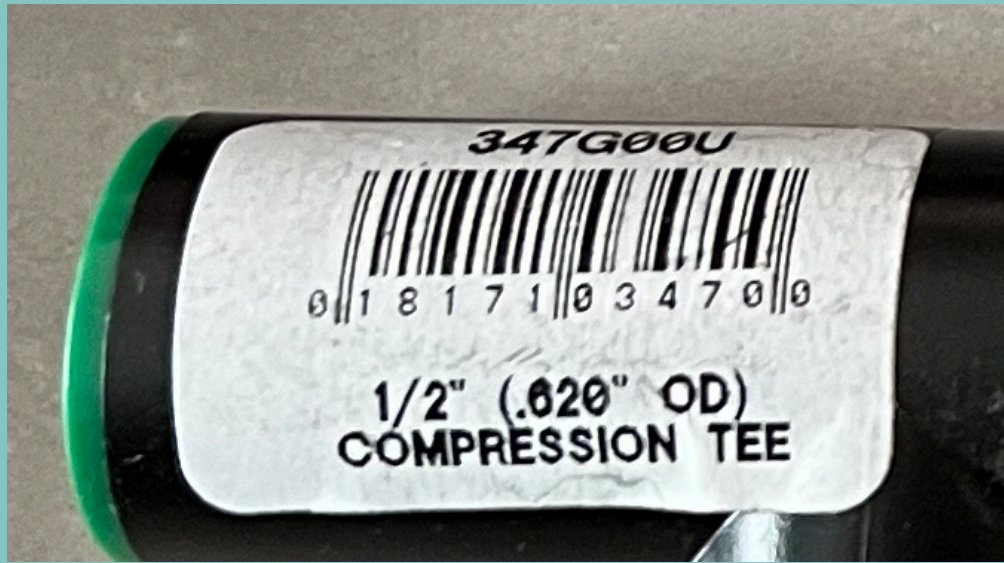
Color Coded - Green = 1/2"

.620 OD



BUYING MISTAKES!

Rain Drip

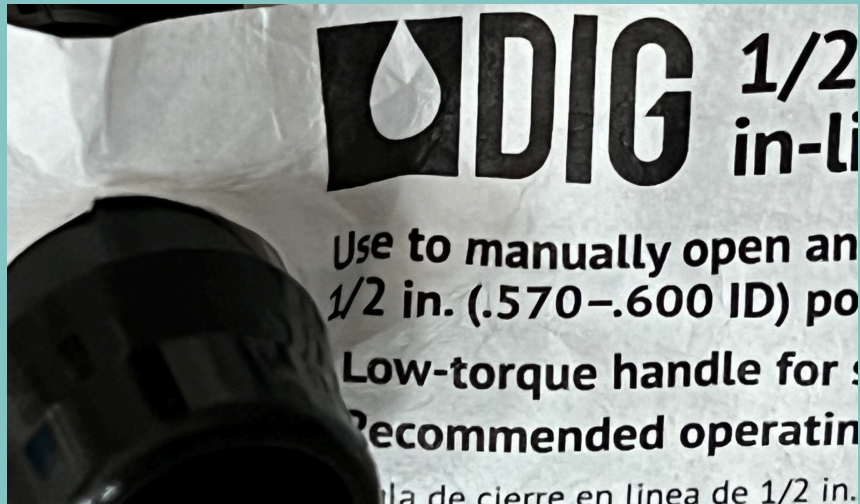


Color Coded - Green = 1/2"



.620 OD

DIG



.570 - .600 ID

In-line barbed ball valve

Repair or Connect More Easily

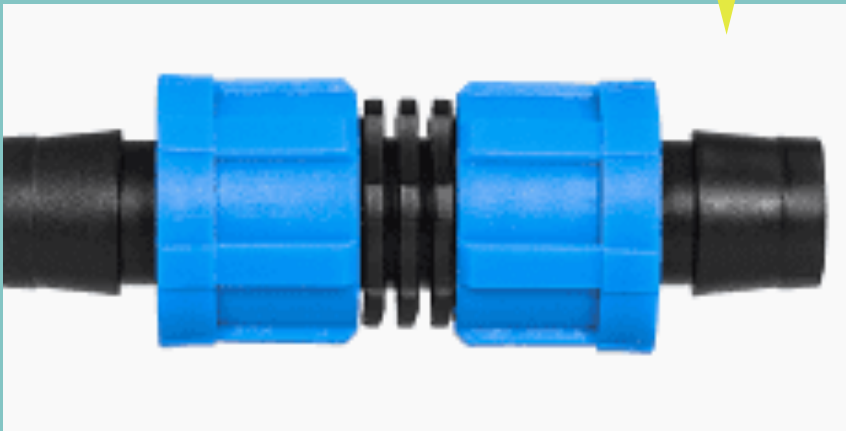
Repair Coupler Fittings

Female / Female

Male / Male



Toro - basically a double ended 1/2" barb coupler



In-line 1/2" barbed connector



Universal Coupler
.590"-.710" O.D.

Used to connect
dissimilar sizes of tubing

EVERYDAY MISTAKES!

Goof Plug - fat side - skinny side

Correct wrong holes in 1/2" poly

Cap off the end of 1/4" tubing

Use needle nose pliers to make
installation easier



1/2"



1/4"



Remember our original Simple Run?



1/2" hose clamp

Simple and Done

Hose connector
Backbone Poly
1/2 GPM Emitter
End clamp



AUTOMATE!

Simple
Minute
Timer



Automatic
Watering
Timer



Use a Y connector

Create Zones



One arm to a hose
One arm to the hose for
the drip system



Combine it all

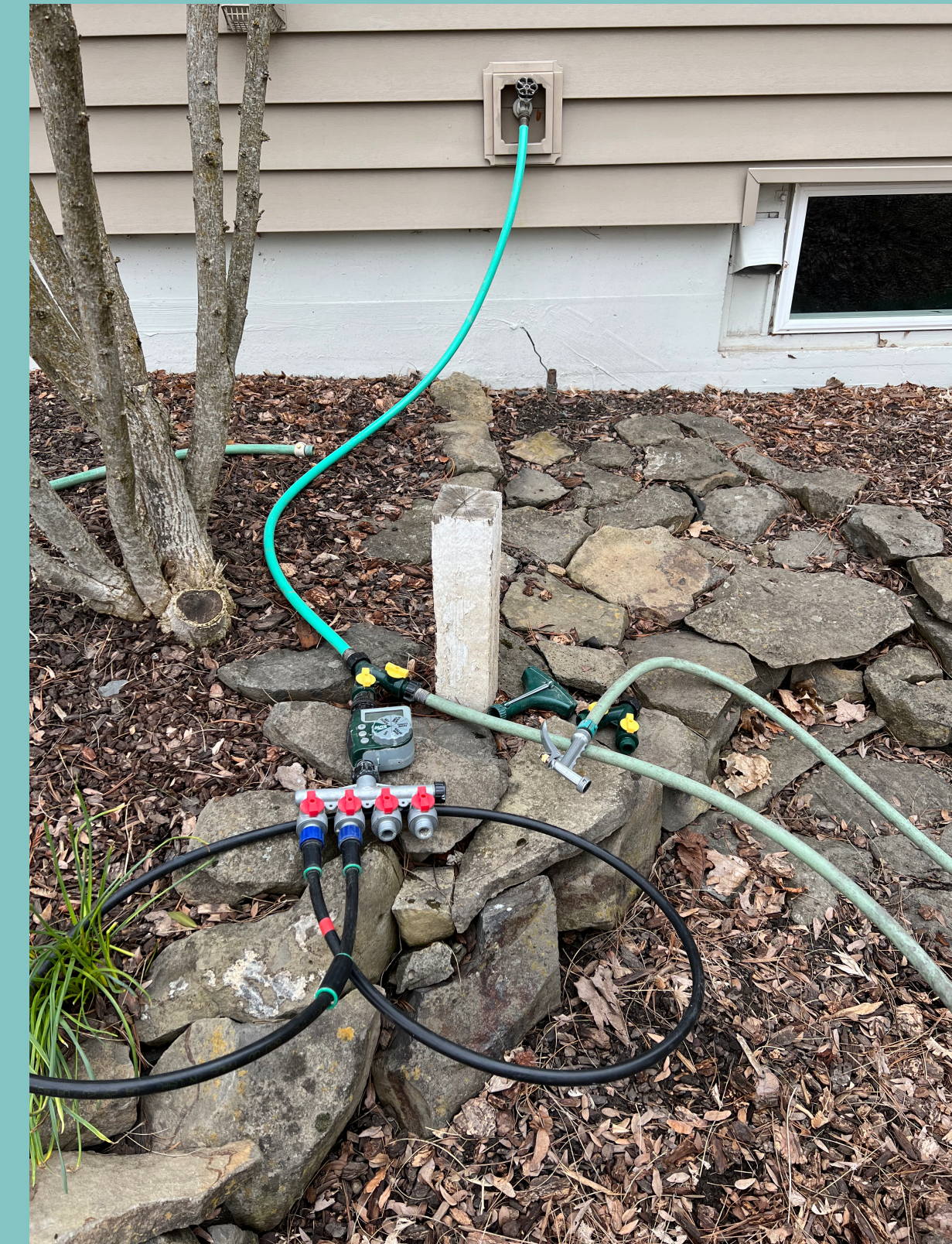
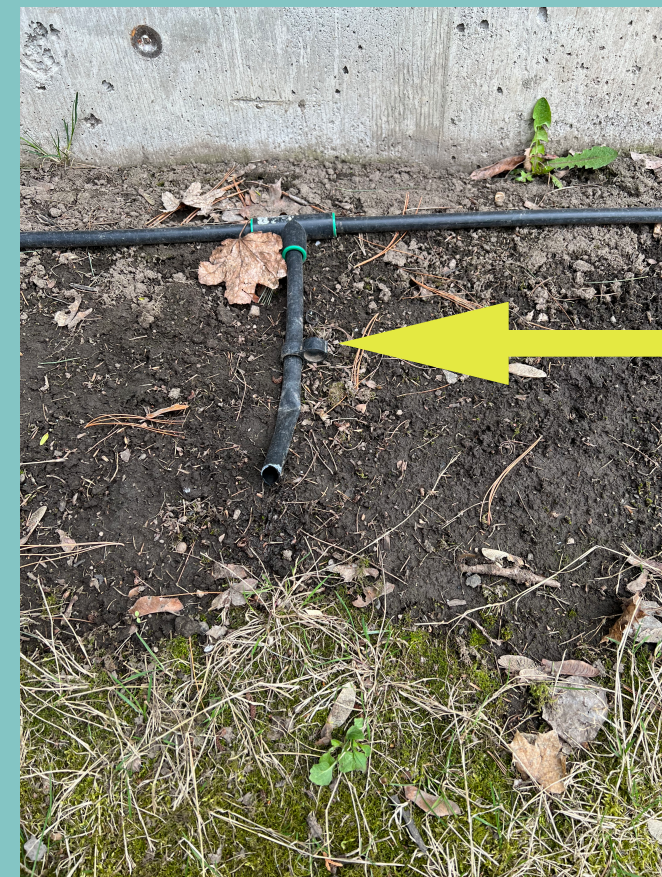


WINTERIZE THE SYSTEM

Remove timers, back flow preventers, filters, pressure regulators

Remove batteries from timers

Store in the garage



Remove all tube end fittings

Raise the hose ends and allow the water to drain out

Insulate the plastic fittings with leaves

OOOPS



Bury the tubing



Bury and cover

Twice:

First, the lawn mower

Next, the aerator

TIPS

Do **not over tighten** back flow preventers, pressure regulators, and other faucet assembly parts.

Punch holes when it's **cold**

Use this tool to push emitters into 1/2" tubing

Reduce the chaos

Hand tighten only

Do not use teflon tape or glue

Connect compression fittings and emitters when it's **warm**

Leave 1/2 " poly in the sun - it becomes more flexible and unrolls easier



OLLAS

[Oi Yah]



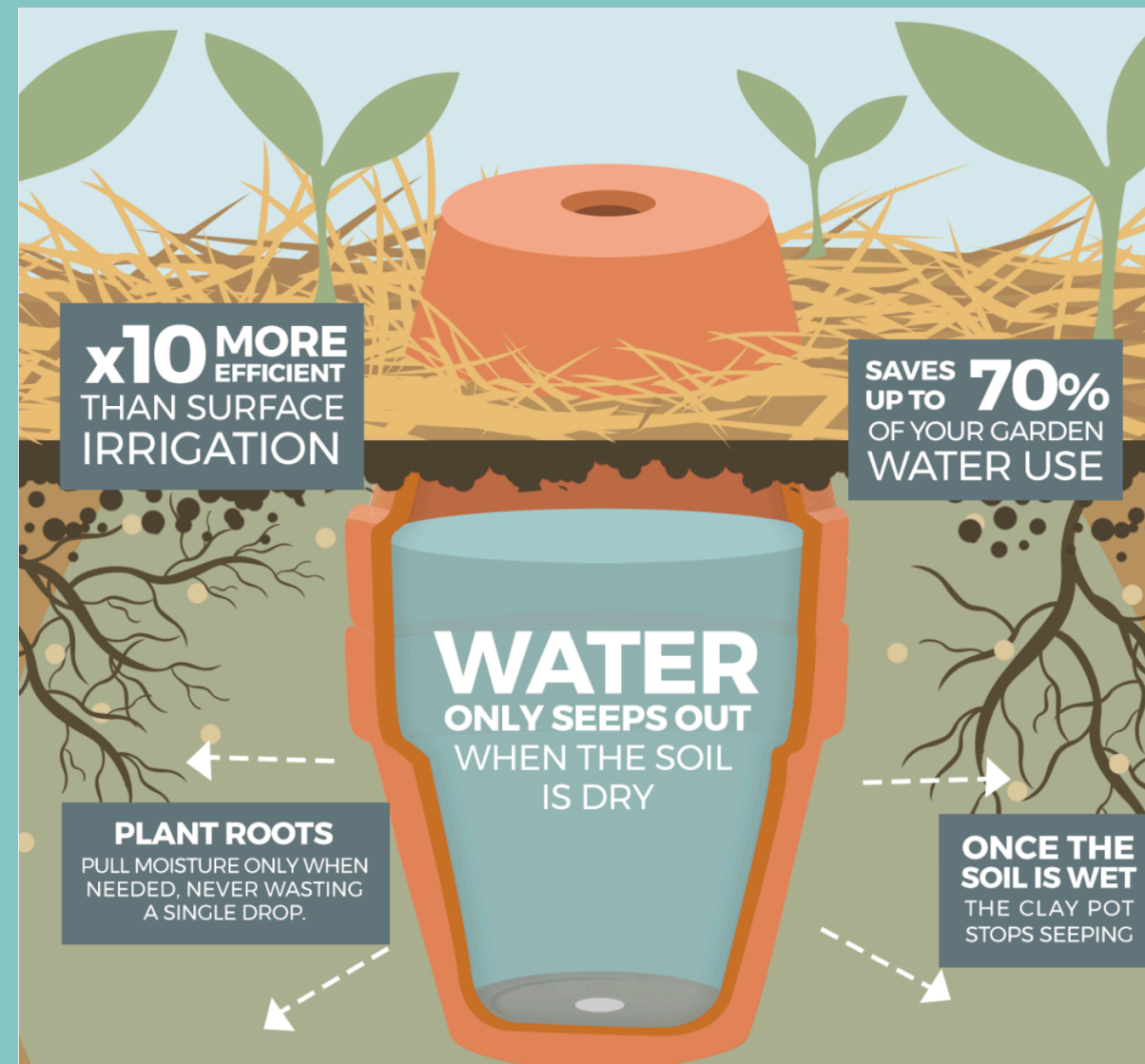
OLLAS



UNGLAZED CLAY POT

- **Originated in Northern Africa**
- **Evidence of use 4000 years ago in China**
- **Still used in India, Iran, Brazil**
- **Local craftsmen make the Ollas**

HOW DO THEY WORK



Ollas are buried in the soil and filled with water. **Dry soil pulls** water through the porous unglazed pots.

Roots pull the water out in response to evaporation through the leaves.

The roots of plants eventually **grow toward and around** the olla, allowing for even and consistent watering.

The rate is influenced by the needs of the plant.

- If the soil is moist, the water stays in the pot.
- Ollas almost eliminate evaporation.

OLLAS

Size

- A commercial **3 gallon** pot will water a **3'** diameter circle
- An **8"** flower pot olla can water plants within a **16"** diameter.
- **Lids** decrease evaporation.



Optimal spacing of ollas will depend on the soil type,
plant type(s), and climate

EASY DIY
CAPACITY

2 - 3.5" pots stacked - hold 1 Liter

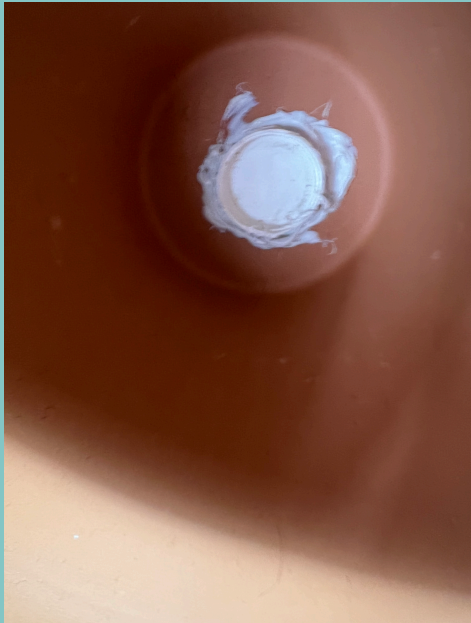


1 - 8" pot holds 4 Quarts

2 -8" pots would hold 2 gallons



Inside



Outside



Cover to use for the top hole - a rock, a stick



EXPERIENCES

- The surface appears dry but the moisture 2-4 inches below the surface is reading wet with a **moisture meter**
- 1 month - 1" left in the bottom
- Rule of thumb: Add water when 50% low - use a dip stick



Particularly well suited to tomatoes, squash and melons

DISADVANTAGES

- Winter Breakage [empty & store or mulch]
- Usage - 5 years - mineral deposits limiting porosity
- Heavy soils
- Time needed for the seedlings/transplants to establish roots around the olla
- Plant them close to the pot
- Water seeds and transplants initially



RAIN BARRELS/CISTERNS

Recycle Rainfall

BENEFITS OF RECYCLING RAINWATER

- Limit pollutants from flowing into rivers and city water systems
- Reduce demand for treated tap water
- Control erosion and moisture accumulation near foundations

RAIN BARRELS & CISTERNS

- Water supplied by downspouts
- Water can be dispersed to a
 - A hose
 - Direct to the ground
 - Rain garden

Gravity Fed if **above** ground

Pump needed if below ground

RAIN BARRELS & CISTERNS ABOVE GROUND

55 Gallons



1 Full Barrel = 500 pounds

550 Gallons



Cistern

ABOVE GROUND CISTERN

Jean Leffingwell

•550 Gallons



- Tin Roof
- Gravity Feed
- Solid elevated base
- Attaches to a hose



ZENA HARTUNG'S STORY

Goal: Save roof water runoff and use it as an auxiliary water source for the front and side of the house.

Funnel **ALL** downspouts to a single outlet

2200 Gallon concrete cistern captures the water

Directly below the raised bed

Water is pumped to a frost free faucet

Overflow from the cistern is directed into a rain garden

Excess overflow can be directed to the city storm water system

“ In a hundred year flood, if there is more water than the tank and the rain garden can handle, then we can re-route back to the city storm water.”

Pressure from the pump is not sufficient to support a drip irrigation system. Drip Irrigation is a separate system using city water



Rain gardens

Rain gardens allow time for excess water to infiltrate the ground through a system of deep plant roots

Filter pollutants from roof runoff

Recharge groundwater

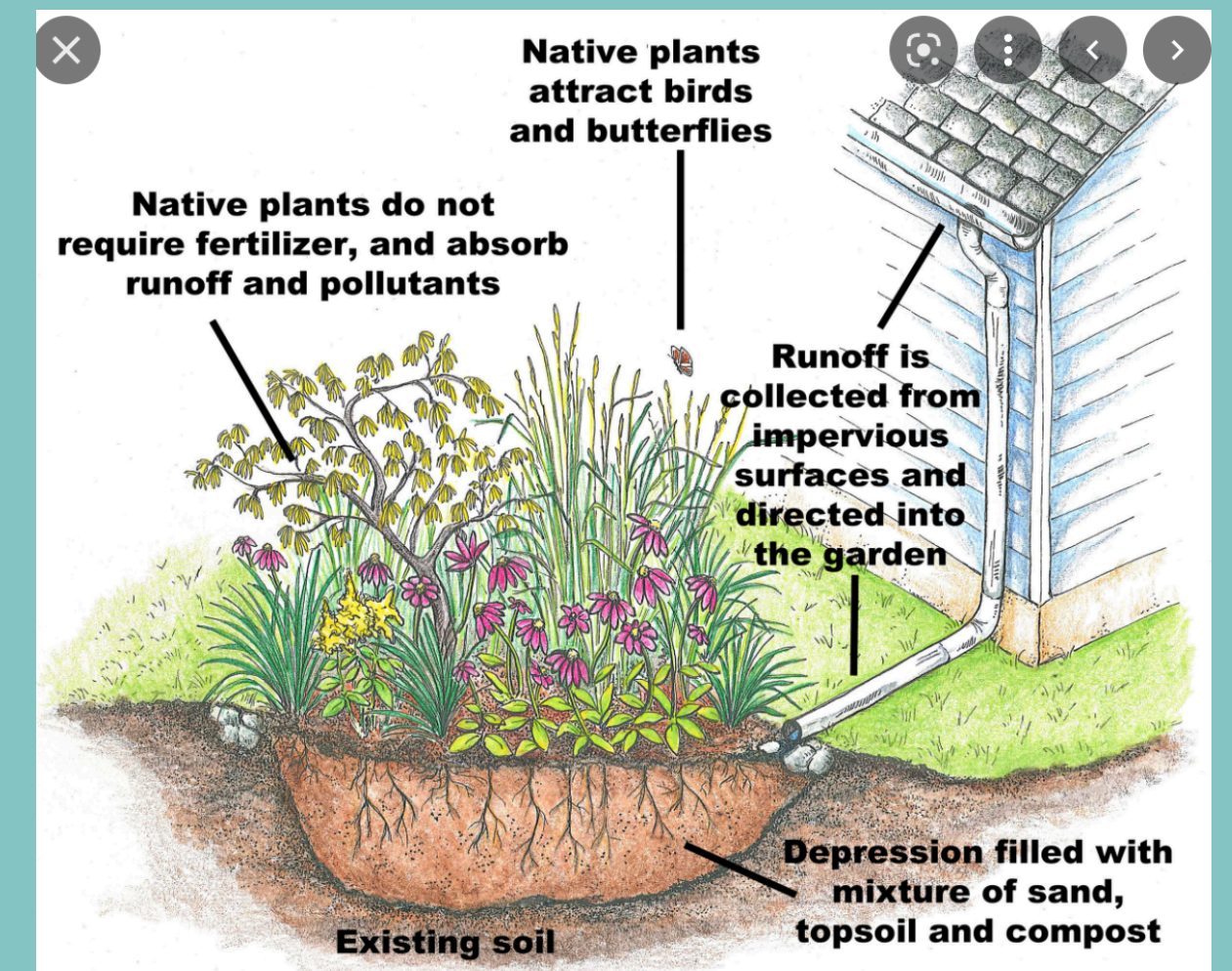
Reduce mosquito breeding

“Water flows from the cistern overflow pipe out into the lined creek bed and around the house, under the walkway from the backyard and into a rain garden.

Around the rain garden I planted thirsty native plants: elderberry, golden currants, black hawthorn, two kinds of willows, 2 alder trees and red osier dogwood. It will look so much better by June!

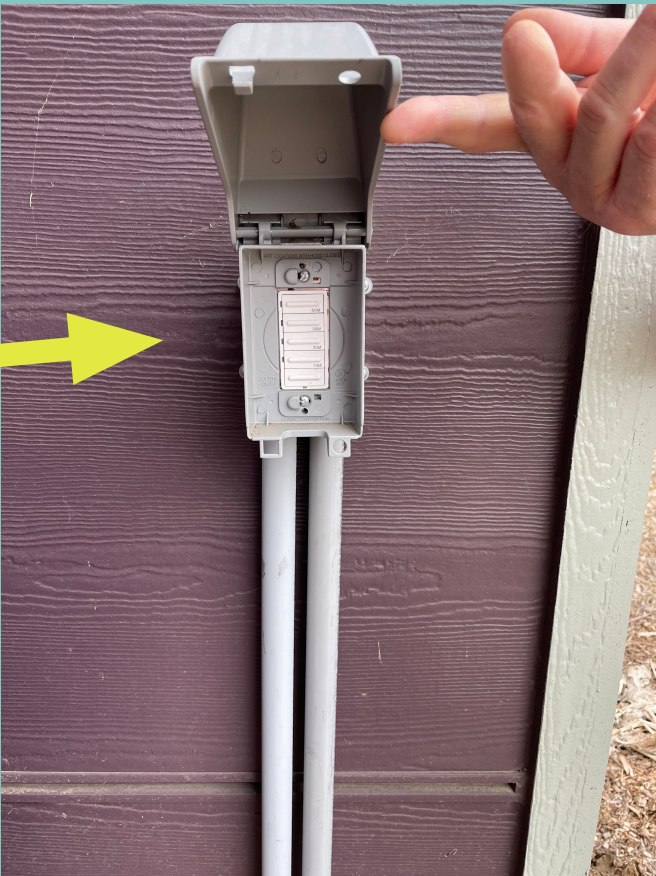
The base of the rain garden has leaf mold. The sedges are expected to eventually grow into it. I'd hoped to start some cattails, too. We shall see if it is wet enough year-round to keep them growing.

I usually blow the leaves and stuff out of it just before the next wet season.”



THE ELEMENTS

Switch for the electric pump



Frost Free Water Pipe



Water level



CISTERN



On/Off valve

Re-route water to the city storm water system



KATHLEEN BURN'S STORY

During a remodel that lifted her **house** Kathleen

Diverted all the house downspouts into a

1500 Gal Cistern

&

Added a **2 Barrel System** to the barn

WHAT IS DIFFERENT ABOUT KATHLEEN'S CISTERN?

Rated for drinking water

Is made of plastic

Kathleen uses a **submersible pump** to draw the water up for a **hose**

- Water fruit trees in the early spring through July or early August

Pressure from the pump is **not** sufficient to support a drip irrigation system

- Drip Irrigation is a **separate** system -
-

KATHLEEN HAS A 2 BARREL SYSTEM

Two barrels **stacked** - one higher than the other

Creates more water pressure

Collects more water - $55 \text{ Gal} \times 2 = 110 \text{ gal/1,000lbs}$

She uses a **hose** to water her pots

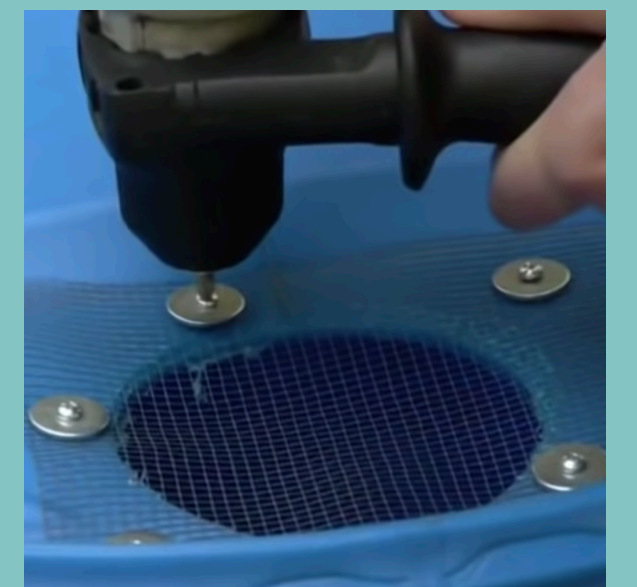
One good rain fills the 2 barrels



Overflow to the ground



Simple downspout diverter into top of barrel



Debris Screen

KATHLEEN'S **BARREL** WINTERIZATION PLAN

- Drains and disconnects the barrels from the downspout and each other
- May use vinegar or baking soda to clean them for algae and/or mold
- Reconnects the barrel parts and stores them in the barn - ready to hook to the gutter in the spring.

KATHLEEN'S **CISTERN** WINTERIZATION PLAN

- Remove the submersible pump
-

JUST BARRELS



PALOUSE CONSERVATION DISTRICT

Education and Outreach

- *K-12 Education, Workshops, Volunteer Events, Outdoor Learning*



RAIN BARREL WORKSHOP BENEFITS WHITMAN COUNTY RESIDENTS

The workshops are made possible by the River Network that collaborates with the Coca-Cola Company and the Coca-Cola Foundation to host local organizations across the U.S.



Backyard Explorations

The information that follows was gleaned from Jodi Prout’s presentation, research on the web and discussions with local residents.

Steps

Select a flat location within 3 feet of the downspout



Construct a **sturdy** stand of bricks, cinder blocks, wood

At least 10” high to support gravity feed to the spigot

Purchase a “KIT” Kits even include drill bits



Or, you could just buy the whole setup, barrel and all



Chattahoochee River Keeper and the RainRecycle Rain Barrel Kits
The Rain Barrel Depot Earthminded - Rain Recycle Kits

CONSTRUCTION

SPIGOT HOLE

Drill a spigot hole on the side of the barrel near the **bottom** of the barrel - the rounded end

Insert the threaded spigot seal into the spigot hole

Screw the spigot into the fitting by hand



FILL HOLE

THERE ARE 2 BASIC STYLES OF DOWNSPOUT DIVERTERS

The **top** hole variety The **side** hole variety



Both require some type of device inserted into the downspout to allow water to flow from the downspout into the barrel.

Get **WATER** into the **BARREL**

Position the barrel on the barrel stand you made next to the downspout

Measure the height of the water entry hole on the top or side of the barrel.

Drill the hole in the gutter

Squeeze the sides of the diverter and insert the diverter into the downspout. The cup and arrow should be facing up

Secure the diverter with the two small screws

Insert the fill tube into the diverter and into the barrel's hole



WATER overflow OUT of the BARREL

THE OVERFLOW DIVERTER

Position the barrel on the barrel stand you made next to the downspout.

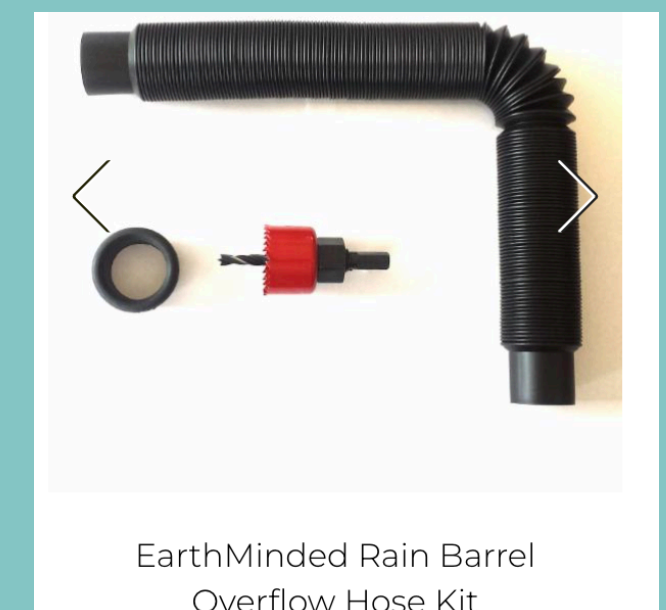
Drill a hole on the side, **near** the top of the barrel, but slightly **BELOW** the fill hole

Install the diverter for the overflow

Attach a PVC pipe or hose



Lower than the fill hole



MAINTAINING

Clean

Rise it out occasionally

Use a non-toxic solution of vinegar to remove & limits sludge - Algae, Mold & Mildew

Winterize

Disconnect and drain

Flip the diverter upside down in the gutter to stop water from filling the barrel

Possibly store inside

INFORMATION SHARED DURING DISCUSSION

DRIP IRRIGATION

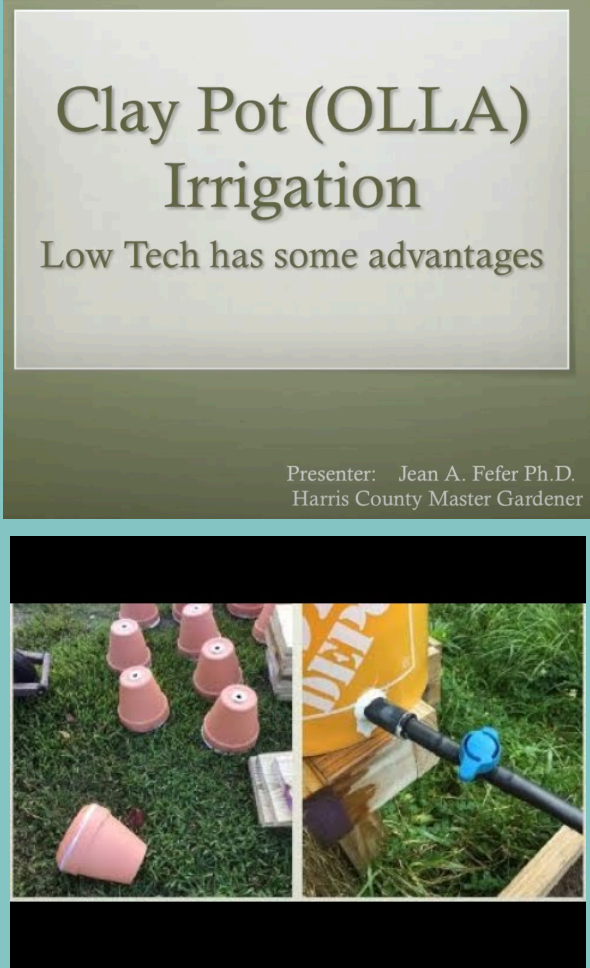
- Winterizing - SYG from Pullman “blows out” irrigation systems.
 - The green hole punch tool creates a small hole which makes it difficult to place an emitter in the 1/2 tubing. The blue and white hole punch tool makes a reasonably sized hole. It is easier to insert an emitter.
 - All supplies were purchased in the Moscow/Pullman area
 - Both Raindrop.com (supplies available locally) and DripWorks.com have excellent videos and guides to help with layout, flows, repair and troubleshooting.
 - DrippingSpringsOllas.com shows how to create an automatic irrigation system with ollas.
 - Moscow’s Wisescape Guidebook - PDF. <https://www.ci.moscow.id.us/DocumentCenter/View/1386/Wisescape-Guidebook-PDF>
 - Rain water has an acidic ph which is good for the soil and both indoor and outdoor plants.
-

OLLAS

DrippingSpringsOllas.com and other YouTube videos show how to connect automatic irrigation system with ollas.



Use wine corks to plug the top hole to prevent debris and mosquitos to enter the olla.



Urban Harvest Houston:
Part 1: Low Tech Irrigation
with Jean Fewer



BARRELS - SCREENS

Screens can help prevent debris, such as leaves and pine needles from clogging the rain water collection system

Check and clear roof connections, downspouts and barrel screens regularly

Depending on the season, that may be monthly, by monthly, or even yearly

Use one approach or try them all!

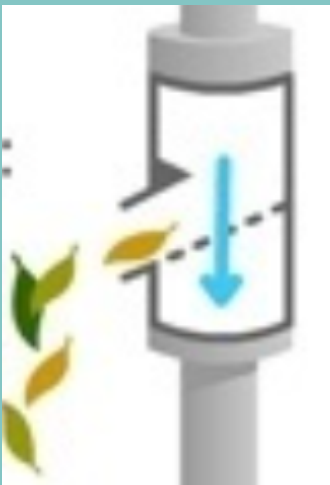
In-gutter filtering systems are very effective



Even top of the downspout inserts can help



Screens within the downspout may allow water to flow directly down the downspout or may divert water to outside the gutter



Screens at the gutter/barrel interface may be sufficient and are easy to access

Panty hose attached to the bottom of the diverter can also filter debris



BARRELS - OVERFLOW

Most overflow diverters require a hose attachment to direct water away from the barrel

It is possible to find diverters that funnel water from the overflow diverter right back into the downspout

BARGAIN HUNTERS

It is often possible to find used supplies at Habitat for Humanity