UNIVERSITY OF ARKANSAS
DIVISION OF AGRICULTURE

Water Efficiency For Turf and Landscapes

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Sprinkler Smart Program

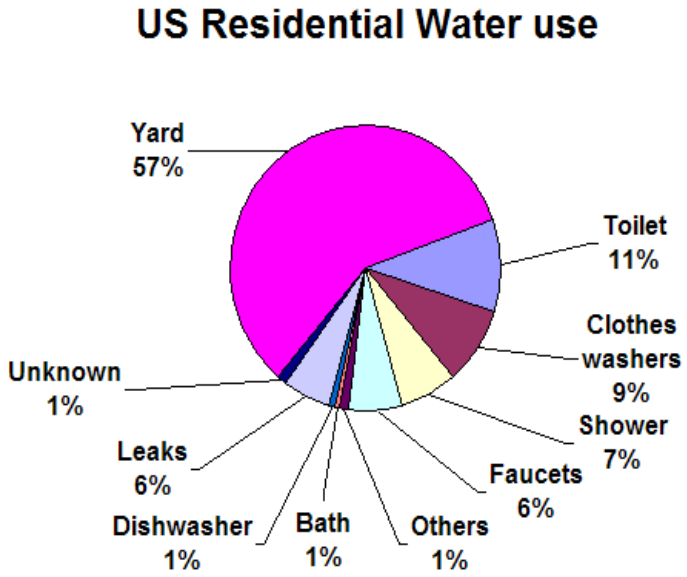
- Joint program with Central Arkansas Water
- Help reduce water usage during peak times 4:30 am – 7:30 am
- Help reduce peak day demand
- Provide education for homeowners and irrigation professionals through workshops, presentations, site visits
- Help reduce demand management charge

Outdoor Water Usage

- Of total water budget--Outdoor use is around **57%** on average

- In **summer months** this goes to **70%**

- What effect does this have?
  - Greater population = greater demand for water
  - More demands on municipalities
  - More demand on infrastructure
  - Increased regulations
  - Higher water costs



American Water Works Association 2010

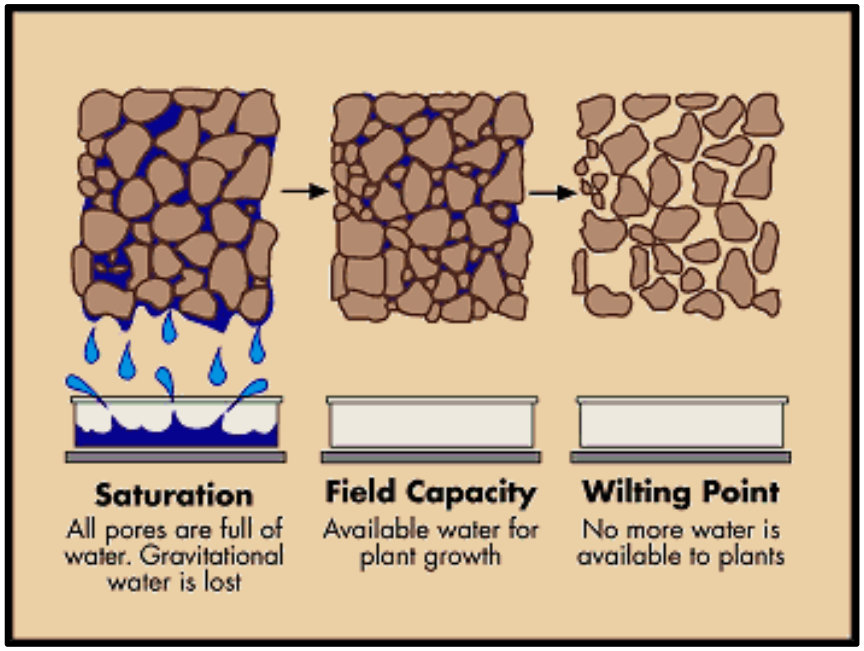
Basic Questions for Irrigation

- How **should** water be applied?
- How **much** water should be applied?
- How **often** should water be applied?

How should water be applied?

- Never be applied at a rate faster than it can be **absorbed** by the soil.
- Rate at which the water is applied will change with the **type of soil** present
  - Sandy
  - Silty
  - Clayey

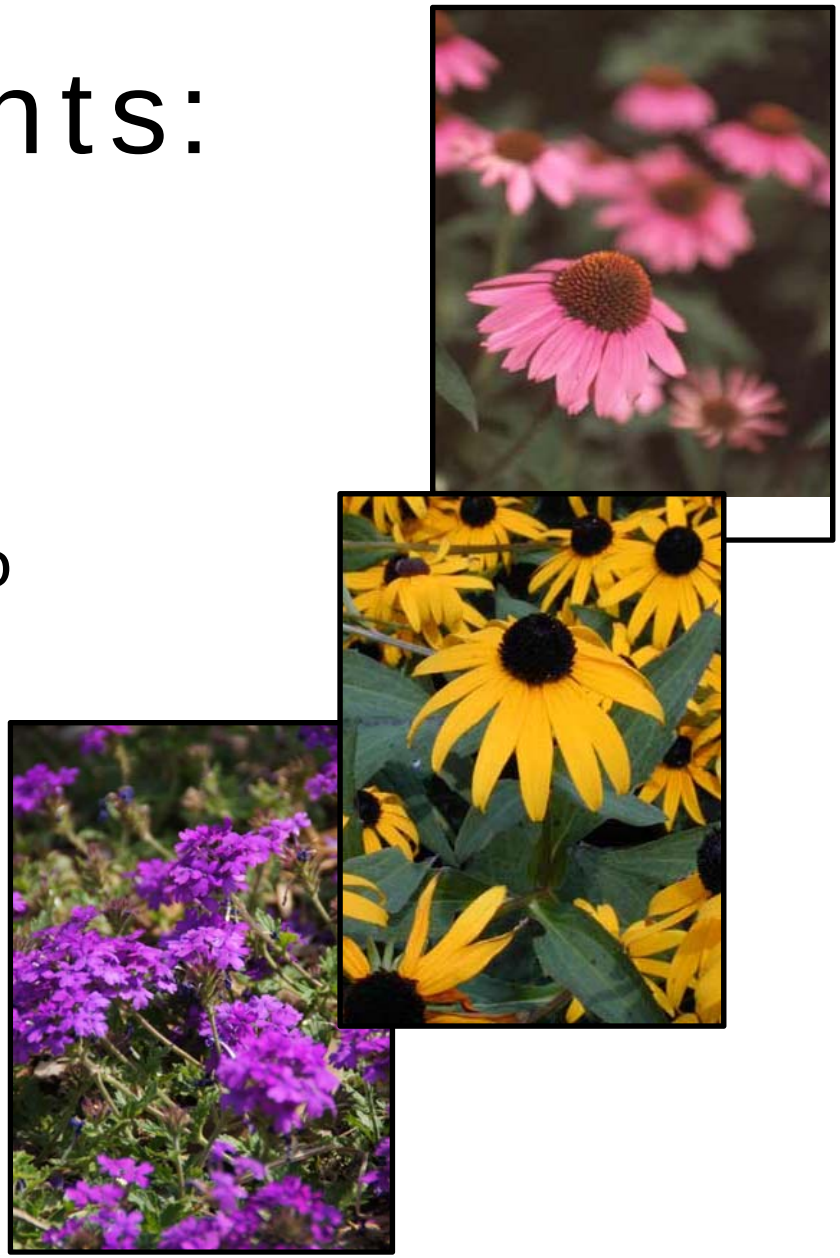
Know the Soils:



Do a perk test or saturate the surface to check the drainage.

Know the Plants:

- Right plant, right place
- Choose low maintenance plants and natives
- Group plants according to their water needs
- Use mulch



- *See list "Drought Tolerant Plants" by Pulaski Co. Master Gardeners*

When Do I Water?

- Many factors determine when:
  - plant type
  - soil type
  - run time
  - sprinkler system size
  - weather
  - water restrictions.

- Follow rules of not over-watering and not introducing the favorable environment for disease

- Adjust times and amounts to seasonal changes-
  - spring, summer, fall, etc..

- Follow all municipalities regulations-
  - they are there for a reason

- Establishment of sod and seed –
  - different rules.

When Do I Water?

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When Do I Water?

BEST TIME!

Early morning- (4 am- 5:30 am) (7:30 am- 9 am)

- Should be completed by 9am
- Give water time to soak into the soil and leaves to dry.
- Wind is usually calm
- Temperatures are cooler
- Water loss can be **10-15% (more efficiency)**

When Do I Water?

OK TIME, BUT NOT IDEAL…

Evening (5pm-10pm)

- May be only option for large systems or hose end sprinklers.
- Loose some efficiency depending on weather
- Can have **disease problems** from excessive moisture sitting on plants overnight

When Do I Water?

POOR CHOICE!

Afternoon- (10am-4pm)

- Loose **25-35% of water** to wind, humidity, and ET.
- Plant is working the hardest dealing with stress
- Better to take a preventive approach.
- Water can burn leaves

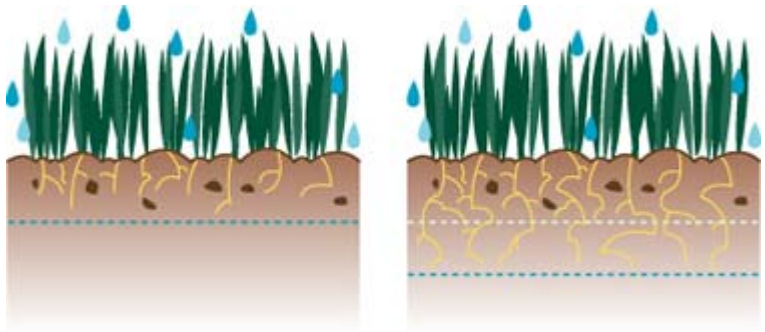
How much water should be applied?

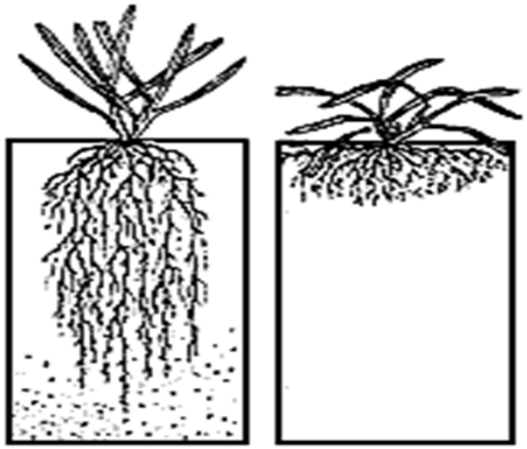
Dependent upon :

- the **water-holding capacity** of the soil
- the amount of **moisture present** when irrigation is started
- **drainage potential** of soil
  - Apply ½ to ¾ inch water per application
  - Soak soil thoroughly to promote a deeper, more drought tolerant root system

Efficient watering wets only the root zone.

How much Water to Apply?





Depends on:

- Variety of turf and other plants
- Soil type and drainage
- ET rates
- Sprinkler system type

Warm season grasses generally require 1 inch of water/week

Apply enough water to soak to a depth of 6-8 inches

One inch water over 1000 sq ft is 600gal

We know that frequent and shallow does not work!!

How often should water be applied?

Frequency of irrigation depends on:

- Type of plant
  - Turf
  - Landscape
- Soil's physical properties
  - Drainage
  - pH
- Climatic condition
  - Rainfall (especially)
  - Humidity
  - Temperature
  - Wind movement

How Often? Water "As Needed"

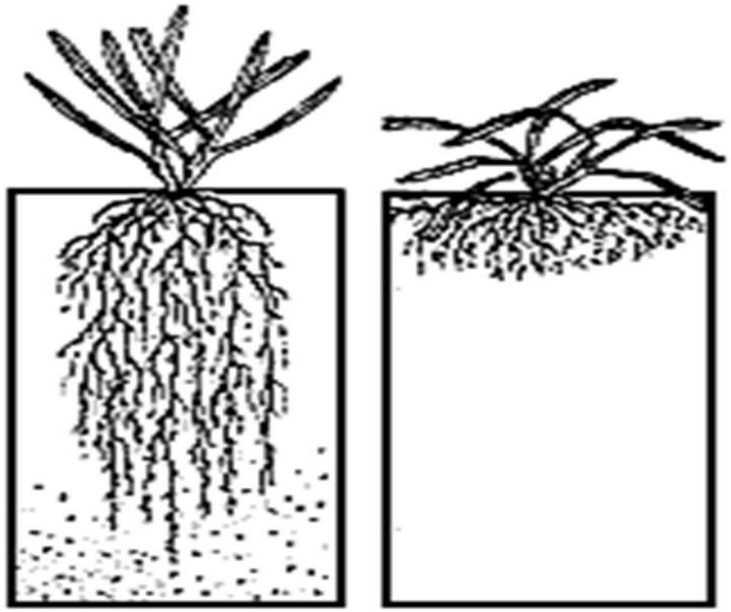
- Water "as needed," not routinely!
- Less frequently in the fall and winter

- Folded leaflets
- blue color
- footprints that remain on the lawn

are indications of a lawn that needs water.

Landscape Plants

Water Deeply - **3/4 inch to one inch** on the soil surface moistens the soil 9 – 12 inches. This is where the plant's **feeder roots** are located. Water less and the plant roots become concentrated near the soil surface and the plants are less able to tolerate stress.



Water Infrequently – Water as needed. Plants will tell you when they need water.

Water Early – just before sun up is best
Loose less water to **evaporation**
Less wind to disrupt irrigation pattern
Leaves dry quickly = less disease

Watering Tips

Wilting azalea

- Learn to recognize when plants need water
- In the heat of midday, some plants wilt. No amount of water will change this.
- If the plant is still wilted by evening, water it then.

Too much of a good thing?

- **Over watering** occurs when water is applied too frequently or in excessive amounts
  - Encourages growth of fungi and bacteria
  - Promotes a shallow root system
  - Reduces oxygen to the roots, causing stress
  - Encourages weed growth

Poa (Annual Bluegrass) is a good indication of an over watered lawn or poor drainage.

Irrigation Systems

- **Calibrate** the sprinkler system
- **Install** a rain shut-off device
- Have your sprinkler system **"tuned up"** yearly
- **Replace** worn hose and faucet washers
- Separate lawn **zones** from landscape zones
- Convert landscape beds to **drip** or low volume irrigation
- Divert sprinklers to **avoid spraying water** on sidewalks and streets

Figure an Irrigation Schedule

- **Understand** how much water is needed in the landscape
- **Relate** actual usage to need
- **Reduce** irrigation water waste
- Be **responsible** in water usage

Measure It

Precipitation Rate—

Know how much water your sprinklers are putting out.

- Use a rain gauge, *or…*

1) Place cans of equal diameter in random places underneath the sprinkler's spray pattern
2) Measure the depth of water in each can
3) Add depth measurements & divide by the number of cans

Determine the length of time it takes for your sprinkler system to deliver ¾ inch water.

Don’t mix sprays and rotors on the same Zone!

- Of lesser importance:
  - Use same manufacturer products on same zones

HEAD TO HEAD COVERAGE

High Pressure = Misting

Water droplets atomized

High Pressure = Misting

- **Install pop-up sprays with in-head pressure regulation. (MP-Rotors, R-Van)**
- At 50 psi, without pressure regulation (PR) the flow would be 4.8 GPM
- With PR at 30 psi, flow would be 3.3 GPM, 1.5 GPM less
- If there are 10 pop-up sprays on that zone and you run zone for 10 minutes, you've saved 150 gallons each time you irrigate that zone!

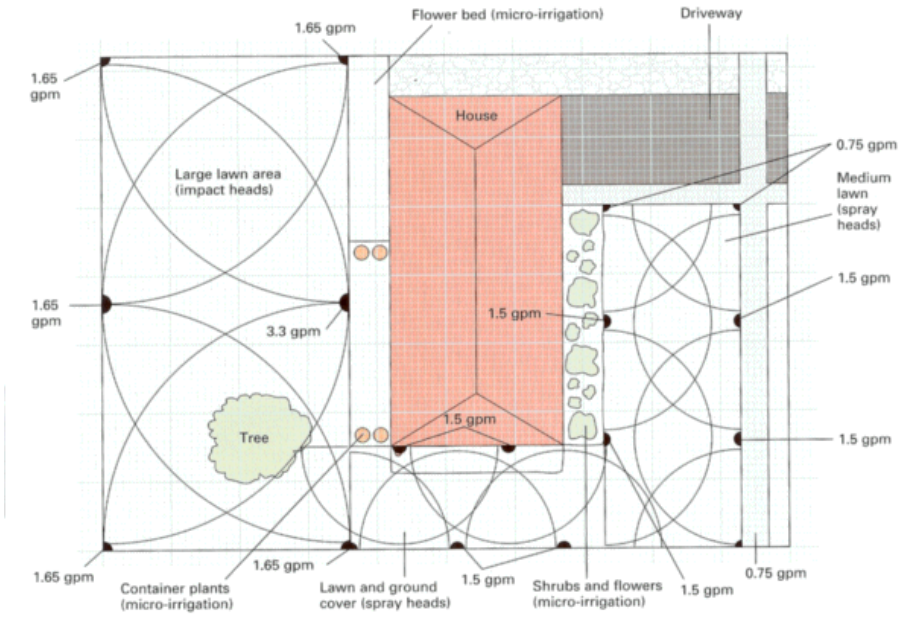
Avoid Runoff

•Applying too much water at one time
•Applying water to saturated soil
•Sprinklers not adjusted or fitted correctly to situation

Problems:

- •Wastes thousands of gallons of water
- •Hazardous household products like insecticides, pesticides, paint, solvents, and used motor oil can poison aquatic life.

Water Use Efficiency



A bad design can cost major $ in the future

- Proper spacing
- Proper amount of heads for good coverage
- Placement of valves and other components

- Correct type of heads
- Good PSI
- Placement of plants after system is in. If it doesn't get water in that spot don't put a plant there!!

Water Strategies – Utilize Pervious Hardscape

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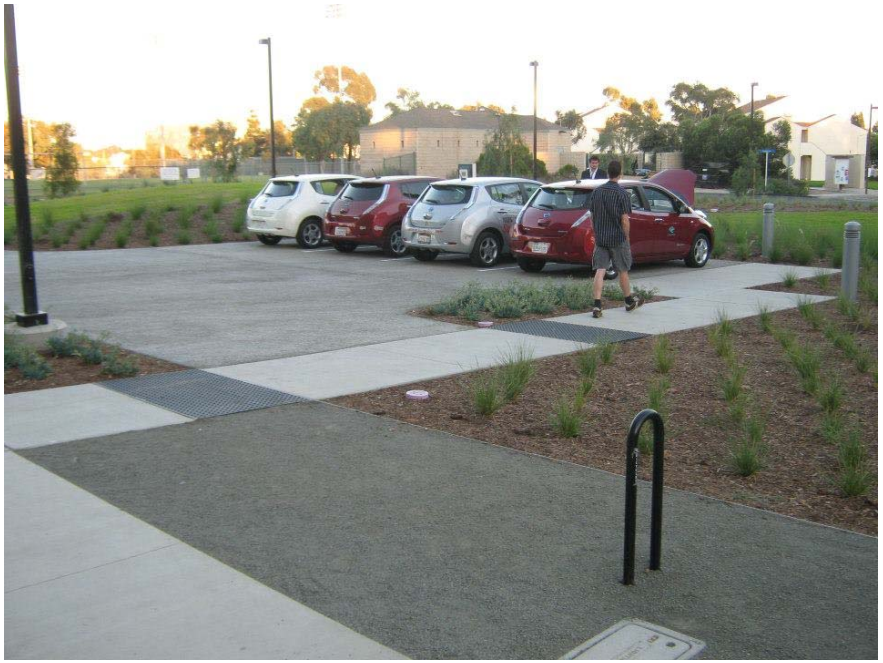
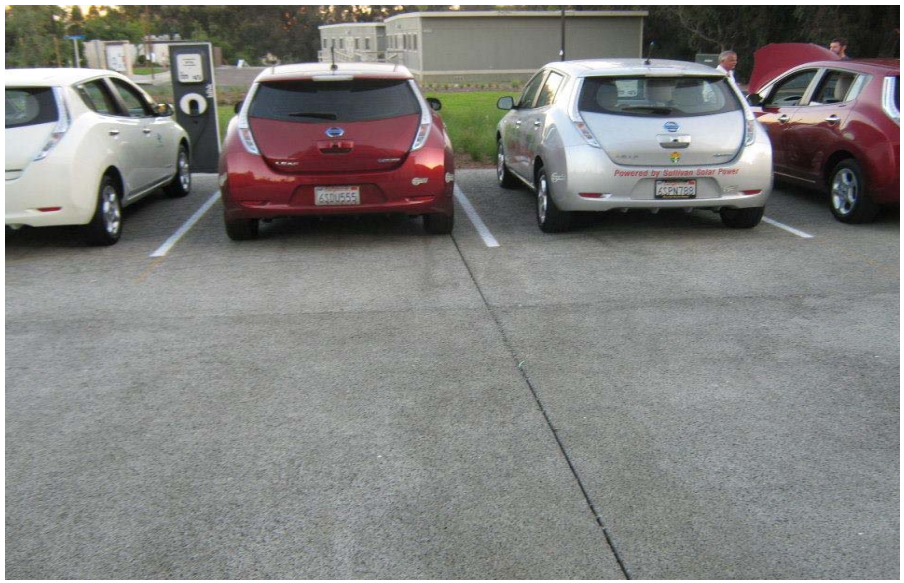
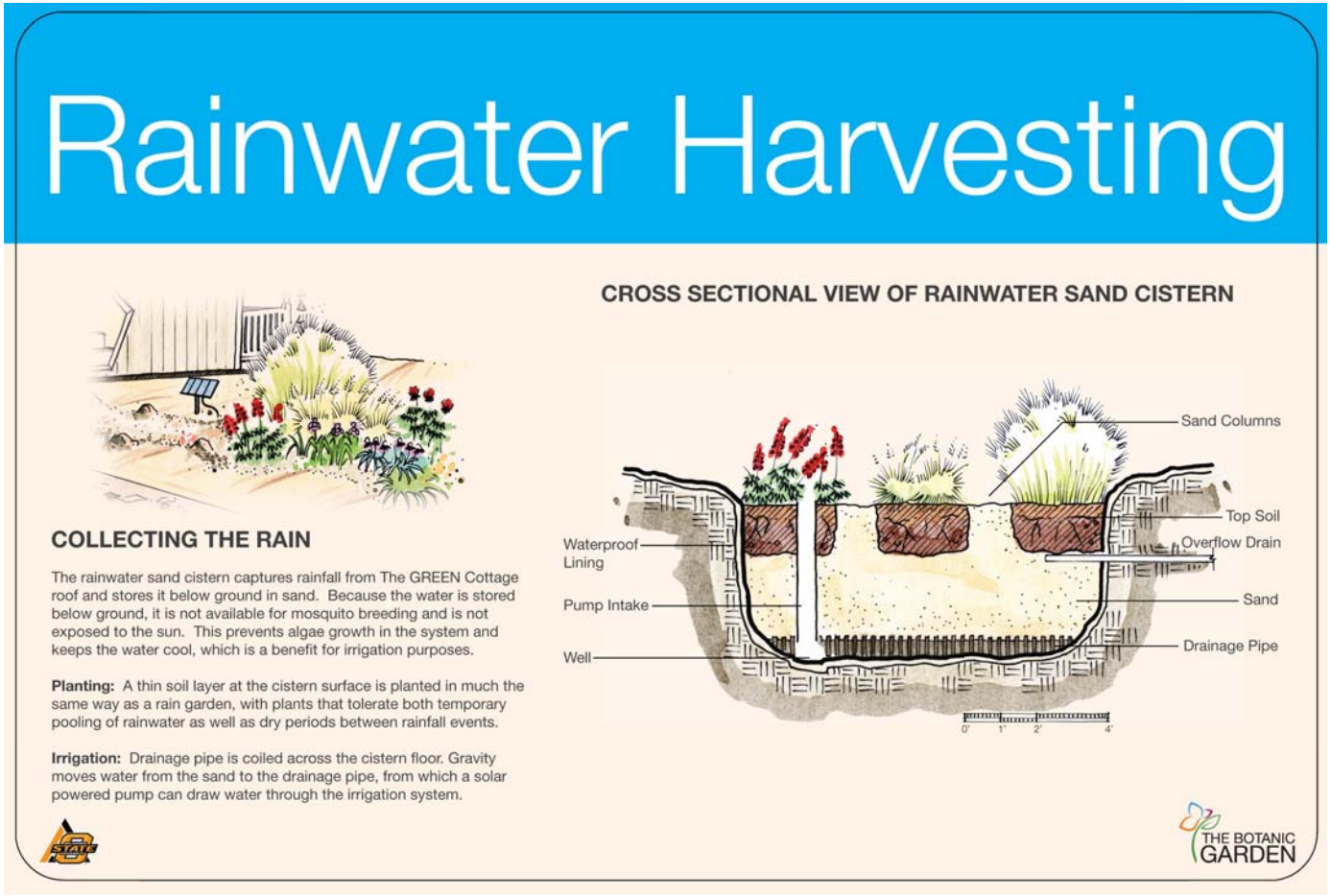




Water Strategies – Utilize Pervious Hardscape

Water Strategies –

Collect Rainwater for Reuse



Water Strategies –
Create Rain Gardens for Water Catchment

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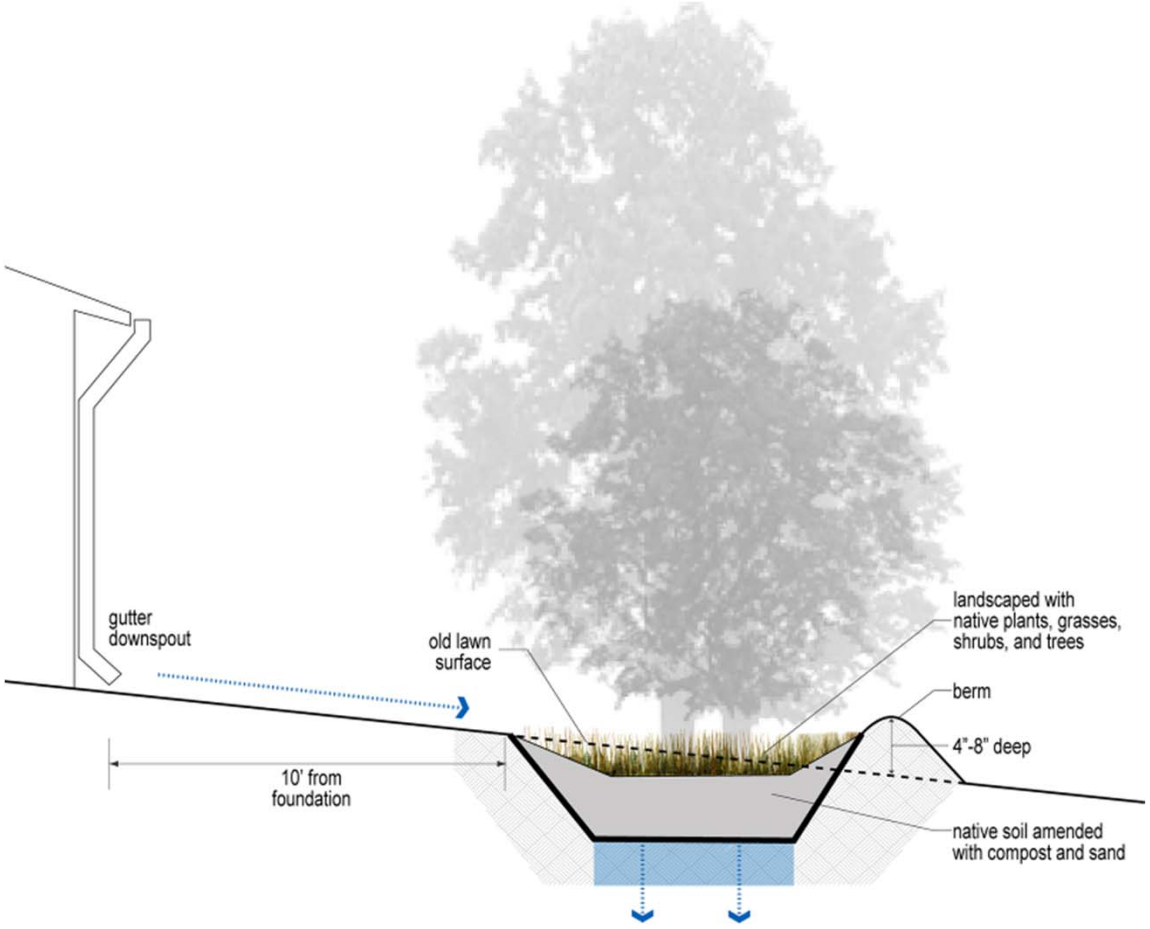
Create Rain Gardens for Water Catchment

What is a Rain Garden?

A landscaped depression planted with native vegetation to soak up rain water draining off roofs, lawns, or streets.



Water Strategies –

Create Rain Gardens for Water Catchment

- **Increasing water infiltration**, recharging groundwater
- **Protecting streams and lakes** from urban stormwater pollutants including sediment, fertilizers, pesticides, auto fluids, and metals
- **Enhancing the beauty** of yards and neighborhoods
- **Providing food and habitat** for birds, butterflies and insects
- **Reducing flooding and drainage problems** in communities

Water Strategies –

Create Rain Gardens for Water Catchment

Since the rain garden serves the purpose of catchment, sediment will tend to accumulate within the garden. This is a sign of success – this soil would have been directed straight to the stream, without your efforts!

When it rains, the garden fills with a few inches of water that filters into the ground within 48 hours instead of running off into a storm drain or drainage ditch.

Rain Barrels

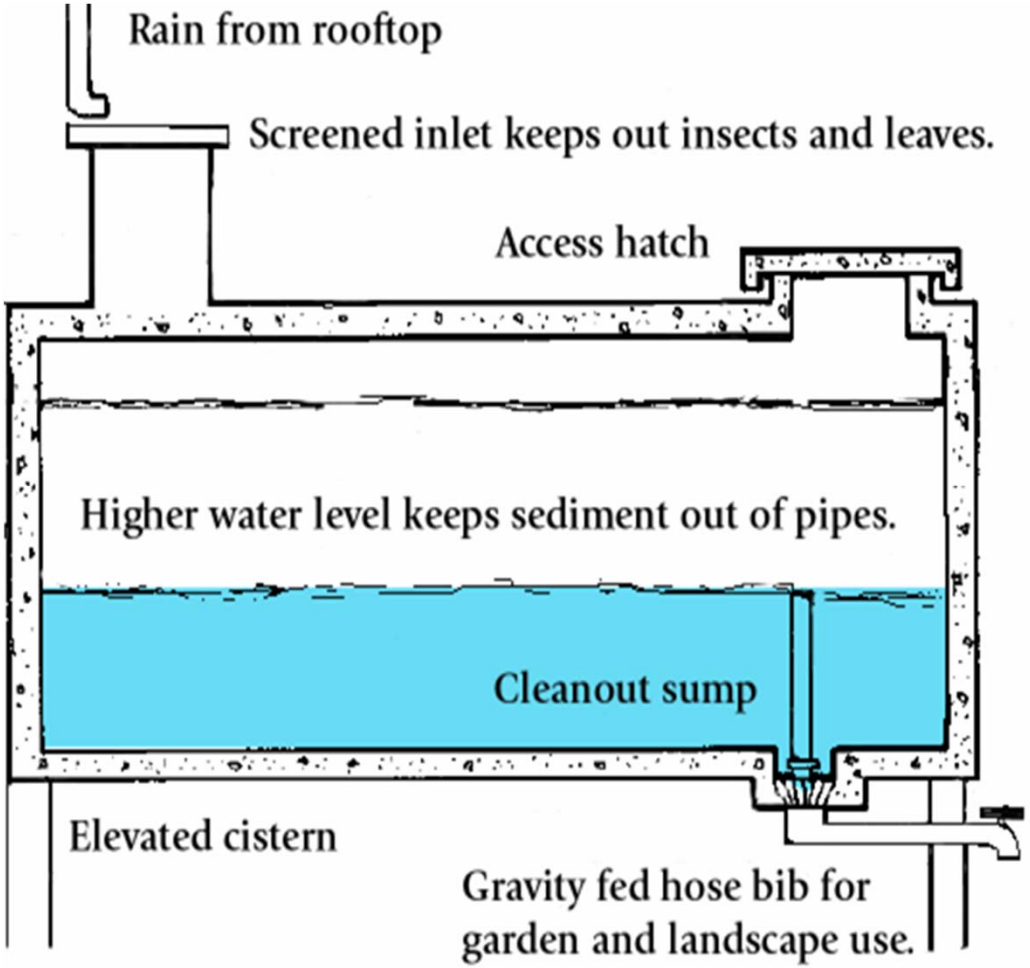
- Collect and harvest rain water for irrigation purposes
- Rainwater runs off roof into the barrel from the downspout
- A screen fastened over the inlet prevents leaves or insects from entering

Water Strategies –

Collect Rainwater for Reuse

Cisterns

- Imply greater storage capacity and a bit more engineering
- Water travels by gravity or pump action



Tips on Conserving Water

- Use recycled or gray water to irrigate
  - From showers or washing machines, but not toilets
- Direct downspouts toward beds or lawn
- Cover pools and hot tubs to prevent evaporation

Water Conservation and Efficiency

- Check local restrictions
- Train your friends and neighbors…
- Know the soil type / drainage
- Follow good cultural practices: fertilization, cultivation, mowing, etc…
- Know and select the proper plants
- Remember “Infrequent and Deep”
- Calibrate your system
- Update with new technology
- Don’t mix head type on the same zone
- Water lawn zones separate from landscape zones
- Split run times and use multiple programs
- Avoid afternoon watering
- Adjust watering with changing seasons
- Remember “ Lawns don’t waste water people do”

Credits

- Brown, Mark, UACES-Water Conservation, U of A, Little Rock, AR.
- Gerken, David Associate Professor, Oklahoma State University – Oklahoma City, OK.
- McNair, Rebecca, University of Florida Extension.
- Photo courtesy photos-public-domain.com
- Sifers, S.L., and J.B. Beard *Golf Course Management* • September 1999

THANK YOU

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