BASIC IRRIGATION: PRINCIPLES & PRODUCTS

Ken Futrell 5-15-14
WHY DO WE IRRIGATE?

The earth is 70% covered in water of all the water on Earth, 2% is potable.
Of this 2%, 55% is used for agriculture.
Of the remaining 45%, 60% is used for landscape irrigation.

Las Cruces is in the Chihuahuan Desert.
8 in. rain vs. 88 in. E.T.
E.T. can be .32 in. per day in July.
High Desert, gen. over 3,000.

N.M.S.U. Recommends 1-1.5 in week.
Bermuda, summer (20-30“ year).
DESGTS OF NORTH AMERICA
Chihuahuan Desert
What Is a Desert?

- NOUN:
  - A barren or desolate area
  - A dry, often sandy region, little rainfall, extreme temperatures, and sparse vegetation.
  - A region of permanent cold that is largely or entirely devoid of life.
  - Generally less than 10 in. per year
Basic Plant water relationship + E.T.
Where Does Las Cruces Get It’s Water?

Las Cruces relies on surface and groundwater. Surface water, supplied by the Rio Grande River, comes from Co. and N.M. snowmelt and is stored in Elephant Butte for Irrigation and municipal use in New Mexico and Texas.

Ground water sources include the Jornada and Mesilla Bolsons, which underlie much of New Mexico and Texas and are partially recharged by the Rio Grande River.
Current Las Cruces Water Usage

Average yearly production of 6.5 Billion gallons

Daily production of 17,808,219 gallons

Per person daily average of 178 gallons for 100,000 people

E.P. daily average, 110 million gallons, 145 gal. per person

With approximately 750,000 users.
Las Cruces Water Rates

Water Services - Rates
Access (monthly) Charge is $6.82
Summer Period (billing months: June, July, August and September)
First 3,000 gallons — $0.70 per 1,000 gallons
Over 3,000 gallons — $2.08 per 1,000 gallons
The billings also include a water Rights fee of $0.11 per 1,000 gallons
Detailed Water Services Rates
Non Summer Period (all other billing months)

Wastewater Services - Rates
Yearly average depends on December, January and February water consumption
0 to 2,000 gallons — $1.30 per 1,000 gallons
more than 2,000 gallons — $2.34 per 1,000 gallons
$5.38 monthly access charge
Detailed Wastewater Rates
What is reflected on this web page is the Water Rate plus the Water Rights Fee.
Cost of service for water usage – Texas residential

- Austin: $71.52
- Corpus Christi: $68.36
- Houston: $59.03
- Ft. Worth: $54.41
- Dallas: $51.61
- San Antonio: $44.19
- El Paso: $34.50

Financial Highlights – Averaged based on 7,788 gallons water/6,178 gallons sewer usage. Rates as of December 2009, Excludes City of San Antonio Stomwater fee.
Water Conservation Is Important!

- Effects everyone in this room...
- Effects everyone in the world.....
- Is the number one priority and concern of irrigation professionals.
- Hard decisions will have to be made.
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.
Learn To Conserve
Water Conservation, City of El Paso

Water conservation methods
- odd/even days
- turf rebates
- water audits
- citations for runoff and mis-use
- Use of xeriscaping techniques
  native and low water us plants
- More usage of reclaimed and gray water
- Desalinization
- Tiered water rates.
- Toilet, swamp cooler rebates
We can waste water other ways
Turfgrass Irrigation
Spray heads and Impacts
Large Rotor Heads
Bad Sprinklers?
The 7 Principles of Xeriscape Gardening:
1. Design for conservation
2. Select appropriate plants
3. Improve the Soil
4. Mulch as much as you can
5. Minimize lawn area
6. Irrigate efficiently
7. Practice proper maintenance

Xeriscape Zones:
Oasis zone
( irrigated most frequently )

Drought tolerant zone
( irrigated rarely to infrequently )

Natural zone
( no irrigation needed )
Soil types can affect irrigation.
Soil and irrigation patterns
Popular 21" model or unique 36" model available.

Handle is pliant and will not break in your hands.

Exclusive Drawn Probe cup cuts a soil core slightly smaller than the diameter of the tube, enabling the core to rise in the tube without breakage as the sampler is pushed into the soil.

Cutting edge won’t bend when it strikes hard objects. Sampler is tempered to tool steel hardness to increase rigidity and strength.
Home and Garden

IRRIGATION PRODUCTS:

1. Backflow devices
2. Electric valve and components
3. Drip Tubing and emitters
4. PVC pipe and fittings
5. Irrigation Controllers
6. Irrigation Sensors
7. Other irrigation options
Backflow Prevention Device - Any approved device which prevents backflow or back siphon age by the introduction of air, use of check valves, or a combination of both principles.
Hose end backflow preventer

- Basic protection for hose and drip systems
- Required on new hose bib installations.
Typical Electric Irrigation System

- Backflow Device
- Electric Valves
Typical Electric Valve

Few parts
Easy in-line servicing
PVC pipe and fittings
Solvent Welding
Drip Irrigation Creation
What is Drip Irrigation?

- Drip, Trickle, Spot, Micro, Localized

- An Irrigation method which saves water and fertilizers by allowing water to drip slowly to the roots of the plants. Using drip emitters, multi outlet devices or small tubing to apply water where it is needed.
Drip valve assembly
Filters:
Pressure Regulators
Poly tubing and fittings
Compression Fittings
Spaghetti tubing and fittings
Types of sprayers
Tree ring irrigation
Tree roots can extend 1 1/2 to 4 times beyond the Canopy.
In line drip emitter
Typical Electric Irrigation System
Typical Controller

管理工作

1. On/off switch
2. Program button
3. Valve run times
4. Toggle, time button
5. Start times
6. Day of week set
7. Seasonal adjust
Irrigation Controllers
Program to Match Usage
E.T. / Smart Controllers
Don’t Water in the Rain

Add a “Rain-Sensor”
Other Irrigation Options

1. Rotator Nozzles
2. Rainwater Harvesting
3. Dri-water
Rotator Nozzles
Rain Water Harvesting
Plants that fit soil conditions

Runoff from roof or driveway, flowing in over yard or through ditch or pipe.

Ponding depth (6” to 12” inches)

Mulch layer

Rain garden soil mix

 Overflow (rock-lined to prevent erosion)

Rain garden soil mix (12” to 24” inches deep)

1/3 compost, 2/3 soil
Reclaimed Water
Grey Water Systems
With proper irrigation
Questions?