

This presentation premiered at WaterSmart Innovations

watersmartinnovations.com





Water-Efficiency Solutions in Landscape Irrigation



Water Saving Topics

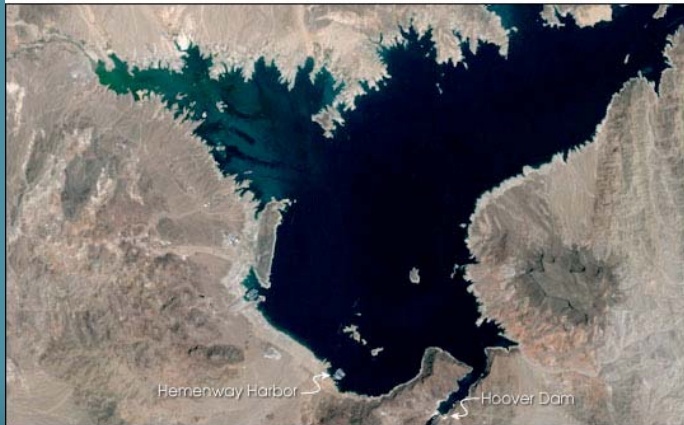
- **Water Use Today**
- **Water Use Trends**
- **SWAT, EPA WaterSense, AWE**
- **Irrigation Manufacturer Role in Driving Water Efficiency and Conservation**
- **Water Saving Irrigation Equipment**



Water Use Today: Preparation for a Dry Future



May 3, 2000



May 28, 2003



Lake Meade December 2007

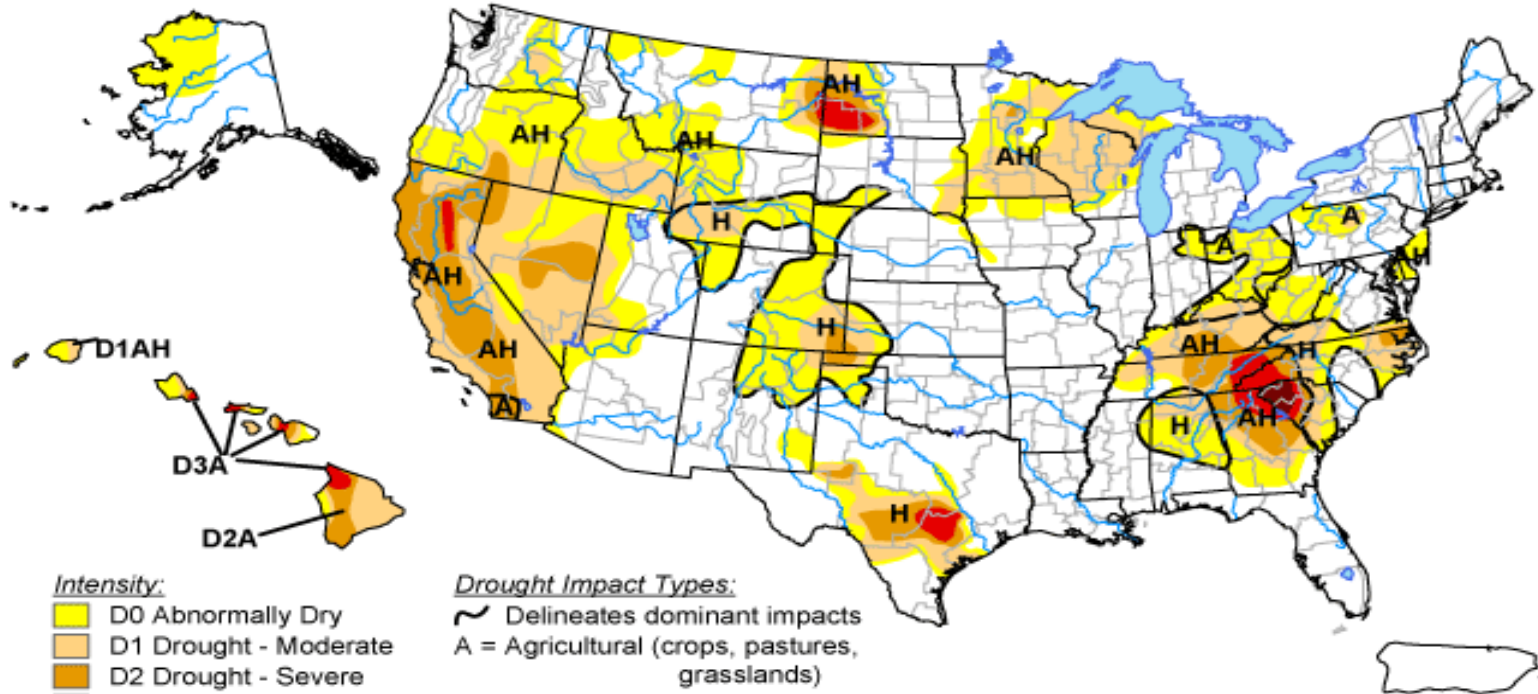


Drought

U.S. Drought Monitor

September 23, 2008

Valid 8 a.m. EDT



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

Drought Impact Types:

- ~ Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



Released Thursday, September 25, 2008

Authors: Richard Heim/Liz Love-Brotak, NOAA/NESDIS/NCDC





Water Use Trends



Water Use Trends

- **Climate-Based Irrigation Controllers**
- **Weather Sensors**
- **Low Precipitation Rates**
- **Low Volume**
- **High Application Uniformity Profiles**
- **Reclaimed Water**
- **Rain-water Harvesting**
- **De-Sal Water**
- **Greywater or Sullage Use**
- **Rebates Associated with Water Saving Devices**



Water Use Trends Continued

- **Low Water Use Landscape Design**
 - Still needs Irrigation Equipment
 - Needs less water to survive
- **Synthetic Turf**
 - More introduced year-after-year
 - Irrigation applications exist with synthetic turf

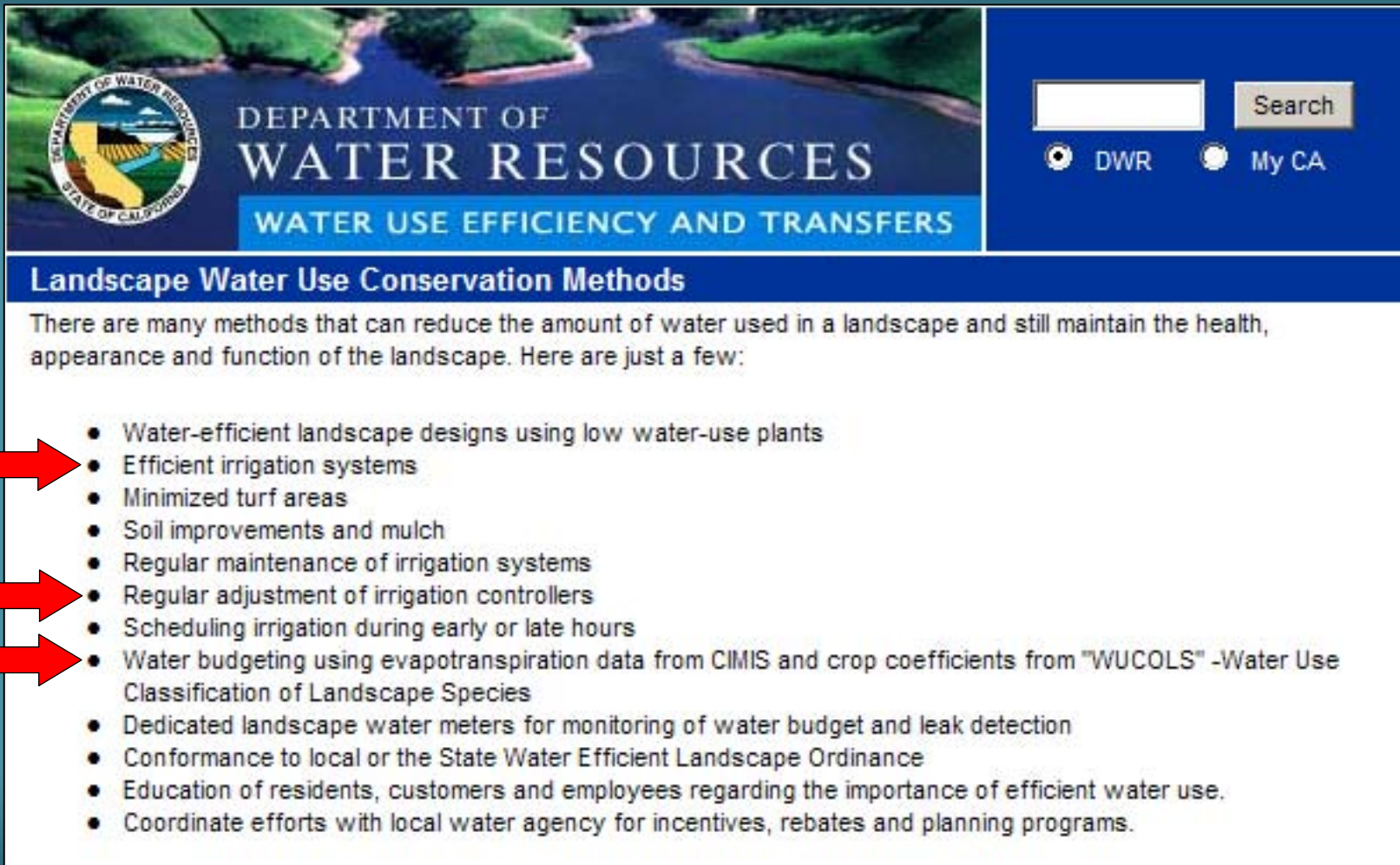




Legislation Trends



DWR Legislation Trends: Conservation Methods



The screenshot shows the top navigation bar of the Department of Water Resources website. On the left is the state seal and the text 'DEPARTMENT OF WATER RESOURCES' and 'WATER USE EFFICIENCY AND TRANSFERS'. On the right is a search bar and radio buttons for 'DWR' and 'My CA'. Below the navigation bar is a blue header with the title 'Landscape Water Use Conservation Methods'. The main content area has a paragraph of introductory text followed by a bulleted list of 13 conservation methods. Three red arrows on the left side of the page point to the first three items in the list.

DEPARTMENT OF WATER RESOURCES
WATER USE EFFICIENCY AND TRANSFERS

Search

DWR My CA

Landscape Water Use Conservation Methods

There are many methods that can reduce the amount of water used in a landscape and still maintain the health, appearance and function of the landscape. Here are just a few:

- Water-efficient landscape designs using low water-use plants
- Efficient irrigation systems
- Minimized turf areas
- Soil improvements and mulch
- Regular maintenance of irrigation systems
- Regular adjustment of irrigation controllers
- Scheduling irrigation during early or late hours
- Water budgeting using evapotranspiration data from CIMIS and crop coefficients from "WUCOLS" -Water Use Classification of Landscape Species
- Dedicated landscape water meters for monitoring of water budget and leak detection
- Conformance to local or the State Water Efficient Landscape Ordinance
- Education of residents, customers and employees regarding the importance of efficient water use.
- Coordinate efforts with local water agency for incentives, rebates and planning programs.



Irrigation Efficiency Models and Ordinances ...

- **California Model Efficient Landscape Ordinance (AB 325, AB 2717, AB 1881)**
- **Texas HB 1656 – Licensed Irrigator Update, HB 4 and SB 3**
- **Atlanta – Outdoor Water Use Registration Program**
- **Florida Water Star**



Water Conservation Industry Initiatives...



Water Conservation Rebates & Incentives!

- Southern California Water Smart Program



IT PAYS TO BE SMART ABOUT WATER



Water Efficient Technologies Program (WET)



- ▶ Landscape Rebate
- ▶ Rebate Coupons
- ▶ Car Wash Coupons
- ▶ Conservation Tips
- ▶ Pools & Spas
- ▶ Indoor Water Audit Kit
- ▶ Water Smart Art
- ▶ Commercial Programs
- ▶ Conservation Coalition
- ▶ Restaurants
- ▶ Water Efficient Technologies
- ▶ Water Smart Home
- ▶ Conservation Plan
- ▶ Water Use Facts
- ▶ Helpline
- ▶ Interest Form - Homeowners
- ▶ Interest Form - Commercial

Conservation and Rebates

The Southern Nevada Water Authority (SNWA) offers a variety of resources, services, programs and information to help you save money and live water smart.

Get off your grass, we'll pay cash

The SNWA Water Smart Landscapes program provides a rebate of \$1.50 per square foot of grass removed and replaced with water-efficient landscaping. [More»](#)

Wash your car the water-smart way

The Water Authority has partnered with local companies to create the Water Smart Car Wash program. Print out a coupon for a Water Smart Car Wash and start saving. [More»](#)

Cash in with instant rebate coupons

SNWA has teamed with local retailers to provide coupons toward the purchase of a removable or permanent pool cover, rain sensor and smart irrigation controller. [More»](#)

Buy a Water Smart Home

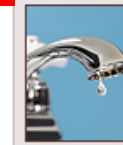
The Southern Nevada Home Builders Association and SNWA sponsor the Water Smart Home program, the first of its kind in the nation. It certifies qualifying new homes and neighborhoods as Water Smart, ensuring that home buyers are purchasing a home that can save as much as 75,000 gallons of water per year. [More»](#)

 Print  E-mail

Related Information

- Landscape rebate
- Car wash coupons
- Rebate coupons
- Kids' information

Video



Get helpful tips to conserve water at your home

[PLAY ▶](#)

Before and after



View before and after photos of landscape conversions.

[LAUNCH ▶](#)

Drought Status

ALERT

[More »](#)



bewaterwise.com

METROPOLITAN WATER DISTRICT and THE FAMILY OF SOUTHERN CALIFORNIA WATER AGENCIES

[Home](#) | [Garden Spot](#) | [Rebates](#) | [Events](#) | [Contacts](#) | [Sitemap](#)

It's time to get serious about saving water.

California's main water sources have been severely impacted by record dry conditions. Our water situation is serious. But you can help. Check out the water-saving tips to learn how.



[TIPS](#)

[REBATES](#)

Rebates in your area

Find your local water agency and learn more about your city or community's rebate programs.

Enter your Zip Code:

This search function finds water providers in Metropolitan Water District's service area.

Tips and Rebates



Water Saving Tips

It's easier than you think to save water. Find out how with these quick tips.



Rebates from \$30 - \$630

Save hundreds of dollars while upgrading your home or business with the latest water-saving technologies and strategies.



Video Tips

Watch short video clips that demonstrate how to create and care for a California Friendly landscape.

Click on the programs below to learn how other communities are getting serious about saving water:



20-Gallon Challenge

San Diego County Water Authority
Santa Monica
Burbank
Pasadena

Join the 20-Gallon Challenge today! Check out the following tips to learn how easy it is to save 20 gallons of water a day.



Help Us Save Water!

Anaheim Public Utilities

Attend workshops to learn about California Friendly plants, irrigation equipment and maintenance techniques at the Anaheim Downtown Community Center. (714)765-4256.



The Bus is Leaving

Are we along for the ride?



Or...



Are we going to help navigate?





Water Efficient Irrigation Equipment





Water Efficient Equipment:

- **Climate-Based Irrigation controllers such as Evaporation Transpiration (ET)**
- **Weather Sensors**
- **Pressure Regulators**
 - In Stem
 - At the valve
- **Schedule Coefficients/ Sprinkler Profiles**
 - Do what we currently do better



Water Efficient Equipment Continued:

- **Check Valves**
- **Root Zone Water Systems**
- **Multi-Stream Rotary Nozzles**
- **Micro-Irrigation and drip**
- **Soil Moisture Sensing Devices**



*Climate-Based
Irrigation*

ET Systems

Climate-Based Irrigation Controllers

- **The Irrigation Association via Smart Water Application Technology (SWAT) has implemented a process for irrigation manufactures to help achieve better performing smart controllers**
- **Climate-based controllers efficiency testing through the Center for Irrigation Technology**



Water Efficient Irrigation Equipment: Sensors



Rain
Sensors



Wireless
Rain
Sensors



Freeze
Sensors



Wind
Sensors



Mini-
Weather
Station
Rain,
Freeze and
Wind
Sensors

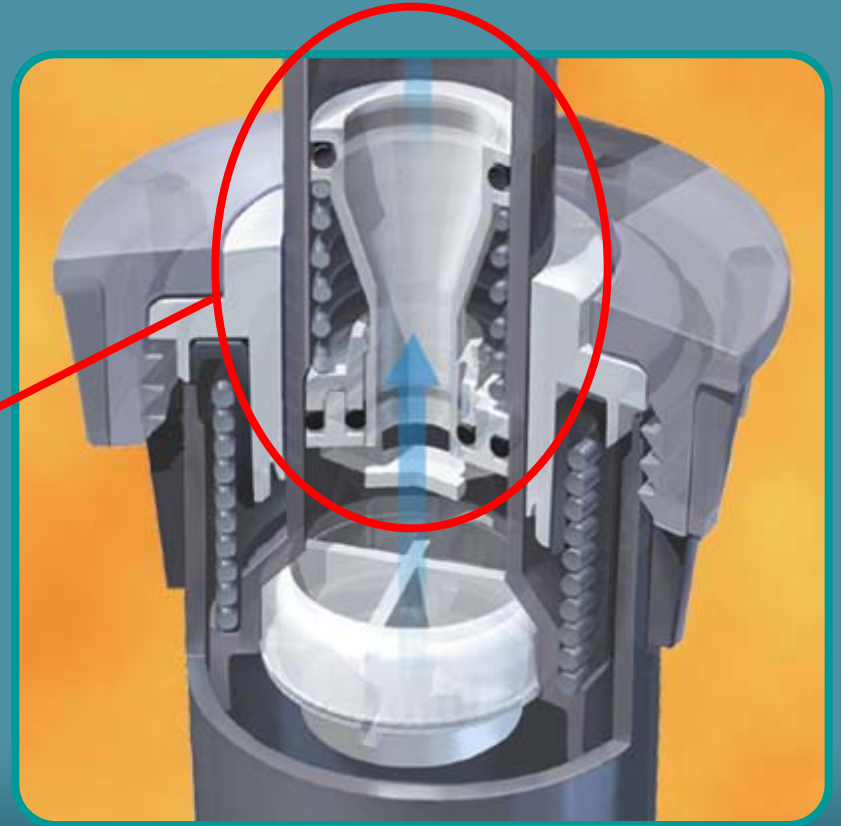


Flow
Sensors



Water Efficient Irrigation Equipment: Pressure Regulation

Standard in-stem pressure regulator eliminates misting and fogging – regulates nozzle output to a true 30 PSI optimum for spray nozzles and to 40 PSI for rotary nozzles.



Water Efficient Irrigation Equipment: Pressure Regulation



Non-Pressure Regulated



Pressure Regulated



Water Efficient Irrigation Equipment: Pressure Regulation



- **Accurate pressure regulation**
- **Irrigation system more efficient**
- **Reduces system wear and tear**
- **Saves water**



Scheduling Coefficient

The SC (scheduling coefficient) is a multiplier used to calculate the actual run time needed to have the entire area receive adequate water

(Inches of water required /precipitation rate)
X 60 = run time

Calculated Run Time X SC = actual run time



Water Efficient Performance: Efficiency Focused Design

Example: 50 GPM Zone of 15 ft Nozzles
Spray Nozzle with Scheduling Coefficient = 1.5

Vs. a spray nozzle with Scheduling Coefficient = 2.7
= a 55% advantage

If ET Demand Required 0.25" of water, which is ten minutes with a 1.5"/hr precipitation rate....

Spray nozzle #1 would run for 15 minutes

Spray nozzle #2 would require 27 minutes

Spray nozzle #1 saves 12 minutes and 600 Gallons



Water Efficient Irrigation Equipment: Check Valves

Check valve
installed to control
low head drainage.



Water Efficient Irrigation Equipment: Check Valves



Water Efficient Irrigation Equipment: Check Valves

Gallons per 100 feet

1" 4.08

1 1/2" 9.17

2" 16.31

2 1/2" 25.49

3" 36.71

4" 65.26



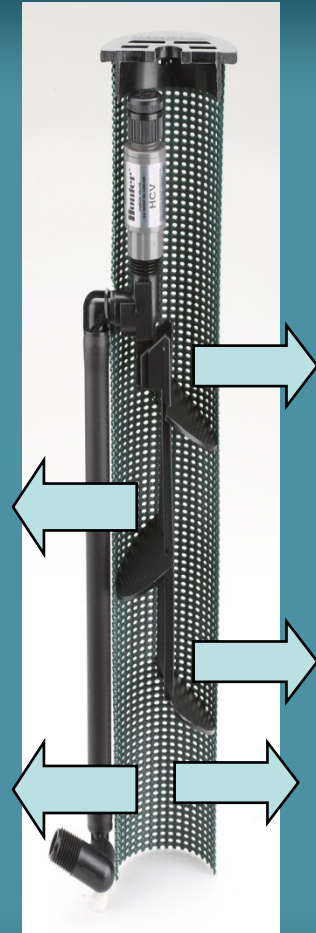
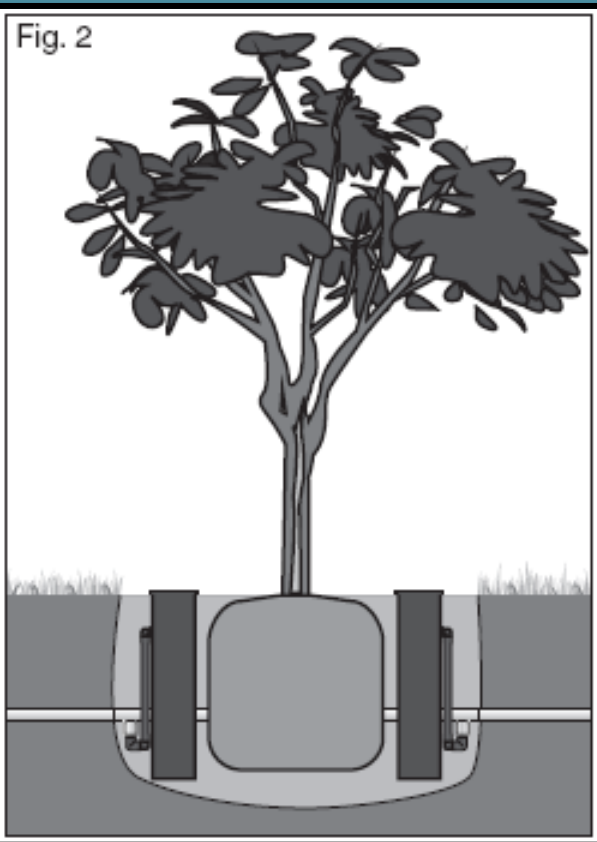
Water Efficient Performance: Check Valves

- **1000' of 1" pipe**
- **4 gallons per 100'**
- **40 gallons drains per irrigation cycle**
- **225 irrigation days per year**

9000 gallons per year wasted



Root Zone Watering Systems



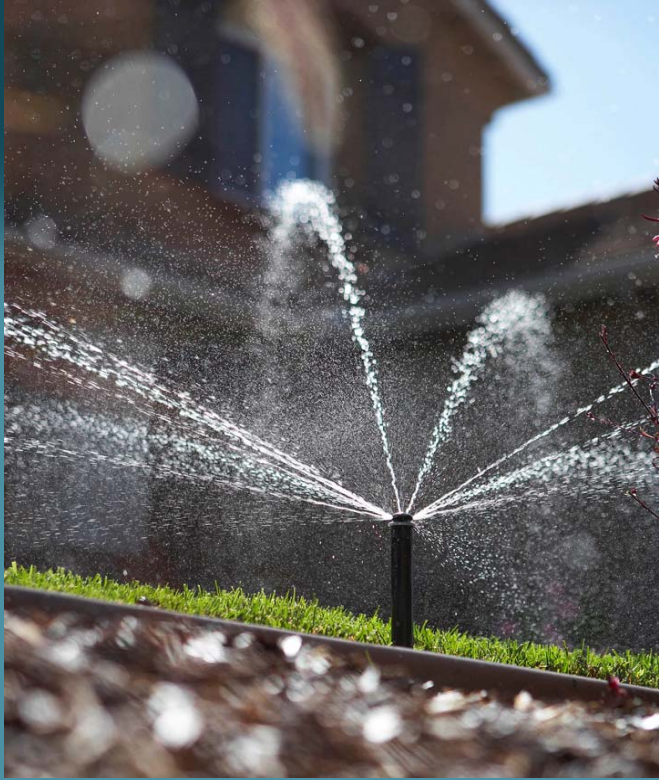


Water Conservation

What is an Multi-Stream Rotary Nozzle?

- A multi-stream rotor the size of a spray nozzle that fits any spray head body or shrub adapter
- Provides high uniformity, low application rate, with matched precipitation
- A rotor that is setting a new standard for water efficiency in the turf & landscape industry.





Metropolitan Water District (MWD)

Rotating Nozzles

Rotating Nozzles for Pop-up Spray Heads

Retrofits and New Construction

\$4.00 REBATE per nozzle

25 nozzle minimum - no maximum

Using Pop-up spray heads with Rotating Nozzles can save up to 6,600 GALLONS PER NOZZLE OVER A FIVE-YEAR PERIOD.

The Ideal solution for... Parks, Schools, Office Complexes, Golf Courses, Nurseries and other commercial irrigation applications.

The multi-trajectory, rotating streams of the **ROTATING NOZZLES** apply water more slowly and uniformly than conventional sprays and rotors - especially after arc and radius adjustment. Independent water audits now document **water savings of 20% or more** when conventional sprays are replaced with **ROTATING NOZZLES**. Additional water-saving advantages include better wind resistance, less misting and virtually no run-off.

The Goal is to SAVE WATER!

Water-conserving Rotating Nozzles offer the following features :

- Low precipitation rate to reduce runoff
- Effective pattern options or pattern adjustment to reduce overspray
- Matched precipitation rate among arcs and radius options
- High uniformity of water application
- Resistance to the negative effects of wind
- Functional reliability

ROTATING NOZZLES and SMART IRRIGATION CONTROLLERS work



Water Conservation

A water-conserving sprinkler must have the following characteristics:

- **Reduces Run Off**
- **Reduces Over-spray**
- **Matched Precipitation Rate**
- **High Uniformity of Water Application**
- **Wind Resistant**
- **Functional Reliability**



Water Conservation

KEY ELEMENT

- Uniformity





Water Saving Irrigation Equipment:
High Application Uniformity Equipment

Multi-Stream rotating nozzle v. Typical Spray Head

- 75% DU v. 60% DU**
- 1.2 SC v. 1.7 SC**
- Superior Wind Performance**

Poor Sprinkler Uniformity Reported at 2004 IA

“With over 6800 audits used to measure how well the typical sprinkler system performs it appears that the average DU_{LQ} is about 50% no matter what type of sprinkler head is being used.”

Paper: “Using Distribution Uniformity to Evaluate the Quality of a Sprinkler System”

Brent Mecham – Northern Colorado Water Conservancy District, Berthoud, CO



Water Conservation

KEY ELEMENT

- Uniformity
- Low Precipitation Rate
 - At what rate does your sprinkler system apply the the water?



Scheduling

- **Multi-Stream Rotating Nozzle Applies Water Slower Than Sprays (.4"/hr v. 1.5"/hr)**
 - **RUN TIMES MUST BE LONGER!!**



Runoff & Erosion



For Over 50 Years - High Application Rate Sprays



Water Saving Irrigation Equipment: High Application Uniformity Equipment

- **Multi-Stream Rotating Nozzle v.
Typical Spray Head**

Example Water Savings:

ET demand = 1/2" per week

Area of turf = 1000 sf

Volume required = 312 gal/wk





Water Saving Irrigation Equipment:
High Application Uniformity Equipment

**Rotary Nozzle Water Required =
 $1.2 * 312 = 374$ gal**

Spray Noz. Req'd = $1.7 * 312 = 530$ gal

Weekly Savings = 156 gal per 1000 sf

Irrigation Weeks per Year = 45

Annual Savings = 7000 gal/1000 sf

Landscape Drip Line

You asked for it and we have delivered. Our landscape drip line has everything covered, from pressure compensating emitters to built-in check valves.





Thank You!