

# Green Notes

## STRATEGIES FOR WATER EFFICIENCY

### THE STATE OF AFFAIRS

There is no doubt that some of you are tired of hearing about drought, water restrictions and the grim predictions of a drier future for California. As I write this, there is a significant storm outside that promises some welcome relief to the reservoirs currently at record low levels.

It should be stressed again and again, however, that even with several wet winters, our state now has more people and more agricultural and industrial production than our current water infrastructure can service without drawing down our groundwater reserves to dangerous levels.

### A RESPONSIBLE RESPONSE

For landscape professionals, conservation of water is no longer an option. With the Water Conservation Act of 2009, the urban water agencies were required by state law to reduce their water use 20% by the year 2020. This law has only been in effect for 4 years, and we have yet to see all the consequences from it, though the recent drought has led to greater restrictions. These may ease up if we have several wet years, but they are not going away!

The responsible landscaper is going to learn all they can and do all they can to provide the highest level of irrigation efficiency to their clients. This savvy approach will make you indispensable to your customers and ahead of the crowd in the market.

To help you accomplish this, these next three newsletters will be focused in-depth on THREE MAIN water efficiency strategies.



Folsom Lake - September 5, 2014

DWR Photo of low Folsom Lake

### 1. FIX IT

Regular system maintenance is the most important strategy for insuring efficient delivery of water to landscapes. We'll focus on this more inside this issue.

### 2. TIME IT

Proper irrigation scheduling takes time and research, but once it's in place, it can make for healthier landscapes and lower water bills at the same time. We'll take up this topic next month.

### 3. UPGRADE IT

Outdated heads, layouts, systems, and controllers should be replaced as budgets allow. New technologies provide more accurate angle of delivery, slower precipitation rates, and pressure shut-off valves to prevent dribbling. In February we'll take up this topic; these things, along with better timer controls, can significantly reduce water use when installed and programmed correctly.

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When water pressure is too high, water mists and is lost to the air.

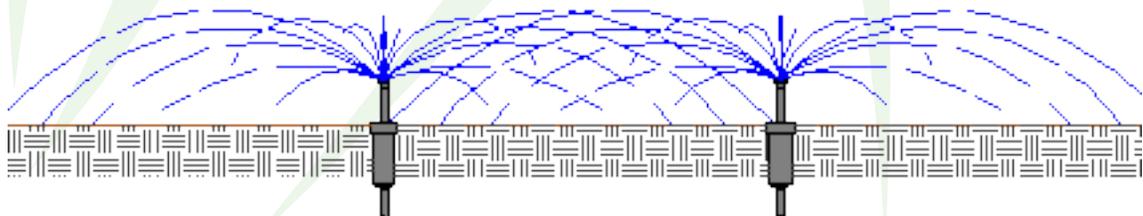
**Regular maintenance and timely repairs** have been shown to reduce effective irrigation time by as much as 50%.

**Distribution Uniformity**, or DU, is a measurement of how evenly an irrigation system is delivering water, and is calculated with a *catch-can test*. If a system has *low DU*, you will need to water longer to keep the dry spots healthy.

- **Worn out nozzles**, and cocked, broken, or blocked heads drastically reduce DU. When this happens, dead spots and/or soggy spots develop, and water is wasted. Drip systems should be checked for leaks, blown pressure release valves, and missing or clogged heads. If the shrubs on drip begin to look wilted or yellow, the drip system may be to blame. Make a monthly visual check of all systems; straighten, repair, or replace as needed.
- **Mismatched heads** are one of the most common reasons for low DU. A broken head is often replaced with whatever the landscaper has in his truck at the time. If the precipitation rate ( PR) or throw distance is not the same, the coverage will not be even,

and plants will suffer. For best coverage and DU, all heads on a valve should be the same model from the same manufacturer. **Head-to-head coverage** is the term used to describe the water pattern of a properly designed and operating irrigation system (illustrated below). Each head should reach the base of all the neighboring heads. Sprinklers are not very good at watering right next to themselves.

- **Mismatched precipitation rate** can occur when rotors with full circle coverage are in the same zone as arcs of 180° or 90°, and have identical PRs . Because the full circle takes twice as long to cover its area as the 180° nozzle and 4 times as long as the 90°, the coverage will not be even. When designing these systems or making repairs, remember to divide the PR of the 180° nozzles by half and the 90° nozzles by 4. This isn't necessary with "matched precipitation" heads.
- **Check your pressures.** Every irrigation manager needs gauges in their toolbox to check the static (at the beginning) and dynamic (at the head) pressure of each system. Systems running at pressures too high for the heads cause the water to mist and be lost to the air. If the pressure is too low, the heads won't throw the water as far as they should. If the pressure is correct at the start, but too low at the head, you should look for a leak somewhere along your line. Taking the static pressure is as simple as screwing the gauge on a hose bib close to the start of a valve. Be sure your heads are rated for the pressure available here. If the pressure is too high for a drip system, for instance, install a pressure reducer to bring it down. The pressure at the head can be taken with a special gauge made for this purpose; these can be ordered from your local supplier or



## PERFORMING A CATCH CAN TEST

*Catch can tests* are the part of an irrigation audit that tells you the DU of a system. They can also help pinpoint weak areas in need of repair or upgrading. Once a system's DU is optimized, this is the starting point of accurate and efficient scheduling.

1. Place enough catch cans in the area so that there is one can about a foot in front of each head, and then evenly distribute cans in the remainder of the area. The calculations are easier if you use a number of cans divisible by 4. Make a rough diagram of your cans and number them.
2. Make sure all the cans are level, and then turn on the water for 10-15 minutes. If the PR is high, as it is often is with sprays, you may use a lower time. Record your time (for calculating PR for scheduling next month).
3. Measure the water in each can and record it by its number (from Step 1). Some cans come with measurements on them. For small areas, you can use straight-sided cans and measure the height of the water.



Catch cans like these can be purchased online

4. Calculate the average of all the cans.
5. Calculate the average of the cans that make up the lowest  $\frac{1}{4}$  of the cans. For instance, if you used 24 cans,  $24 \div 4 = 6$ . Average the volumes from the 6 cans with the lowest volumes. This is your low-quarter (LQ) average.

**6. Now you're ready to calculate!**

## THE DU CALCULATIONS

Distribution Uniformity - DU- is a fraction and represents a percentage of perfect. 100% (1.0) would be perfect DU- but no system has that! Very good to excellent DU would be 65% (0.65) or more for sprays and 70-85% ( 0.70- 0.85) for more efficient systems like rotors and rotators.

### Average of all the cans:

Sum of the volumes of all the cans  $\div$  the no. of cans

Example from a 24 can test:  $2304 \div 24 = 39.96$

### Average of the LOW QUARTER:

Sum of the lowest 6 volumes  $\div$  6

$127 \div 6 = 21.17$

**DU = Average of the LQ  $\div$  Average of all cans**

Example from above

$21.17 \div 39.96 = 0.53$  or 53%



cocked heads will lower DU

This is a quick overview of the process, but there are plenty of online resources. [The Irrigation Association website](#) has great tools to help you improve your knowledge and skills.

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## **Green GARDENER** QUALIFICATION TRAINING FOR LANDSCAPE PROFESSIONALS

**8 weeknight classes**

**2 half-day Saturday workshops**

An 8-week course to increase your  
KNOWLEDGE, SKILLS &  
MARKETABILITY  
as an environmentally friendly  
landscape professional

### **WHO IS IT FOR?**

- Residential and commercial gardeners
- Parks and school grounds workers
- Landscape maintenance contractors

### **BENEFITS of BECOMING a Green Gardener**

- Improve the health of landscapes
- Improve efficiency with water, time, chemicals, and money
- YOUR NAME on the **Green GARDENER** website of qualified professionals
- A qualification that can help you enhance your value to your current clients and attract new ones
- Use of the official logos in your advertising.

CEUs available for pesticide applicators  
with DPR and ISA Certified Arborists.



### **NEXT COURSE RUNS**

**JANUARY 15 - MARCH 5, 2015**

8 Thursdays

6-8:30 pm

2 Saturdays

8:00 am - 12 noon

Enrollment is limited!

registration deadline is Jan. 12!

**[CLICK HERE FOR REG. DETAILS](#)**

**35 GRADUATES IN 2014!**

**FOR MORE INFORMATION:**

**<http://ucanr.org/GreenGardener>**

### **PLANT THIS**

#### ***Salvia microphylla* - Mint Bush Sage**

A truly adaptable shrub, this bush sage is an easy-going focus shrub or hedge that blooms nearly year-round. It grows to about 3' tall and up to 5' wide. It's looks are greatly improved if sheared by  $\frac{1}{3}$  its height 2 times a year after each flush of blooms begin to fade (late spring and early fall), and will rebound with new leaves and blooms in a short time. Once established it performs well on only weekly or even twice-monthly summer watering.

This can be seen blooming on and off all year in **The Learning Landscape** demonstration gardens at the Robert J. Cabral Agricultural Center, 2101 E. Earhart Ave., Stockton.



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