

Green Notes

STRATEGIES FOR WATER EFFICIENCY II

WATER UPDATE

This week the *Water Resources Control Board* came out with its verdict for the state of the State's water for the year: NOT GOOD.

The statewide restrictions they have imposed include landscape irrigation no more than 2 days a week for all urban water providers. Now more than ever it will be important to apply water in the most efficient manner possible.

Is it possible to keep home gardens and public landscapes healthy and providing benefits to people in urban areas during drought with twice a week irrigation? YES! But success depends on a number of factors including *what* is planted in the garden, *how* it has been cared for up to now, and *how well* you apply the irrigation and preserve soil moisture from now on.

SMARTER SCHEDULING

In the last newsletter we focused on the repairs and adjustments you can make to irrigation systems to optimize their efficiency by increasing the distribution uniformity (DU) of the system. This month we will demonstrate how to schedule irrigation to get the most out of that system in your allowed 2 days per week. Our next issue we will explore upgrades you can make to systems and plantings to maximize impact and minimize labor.

TIMING IS EVERYTHING

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.

A WORKSHOP FOR LANDSCAPE IRRIGATION MANAGERS

GET AHEAD OR GET PARCHED: SIX WAYS TO SURVIVE THE DROUGHT



Learn how to maintain your landscape and reduce water use by improving water management and system efficiency. This workshop features indoor presentations and outdoor demonstrations on the following topics:

Workshop for Landscape Professionals
Friday, May 29
YOU DON'T WANT TO MISS THIS
See Page 4 for details!!

SCHEDULING CHECKLIST

To schedule effectively, you will need to gather or calculate the following information.

1. **Precipitation Rate (PR) of each valve.**
2. **Distribution Uniformity (DU) of each valve.**
3. **Current or historical weather and reference plant water use (ET₀).**
4. **Plant type being irrigated and its water needs.**

You must know PR and DU of each station before you schedule. This is found by a *catch-can test*. If you do not know how to perform one, please see [Vol.4, Issue 3](#) of this newsletter for simple instructions.

DU is a measure of a system's efficiency in covering the area evenly. It represents the percentage of the PR you must compensate for to make sure every spot gets the desired amount of water. We will show you how to calculate this after the PR inside this issue.

GREEN NOTES

2015

2

SPRING



Typical controller for home irrigation .

Everyone knows plant water needs vary by season, but we don't necessarily adjust the schedule according to the *actual* changes. We pick a number and go up or down according to a hunch that things have changed.

Instead, use the website for the California Irrigation Management Information System (CIMIS) to look up the amount of water *in inches* used each month by cool season turfgrass in each region of the state. This amount of water is called **reference evapotranspiration (ET₀)**. Divide the monthly number of inches by 4 to get the weekly water use (**Weekly ET₀**) for each month. All plants other than cool-season turf will then need a *percentage* of that reference plant's use. ET₀ for each region of California can be found at the website below. There are good explanatory pages on the site, but if you need help navigating, feel free to email me and we'll set up a time to go over it online together.

<http://wwwcimis.water.ca.gov/>

Different plants have different optimal water needs. We want to give them what they need and not one drop more. You can find plant water need categories by accessing the website for *The Water Use Classification of Landscape Species* or WUCOLS.

<http://ucanr.edu/sites/WUCOLS/>

- **HIGH** water users will need **80-100%** of what a cool-season grass uses.
- **MODERATE** water users will need **40-60%**.

- **LOW** water users will need **30% or less**.

You may start by using 80% for High (0.8), 50% for Medium (0.5), and 20% for Low water-use plants (0.2), and make small adjustments if the plants show signs of stress or the ground stays too moist between irrigations. It is healthy for plant roots and soil microbes to have some dry-down time. This number (0.8, 0.5, or 0.2) is your plant factor which we will call **PF** in the equation below.

Now, do the calculations for PR and DU using the formulas in the blue boxes on the next page. You now have the 4 numbers you need to calculate your **WEEKLY RUNTIME MINUTES** for each station for each month you irrigate. With these numbers you can create a table to put inside each timer so that you can quickly make the monthly adjustments to optimize your water use and landscape performance.

$$\text{WEEKLY RUNTIME MINUTES} = \text{Weekly ET}_0 \times \text{PF} \div \text{PR} \div \text{DU} \times 60$$

Let's do an example: It's August and the monthly ET₀ is 8, which makes the weekly ET₀ 2 inches. I have cool season lawn which has a PF of 0.8. My catch can test shows my PR as 1.7 and my DU as 0.65. My weekly runtime minutes will be:

$$2 \times 0.8 \div 1.7 \div 0.65 \times 60 = 87$$

If I only have two days to water, I need to run a total of 43 minutes on each of those days. If I have very much clay in the soil or any slope at all, that will be too long for one run. I will almost certainly have runoff which is prohibited by the drought regulations! What should I do? See the box on the next page titled: **Preventing Runoff**



Too long running times = water wasted as runoff

CATCH CAN TEST CALCULATIONS

If you have performed your catch-can test, you now have a numbered list of volumes of water from the cans, and hopefully you used a number of cans divisible by 4.

PRECIPITATION RATE:

1. Add up all the volumes and divide by the total number of cans. This is your average volume which we will call V_{avg} .
2. The next number you need is the area of the catch can opening which we will call A_c . If you are using catch cans like the ones to the right with the metal rings, your catch can opening has an area of 16.6 in^2 . If you are using a standard tuna can the area is 8.3 in^2 . The cans from the Bureau of Reclamation have an opening of 14.2 in^2 . If you are using anything else, you will need to calculate the area of the opening using: $A = \pi r^2$.
3. The number of minutes you ran the test we will call T_r .
4. Now you use these numbers and a conversion factor (3.66) to get PR in inches per hour in this equation- just plug in your numbers:

$$PR = 3.66 \times V_{avg} \div T_r \div A_c$$



Catch cans like these can be purchased online

DISTRIBUTION UNIFORMITY:

1. Divide your number of cans by 4. Add up the volumes from the lowest $\frac{1}{4}$ of your cans, and divide by that number of cans. (For example: if you have 24 cans, add up the lowest 6 volumes and divide by 6.) This is your Low Quarter Average which we will call V_{LQ} .
2. Now divide:

$$DU = V_{LQ} \div V_{avg}$$

PREVENTING RUNOFF: CYCLE & SOAK

If your runtime is too long and you are generating runoff, you need to break your total runtime into several shorter cycles that will allow the water to soak in before you apply more.

The only way to determine your maximum single run time is to turn it on and watch it with a clock or stopwatch - when you start to have runoff you've reached your maximum cycle time. Divide your total runtime for the day by this number- that is the number of cycles you will need to complete your total.

In the example before, we needed 43 minutes on each irrigation day. If you start to have runoff at 10 minutes, you will need to have four runtimes of 10 minutes, separated by at least an hour. The station probably won't show the missing three minutes, but if it does, add an additional run time and make each one 9 minutes.

If you begin your irrigation at 10 pm, your subsequent times can be 11:15, 12:30, 1:45, and 3:00 am, with all the cycles done before 6 am.



rotary stream heads with lower PRs can help reduce runoff

GREEN NOTES

2015

4

SPRING

A Workshop for Landscape Professionals

GET AHEAD OR GET PARCHED!

SIX WAYS TO SURVIVE THE DROUGHT

Classes in English and Spanish

Learn how to maintain your landscape and reduce water use by improving water management and system efficiency. This workshop features indoor presentations and outdoor demonstrations.

TOPICS

1. Understanding PR to reduce water and pesticide runoff
2. Improving sprinkler DU to reduce water use
3. Improving controller programs to reduce and manage water use. Determining PRs for drip/micro irrigation
4. Understanding soils to reduce runoff or deep percolation
5. Understanding and reading water meters to improve irrigation efficiency

WHEN Friday, May 29, 2015
7:30 am to 1:00 pm

WHERE Robert J. Cabral Ag. Center
2101 E. Earhart Ave., Stockton

COST \$20; includes morning snack, lunch, a certificate for IA and PLANET CEUs, and 3 hours for DPR "Other" CEU category.

Register in English or Spanish at :
<http://ccuh.ucdavis.edu>



QUALIFICATION TRAINING

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, and use of the official logo in advertising.
- A qualification that can help you enhance your value to your current clients and attract new ones.

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

NEXT COURSE IN JAN. 2016

FOR MORE INFORMATION:
<http://ucanr.org/GreenGardener>

PLANT THIS

***Ceanothus* 'Concha'**

A beautiful, spring-blooming California native hybrid, 'Concha' California lilac is a tough, very low water-use shrub. It varies in size, depending on the growing conditions, but averages 6-9 ft. tall and wide with age, so plant it with room to grow. It has dark green leaves on arching branches, and is a heavy bloomer. Although it is known to tolerate clay soil, it is best on soils with good drainage. Irrigate regularly to develop a deep root system the first year. Recent research shows that it then performs best with as little as one deep irrigation per month *or less* in inland landscapes, though it will sometimes tolerate more if the soil is well-drained.

This can be seen blooming now in the California native garden of the **The Learning Landscape** demonstration gardens at the Robert J. Cabral Agricultural Center, 2101 E. Earhart Ave., Stockton.



CONTACT US:

Karrie Reid

Environmental Horticulture Advisor
UC Cooperative Extension
San Joaquin County
2101 E. Earhart Ave., Ste. 200
Stockton, CA 95206-3949
209-953-6109

skreid@ucanr.edu

To receive this newsletter via email, visit our website Newsletter tab and subscribe.

<http://ucanr.org/SJHort>