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RESOURCES

Get Ahead or Get Parched: Six Ways to Survive the Drought Workshop

> Fresno, California June 27, 2014





RESOURCES INSIDE

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- City of Fresno Free Water Efficiency Surveys
- Literature for Fresno Region

Compiled by City of Fresno Water Conservation Program

Nora Laikam, Water Conservation Supervisor





City of Fresno Outdoor Watering Schedule

Reporting Water Waste

If you see water being wasted, contact the City of Fresno Water Conservation Program.

- Phone: Conservation Hotline at: (559) 621-5480
- Email: waterconservation@fresno.gov
- Online: click on Report Leaks/Water Waste at www.fresno.gov/water.



WATERING SCHEDULE					
March 2 - November 30	WINTER December 1 - March 1				
ODD Numbered Addresses:	ODD Numbered Addresses:				
(Ending in 1, 3, 5, 7, 9)	(Ending in 1, 3, 5, 7, 9)				
Tuesday/Thursday/Saturday	Saturdays Only				
EVEN Numbered Addresses:	EVEN Numbered Addresses:				
(Ending in 0, 2, 4, 6, 8)	(Ending in 0, 2, 4, 6, 8)				
Wednesday/Friday/Sunday	Sundays Only				
NO WATERING	WATER ANYTIME				
BETWEEN 6 A.M. AND 7 P.M.	ON YOUR DAY				



HORARIO DE RIEGO						
VERANO	INVIERNO					
2 de Marzo	1ero de Diciembre					
al 30 de Noviembre	al 1ero de Marzo					
Domicilios con Número <mark>Nones</mark>	Domicilios con Número Nones					
(terninando en 1, 3, 5, 7, 9)	(terninando en 1, 3, 5, 7, 9)					
Martes, Jueves Y Sábado	Solo Sábados					
Domicilios con Número Pares	Domicilios con Número Pares					
(terninando en 0, 2, 4, 6, 8)	(terninando en 0, 2, 4, 6, 8)					
Domingo, Miércoles Y Viernes	Solo Domingos					
NO RIEGUE ENTRE LAS	RIEGUE A CUALQUIER HORA EN					
HORAS DE 6AM A 7PM	EL DIA QUE LE CORRESPONDE					

Fresno Municipal Code Section 6-520 Wastage of Water

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√ CHECK FOR LEAKS

Manually turn on each sprinkler station valve and check to make sure there are no broken sprinkler heads or pipes in each area. Make all repairs and clean the filters in pop-up sprayers. While the sprinklers are running, it's a good time to check your entire sprinkler system. Look for clogged, realigned or broken emitters or pipes. You may want to remove a sprinkler at the end of the system and flush out any dirt. Flush out drip and micro system filters and tubing. Check each station for leaks at least every two weeks.

√ CORRECT OVER SPRAY

While checking each station for leaks adjust any sprinkler heads that are spraying onto driveways, sidewalks or the street by rotating the head, adjusting the amount of flow from the heads, and/or using the correct spray pattern.

√ DETERMINE 'RUN OFF' POINT

Start your system through its automatic cycle. As each station comes on make a note of the time it starts. W atch each station and note how many minutes it takes to start running over the curb, onto the sidewalk or driveway, or to start forming puddles. This is the "run off point."

\checkmark HOW TO AVOID 'RUN OFF'

Using the shortest length of time noted above reset each station on your time so the individual stations will shut off at this "run off point". If you have clay or

AUTOMATIC IRRIGATION SPRINKLER SYSTEM

√ CHECK LIST

Efficient water use is especially important during the hot summery months when more than 60 percent of home water use is for watering lawns and gardens



compacted soil that is slow to absorb water, set your time to run a second cycle (again to the "point of runoff") that begins <u>AFTER</u> the first cycle has soaked in.

$\sqrt{\rm AVOID}$ POW ER OUTAGE PROBLEMS

Replace battery in controller with recommended type. A good battery maintains the controller's memory during power outages.

$\sqrt{WATERSCHEDULE}$

Set your system to follow the City of Fresno Water Schedule. Water only on your watering day and watering time.



Contact the City of Fresno Water Conservation Program for more information. Call (559)621-5480 Email: waterconservation@fresno.gov Online: www.fresno.gov/water





Lawn Watering Guide - Irrigating Your Garden

Lawn Watering Time Guide

(Approximate Minutes per week)

Warm Season Grass						
Rotor Minutes per week*	<i>Spray</i> Minutes per week	% of July	Month	Rotor Minutes per week*	<i>Spray</i> Minutes per week	% of July
20	5	12	January	20	5	8
36	9	21	February	50	13	20
88	22	51	March	100	25	40
120	30	70	April	196	48	76
136	34	79	Мау	166	41	65
136	34	79	June	232	58	92
172	43	100	July	252	63	100
140	35	81	August	182	46	73
88	22	51	September	116	29	46
52	13	30	October	62	16	26
24	6	14	November	36	9	15
12	3	7	December	14	4	6

*Based on Full Circle Rotors. Less time needed for 1/2 and 1/4 Circle Rotors

Call (559) 621-5480, for a Free City of Fresno Lawn Watering Timer Guide refrigerator magnet.

HOW TO USE THE LAWN WATERING TIME GUIDE

The Lawn Watering Time Guide above, shows the approximate lawn watering time needed in minutes per week for both warm and cool season grasses using both spray and rotor heads <u>if</u> there is no rainfall. Warm season grasses grown in our region include Common Bermuda, Hybrid Bermuda, and Buffalo Grass; they thrive in hot weather and turn brown due to dormancy in cold weather. Cool season grasses grown in our region include both Fine and Tall Fescues and Perennial Ryegrass (used to over seed winter-dormant grasses); these grasses thrive in the spring and fall and maintain their color year round. Cool season grasses require more water than the warm season grasses.

Continued

Lawn Watering Guide – Irrigating Your Garden continued

To use this chart remember that the minutes of watering time needed is for an entire week, so you must consider the frequency that you are going to water during the week. Let us use July with a cool season grass and spray heads as our example. We chose to water three days a week, and cycle three times on our watering days to avoid run-off; then 63 minutes per week divided into 3 days equals 21 minutes per day. Three cycles per day makes the 21 minutes per day into 7 minute cycles.

Ideally, timers should be reprogrammed monthly. If your irrigation timer has a water budget (%) feature, the	
timer may be programmed in the spring for the anticipated July usage (100%) and then on a monthly basis	
rather than reprogramming all of the run times just the water budget (%) feature needs to be adjusted to reflect	t
the monthly % of July. Using the example above with the lawn needing 63 minutes a week in July, then setting	
the Water Budget (%) for March at 40%, gives 40 % of 63 minutes, or roughly the 25 minutes of irrigation	
needed, divided equally between the days of the week and all cycles.	

Recognize that the above chart is based on historical averages and may not meet the current needs of your lawn because of unusual weather.

Irrigating Your Garden

There are many factors involved in developing an irrigation schedule for your garden. These factors include soil particle size (sand, clay), chemical properties of the soil, slope, sun/shade, plant rooting depth, plant water needs, soil amendments, mulch, type of irrigation system, rate of application, so on and so forth. However, the person who is establishing the irrigation schedule does not have to be formally educated in the field of irrigation in order to develop a good schedule.

Observing what is happening in each garden area is the key to good watering practices. Get to know your soil-determine how quickly the water being applied by your existing irrigation system is absorbed, the 'run-off' point of time, the depth of absorption, and how quickly the soil dries out in the root area. You will need to do some observing and digging in your soil to determine this information.

On a well designed and maintained irrigation system any one valve (station) should have the following:

- 1. plants with similar water needs
- 2. plants with similar rooting depth
- 3. same sun/shade exposure
- 4. slope
- 5. matched precipitation (nozzles or other type of emitting devises that apply water at an even rate)
- 6. emitting devises that operate at the actual operating pressure
- 7. emitting devises that cover the proper area.
- 8. emitting devises not blocked by plants or other objects.

Your system probably does not meet the above criteria. Alter it where possible-change sprinkler nozzles to help slow the water application rate, prune or transplant plants blocking sprinkler distribution, etc. Then develop your irrigation schedule based on the knowledge you have acquired from your observations.

Our typical garden plants require the most water during the summer and little in the winter. Starting in spring, here in the Central Valley plant water needs increase each month through July. After July, plants need less water each month, and by November, often little or no irrigation is required until March or April depending on the season's rainfall. Ideally, your irrigation timer should be reprogrammed on a monthly basis to give your plants the correct water for optimum growth and to save water.



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Approximate	Warm Season Grass (e.g. Bermuda)			Cool Season Grass (e.g. Fescue)	
Lawn	Rotor	Spray		Rotor	Spray
Watering	20	5	Jan	20	5
	36	9	Feb	50	13
Time	68	22	Mar	100	25
in minutes per week)	120	30	Apr	196	48
	136	34	May	166	41
City of	136	34	Jun	232	58
	172	48	Jul	252	63
	140	35	Aug	182	46
Water	88	22	Sep	116	29
Conservation Program	52	13	Oct	62	16
and the second se	24	6	Nov	36	9
621-5480	12	1	Dec	14	4



Compiled by the City of Fresno Water Conservation Program

Things to Read! Places to Visit! Web Stes to View!



Are you using more water than is needed in your yard?

On average over 60% of home water is used outdoors for watering lawns and gardens. This is where we can save the most water. Water that flows onto the sidewalks and into the gutters is water being wasted. Does it really make any sense to water concrete?

Rethink Traditional Landscape & Irrigation

Most water is wasted in your landscape by watering when your plants do not need water or by not maintaining the irrigation system. Many landscape problems are directly related to over-watering. By combining water conservation practices with creative landscape design, you can create an

attractive haven that's relatively hassle-free. Water use can be reduced by rethinking traditional grass lawns, planting water-wise plants, and using a properly designed and operated irrigation system.

The City of Fresno Water Conservation Program can help you develop efficient outdoor water watering practices. FREE landscape consultation for residential and commercial/industrial customers are available. The service includes irrigation and plant material tips, and the Landscape Specialist will help you develop an irrigation schedule as well as help set your timer. Free water leak audits are also available. For an appointment, call 621-5480 or email waterconservation@fresno.gov.

Let's get started! Learn more about landscape and efficient watering from the resources that follow:

Things to Read!

Book References providing landscape information

All About Sprinklers and Drip Systems. Ortho Books, ISBN: 0-89721-515-X

California Master Gardener Handbook,

University of California Cooperative Extension, text book developed for UC Master Gardener training classes, covers full range of fundamental horticultural knowledge.

Drip Irrigation for Every Landscape and All Climates. ISBN: 0-9615848-2-3

Garden Watering Systems. Sunset Publishing

Landscape Plants for W estern Regions: An Illustrated Guide to Plants for W ater Conservation - Author Bob Perry, Library of Congress # 92-073474, Land Design Pub, Claremont CA. Drought tolerant plants for western US regions with pictures of mature plants.

Sunset Western Garden Book

Sunset Publishing supplies the western US climate zones with descriptions, provides plant selectionplant lists for different categories and gardening techniques, keyed extensive plant encyclopedia to climate zones, water needs, sun/shade conditions, and a glossary of terms. It is the most used reference book in the horticulture industry written in layman's terms.

Places to Visit!

Local water efficient public gardens

City of Fresno Conservation Gardens

1919 E McKinley, Fresno www.fresno.gov/water Garden that Blooms Year Around. A water-wise demonstration garden for small business lots.



Clovis Botanical Gardens 945 N Clovis Ave, Clovis http://clovisbotanicalgarden.org/ Three-acre botanical garden with climate appropriate plants. Drip irrigation demonstration site.

Fresno State – California State University 5241 N Maple Ave, Fresno http://www.fresnostate.edu/adminserv/arboretum/

- Allergy-Free Demonstration Garden Encompasses an acre and over 50 nonallergenic trees and shrubs.
- Arboretum An arboretum is a place where plants, especially trees and shrubs are grown for exhibition and study. A tree guide is available.
- Iris Garden Memorial Garden with over 100 different varieties of bearded iris.
- Water Wise Garden featuring waterwise plants in the Horticulture Greenhouse Park at the Nursery.



Garden of the Sun

1750 N Winery, Fresno http://ucanr.edu/sites/mg/resno/Garden_of_the_Sun_ Demonstration_Garden/

One-acre UCCE Master Gardener demonstration Garden with an extensive food production garden and a lovely perennial garden. Adult education classes and other events.



Web Stes!

Useful Web Stes for landscape resource information

California Urban W ater Conservation Council Saving water outside and inside the home http://h2ouse.org/

Center for Irrigation Technology, Fresno State Interactive irrigation scheduling program. www.wateright.org

Central Valley Friendly Landscape Awards Program View many examples of sustainable landscape efforts in the Fresno/Clovis region http://ucanr.edu/sites/cvlandscape/2011_Awards/

City of Fresno W ater Division *Lawn Watering Time Guide* (click conservation, literature) <u>www.fresno.gov/water</u>

Save Our Water

View many tips and examples of yards in California that are saving water. http://www.saveourh2o.org

W ater-wise Gardening, Fresno Region http://www.fresno.watersavingplants.com/

University of California, Cooperative Extension, Master Gardeners, Local Water Agencies – Local Water Agencies 621-5300

ADDITIONAL RESOURCES

California Department of Water Resources Landscape Water Use Program www.water.ca.gov/wateruseefficiency/landscape - Water Efficient Landscape State Ordinance www.water.ca.gov/wateruseefficiency/docs/MW ELO0 9-10-09.pdf

California Irrigation management Information System (CIMIS) Current daily ET values www.cimis.water.ca.gov

California Landscape Contractors Association http://clcaorg/ - Protecting landscape/trees during drought http://www.clcaorg/clca/about/consumer/drought/

EPA WaterSense Program www.epa.gov/watersense

Irrigation Association www.irrigation.org

Irrigation Tutorials, Jess Stryker http://www.irrigationtutorials.com/

Tree Fresno http://www.treefresno.org/

University of California -Water Use Classification of Landscape WUCOLS IV Species, trees, shrubs, perennials rated for water needs in various state regions http://ucanr.edu/sites/WUCOLS/

UC Guide to Healthy Lawns www.ipm.ucdavis.edu/TOOLSTURF/MAINTAIN/irrs ched.html

Underground Service Alert North 811 (USA) Call 811 Before You Dig http://usanorth811.org/



Association of Metropolitan Water Agencies – Local Water Agencies 621-5300

Bakman Water Company http://bakmanwater.publishpath.com/

California Department of Transportation – Storm Water Management 488-4045

Center for Irrigation Technology, Fresno State http://www.fresnostate.edu/jcast/cit/index.html

Central Valley Water Awareness Committee http://centralvalleywater.org/

City of Clovis Public Utilities http://www.ci.clovis.ca.us/Departments-and-Services/Public-Utilities

City of Fresno Water Division www.fresno.gov/water

Fresho County Public Works & Planning, Water http://www.co.fresho.ca.us/DepartmentPage.aspx?d= 58137

Fresno County Farm Bureau http://www.fcfb.org/

Fresno Irrigation District http://www.fresnoirrigation.com/

Fresno Metropolitan Flood Control District http://fresnofloodcontrol.org/

Friant Water Authority http://friantwater.org/

International Center for Water Technology http://www.californiawater.org/

Kings River Conservation District http://www.krcd.org/

Kings River Water Association http://www.kingsriverwater.org/

Malaga County Water District http://www.malagacwd.org/

Pinedale County Water District http://pcwdonline.com/

San Joaquin Valley Air Pollution Control District http://www.valleyair.org/Home.htm

US Green Building Council, Central Valley Chapter http://usgbccc.org/

Xeriscape

Consider the principles of xeriscaping when planning your landscape design.

Although xeriscaping (*xeros* = dry) originally related to landscaping in extremely dry climates, its principles, which include using water-efficient and drought-tolerant plants, fit well with conservation goals. For example, using regionally adapted plants, such as the growing variety of natives, ensures that the plant can handle this area's seasonal temperatures and rainfall, along with other environmental and soil conditions. But non-natives can also be used to add color and texture to the garden, especially those which are suited for dry, sunny locations.

Xeriscaping does not mean using only colorless plants; it does mean using the right plant in the right place. It is a water-wise landscape using colorful flowers, plants and trees as a water-saving alternative to grass.

Principles of Xeriscape

- Planning and design Successful xeriscapes begin with a good design that consider the function of the landscape and the mature size and water needs of the plant. Consider the view, slope, exposure and soils of the area. Take into account the existing vegetation and topography of the site and intended use. Decide where things will be. Decide when things will be done. Most landscapes are best done in phases.
- <u>Soil improvements</u> Soils can vary within any site. Use organic matter to improve the soil when planting. This will improve root development, water penetration and retention. It also feeds nutrients to your plants. Improve the soil before planting and installing the irrigation system.
- <u>Appropriate turf areas</u> Locate grass only in areas where it provides functional benefits like family recreational or children's play areas. Keep grass away from sidewalks, walls and fences for easier maintenance. Avoid planting grass in oddly shaped areas that can't be watered and maintained efficiently. The reduction or elimination of high-water-use turf areas, and locating them separately so that they may be watered more efficiently, can result in significant reductions in water use.
- <u>Low water-use plants</u> Most plants have a place in Xeriscape even those that have high water needs. Plant selection should be based on the intended use in the landscape. Use of more plants with low water needs and native plants will allow the maximum water conservation. Some provide shade and screening, others are perfect for borders and accents. Many low water flowering plants are seasonal.
- Efficient irrigation Irrigation systems should be well planned. Irrigate grass areas separately from other plantings. Group plants with like water needs, and water each group on separate zones. Not all plants need the same amount of water. Irrigate according to the needs of the plants rather than watering on a fixed schedule. Even plants used in Xeriscape will require supplemental irrigation until they become established. Change the irrigation schedule with seasonal weather changes.
- <u>Surface mulches</u> -_Use mulches to cover and cool the soil, decrease evaporation, reduce weed growth and slow erosion. Organic mulches such as bark chips or wood shavings will decompose slowly over time, but it will improve the soil by adding nutrients. Inorganic mulches like rock and gravel should be used sparingly. Surrounding a home with rock will increase the temperatures.
- <u>Appropriate maintenance</u> A landscape adapted to the environment will require less maintenance, less fertilizer and reduce the use of pesticides and other chemicals than traditional landscapes, but some regular maintenance is required. Proper pruning, weeding, fertilization and pest control will preserve and enhance the quality of your xeriscape. Irrigation system maintenance and adjustments help save water.







CITY OF FRESNO WATER CONSERVATION WATER EFFICIENCY SURVEYS

Looking for ways to save money by reducing your water use? Take advantage of these FREE services offered to City of Fresno water customers. Call today for an appointment convenient for you can be made for any or all of these FREE Water Efficiency Survey services. Hmong and Spanish translation is also available.

- Interior and Exterior Leak Surveys
- Water-wise landscape consultation
- Irrigation efficiency audit
- Help setting irrigation controllers
- Meter use reports

Contact us: Call (559)621-5480 Email: water conservation@fresno.gov Online: www.fresno.gov/water

The City of Fresho Water Conservation Program offers all customers FREE Water Efficiency Surveys to help save water inside and outside. During the water survey appointment, Conservation specialists will check for water inefficiencies at the location. The specialist may provide a water-wise landscape consultation if requested. A report with the findings and recommendations is left with the customer. The specialist will also discuss with customers methods of using water more efficiently.

Interior

Exterior

Interior surveys are designed to help you save water. The survey includes:

- Check for leaks at all points where water enters the structure such as leaks at faucets. showerheads, toilets, clothes washers, and under sinks.
- Provide low-flow showerheads and faucet aerators. if needed.
- Explain rebates for high-efficiency dothes washers and Water Sense toilets.
- Provide conservation tips and literature.





The FREE exterior surveys and landscape consultations are very popular with our customers. We show you methods of saving water in the yard and also offer waterwise landscape design ideas.

- Inspect irrigation systems, and suggest improvements and adjustments.
- Discuss irritation products.
- Help with your irrigation scheduling and show you how to set your irrigation timer.
- · Check for signs of faucet, irrigation and water feature leaks (pools, spas, fountains, etc.)
- · Answer questions about your landscape, and provide a water-wise landscape consultation including design ideas.
- Provide a hose nozzle and other conservation materials.
- Provide water conservation tips and literature.



City of Fresno Water **Conservation services** include:

Water-wise landscape consultations

Irrigation efficiency audit, including setting controller

Water leak surveys

Rebates for clothes washers and WaterSense toilets

Meter use reports

Public outreach - speakers, tours, literature

Enforcement of Fresno City Water regulations / schedule

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City of Fresno Water Conservation Program - Developed for Fresno Region Contact us today to request one or more brochures.

Phone: (559) 621-5480 Email: waterconservation.gov Online: www.fresno.gov/water

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Approximate Lawn W atering Time MAGNET Indicates how many minutes to water turf each month.	Approximate	Central Valley Friendly Landscape Program Awards Annual Fresno- Clovis Metropolitan area Landscape Awards	CAUSE AND	Commercial Demonstration Garden W ater Conservation Office. Brochure showing small commercial type garden that blooms year around	<section-header><text><text><image/><section-header></section-header></text></text></section-header>	Creating a Fresno-Friendly Garden Plant Choices & Water Conservation Tips for our Climate Plant list for local conditions	CREATINGA FRESNO-FRIENDLY GARDEN PLANT CHOICES & WATER CONSERVATION TIPS for our cleants
Creating a W ater-wise Landscape, Seven Steps to Follow for Our Climate. Considering local conditions for landscape.	CREATING A WATER-WISE LANDSCAPE SEVEN STEPS TO FOLLOW for our climate	Creating Green Grass Alternatives - How to Replace Thirsty Lawn with W ater-wise Groundcover & Ornamental Grasses. Turf removal and replacement	CREATING GREEN CREASE ALTERNATIVES WITH WATER WARE OR ON DOWNER O OR ON MENTAL CREASES	Drip Irrigation - A Guide to Installation and Maint enance A Guide to Installation and Maint enance Illustrations and information	при	Home W ater Use Survey Interior and Exterior. Landscape/leak survey about this free service for Fresno customers	
O ut door W at ering Schedule Excerpt of watering schedule regulations	<image/> <section-header><section-header><section-header><section-header><text><text></text></text></section-header></section-header></section-header></section-header>	W ater Conservation Landscape Ideas - Park Strips and Median Islands Ideas to make these small areas water- wise	Water Conservation Landscape Ideas Park Strips and Median Islands	W ater-wise Gardening for Fresno Region Gardens in Fresno/Clovis area. Describes how to use this Online resource www.fresno.waters avingplants.com	Wates-weise Gazdeniag FRESNO REGION	W hat you Should Know Before you Mow Tips for saving water while meintaining a lawn	

Literature developed for the Fresno Region