Landscape Watering by the Numbers

A Guide for the Arizona Desert

There are a number of ways to save water, and they all start with you.

WATER USE IT WISELY

Landscape Watering by the Numbers

There are a number of ways to save water in your landscape, and there are some very good reasons to do so. Over half of household water—in some cases as much as three-quarters—goes into our landscapes. That means watering your yard efficiently is one of the best and easiest ways to save water. Proper watering will also keep your landscape plants healthy and beautiful through the year.

With a little help from this booklet you can figure out most of your landscape watering needs on a weekend morning. Afterwards, use the Landscape Watering Guidelines chart (page 18) to water efficiently and save water throughout the year.

There are three parts to sensible landscape watering:

1. Know how much water your plants need.
2. Know how much water each part of your watering system applies.
3. Match your system's output to your plants' needs.

Photo: Charles Mann, Designer: Jim Coffman

Water Wisdom

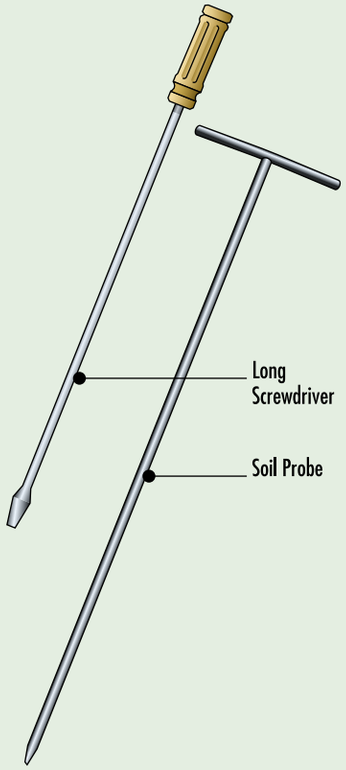
- Water is limited in our desert home and should be used wisely.
- Plants don't save water, people do.

Water Wisdom

- When you give plants more water than they need, they grow more than they should, and you have to do more pruning and mowing.
- While fertilizers promote plant growth, they also increase water consumption. Apply the minimum amount of fertilizer needed.

Soil Probes

A soil probe, sharpened piece of rebar, or a very long screwdriver works well to test how deep the water has penetrated into the soil.



1. How much water do your plants need?

The trick is to give your plants enough water without giving them too much water. Why? Watering too little can lead to wilt from which the plant may not recover, but watering too much is bad for plants because it starves the roots of oxygen.

Depending on the size and type of the plant (tree, shrub, or groundcover), you will need to water to different depths and widths. A large tree needs more water than a small groundcover because it has a larger root zone—the area in which the plant's feeder roots are concentrated. Your plants will be healthiest if you completely wet the root zone each time you water.

How Deep Should You Water?

The **1-2-3 Rule** is an easy way to remember how deep to water:

- Water small plants such as groundcovers, cacti, and annuals to a depth of **1 foot**. (Grass should be watered to a depth of 10 inches.)
- Water medium plants such as shrubs to a depth of **2 feet**.
- Water large plants such as trees to a depth of **3 feet**.

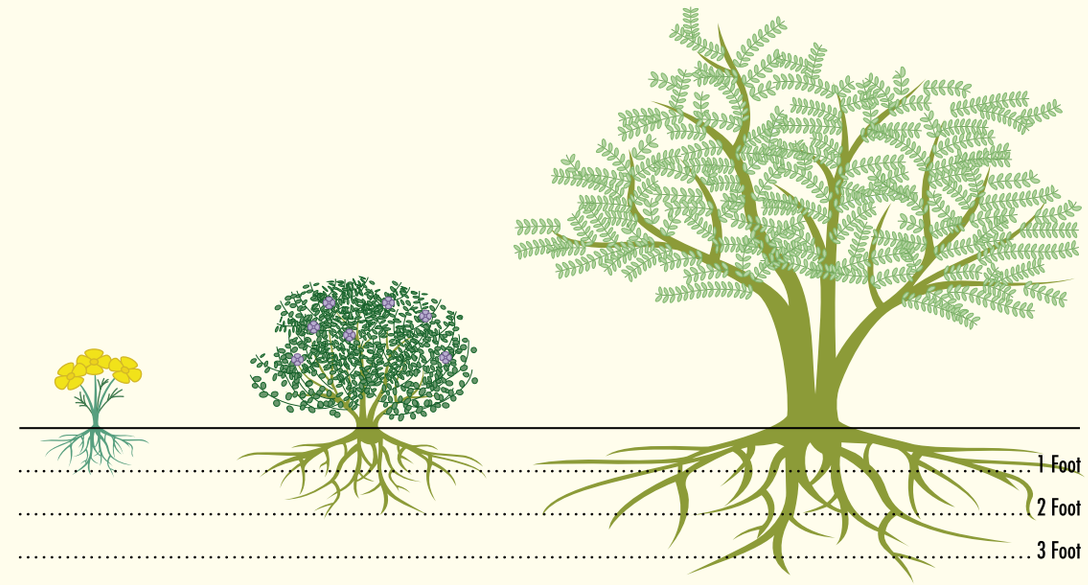
A good way to test how deep you have watered is to use a soil probe—a sharpened piece of rebar or a very long screwdriver works well. About an hour after watering, push the probe into the soil. It will slide easily through wet soil but will be difficult or impossible to push through dry soil. Water your plants and lawn until you can easily slide the probe to the recommended depth.

How Wide Should You Water?

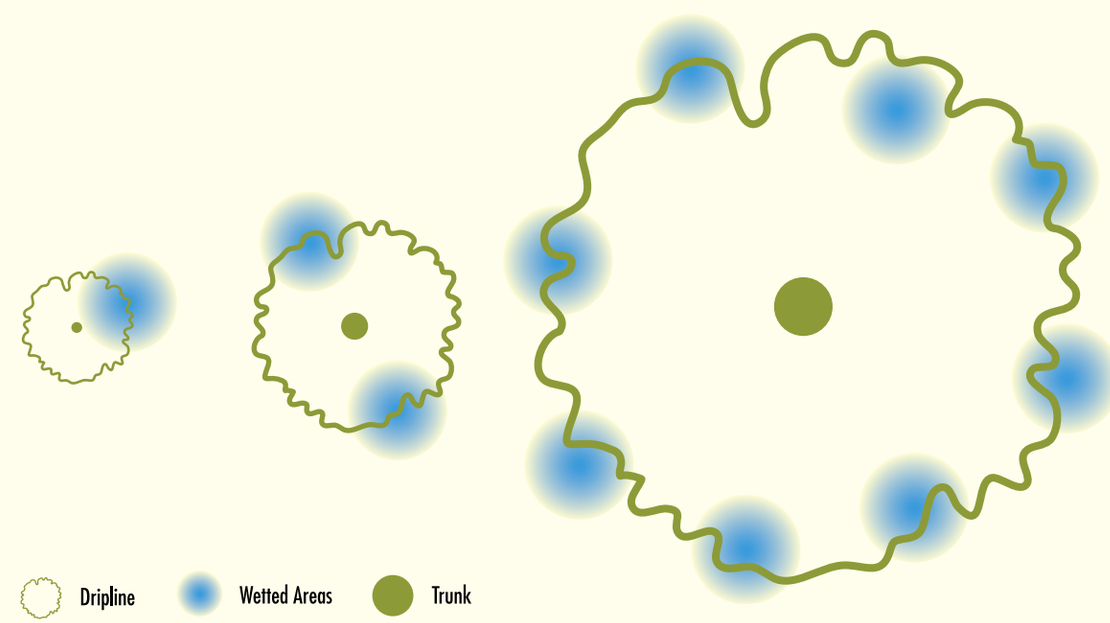
After plants are established (see page 14), most water absorbing roots are located near the dripline—which is beneath the outer edge of the plant's canopy—not close to the trunk or stem. Concentrate your emitters along the dripline of each plant. The water will spread down and horizontally as it soaks into the soil, reaching the entire root zone.

To estimate how much water it takes to wet the root zones of your plants, see Table C on page 9.

Suggested Watering Depth for Different Types of Plants



Place Emitters Along a Plant's Dripline

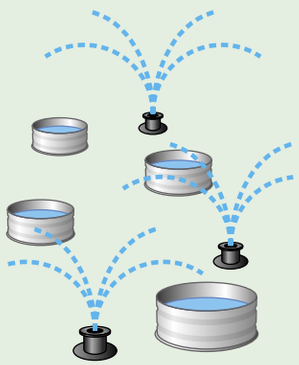


Water Wisdom

► With sprinklers, water in the early morning—about one to three hours before sunrise. That way more water gets to the roots instead of evaporating due to the sun and wind.

Can Test

Use the can test to find out how much water your sprinklers apply.



Step 1. Place several shallow, flat-bottomed cans on your lawn. Turn the sprinklers on for 15 minutes.

Step 2. Measure the depth of water in each can.

2. How much water does each part of your watering system apply?

Now that you have an idea of how much water your plants need, you need to find out how much water your irrigation system applies. Keep in mind that there is a huge difference between the output of a drip emitter and a bubbler or garden hose. Compare how long it would take to apply 10 gallons of water through these methods:

- 2 minutes with a watering hose
- 10 minutes with a 1-gallon per minute bubbler
- 600 minutes or *10 hours* with a 1-gallon per hour drip emitter

As you can see, drip systems should use multiple emitters and run for longer periods of time to adequately water the root zones of your plants.

Measuring Lawn Sprinkler Output

Sprinkler output can vary depending on your system design and water pressure. Here's a simple and fun method to measure your sprinkler output. This is a great activity for kids!

Collect 6 to 8 shallow, flat-bottomed cans like tuna or cat food cans. Spread the cans around your lawn 4 to 5 feet apart, then turn on each valve or station of your sprinklers for 15 minutes. When the sprinklers turn off, measure the depth of water in each can (use the ruler on page 18). Record your numbers below, then add the measurements together and divide by the number of cans to get the average depth. This is your sprinkler number—the amount of water in inches that your sprinkler system applies in 15 minutes.

WRITE YOUR NUMBERS IN THE SPACE PROVIDED BELOW:

Amount of water in cans (tenths of an inch)

can 1 _____
can 2 _____
can 3 _____
can 4 _____
can 5 _____
can 6 _____
can 7 _____
can 8 _____
Total _____ ÷ no. cans _____ = _____
Circle this number on Table A (page 7) ⟶

EXAMPLE

can 1 .3
can 2 .2
can 3 .3
can 4 .25
can 5 .4
can 6 .3
can 7 _____
can 8 _____
Total 1.75 ÷ no. cans 6 = .29
(approx .3 in.) ⟶

On average, pop-up sprinklers apply 0.4 inches of water in 15 minutes, and impact sprinklers apply 0.2 inches of water in 15 minutes. You will typically see some variation in measurement from can to can. However, if you see big differences (greater than .2″), you may need to modify or adjust the sprinkler system to get more uniform and efficient coverage. After you've completed any modifications, repeat the can test.

Measuring Drip or Bubbler Output

Drip emitters are typically used around trees and shrubs and are sized in gallons or liters per hour. If you have more than one emitter on a plant (and you often should), total the output of the emitters on each plant. For example, if your tree has three 2-gallon per hour emitters, the output will be 3 emitters x 2 gallons = 6 gallons per hour.

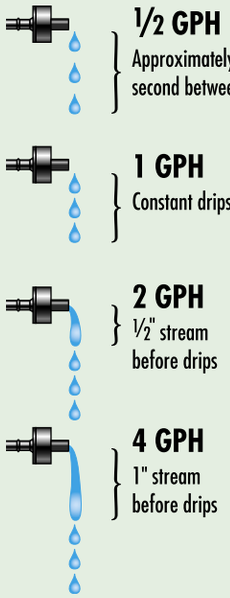
If you don't know the output of your drip emitters, you can remove an emitter and take it to an irrigation supply or home and garden store, or you can estimate emitter output with the diagram at the right.

Bubblers typically apply 1/2 to 2 gallons *per minute*. Some allow you to adjust the flow and some do not. The flow rate is often stamped on the top of the bubbler.

Now you're ready to calculate the total emitter output for your plants. This output will help determine run times for each watering line or valve. However, it is not necessary to list every plant in your landscape. You can group them by type and size, such as 15-foot trees, 6-foot shrubs, or 3-foot groundcovers (sizes refer to the diameter of the plant canopy). Record your numbers on the worksheet on page 10. See the example below.

Estimating Emitter Flow

Use this visual guide to estimate emitter flow rates in gallons per hour (GPH).



Run Time Worksheet (Example)

Valve No.	Plant Type & Size	Number of Emitters per Plant	Emitter Output in Gallons/Hr	Total Output in Gallons/Plant/Hr	Gallons Required (From Table C)	Run Time (gal req ÷ gal per plant)
1	8' TREES	3 ×	2G/HR =	6G/PLANT/HR		
1	3' SHRUBS	2	1G/HR	2G/PLANT/HR		
1	2' SUCCULENTS	1	1G/HR	1G/PLANT/HR		
2	6' CITRUS TREES	2	1G/MIN BUBBLER	2G/PLANT/MIN OR 120G/PLANT/HR		

Water Wisdom

- To germinate cool season grass (such as winter rye), apply light, frequent waterings—up to four times a day—during the first seven to ten days. Gradually increase run time and decrease frequency as grass gets established.

Turf Watering Tips

Signs of Underwatering

- Bermuda turns bluish-gray
- Grass doesn't spring back after being stepped on
- It is difficult to push a screwdriver into the soil
- Turf still feels warm in evening after sun is down

Signs of Overwatering

- Water is constantly puddled in areas
- Turf has a musty odor
- Soil is extremely soft and mushy
- Algae or mushrooms are present

3. Match your system's output to your plants' needs

You are now ready to use the worksheets to estimate the run time (how long to run the irrigation) and frequency (days between watering) for each area of your landscape. As weather and other factors change, you will need to adjust watering frequency, NOT the run time.

Adding It All Up For Turf

For turf (grass), you should apply about .75" (3/4 inch) of water each time you irrigate to wet the root zone (a soil depth of 6 to 10 inches). On Table A below, circle the sprinkler number calculated from your can test (page 5). This table shows how long to run your sprinkler system. For example, if your sprinkler number is .3 inches you would need to run the system for 37 minutes.

TABLE A: RUN TIME OF SPRINKLERS TO APPLY .75" WITH EACH IRRIGATION

Average can measurement (inches)	.1	.2	.3	.4	.5	.6	.7	.8
Minutes to run sprinklers	112	56	37	28	22	18	16	14

The Landscape Watering Guidelines chart (page 18) is divided into seasons and suggests a wide range in watering frequency. For example, it shows that warm season grass in the spring should be watered every 4 to 14 days. Water needs of turf vary significantly during the seasons, making it worthwhile to adjust watering monthly rather than quarterly. Table B offers a monthly schedule based on historical weather information. This table works well for warm season grasses such as Bermuda and cool season grasses such as winter rye.

TABLE B: MONTHLY FREQUENCY (DAYS BETWEEN WATERING) FOR WARM AND COOL SEASON GRASSES

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Bermuda	30	21	14	7	4	3	3	4	4	6	14	30
Rye	14	10	7	4	3	— grass dies out —				3	10	14

An Alternative Turf Watering Schedule

Efficient sprinkler run times can also be determined using daily climate information measured directly from weather stations across the Valley. To use this method, refer to the lawn watering information that is provided on the weather page of the newspaper (see example). You can also access this on the Arizona Cooperative Extension website, http://ag.arizona.edu/azmet.

Use the sprinkler number from your can test (page 5) and the lawn watering weather information to determine efficient run times.

Example: The lawn watering information states that 0.6 inches of water needs to be applied to the lawn. The average depth of water in the cans (sprinkler number) was .3 inches. The sprinklers should run for about 30 minutes every 3 days.

Sprinkler Run Time

Watering Requirement in Inches (if last watered 3 days ago)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
0.1	15	8	5	4	3	3	2	2
0.2	30	15	10	8	7	5	4	4
0.3	45	23	15	11	9	8	6	6
0.4	60	30	20	15	12	10	9	8
0.5	75	38	25	19	15	13	11	9
0.6	90	45	30	23	18	15	13	11
0.7	105	53	35	26	21	18	15	13
0.8	120	60	40	30	24	20	17	15
0.9	135	68	45	34	27	23	19	17
1.0	150	75	50	38	30	25	21	19
	0.1	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**

Sprinkler Number-Output per 15 Minutes

Sprinkler Run Time

EXAMPLE

0.1	15	8	5	4	3	3	2	2
0.2	30	15	10	8	7	5	4	4
0.3	45	23	15	11	9	8	6	6
0.4	60	30	20	15	12	10	9	8
0.5	75	38	25	19	15	13	11	9
0.6	90	45	30	23	18	15	13	11
0.7	105	53	35	26	21	18	15	13
0.8	120	60	40	30	24	20	17	15
0.9	135	68	45	34	27	23	19	17
1.0	150	75	50	38	30	25	21	19
	0.1	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**	**0.7**	**0.8**

Water Wisdom

- Bermuda grasses are dormant in the winter and will only require water once every 3-4 weeks or less if it rains.

Water Wisdom

- Your landscape plants can share water. If you have high plant density in your landscape (canopy edges are 2 feet apart or less) you may be able to apply less water per plant.
- Because of different watering needs, it is best to place trees and shrubs on separate valves.

Suggested Drip Emitter Quantities

	Canopy Diameter (Feet)	Number of Emitters	Emitter Flow Rate (GPH)
Trees	7 - 10	3 - 5	2 - 4
	11 - 14	4 - 6	2 - 4
	15 - 20	6 - 12	2 - 4
	21+	12+	4
Large Shrubs	4 - 6	2 - 3	2
Small Shrubs/ Groundcovers	1 - 3	1	1

Adding It All Up For Landscape Plants

For your landscape plants that are on a drip or bubbler system, use Table C and the worksheet on the next page to help you determine how long to water. Table C will give you an idea how much water is required to wet the root zones of different plant types and sizes. Using this information and the output numbers from the previous section, you can estimate your system run times using the Run Time Worksheet.

TABLE C: GALLONS OF WATER REQUIRED TO WET ROOT ZONE

Plant Type	Plant Canopy Diameter in Feet												
	1′	2′	3′	4′	5′	6′	8′	10′	12′	14′	16′	18′	20′
Trees	1.5	5	11	16	22	26	38	59	85	115	150	190	235
Shrubs	1	4	8	12	17	20							
Groundcover/Cacti	.5	2	3.5	5	7	9							

NOTE: The amount of water needed will vary depending on soil type and soil conditions. See illustration on page 13.

Try to adjust the number and output of emitters on each plant so that they get the total quantity of water they need in two to six hours. For example, Table C suggests that a tree with a five-foot canopy needs about 22 gallons of water around its root zone. If you had a single 1-gallon per hour emitter on this tree, you would need to water for 22 hours. Clearly, an adjustment to this emitter system would be needed. A good setup for a five-foot tree would be three 2-gallon per hour emitters spread out around the dripline of the tree. At a combined output of 6 gallons per hour, the tree would get a healthy drink in about 3.5 hours.

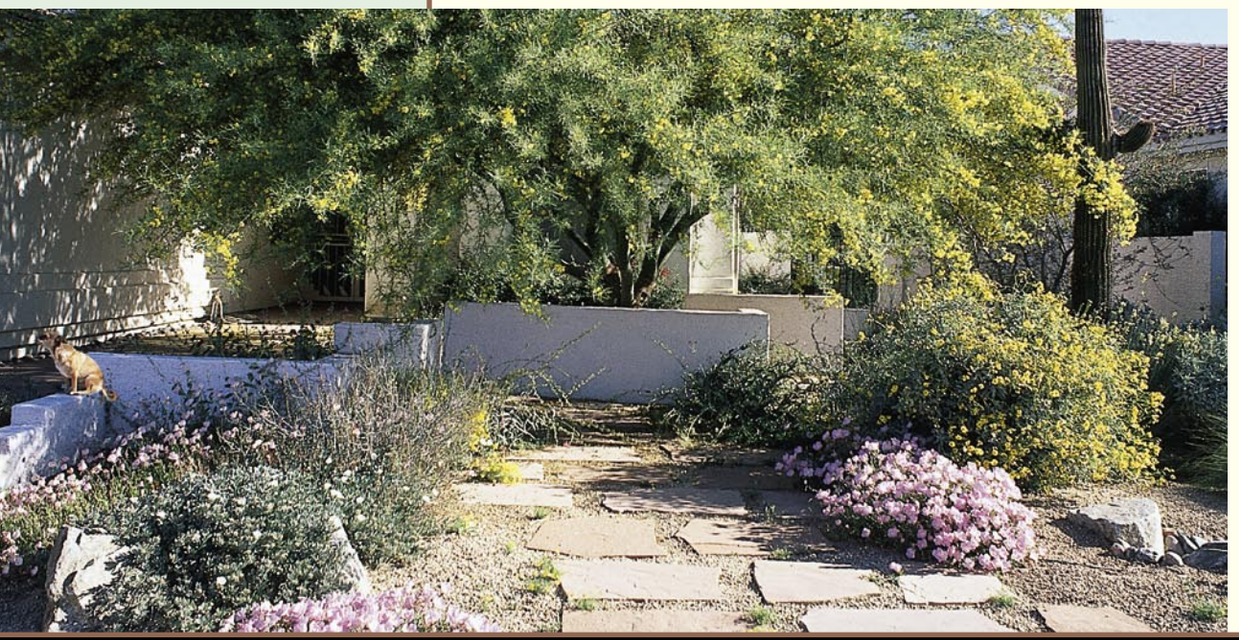


Photo: Steve Priebe, Designer: Selby Saubolle

Run Time Worksheet

Step 1: List your plant types and sizes by valve (columns 1 & 2)
Step 2: For each plant type on each valve, list the number of emitters and emitter output in gallons/hour (columns 3 & 4)
Step 3: Multiply the number in column 3 by the number in column 4 and write the results in column 5
Step 4: Look up the water required for each plant type and size from Table C and write it in column 6
Step 5: Divide the number in column 6 by the number in column 5 to determine the run time in hours

Metric conversions: 1 liter per hour (LPH) = .25 gallons per hour (GPH), 2 LPH = .5 GPH, 4 LPH = 1 GPH, 8 LPH = 2 GPH

	1 Valve No.	2 Plant Type & Size	3 Number of Emitters per Plant		4 Emitter Output in Gallons/Hr		5 Total Output in Gallons/Plant/Hr	6 Gallons Required (From Table C)	Run Time (gal req ÷ gal per plant)
EXAMPLE	1*	8′ TREES	3	×	2G/HR	=	6G/PLANT/HR	38	6 HR
EXAMPLE	1*	3′ SHRUBS	2		1G/HR		2G/PLANT/HR	8	4 HR
EXAMPLE	1*	2′ SUCCULENTS	1		1G/HR		1G/PLANT/HR	2	2 HR
EXAMPLE	2	6′ CITRUS TREES	2		1G/MIN BUBBLER		2G/PLANT/MIN OR 120G/PLANT/HR	26	13 MIN

*How can you water your landscape efficiently when it requires three different run times on the same valve? Make some simple adjustments. See page 11.

Visit wateruseitwisely.com for an interactive run time worksheet

Water Wisdom

- Pull weeds every week so they don't steal water from your plants.
- As your landscape plants grow, water needs will change. Mark your calendar to reevaluate your landscape each year to determine if water placement should be changed and if more water should be applied.

Are your trees and shrubs on the same valve?

Many systems have been installed with one valve to water plants of different types and sizes. In the example on the Run Time Worksheet (page 10), trees, shrubs, and succulents are all watered on the same valve. Since these plants have different watering needs, it would be more efficient to have them watered by different valves.

However, we can water this landscape more efficiently by making some simple changes to the emitters. If we add two emitters to each tree and change the emitter output on the succulents from 1 gallon per hour to 1/2 gallon per hour, the run times would be adjusted in line with one another. Here's how the example would look after adjustments:

Valve No.	Plant Type & Size	Number of Emitters per Plant	Emitter Output in Gallons/Hr	Total Output in Gallons/Plant/Hr	Gallons Required (From Table C)	Run Time
1	8' TREES	5	× 2 G/HR	= 10 G/PLANT/HR	38	3.8 HR
1	3' SHRUBS	2	1 G/HR	2 G/PLANT/HR	8	4 HR
1	2' SUCCULENTS	1	.5 G/HR	.5 G/PLANT/HR	2	4 HR

Here are some other ideas for modifying your system:

- Hand water smaller plants that cannot survive longer frequencies between waterings.
- Place organic mulches around smaller plants to slow evaporation.
- Plug all emitters around your trees and use soaker hoses periodically instead.

Photo: Charles Mann, Designer: Christie Ten Eyck

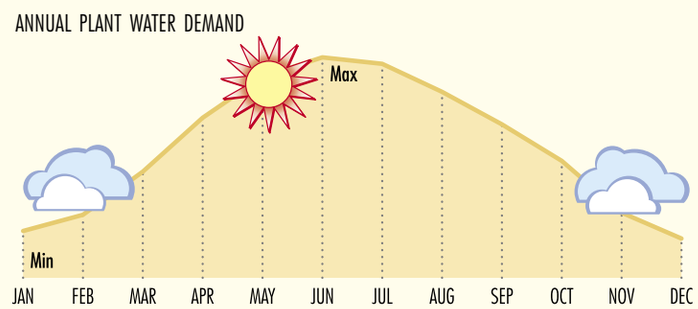
LANDSCAPE WATERING GUIDELINES

How Much & How Often — Water to the outer edge of the plant's canopy and to the depth indicated. Watering frequency will vary depending on season, plant type, weather and soil.		Seasonal Frequency — Days Between Waterings: Spring Mar - May	Summer May - Oct	Fall Oct - Dec	Winter Dec - Mar	Water This Deeply (Typical Root Depth)
Trees	Desert adapted	14-30 days	7-21 days	14-30 days	30-60 days	24-36 inches
	High water use	7-12 days	7-10 days	7-12 days	14-30 days	24-36 inches
Shrubs	Desert adapted	14-30 days	7-21 days	14-30 days	30-45 days	18-24 inches
	High water use	7-10 days	5-7 days	7-10 days	10-14 days	18-24 inches
Groundcovers & Vines	Desert adapted	14-30 days	7-21 days	14-30 days	21-45 days	8-12 inches
	High water use	7-10 days	2-5 days	7-10 days	10-14 days	8-12 inches
Cacti and Succulents		21-45 days	14-30 days	21-45 days	if needed	8-12 inches
Annuals		3-7 days	2-5 days	3-7 days	5-10 days	8-12 inches
Warm Season Grass		4-14 days	3-6 days	6-21 days	15-30 days	6-10 inches
Cool Season Grass		3-7 days	none	3-10 days	7-14 days	6-10 inches

These guidelines are for established plants (1 year for shrubs, 3 years for trees). Additional water is needed for new plantings or unusually hot or dry weather. Less water is needed during cool or rainy weather. Drip run times are typically 2 hours or more for each watering.

How frequently should you water?

The Run Time Worksheet helps you determine how long to water, but how often to water can be one of the most difficult questions to answer. Notice that the Landscape Watering Guidelines is divided into seasons. It is important to adjust your watering schedule at least seasonally, because plants can use 3 to 5 times as much water during the hot, dry summer as they do during the winter.



If you look at the Guidelines for the spring watering frequency for desert adapted trees, you'll see that the recommendation is 14 to 30 days. How do you determine if it should be every 14 days, every 30 days, or somewhere in between? Besides the current weather conditions, watering frequency depends on a number of factors:

- Plant type
- Soil type
- Plant size
- Plant establishment

These factors are discussed in more detail on the next two pages.

Water Wisdom

- You can reduce your landscape watering 30 to 50 percent by adjusting your irrigation each season.

Water Wisdom

- Rainwater is very beneficial for your plants, and it's free. You can harvest rain by contouring your yard with small berms, channels, or swales to direct water runoff to your plants.
- Place a rain gauge in your yard. If you receive at least ½" of rain you can skip your next irrigation cycle.

Landscape Plant Watering Tips

Signs of Underwatering

- Older leaves turn yellow or brown and drop
- Leaves are dull, wilted, or drooping
- Leaves curl
- Stems or branches die back

Signs of Overwatering

- Leaves turn a lighter shade of green or yellow
- Young shoots are wilted
- Growth is excessive
- Algae and/or mushrooms are on or around plants

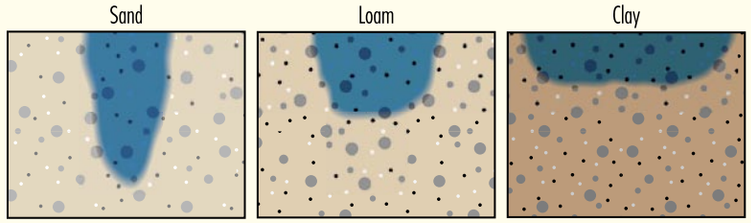
Plant type: Different plant types (or species) will need different amounts of water to stay healthy. You will notice in the Guidelines a distinction between desert adapted and high water use plants. A desert adapted plant can go much longer between waterings than a high water use plant. Low water use plants can help you save water in your landscape.

High water use	Desert adapted
Citrus	Palo Verde
Hibiscus	Texas Sage
Rose	Penstemon

Plant size: A tree has a large root zone, so the soil and roots in a tree's root zone form a large water storage tank. That means large plants need more water at each watering, but can be watered less frequently.

Soil type: Soil absorbs and holds water like a sponge. Different types of soil will hold different amounts of moisture.

COMPARATIVE WETTING PATTERNS FOR DIFFERENT SOIL TYPES



One inch of water applied to the soil surface will penetrate approximately 12 inches in sand, approximately 7 inches in loam, and approximately 5 inches in clay soil.

How do you adjust your watering to account for soil type? Here's an example: According to Table C (page 9), a 4-foot shrub needs about 12 gallons of water to wet the root zone.

Sandy soil requires less water to wet the root zone. However, that water will not be held by the soil as long. In sandy soil, you would give the shrub less than 12 gallons, but water more frequently.

Clay soil requires more water to wet the root zone, but it will hold the water longer. In clay soil, you would give the shrub more than 12 gallons, but water less frequently.

Plant establishment: The Watering Guidelines are designed for established plants. On average, the root system of a shrub will be well established after one year, and a tree after three years. New plantings need to be watered more frequently. The schedule below offers guidelines to help new plants get established.

WATERING SCHEDULE FOR NEWLY PLANTED DESERT ADAPTED PLANTS*

Weeks 1 & 2	Water every 1-2 days in summer, every 3-4 days fall through spring
Weeks 3 & 4	Water every 3-4 days in summer, every 6-7 days fall through spring
Weeks 5 & 6	Water every 4-6 days in summer, every 7-10 days fall through spring
Weeks 7 & 8	Water every 7 days in summer, every 10-14 days fall through spring
After week 8	Gradually extend the time between irrigations until plants are established

Note: After the eighth week, move the drip emitters to the outer edge of the root ball.
* High water use plants will require more frequent irrigations.

To determine the watering frequency that is best for your landscape, simply take these variables—plant type and size, soil type, and plant establishment—into account. For example, if you have small plants in sandy soil, water on the more frequent end of the range. For large plants in clay soil, water on the less frequent end of the range. Through observation and periodic checks for underwatering or overwatering, you will get a good feel for your plants' water needs. Remember that the best fertilizer for the garden is the gardener's shadow.

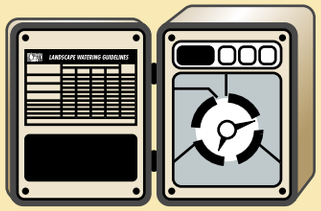
Water Wisdom

- If you place mulch—especially organic mulch such as wood chips or compost—over your plants' root zones, moisture will stay in the soil longer. Mulches reduce evaporation by covering the soil and keeping the temperature cooler. Keep mulches 2 to 4 inches from plant stems. You can cover organic mulches with granite if you prefer.

Photo: Charles Mann, Designer: Landscaping by André

Water Wisdom

- Once established (1-3 years), many plants that are desert adapted can survive on rainfall along with occasional supplemental waterings during extended dry periods.
- Potted plants have restricted root systems and less soil compared to plants established in the ground. They will typically need more frequent watering.
- Use the 'off' or 'rain' setting on your controller to stop the watering cycle without disturbing your programs.



If you have the opportunity, select a controller that is easy to use. Look for these features:

- Multiple program capability
- Watering intervals of 14 days or greater
- Run time options of 2 hours or greater
- Battery backup feature to maintain your programs and clock during a power outage

Scheduling with an irrigation controller or automatic timer

A good irrigation controller that is properly programmed can keep your plants healthy and save a lot of water. However, for efficient watering, you can't just set it and forget it. Change the watering frequencies as plants become established and as the seasons change.

Use the basic instructions printed inside the controller door to input your programming information. To get started, there are four important pieces of information that need to be entered and maintained:

- Current day and time
- Start times
- Watering days or frequency
- Length of time to water

After inputting the program, double-check your entries to make sure they are correct. You can run a program test by pressing the semiautomatic button if your controller has this option. This will run the program immediately, then not water again until the programmed days and times. Some controllers will also allow you to run a program test by pressing the manual button (check your irrigation controller instruction book).

If you don't have instructions for your controller, write down the make and model and call a home and garden center or sprinkler supply company for help. Many of the larger controller manufacturers will even talk you through programming over the phone. You might also be able to find instructions for your controller on the Internet.

IRRIGATION CONTROLLER PROGRAM EXAMPLE
SUMMER WATERING SCHEDULE

Valve/Station	A Program	B Program	C Program	Valve/Station Description	Start Time	Watering Days
1	30 minutes	–	–	Turf sprinklers	4 a.m.	Mon & Thur
2	30 minutes	–	–	Turf sprinklers	–	–
3	–	3 hours	–	Desert shrubs drip	7 a.m.	every 14 days
4	–	30 minutes	–	Citrus trees bubblers	–	–
5	–	–	6 hours	Desert tree drip	11 a.m.	every 21 days

Tips:

- On each controller program, group the valves or stations that require similar watering frequencies.
- Enter different start times on different programs to avoid overlap.
- Enter only one start time for each program, even when there are multiple valves on the program.
- Multiple start times on a program are useful when germinating grass or to split the watering time to reduce runoff.

Perform frequent checks on your system

Since your irrigation system provides a lifeline to the plants in your landscape, remember to include it in your regular maintenance routine. To water your landscape efficiently, your irrigation system must be working properly. At least twice a year do a thorough check of all parts of your irrigation system.

General Watering System

- ❑ Check that the controller program is correct.
- ❑ If the controller has battery backup power, replace the battery yearly.
- ❑ Operate each station to make sure valves are opening and closing properly.
- ❑ Check for leaks. Look for standing water, soggy ground, and eroded soil.
- ❑ Open the valve box while the system is running and check for leaks.

Sprinklers

- ❑ Replace broken or missing sprinkler heads.
- ❑ Don't mix head types on the same system.
- ❑ Check that sprinkler heads are flush with the soil surface and straight, not tilted.
- ❑ Clear grass and obstructions that block sprinkler spray.
- ❑ Adjust sprinkler heads so they don't spray walls, driveways, or sidewalks.

Drip or Bubbler System

- ❑ Fix and replace clogged or missing emitters.
- ❑ Check for water placement around plants.
- ❑ Move emitters out to dripline as plants grow.
- ❑ Adjust basin sizes for bubblers.

Landscape Watering and Maintenance Calendar

January	Flush your irrigation system and check the filter.
February	Move emitters out to the dripline of all trees and shrubs as they grow.
March	**Adjust your controller for spring schedule.**
April	Do a thorough check of your irrigation system. Replace controller backup battery.
May	**Adjust your controller for summer schedule.**
June	Check emitters and sprinklers.
July	Check your controller settings after every power outage.
August	Check emitters and sprinklers.
September	Move emitters out to the dripline of all trees and shrubs as they grow.
October	**Adjust your controller for fall schedule.**
November	Do a thorough check of your irrigation system.
December	**Adjust your controller for winter schedule.**

Water Wisdom

- Water dry spots by hand instead of running the entire sprinkler system longer.
- Graywater (used household water from clothes washers, bathtubs, bathroom sinks, and showers) can be used to water your landscape, saving money and our valuable water. However, you must follow state, county, and city guidelines. For more information, call the Arizona Department of Environmental Quality at 1-800-234-5677.

Water Wisdom

- A number of factors contribute to appropriate and efficient landscape watering. The information contained in this brochure has been developed as a general guideline only and may need to be modified for your specific plants and site conditions.
- For more water-saving tips in and around your home, visit www.wateruseitwisely.com.
- For an interactive version of this guide, including run time calculators and printable customized watering schedules, go to wateruseitwisely.com.

WATER USE IT WISELY

This brochure developed by Donna DiFrancesco, City of Mesa, and Robyn Baker, City of Scottsdale. Special thanks goes to Andy Terrey and Steve Priebe, City of Phoenix. Technical assistance provided by the late Dr. Jimmy Tipton, Terry Mikel, Dr. David Kopec, Dr. Paul Brown, and Dr. Thomas Thompson of the University of Arizona Cooperative Extension.

Landscape Watering in the Real World (Troubleshooting)

Controller runs irrigation at strange times

Check the program for proper input, but also check that the controller did not revert to the factory default program (commonly 10 minutes each day). This can happen during a power surge or power outage. If the controller has battery backup capabilities, make sure the battery is charged.

One valve won't stop watering

This occurs most often when a faulty valve gets stuck in the "on" position. You can confirm this by turning off the power to your controller. If the valve continues to water, it is a problem with the valve. If the valve stops watering, it is likely a controller or program malfunction.

Salt accumulation

Salt buildup may occur due to the watering and evaporation cycle. Plants may eventually show salt burn symptoms such as leaf yellowing and leaf burn. Leach salts from the soil two to three times each summer by irrigating twice as long as usual. Heavy summer rains might also leach the salts away.

Water runoff from your yard

If water runs off your yard during the irrigation cycle, then split the watering schedule. Water for half the calculated time and repeat after one hour.

Sprinklers watering sidewalk, driveways, walls, or the street

It is very common for sprinklers to get out of adjustment or misdirected. This creates a great deal of water waste and can damage structures and pavement. Check the condition of your sprinkler heads frequently, especially after you've mowed.

Water squirts from emitters

Water should not squirt or shoot from your drip emitters. Replace emitters that have blown off the tubing or are not working properly. If emitters pop off the tubing frequently, your drip system pressure may be too high. Call a professional landscaper to check your system.

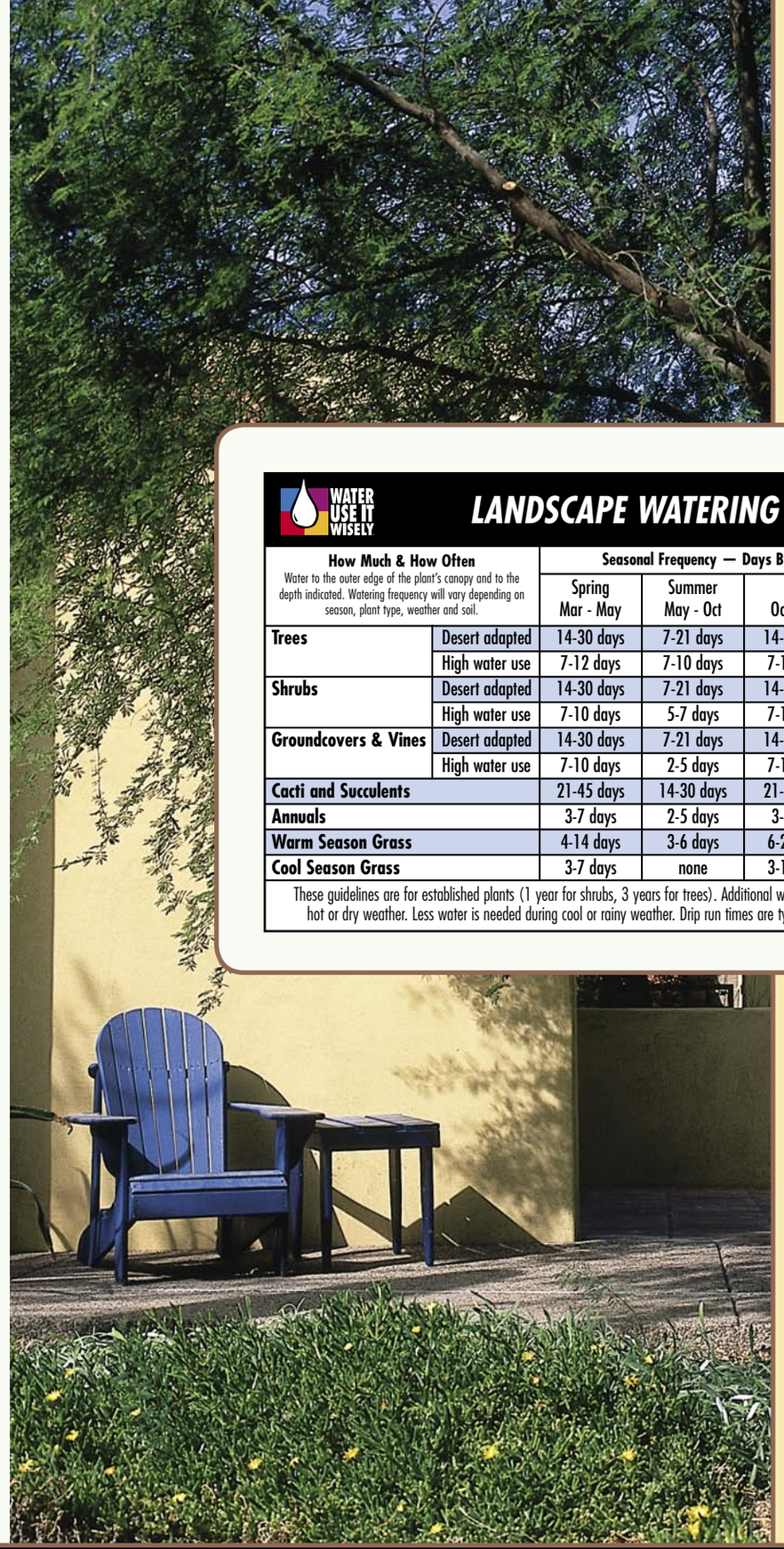


Photo: Kent Newland, Designer: Richard Doria

Water Wisdom

- Cut out or photocopy the chart below and post it as a reminder to change your irrigation controller seasonally.

LANDSCAPE WATERING GUIDELINES

How Much & How Often Water to the outer edge of the plant's canopy and to the depth indicated. Watering frequency will vary depending on season, plant type, weather and soil.		Seasonal Frequency — Days Between Waterings				Water This Deeply (Typical Root Depth)
		Spring Mar - May	Summer May - Oct	Fall Oct - Dec	Winter Dec - Mar	
Trees	Desert adapted	14-30 days	7-21 days	14-30 days	30-60 days	24-36 inches
	High water use	7-12 days	7-10 days	7-12 days	14-30 days	24-36 inches
Shrubs	Desert adapted	14-30 days	7-21 days	14-30 days	30-45 days	18-24 inches
	High water use	7-10 days	5-7 days	7-10 days	10-14 days	18-24 inches
Groundcovers & Vines	Desert adapted	14-30 days	7-21 days	14-30 days	21-45 days	8-12 inches
	High water use	7-10 days	2-5 days	7-10 days	10-14 days	8-12 inches
Cacti and Succulents		21-45 days	14-30 days	21-45 days	if needed	8-12 inches
Annuals		3-7 days	2-5 days	3-7 days	5-10 days	8-12 inches
Warm Season Grass		4-14 days	3-6 days	6-21 days	15-30 days	6-10 inches
Cool Season Grass		3-7 days	none	3-10 days	7-14 days	6-10 inches

These guidelines are for established plants (1 year for shrubs, 3 years for trees). Additional water is needed for new plantings or unusually hot or dry weather. Less water is needed during cool or rainy weather. Drip run times are typically 2 hours or more for each watering.

Depth of water in tenths of an inch

10
8
6
4
2

Cut out and use with the can test on page 5.

This booklet, as well as other water-saving information, is available from the following offices:

City of Chandler
Water Conservation Office
Phone: (480) 782-3580
TDD: (800) 367-8939

Town of Gilbert
Water Conservation Office
Phone: (480) 503-6098
TDD: (480) 503-6080

City of Glendale
Water Conservation Office
Phone: (623) 930-3596
TDD: (623) 930-2197

City of Goodyear
Water Management Department
Phone: (623) 932-3010
TDD: (623) 932-6500

City of Mesa
Water Conservation Office
Phone: (480) 644-3306
TDD: (480) 644-2778

City of Peoria
Utilities, Water Conservation
Phone: (623) 773-7286
TDD: (623) 773-7221

City of Phoenix
Water Conservation Office
Phone: (602) 261-8367
TDD: (602) 534-1113

City of Scottsdale
Water Conservation Office
Phone: (480) 312-5650
TDD: (480) 312-5419

City of Tempe
Water Conservation Office
Phone: (480) 350-2668
TDD: (480) 350-8400

Arizona Municipal Water Users Association
Phone: (602) 248-8482

Alternative formats are available by contacting the cities listed.

WATER USE IT WISELY

www.wateruseitwisely.com