How Much to Water

Shrubs and Trees

Garden Tip TB1110

Technical Bulletin Series

Gardening Tips for successful Landscapes and Gardens

This question is the most asked in Nurseries today. Without adequate questioning of the customers soil condition, type of emitters and plant variety, any answer provided has little chance of being correct. This Garden Tip discusses Shrubs and Trees, NOT Lawns.

Lawn watering is covered in TB1111

Frequency of Watering vs. Quantity of Water. Know the difference. Days per week represents "frequency", while "minutes of run time" (indicating gallons of water) represents quantity. Change your frequency of watering throughout the seasons, and attempt to leave the minutes unchanged.

The following recommendations for appropriate typical watering amount and frequency are not specific guidelines. These are provided to the reader as a convenience, in order to compare typical with their individual situation. Soil, Sun, Slope and Plant type differ greatly, and so will water requirements. Gardeners are often only looking for a starting point and general guidelines for watering. This bulletin only seeks to satisfy this request, while providing some background information regarding various landscape environments and plant types.

HOW OFTEN SHOULD YOU WATER YOUR SHRUBS and TREES?

These recommendations are only typical – Conditions may differ for individual landscapes.

Drought tolerant plants may often be watered less often, but generally will be healthy with regular schedules.

Soil Composition is a CRITICAL aspect for watering frequency, and is not presented here due to complexity. The table below assumes an average drainage time of 40 to 60 minutes (see TB1472).

Please consult with a qualified professional to make certain proper watering is selected for your landscape.

Typical watering frequency **	**Winter** **F < 60 º** **10 hour day**	**Spring – Fall** **F < 80 º** **11 hour day**	**Summer** **F > 80 º** **12+ hour day**
Small plants and vegetables.	1 - 2 per week	2 – 3 per week	3 - 5 per week
Intermediate Plants / Conditions ¥	2 per week	2 – 3 per week	3 - 4 per week
Shrubs	1 – 2 per week	2 per week	2 – 4 per week
Trees (established)	2 per month	1 per week	2 – 3 per week
Desert Plants	1 -2 per month	2 - 3 per month	1 – 2 per week

TABLE 1

** Watering frequency is estimated at a minimum preferred for plant health. With adequate drainage, slightly more frequent irrigations will not cause problems (as this decision must take into account all the various plants being serviced by "one particular zone"). Exceptional weather (such at heat or wind) will cause the soil to dry more quickly, necessitating more irrigations during that period. These estimations are also based on soil with an average 30-to-50-minute drain-time. Use of the Garden Calculator Pro-I can reduce the complexity of these decisions.

¥ Any plant in an area slightly sunnier than recommended, higher water consumer, or located in

faster draining soils will need a bit more regular irrigations than those in more normal conditions. Check with your Plant, Soil and Irrigation Specialist.

HOW MUCH SHOULD YOU WATER YOUR SHRUBS and TREES?

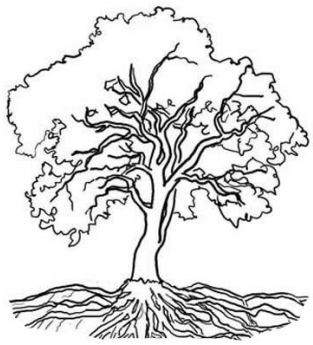
(how many gallons / minutes**)**

Remember "how many minutes" varies with the emitter you use.

Most are rated in gallons per hour, so for convenience…

Please consult with a qualified professional to make certain proper watering is selected for your landscape.

The size of a plant's root system is the critical factor in HOW MUCH water to apply during an irrigation, and if the roots are not large enough for the plant it will suffer. The Garden Calculator Pro-I can quickly answer this for any plant you have, and of course soil composition has a big impact too. As a rule of thumb, it will take about 0.5 gallons of water for every square foot over the primary root system. Example: a rose might have a 2 x 2 primary root system – therefore needs 2 gallons of water. The better this moisture is spread throughout the root area – the healthier the plant. The images below should help you get an idea of where the primary root system should be.



Water applied deep & wide

Water applied in multiple spots

Typical Watering Time & Amount

Hard – Slow Draining Soil minutes / gallons	**Good – Loamy Soil** minutes / gallons	**Sandy – Fast Drain** **minutes / gallons**
Small Plants 30 – 60 mins **0.2 – 0.5 gal**	**Small Plants** 15 - 45 mins **0.4 gal / sq ft.**	**Small Plants** **10 - 30 mins** **0.5 gal / sq ft.**
Intermediate Shrubs ¥ 30 – 90 mins **0.4 gal / sq ft.**	**Intermediate Shrubs ¥** 20 – 45 mins **0.5 gal / sq ft.**	**Intermediate Shrubs ¥** **15 – 30 mins** **0.6 gal / sq ft.**
Shrubs / Trees * 30 – 90 mins **0.4 gal / sq ft.**	**Shrubs / Trees *** 20 – 60 mins **0.5 gal / sq ft.**	**Shrubs / Trees *** **15 – 30 mins** **0.6 gal / sq ft.**
Drought Tolerant **Shrubs / Trees **** 30 - 90 mins **0.3 gal / sq ft.**	Drought Tolerant **Shrubs / Trees **** 20 – 60 mins **0.4 gal / sq ft.**	Drought Tolerant **Shrubs / Trees **** **15 – 60 mins** **0.4 gal / sq ft.**
Succulents 30 – 45 mins **0.2 – 1.0 gal**	**Succulents** 10 – 45 mins **0.3 – 2.0 gal**	**Succulents** **15 – 30 mins** **0.4 – 3.0 gal**

TABLE 2

In order to determine runtime minutes, the above table is an estimation based on using slow rate "one gallon per hour" drip emitters. Hard soil absorbs water very slowly. The slower moisture is applied – the deeper it permeates into the soil. This provides larger root systems and longer lasting moisture.

If you are utilizing high flow rate sprays or emitters, the total gallons will remain the same as long as this does not cause puddling and run-off. The amount of time the emitters would run will obviously be changed according to the flow rate of the emitters used.

¥ A plant in an area slightly sunnier than recommended, or a higher water consumer. Here the amount of water needed is the same as a traditional plant, but varies according to soil type. The frequency that is needed for application is substantially different. See TABLE 1.

* The quantity of gallons for any SHRUB or TREE is also going to vary according to the size of its' CANOPY or SPREAD. Here the Canopy refers to the height and width (whichever is greater) of the Tree, and spread refers to the width and area of a shrub or groundcover type plant. This in turn determines the square feet area of soil under that plant needing irrigation.

** The quantity of gallons for any "DRUOUGHT TOLERANT" Shrub or Tree is also going to vary according to the size of its' CANOPY or SPREAD, but as this type of plant can tolerate a shallower root system the quantity of water per sq ft. is slightly less. The sq ft. area requiring irrigation can also be reduced.

Though plants do well to have a root system as extensive as the size of their canopy or spread, they can generally do well with from 50% to 75% of that (as measured by square feet). Depending on the water use type of plant and soil composition type.

For "Moderate" water use shrubs and trees consider this area to be about 75% the size of the canopy. For "Desert or Drought tolerant" plants consider this area to be about 40% to 50% the size of the canopy. Example: A drought tolerant tree with a canopy that spread 10 ft. in width would have approximately 50 sq. ft. root area.

Use the **Garden Calculator Pro-I** or check with a
Nursery Irrigation Specialist if you need help calculating.

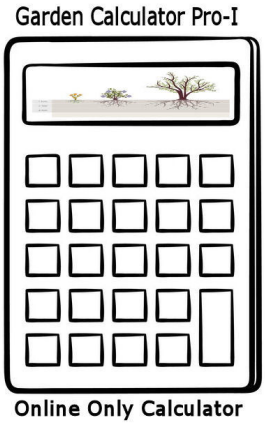
With all your shrubs and desert plants larger than 1 foot in height, you should have a minimum of 2 to 3 drips on each plant. This makes certain that you have adequate coverage around the root system, and not just on one side.

Soil Composition type. Clay, sand and loam all have different water holding capacities and drainage rates. Most of the landscapes in the Desert Southwest are very slow to drain, but not all! Know the characteristic of your soil, and in particular the soil where you intend to plant. Slow draining soils should be watered 'less often'.

Using this Watering Guide

Remember that watering frequency and duration is based on many variables. Things like time of year, soil type (sand, clay or loam) and plant location (sun, shade or slope) all play a part in your decision. For best results, get in touch with your soil and experiment!

Try Using the Garden Calculator Pro I



Location. On a slope? Most slopes will drain quite a bit faster, while others (due to clay) may not. Does water run to this location, or away from it. Does this area get extreme heat and reflected sun in the summer? All of these things will affect water requirements. If plants in a unique location do not have a

different zone or valve than the other, you will very likely have a hard time keeping them all healthy.

Cover under canopy of other plant. Mulch insulates the soil and keeps it from drying out as quickly as it would under normal conditions. Proper use of mulch can minimize the water frequency requirements.

Different Seasons. Plants need water less often in the winter months. Most often in the summer. Try to leave the quantity of water, or minutes you run your drips, mostly constant throughout the year. This helps to keep soil salts build-up to a minimum, and helps to develop and maintain deeper roots. The root system doesn't get smaller when it's cold.

Small flowering plants and vegetables are often on the same zone as the lawn and so watered the same as lawn. If this works for you and you're happy with the results, then stick with it. If you don't have excellent drainage in your beds, frequent watering will cause the soil to become soggy causing chlorosis and root rot. Overhead sprays will cause problems like misshapen fruit, blossom rot, stem rot, leaf spot and other fungus problems, especially in hot weather. It also encourages plant pests like aphids. Plants with large leaves may shed the water and prevent the roots from getting a sufficient amount of moisture.

Shrubs and trees have (or need to have) a deeper, more extensive root system and different water requirements. If possible have them on a different valve or time zone in your irrigation system. Sprinklers can work but drip irrigation is a much more efficient and less costly way to care for your landscape plants. A good rule of thumb is 1-2 gallons of water for smaller accent plants, 3-5 gallons for larger shrubs and 10 gallons of water for a 15 gallon plant each time you water. Boxed trees will need even more water but it doesn't have to be applied every day. Planting a new boxed tree requires "deep watering" otherwise much of the root system will die off.

Try Using the Garden Calculator Pro I

Desert plants need thorough, widely spaced watering to look their best. Follow the Advice Sheet for new plantings and use the same amounts recommended for shrubs and trees above. When established, once a week, even less in winter, will work well for most desert trees and shrubs. Cacti need water even less often. A good soaking every 2 weeks should be sufficient.

Container plants have small amounts of soil and generally need more water than those in the landscape, especially during our hot summers. If watering by hand, keep a close watch on your plants. Low humidity and hot winds dry them out quickly. A one-inch layer of bark or coarse mulch will conserve moisture in these conditions. On the other hand, if there is standing water empty your saucers and drain trays. If the pot remains in standing water, the soil will become waterlogged and your plant will suffocate. Drip emitters and soaker lines can be adapted to hose bibs on porch or patio and do a good job on container plants.

Consider switching to dripper lines, or drip irrigation. Consult a Nursery Irrigation Specialist for specific information depending on your situation. In any event, applying water directly to the root zone and using surface mulches will reduce watering frequency for most flowers and vegetables. Winter flowers need even less since soil evaporation is greatly reduced by colder temperatures. Keep your soil evenly moist for the first few weeks after planting so these shallow-rooted plants can become established.

If you decide on drip, you have made a great choice for the long-term health and ease of maintenance for your plants. You will need to determine how many emitters and where to place them. In addition to this the run time for irrigation will need to be established in order to provide the right amount of moisture and adequate time for that water to permeate the soil. This decision can not properly be made without knowledge of the soil composition in the area.

The Garden Calculator Pro I

really helps make this easy

The Garden Calculator Pro-I (a free online tool) was designed to help you or your landscape professional evaluate your soil and the resulting emitter placement and emitter density.

This irrigation and soil calculator takes the necessary parameters into account and returns answers that will greatly assist in the long-term health of your plants.

If this type of investigation is beyond what you personally would be interested in doing, it certainly is well within the scope of any dedicated landscape professional to utilize and gain success from the application.

As you can see, watering in desert climates is truly quite a science. It's not as simple as it might seem. Understanding the water needs of different plant groups and the nature or composition of your soil will help substantially towards success. Lastly, please choose the right irrigation system for your landscape and learn how to run it correctly. Don't let it run you!