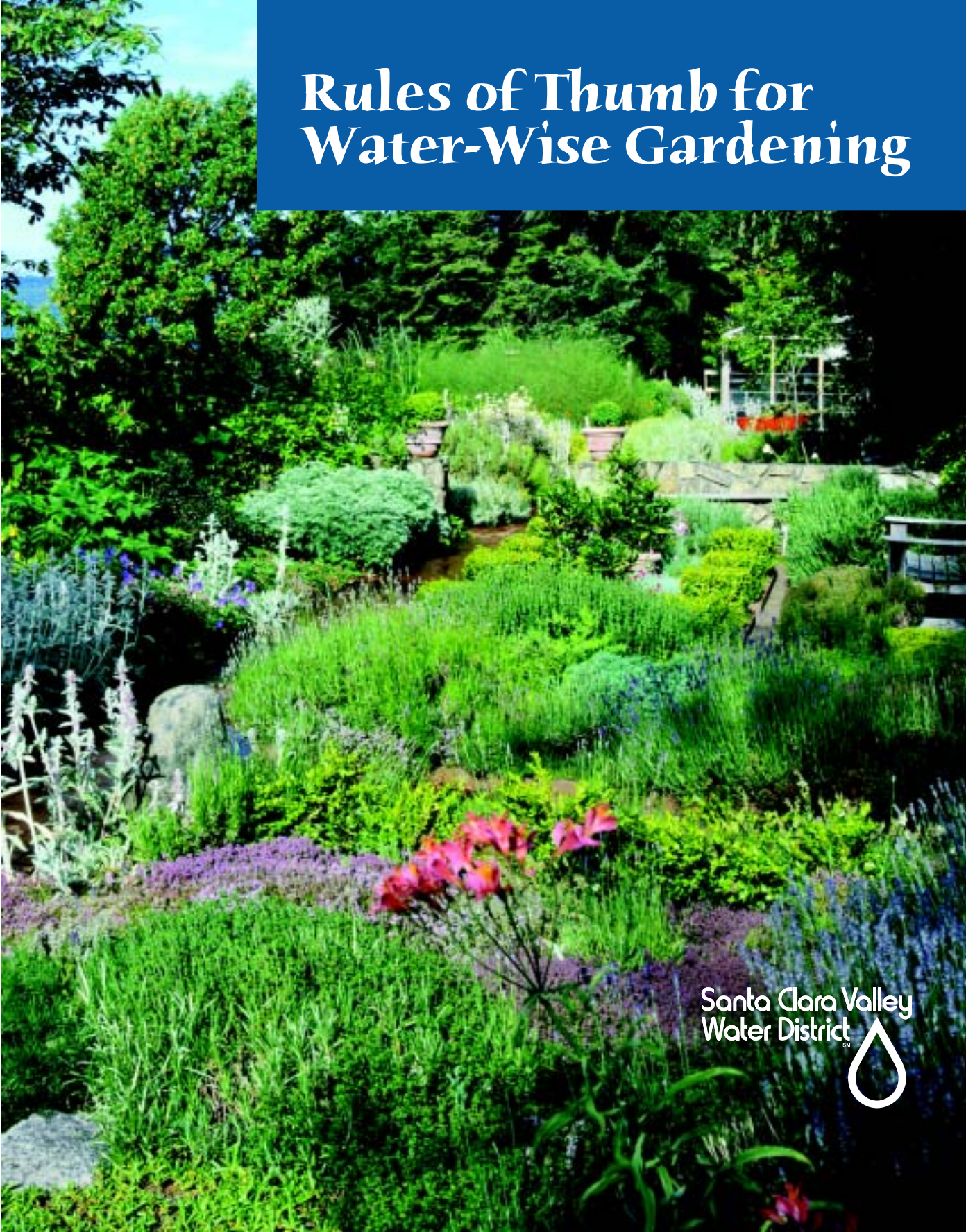
Rules of Thumb for Water-Wise Gardening



Santa Clara Valley Water District

Rules of Thumb for Water-Wise Gardening

1 Design Your Water-Wise Garden

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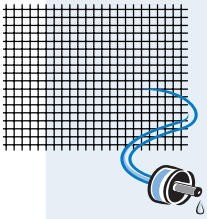
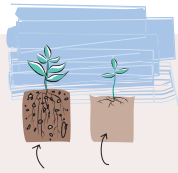


- Climate zones
- Know your site
- Watering zones
- Plan lawn areas
- Plan a watering system
- Controller selection
- Hardscape

HIGH
MODERATE
LOW
NO



2 Do the Groundwork

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- Know your soil
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3 Water Wisely

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- When to water
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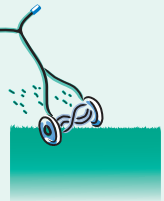
- Watering lawns



- Monitor water use
- Lawn care
- Fertilizing
- Pruning
- Pest control
- Mulch

4 Maintain Your Water-Wise Garden

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South Bay climate zones

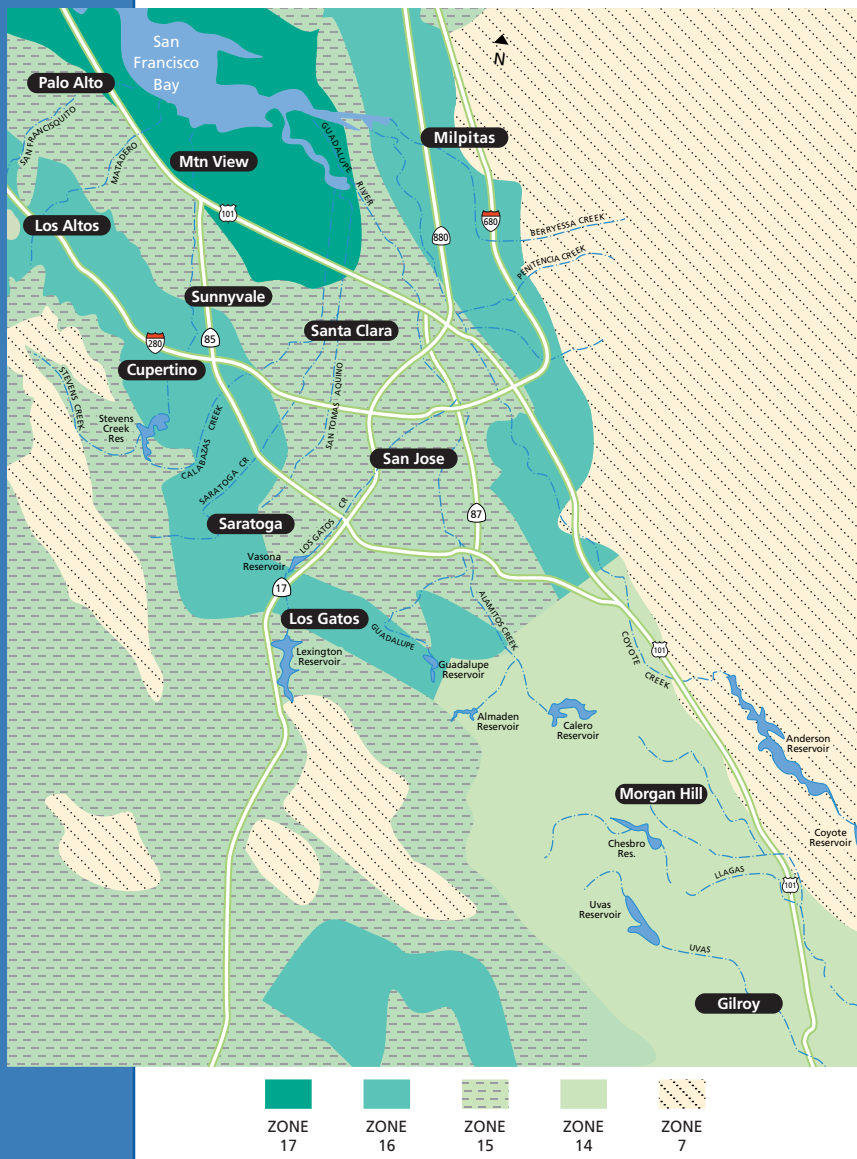
Get to know the climatic factors that influence which plants will do well in your garden. Varying amounts of sun, heat, moisture and frost will influence which plants will survive and thrive in your garden.

South County
(hotter and drier in the summer and colder and drier in the winter):
Gilroy, Morgan Hill, South San Jose

Mountain Influence
(cooler with an increased chance of fog in the winter and summer):
Cupertino, Los Altos Hills, Los Gatos, Saratoga, Monte Sereno

Bay Influence
(moderate summers and winters, nearly frostless winters):
Alviso, Campbell, Los Altos, Milpitas, Mountain View, Palo Alto, San Jose, Santa Clara, Sunnyvale

Zone information courtesy of Sunset Magazine



ZONE 17 | ZONE 16 | ZONE 15 | ZONE 14 | ZONE 7

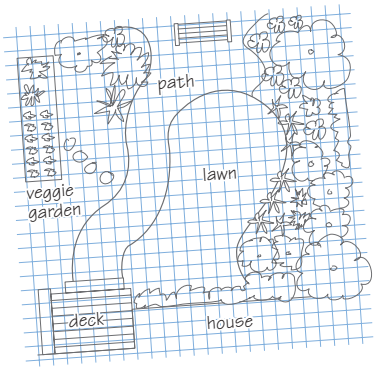
1. Design Your Water-Wise Garden

Planning is the first step for a successful water-wise garden. A well-planned landscape will save you money, time and water.

Get to know your site

Paying attention to your garden's unique characteristics will help you put the right plants in the right place. Look around carefully and note the following (use the notes section on page 20):

- Where are the sunniest areas? How long does the sun shine there each day?
- Where are the shadiest areas?
- Do you have any slopes? How steep?
- Are there any spots where drainage is a problem?
- Is wind a particular problem?
- Are there any views you'd like to enhance or screen?



A landscape map can be the backbone of a successful design.

How will you use your garden?

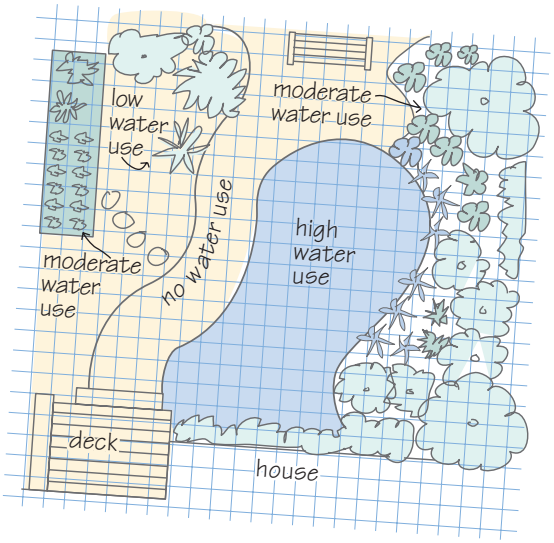
Will it be a place of quiet contemplation or a play space for kids? Will it be used for:

- Entertaining
- Play or sports
- Vegetable gardening
- Erosion or climate control
- Wildlife habitat

In addition, where are the most appropriate places for paths or walkways to the house?

Water-use zones

High water-use plants generally do better in shady areas. Before you purchase plants, look at the following chart, noting the different types of zones you have. Next, draw a rough map of your garden based on the zone information.



Mapping out your water-use zones makes landscape planning easier.

HIGH water-use zone

Lawns, fruit trees, water-loving plants

Container plants

MODERATE water-use zone

Roses, deciduous trees, plants needing a little more water

May take advantage of runoff from downspouts and patios

LOW water-use zone

Native plants such as California Poppy and California Morning Glory, established trees and plants

Requires little, if any, additional water during summer months

NO water-use zone

Permeable hardscapes such as brick or flagstone set in sand and established plants that can survive on rainfall only

Planning for lawn areas

Lawns are great for play and entertaining. But they also use lots of water and require continual upkeep. When planning your garden, think about how much lawn you actually need, and place it where it will be enjoyed. Consider lawn alternatives, such as hardy ground covers, decks, patios, containers, ornamental grasses or cut-flower gardens.

Groundcovers: Attractive, fragrant–even edible

Varieties of thyme, yarrow, verbena, chamomile and other herbs make delightful perennial lawn alternatives. What's more, they smell good when stepped on, can be used in cooking and generally require much less maintenance than lawns. Other herbs, such as sweet woodruff, make great shade-tolerant groundcovers. After you "zone" your landscape, ask your nursery professional for the best groundcover suggestions for your particular site.

Turf Tips

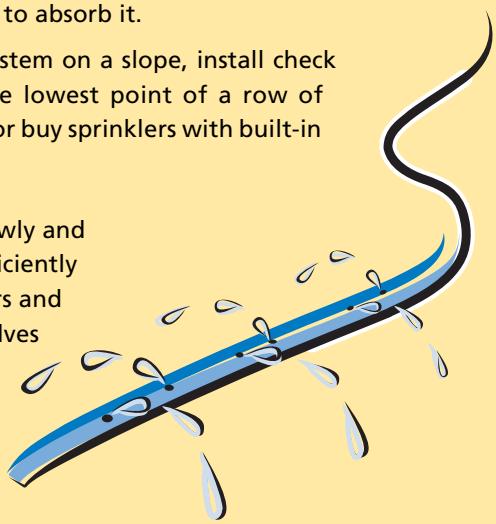
- Place grass near the house and in areas of heavy use.
- Avoid using grass on steep slopes, next to fences and along narrow walkways
- Plant turf only where it will be used and enjoyed, such as in your backyard.
- Try water-conserving turf varieties. Hybrid tall fescue grasses need less water than bluegrass.
- Some sprinkler systems are less efficient at watering narrow lawn areas, so plan accordingly and be sure to check your system.

Plan an efficient watering system

Design your watering system after planning all the zones, plants and hardscapes. An efficient irrigation system applies the right amount of water to the right place at the right time.

- Check your water pressure. If it is greater than 80 psi, consider installing a pressure-reducing valve.
- Design your watering system to match your plan's water-use zones.
- Choose equipment appropriate for your design, layout and type of landscape.
- Use separate irrigation valves for each water use zone so individual scheduling is possible.
- Make sure that drip emitters or sprinklers do not apply water faster than the soil's ability to absorb it.
- When designing a watering system on a slope, install check valves before sprinklers at the lowest point of a row of sprinklers to reduce puddling, or buy sprinklers with built-in check valves.

Drip systems apply water slowly and directly to the root zone, and efficiently water trees, shrubs, ground covers and containers. Filters and pressure reduction valves are often required.



Soaker hoses are inexpensive, easy to install off of a hose bib, and do well in narrow planting beds.

Sprinklers are best used for lawns and larger, high-water-use areas. They should apply water slowly and with uniform coverage; heads should be placed so that the water from one sprinkler reaches the adjacent heads, called head-to head coverage.

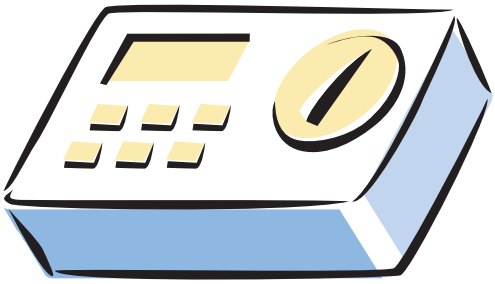
Need Help?

You can consult nursery personnel, landscape designers, landscape contractors or a landscape architect. Ask for referrals from friends and neighbors. Check with previous clients to see examples and ask about their experiences with the landscape professional.

Choose a good controller

Look for these features:

- Look for a "smart controller," which is based on real weather data.
- Allows you to set varying watering times for each station. A drip station may need to run one hour a week, whereas a lawn may need to be watered twice a week for 15 minutes each.
- Features multiple watering times: good for slopes or heavy clay soils.
- Has a battery back-up or "non-volatile" memory. Controllers which do not have back-up memory often water every day for 10 minutes as a default after power outages.
- Has a water-budgeting feature which quickly lets you adjust your watering times depending on the season.
- Rain shut-off device capability (device is purchased separately).



Used properly, a controller with the right features can be one of the most effective water and money-saving tools you can buy.

Including hardscape in your garden design can save water and money and add versatility to your landscape.

Permeable Hardscape: alternatives to concrete

For high-traffic areas, entertainment areas or to reduce maintenance, consider replacing turf grass with permeable hardscape. You can use decorative stepping stones, natural rock pavers or bricks set in sand. Permeable paving allows water to percolate through the soil for filtration and keeps stormwater on-site reducing urban flooding.

Decks with seating areas are another good permeable hardscape alternative. Pots, fence-hanging flower baskets and decorative fence or wall ceramics can turn your deck or patio into an outdoor "room" for entertaining.

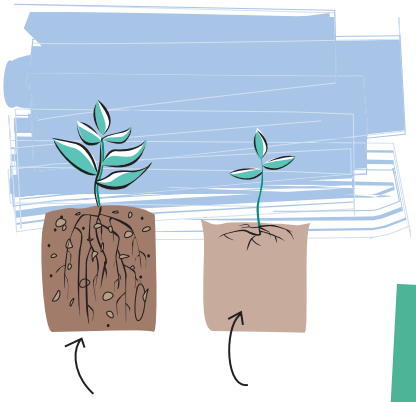
2. Do the Groundwork

Impulse shopping at the nursery can be fun. But devoting some serious thought and planning to your garden before you buy—from the soil to the watering system—will save you money and headaches in the long run.

The right plant in the right place

Before you purchase plants, read up on their water, sun, soil and maintenance needs. Using your zone diagram and rough map from Step 1, choose plants that correspond to appropriate zones in your garden. Group plants together that share similar water, sun and soil needs. And remember—they grow! The one-gallon plant you buy today could grow into a 20-foot tree, so be sure to select plants that will grow to an appropriate size for their location. Following recommended guidelines for spacing can also help prevent overcrowding of plants.

Check projected growth and height of any tree or shrub you plant, and choose its location accordingly. Otherwise, you could end up with a space-hungry pruning challenge, like this blue spruce.



Roots in an amended soil have room to reach out to acquire water and nutrients.

Compacted soil makes it difficult for roots to develop properly, depriving the plant of air, water and nutrients.

Get soil-savvy

Many water-wise and other plants prefer loamy to partially sandy soil that drains well, yet holds some water. Santa Clara County soils tend to be primarily clay, which retain water for a long time. This type of soil often gets compacted, which can be harmful to root systems.

Soil Type	Identification	Texture
Sand	Forms a ball. Crumbles easily.	Gritty
Loam	Forms a ball. Holds shape.	Smooth with grit
Clay	Forms a ball. Holds shape very well.	Smooth

Improve the soil

It's a good idea to check your garden's soil and, if necessary, add organic materials to improve it. Some gardeners also test the pH of their soil for acidity/alkalinity, which can be altered by working in organic materials.

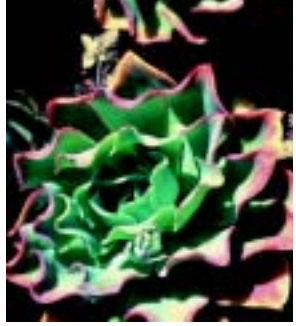
Soil Amendments

Many gardeners believe that they need to use either sand, gypsum or lime to improve the quality of their soil; however, this is often untrue. To aerate your soil, try using organic matter (see below) instead of sand. Lime is rarely needed in Santa Clara County because it is often used to lower acidity of soils typically located in wetter climates. Gypsum is extremely difficult to properly mix with the soil and is rarely needed in residential landscapes.

Compost	Mix in compost from your garden or obtain varieties available at local nurseries to improve the quality of your soil. Mushroom, redwood and fir compost are commonly available in nurseries throughout Santa Clara County. Free compost or composting classes may be available through your local city.
Manure	Both aged chicken and steer manure are frequently used as a mulch or soil conditioner.
Mulch	Any organic material placed over the soil, such as shredded bark or leaves, also adds nutrients to your soil. See page 18–19 for more details on mulches.

Choosing plants

Water-wise gardens focus on plant varieties that thrive with little water. However, no plant is "wrong" in a water-wise garden—it just needs to be in the right zone to use water most efficiently. You can select desert plants, Mediterranean varieties, herbs and perennials from around the world, or native plants. Lush plants, such as ferns and mosses, can play a part, provided they're in the right water-use zone (see Step 3, "Water Wisely"). Include a lawn if you like—but consider limiting it to play/entertainment areas, and use low-water-use grass varieties.



Succulents use little or no water.

Nurseries in Santa Clara County feature an ever-growing number and selection of water-wise plants. Several (see the list inserted into the back pocket of this guide) specialize in particular plants or offer personalized services. It's fun and instructive to look through plant guides that focus on native, perennial and other water-wise plants. Remember to keep in mind your water-use zones and plants' individual water, sun and soil needs as you select plants. Using your map, write in names of plants for particular locations. You can also use the list on page 10.

Keep in mind your water-use zones and plants' individual water, sun and soil needs when selecting plants.

Columbines are colorful, moderate-water-use perennials.

Want ideas?

There are many local and Greater Bay Area water-wise gardens and specialized nurseries. Check our website at www.valleywater.org for locations and phone numbers.

Sword ferns are a high-water-use plant.

Many perennials, like this poppy, are low-water-use plants.

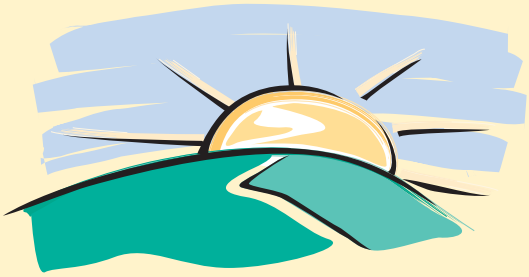
Plant Wish List

A list of low water using plants can be found on our website at www.valleywawter.org

Plant name	Water needs			Sun needs			Notes
	High	Medium	Low	Full sun	Partial sun	Shade	Other needs, size, maintenance; bloom season

3. Water Wisely

It pays to know when, how much and how often to water your plants. A flexible watering schedule—preferably using a drip irrigation system—can save water and money by adjusting to changing weather conditions. Your watering schedule can also help prevent runoff, encourage deep root growth and better meet plants' changing water needs.



Water at the right time

If you have a drip system, you can run it anytime because it minimizes water loss from evaporation and runoff. Sprinkler systems, on the other hand, should be run when it's not windy and when it's cool. Early morning is best because it reduces the chance of mildew forming on the plant and water loss due to evaporation.

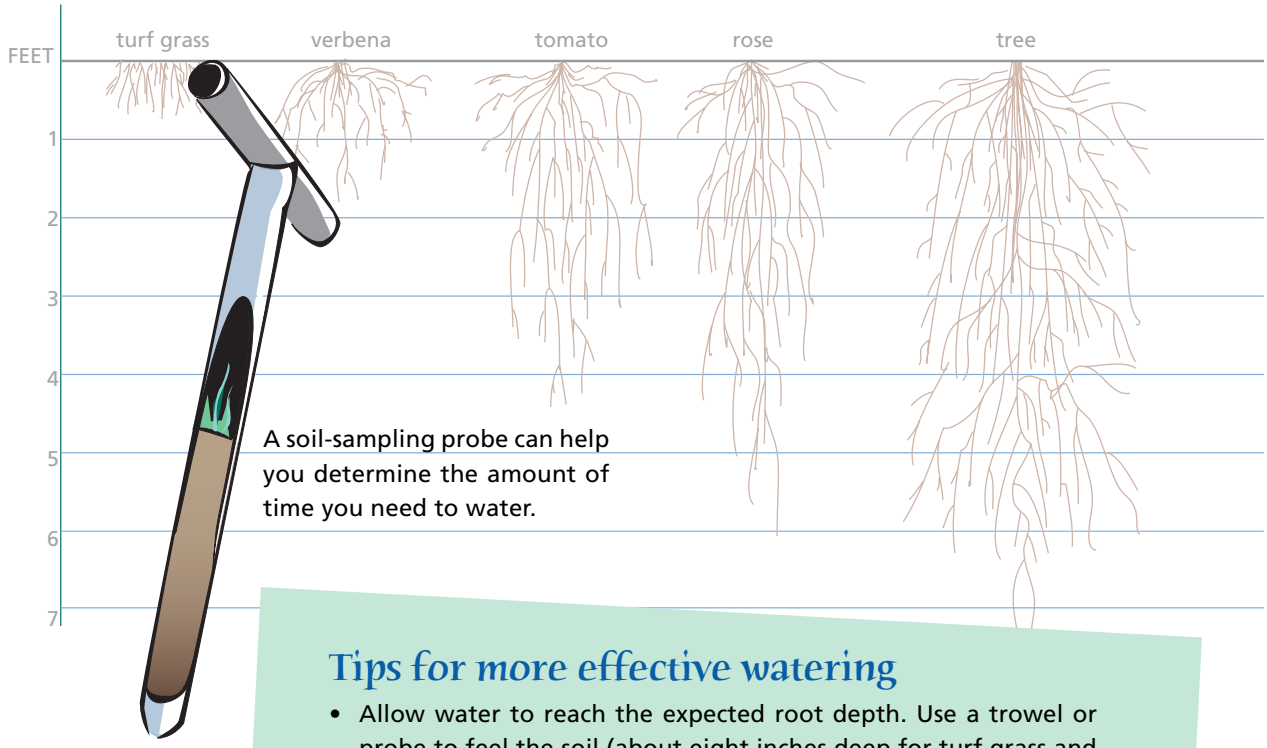
Water deeply but infrequently

Deep soakings encourage roots to utilize moisture deep in the ground and enable plants to thrive between waterings. How much to water? Use your soil type as a watering guide ("Get soil savvy" on page 8).

Watering at the right time of day can save water and money.

Soil Type	Watering Considerations
Sand	Apply water faster and more often.
Loam	Apply water at a moderate rate but less often than for sandy soil.
Clay*	Apply water slowly and infrequently. If you have heavy clay soil, consider adding compost to improve drainage and aeration.

*Most common soil type in Santa Clara County



A soil-sampling probe can help you determine the amount of time you need to water.

Tips for more effective watering

- Allow water to reach the expected root depth. Use a trowel or probe to feel the soil (about eight inches deep for turf grass and two to three feet for shrubs and trees). Record the total time required for water to reach this depth.

Total time required for water to reach eight inches _____

Total time required for water to reach two feet _____

- Apply only the amount of water the soil can absorb at any one time. Stop watering before runoff or puddling occurs. You may need to divide the irrigation time into several shorter periods or cycles.

- Before watering again, allow the soil to dry to a depth of several inches; time and record how long that takes. Then, water again for the same amount of time, watering in cycles if necessary.

Total time required for soil to dry to a depth of several inches _____

- Get to know your plants' signals for water. If moisture is low, grass tends to lie flat under footprints. Some plants lose their luster and begin to droop before wilting. It's best to water before the onset of such stress.

Adjusting your watering schedule

When the weather and seasons change, adjust your watering schedule (and irrigation controller, if you have one). On warm or windy days, plants and soils dry out more quickly. During cooler and wetter months, you won't need to water as often. In December, January, and February the controller can be completely turned off and only operated occasionally if there is an extended dry period. Check the soil periodically for moisture content.

A garden's water needs vary with the seasons.

Tip

In our mild-winter, semi-arid climate, fall is one of the best times to plant your landscape.

As plants grow and become more established, they often need less water. Check plants periodically and gradually decrease watering frequency, but continue to water deeply when you do irrigate.

Photo courtesy of Kay Stewart

Watering on a slope

- If possible, terrace the slope and create basins around your plants.
- Use shorter watering times to avoid runoff; add another watering cycle if necessary.
- Consider planting a groundcover on the slope instead of a lawn.
- Use drip or rotor spray sprinklers on slopes.

Watering your lawn

Did you know that nearly half the summertime water used by local homes goes toward lawn watering? Lawns need to be watered only once every three days to remain healthy and green, yet many are overwatered and unhealthy. Here's a tried-and-true method for determining how long to operate your sprinklers if you water every third day.

Remember to change your irrigation timer seasonally!

Spring
Mar. 15 - May 14

Summer
May 15 - Sept. 14

Fall
Sept. 15 - Nov. 14

Winter
Nov. 15 - Mar. 14

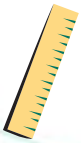
Lawn Problems?

Consult a landscape professional, or check with your local nursery.

1 Measure sprinkler ouput

Place five or more straight-sided cans or coffee mugs randomly around your lawn

Run your system for 15 minutes.



With a ruler, measure the depth of the water in each can or mug.

Then determine the average water depth of the containers.

2 Determine how long to water your lawn

3 Write down your watering schedule

WATERING RUN TIMES (Every 3 days)

Average water depth in cans	Santa Clara San Jose		Morgan Hill Gilroy		Los Gatos Mtn View		Palo Alto Los Altos	
	SUMMER	FALL & SPRING	SUMMER	FALL & SPRING	SUMMER	FALL & SPRING	SUMMER	FALL & SPRING
1"	9 min.	6 min.	11 min.	7 min.	8 min.	5 min.	8 min.	5 min.
3/4"	12 min.	8 min.	14 min.	9 min.	11 min.	7 min.	9 min.	6 min.
5/8"	15 min.	10 min.	17 min.	11 min.	14 min.	9 min.	12 min.	8 min.
1/2"	18 min.	12 min.	20 min.	13 min.	17 min.	11 min.	15 min.	10 min.
3/8"	24 min.	16 min.	27 min.	18 min.	21 min.	14 min.	20 min.	13 min.
1/4"	36 min.	24 min.	39 min.	26 min.	33 min.	22 min.	29 min.	19 min.
1/8"	72 min.	48 min.	80 min.	53 min.	65 min.	43 min.	59 min.	39 min.

NOTE: Use this watering chart as a guide only. During winter months, water only during extended dry periods.

Remember, the ground is like a sponge. To make sure it can absorb all the water your lawn needs, divide your total watering time into two or three cycles. For example, if your lawn requires 18 minutes of watering, don't water once for 18 minutes; instead, water three times for six minutes each. Water between 5 a.m. and 9 a.m., if possible.

IRRIGATION RUN TIMES:

STATION 1	STATION 2	STATION 3	STATION 4
SUMMER / FALL & SPRING	SUMMER / FALL & SPRING	SUMMER / FALL & SPRING	SUMMER / FALL & SPRING
min. / min.	min. / min.	min. / min.	min. / min.

STATION 5	STATION 6	STATION 7	STATION 8
SUMMER / FALL & SPRING	SUMMER / FALL & SPRING	SUMMER / FALL & SPRING	SUMMER / FALL & SPRING
min. / min.	min. / min.	min. / min.	min. / min.

Clip and post near irrigation controller.

IRRIGATION FREQUENCY:

Although the preferred watering frequency is once every three days, you may need to water more frequently if your lawn soil is compacted, if the lawn has a thick layer of thatch* or if it is on a slope. Ideally, you should aerate or dethatch, so water can percolate through the soil. If that is not possible, you may need to water every other day during the hot summer months. If you water every other day, use the fall/spring column instead of the summer column on the chart above to determine your daily watering time.

* Compressed grass & leaves

4. Maintain Your Water-Wise Garden

A small amount of regular maintenance throughout the year is all your garden needs to look great. Follow the tips below for an effective maintenance plan.

Checking your irrigation system

Clogged, leaking or misaligned drip emitters and sprinkler heads waste a lot of water—and money. Be water-wise and keep an eye on your system with these tips:

- Every month check your sprinkler heads and drip emitters for clogging, leaks and malfunctioning (e.g., broken or misdirected) heads, then get them fixed. Clean the emitter filters twice a year.
- Look for wilting trees, shrubs and groundcovers and for dry spots in the lawn. They could point to inadequate water coverage or indicate that more water is needed if adequate coverage already exists.

Checking and adjusting your controllers

- Adjust your controller schedule every month in order to properly adjust your irrigation for the changing weather.
- Replace your controller battery every six months.

Mowing, dethatching and aerating lawns

To look their best, lawns need constant upkeep, including regular mowing and aeration.

- Aeration allows water to penetrate and percolate downwards to grass roots. It promotes efficient use of water and also reduces soil compaction. To aerate, invest in a hand aerifier or a pair of aerating shoes. You can also rent an aerifier or pay a service to aerate your lawn. You may need to aerate more frequently depending upon the amount of foot traffic on your lawn.
- Dethatching, or removing undecomposed grass stems, leaves and roots, is important because this layer prevents air and water from entering the soil, leading to plant disease and water waste due to runoff. Dethatch a small lawn with an iron garden rake, or, for larger lawns, rent, purchase or pay a service to use a vertical mower, which cuts through the thatch with a series of revolving blades. Remove thatch during the growing season so the grass has an opportunity to recover.
- Raise the mowing height of your lawn mower to encourage a more extensive root system. For bluegrass and tall fescue lawns set your lawn mower to cut two to three inches high. For additional information contact a lawn care professional or check with your local nursery.

Fertilizing

Fertilizers, especially organically-based ones, can work wonders for your garden. But too much fertilizer can damage plants and can impact stream and Bay water quality through storm drain runoff. So fertilize as needed, when new growth is less than normal or if color appears pale—but be sure to follow directions.

- One of the best, easiest and cheapest forms of fertilizer is compost. You can start a backyard compost pile easily with kitchen scraps (no meat), garden and lawn clippings, strips of newspaper and a little soil. Check your library, garden center or the Internet for a how-to guide. Some cities also offer composting classes.
- Consider using organic fertilizers, such as aged and dried manure, cottonseed meal and dried blood meal.
- Try using a low-nitrogen fertilizer (nitrogen stimulates growth, creating a demand for more water).

If you do use chemical fertilizers, try a slow-release variety.

Pest control

Insects, snails and other critters—some beneficial, some harmful—are an integral part of any garden. Sometimes the most effective methods of controlling them are also the simplest. As with other maintenance, pest control should be part of your gardening routine.

- Begin by using simple physical control measures, such as hand-picking and setting traps and barriers.
- Try biological control measures by introducing predatory insects, such as aphid-eating green lacewings or ladybugs, or by using bacterial insecticides, such as *Bacillus thuringiensis*. Your garden center may have others to recommend.
- As a last resort, control with chemicals. Choose the least toxic products available (e.g., insecticidal soaps, horticultural oils, silica gel, diatomaceous earth and pyrethrin-based insecticides), but follow directions and use sparingly.

Pruning

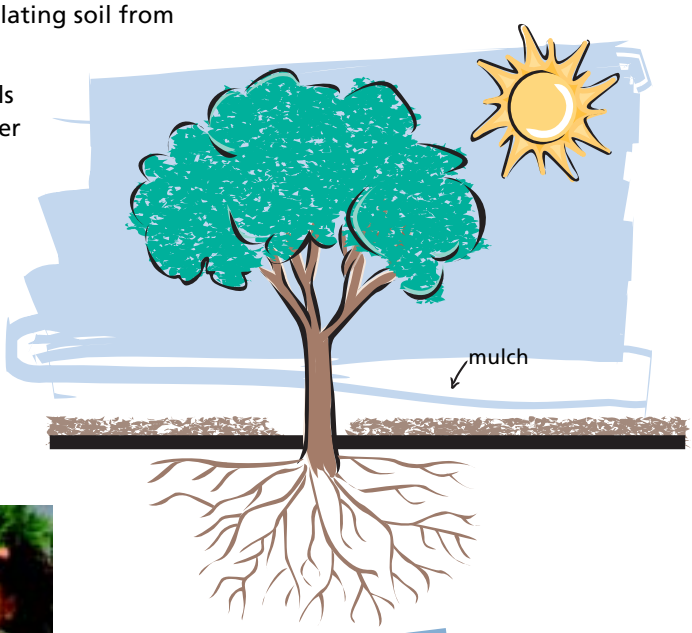
Pruning can be a regular part of your gardening routine, rather than a demanding yearly ordeal. Prune portions of your plants that are dead, diseased or damaged.

To direct growth, lightly prune during the winter months before spring growth begins.

Mulching

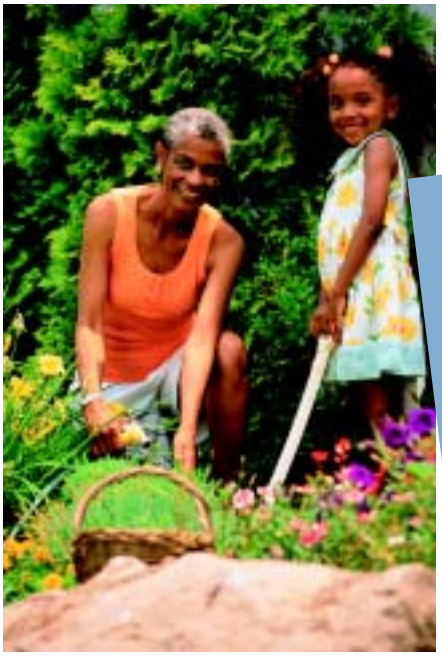
Mulch is one of the quickest, easiest and most cost-effective ways to save water in your garden. It provides an attractive surface as well as many other landscape benefits. Mulch can:

- Conserve water by reducing evaporation
- Suppress weed growth
- Reduce erosion by allowing water to penetrate the soil
- Encourage better root growth by insulating soil from temperature extremes
- Balance soil temperature, keeping soils cooler in summer and warmer in winter
- Improve soil



Applying mulch

Mulch should be layered three to four inches deep over the soil. Keep mulch about six inches away from the base of plants to prevent fungal diseases. Avoid using mulched material from diseased plants.



Weeding Tips

- Pull weeds when shoots first appear, before they set seed.
- It's easiest to pull stubborn weeds when the soil is damp.
- To keep weeds down, use mulch consistently.

Which mulch to use?

Organic Mulches

Mulch type	Facts
Bark	Bark is available ground, shredded or in chips. Ground fir, pine, hemlock or redwood are attractive and long-lasting. Fine-textured sawdust and wood shavings require nitrogen to decompose. Check the package label and, if not present, add a nitrogen supplement before applying.
Straw	Although short-lived, straw is inexpensive and virtually free of weed seeds.
Aged or composted animal manures	Animal manures are effective for about a year. Fresh manure can burn plant roots.
Agricultural by products	Agricultural by-products such as mushroom compost, ground corncobs and apple or grape pomace vary by region; check your garden center for resources.
Tree leaves	Tree leaves with thicker textures, like most oaks, make good mulch. Thin-textured leaves (maple leaves, for example) will compact into a water-repellent mat and are not recommended.
Grass clippings	Grass clippings should be spread in a thin layer and allowed to dry before adding another thin layer.
Recycled wood chips	Recycled wood mulch is made from reclaimed, chipped wood, and is colored with vegetable dye. It is long lasting, and the process diverts wood waste from landfills.

Inorganic Mulches

Mulch type	Facts
Polypropylene plastic	Polypropylene plastic (landscape fabric) allows air and water to pass through, but suppresses weed growth. Use it on steep slopes to limit runoff and erosion. For a more attractive appearance, cover the plastic with organic mulch. It helps conserve water; however, it does not build up the soil.
Rocks	Rocks are available in varying sizes, shapes and colors and make a permeable and permanent mulch. They help conserve water; however, they do not build up the soil.
Jute netting	Jute netting is fully biodegradable in 2 to 3 years depending on soil and weather conditions. It can be used as a soil stabilizer and erosion control agent on slopes. It absorbs water at 4 to 5 times fabric weight.

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