

WATER WISE LANDSCAPE HANDBOOK

Save water and enjoy a beautiful yard
with these landscape tips





Colorado is a dry state, averaging only 15 inches of precipitation a year. By using Xeriscape techniques, watering your landscape efficiently and implementing sustainable gardening practices, you can reduce your water use and maintain a stunning yard that complements Colorado's natural beauty.



Xeriscape principles

Xeriscape organizes high- and low-water-use plants to maximize watering efficiency and create a landscape that's sustainable in Colorado's dry climate. Denver Water coined the word in 1981 to help make water-efficient landscaping an easily recognized concept. Xeriscape is a combination of the word "landscape" and the Greek word "xeros," which means dry.

If designed properly, Xeriscape can be lush, colorful and easy to care for. The Xeriscape concept is based on seven principles:

- Plan and design
- Soil amendment
- Efficient irrigation
- Mulch
- Plant zones
- Alternative turf grasses
- Maintenance



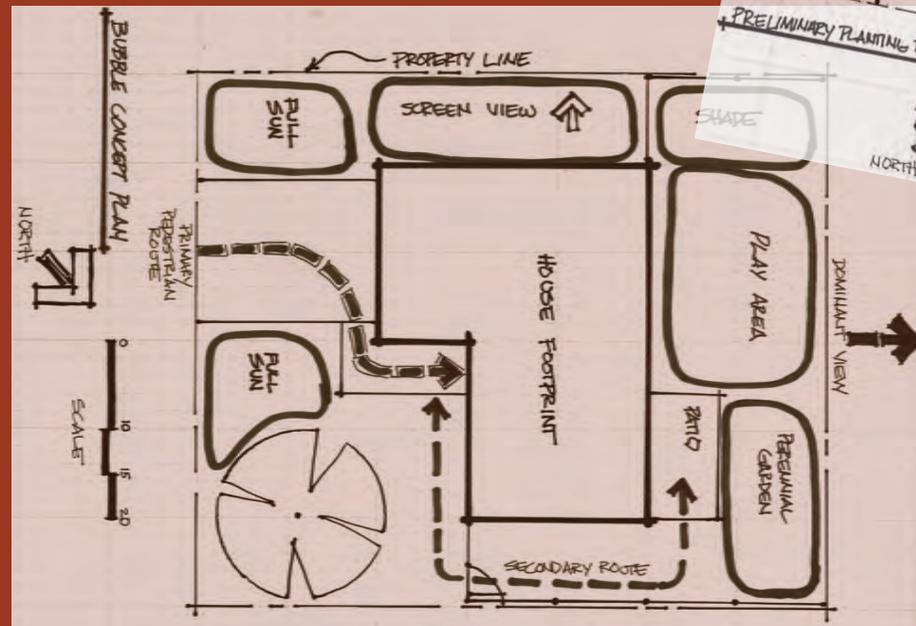
1. Plan and design

Create a diagram, drawn to scale, that shows the major elements of your landscape, including house, driveway, sidewalk, deck or patio, existing trees and other elements.

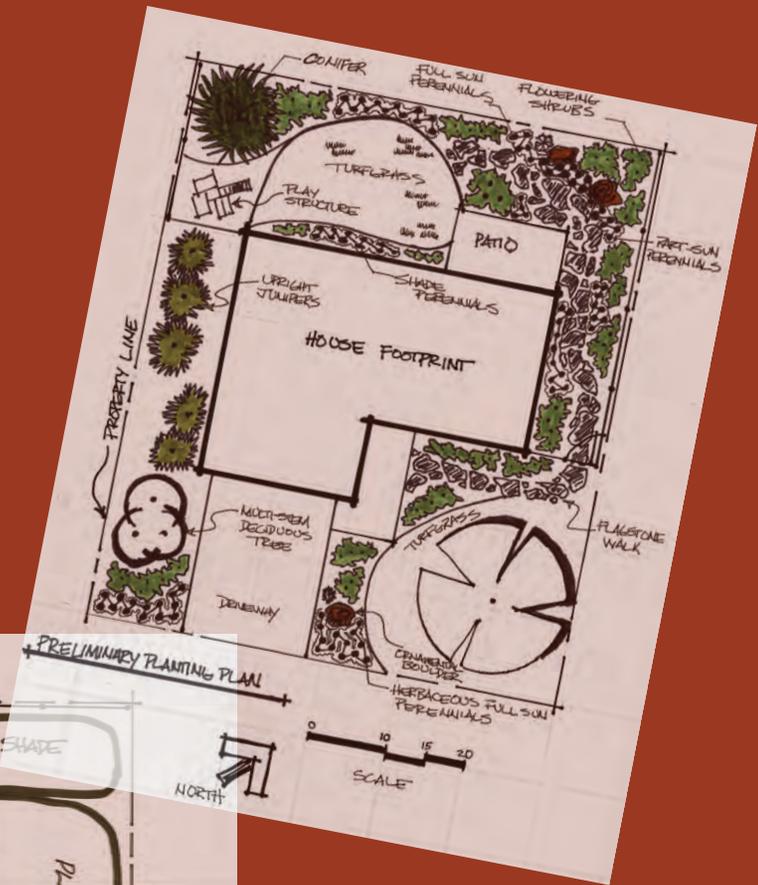
Once you've completed a site plan of your existing property, think about how you want to use your new Xeriscape. Do you want it to be a place for dogs to run? Curb appeal? Frame or screen views? Create a conceptual plan that shows the areas for turf, perennial beds, views, screens, slopes, etc. Once finished, develop a planting plan that reinforces the areas in the appropriate scale of mature plant sizes.



Site Plan



Conceptual Plan



Planting Plan

XERISCAPE

2. Soil amendment

All plants will benefit from the use of compost. In our predominantly clay and sandy soils, compost tilled to a depth of 4 to 6 inches loosens the soil and changes its texture to allow water to be better stored and released. For most plants, that equates to 1 to 2 inches of compost over the area to be tilled. Native plant material needs minimal compost to establish an area.



3. Efficient irrigation

Xeriscape can be irrigated efficiently by hand or with an automatic sprinkler system. Zone lawn areas separately from other plants and use the irrigation method that waters the plants in each area most efficiently. For grass, use gear-driven rotors or rotary/high-efficiency spray nozzles that have larger droplets and low angles to avoid wind drift. Spray, drip line or bubbler emitters are most efficient for watering trees, shrubs, flowers and ground covers in designated beds.

If you water by hand, avoid oscillating sprinklers and other sprinklers that throw water high in the air or release a fine mist. The most efficient sprinklers release big drops close to the ground. To maximize efficiency and allow the soil time to soak up the water, add multiple start times and reduce each zone's watering time. Never water between 10 a.m. and 6 p.m. to reduce water lost to evaporation. If you have an automatic sprinkler system, adjust your controller regularly to accommodate weather conditions. Also, install a rain sensor to shut off the device when it rains.



4. Mulch

Mulch keeps plant roots cool, prevents soil from crusting, minimizes evaporation and reduces weed growth. Organic mulches, such as bark chips, pole peelings or wood grindings, should be applied at least 4 inches deep. Fiber mulches create a web that is more resistant to wind and rain washout. Inorganic mulches, such as rocks and gravel, should be applied at least 2 inches deep. Boulders, rocks and gravel make great natural drainage areas or dry beds. Keep plants to the edge to create a meandering appearance. Limit surrounding plants with rock because it will make the area hotter.



5. Plant zones

Different areas in your yard receive different amounts of light, wind and moisture. To minimize water waste, group together plants with similar light and water requirements, and place them in an area that matches these requirements. Put high-water-use plants in low-lying drainage areas, near downspouts or in the shade of other plants.

Dry, sunny areas or areas far from a hose are great places for low-water-use plants that grow well in our climate. Planting a variety of plants with different heights, color and textures creates interest and beauty.



6. Alternative turf grasses

Native grasses (warm-season) that have been cultivated for turf lawns, such as buffalograss and blue grama, can survive with one-fourth of the water that bluegrass varieties need. Warm-season grasses green up around mid-May, grow fastest in summer, and go dormant with the first hard frost, usually in early October. They tend to have a light tan color while dormant.

Cool-season grasses grow fastest in spring and tend to go partially dormant in the heat of the summer. They grow best in temperatures between 60 and 75 degrees. New cultivars of bluegrass, such as Reveille and tall fescue, can reduce typical bluegrass water requirements by at least 30 percent. Fine fescues can provide substantial water savings and are best used in areas that receive low traffic or are in shady locations.

Use appropriate and limited amounts of grass to reduce your watering and maintenance requirements.



Blue grama

Blue grama is Colorado's state grass. It is a warm-season, bunch grass with flat blades and a blue-green color.

Height: Mow to 2 1/2 to 3 inches or leave unmowed (8 to 15 inches).

Watering: 1/2 to 3/4 inch every two weeks during hot, dry spells.

Sun/shade: Full sun.

Traffic: Fair tolerance to traffic during periods of active growth.

Planting: Plant seed in early May to late July. Seed 2 to 3 pounds per 1,000 square feet of lawn.

Advantages: Attractive, requires minimal water and fertilizer once established, won't invade flower or vegetable beds. Good for sunny areas, such as slopes where foot traffic is minimal. Very heat- and drought-tolerant, goes dormant when stressed and can stay dormant for extended periods.

Disadvantages: Not very traffic-tolerant during dormancy (October through May). Weeds can be a problem, seed is expensive, doesn't perform well as a lawn above 6,500 feet elevation.

Blue grama

Buffalograss

Buffalograss

Buffalograss is a warm-season, sod-forming grass with fine blades.

Height: Mow to 2 to 2 1/2 inches or leave unmowed (4 to 8 inches).

Watering: 1/2 to 3/4 inch every two weeks during hot, dry spells.

Sun/shade: Full sun.

Traffic: Fair to good tolerance to traffic during periods of active growth.

Planting: Seed, sod and plugs available. In early May to late July, seed 2 to 3 pounds per 1,000 square feet of lawn.

Advantages: Attractive, requires minimal water and fertilizer once established. Good for sunny areas, such as slopes where foot traffic is minimal. Few insect or disease problems, low fertility requirement. Very heat- and drought-tolerant, goes dormant when stressed and can stay dormant for extended periods.

Disadvantages: Not very traffic-tolerant during dormancy (October through May). Weeds can be a problem, more prone to weed invasion when over-fertilized, stolons (above-ground stems) will invade vegetable and flower beds.

For more information on different types of Colorado grasses and their advantages and disadvantages, visit denverwater.org/Conservation/TipsTools/Outdoor/RightGrass/KnowYourTurf.

Reveille bluegrass

Reveille is a dark blue-green bluegrass that performs well in a variety of uses and locations.

Height: Mow to 2 1/2 to 3 inches.

Watering: ¾ to 1 inch of water per week in peak season (July).

Sun/shade: Sun, but it is also tolerant of shady locations.

Traffic: Holds up well to high traffic.

Planting: Seed or sod available. Seed 3 to 4 pounds per 1,000 square feet in April through June for best results.

Advantages: Used on both residential and commercial lawns; also can be used on athletic fields because of its resistance to foot traffic. Very tolerant to heat, drought and shade.

Disadvantages: Can be invasive into other areas if not controlled.

Reveille



Rhizomatous tall fescue

Rhizomatous tall fescue

Rhizomatous tall fescue has a strong, deep root system and is tolerant to drought.

Height: Mow to 2 1/2 to 3 inches.

Watering: ¾ to 1 inch of water per week in peak season (July).

Sun/shade: Sun, but it is also tolerant of shady locations.

Traffic: Holds up well to high traffic. Will self-repair.

Planting: Seed or sod available. Seed 3 to 4 pounds per 1,000 square feet in April through June for best results.

Advantages: Attractive uniform appearance, self-repairing turf, disease resistant. Shade and drought tolerant.

Disadvantages: Can creep into planting beds if not controlled.

7. Maintenance

All landscapes require some degree of care during the year. Turf requires spring and fall aeration along with regular fertilization every 6 to 8 weeks. Keep your grass height at 3 inches and allow the clippings to fall. Never cut more than one-third of the grass' height. Trees, shrubs and perennials will need occasional pruning to remove dead stems, promote blooming or control height and spread. Much of the removed plant material can be shredded and used in composting piles.

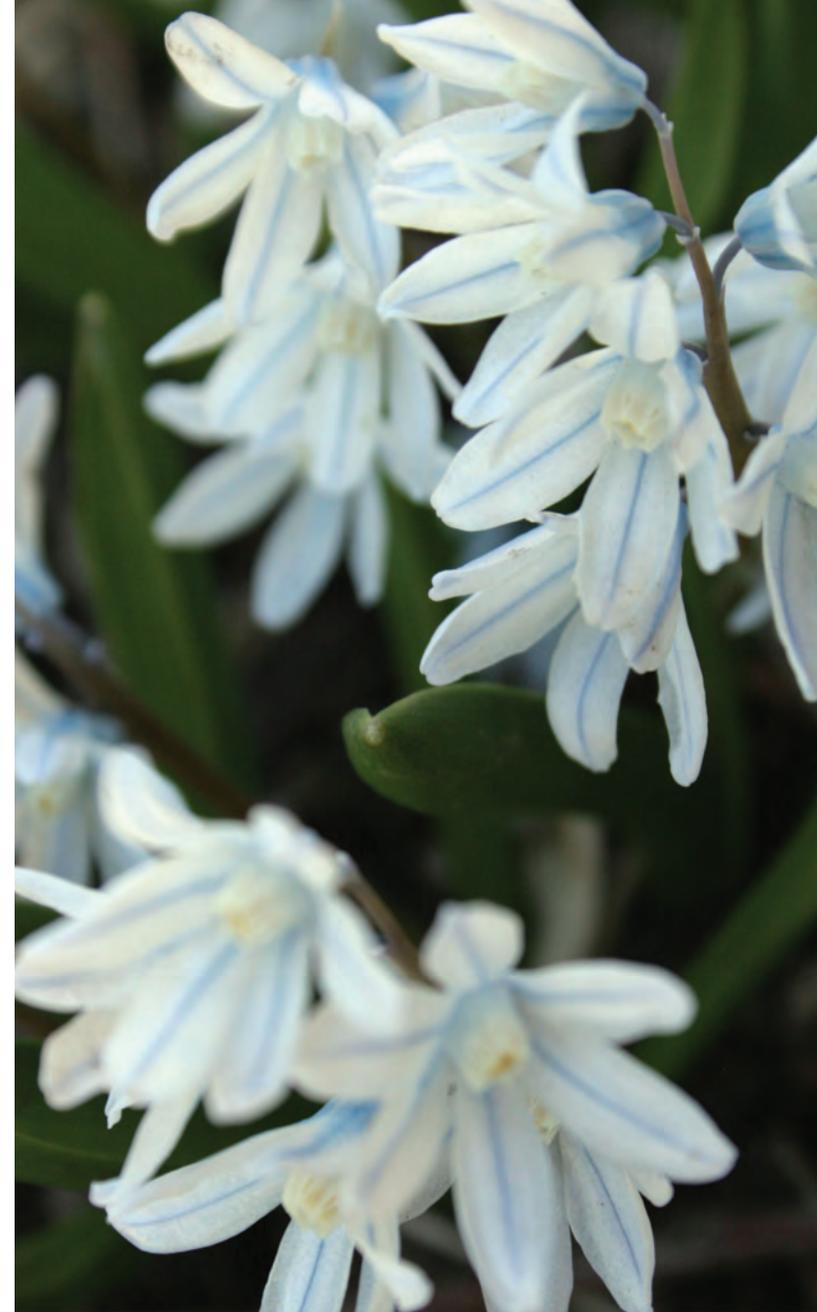




Many people put off Xeriscaping their yards because they're concerned about the cost. But with a little planning and some patience, you can landscape for surprisingly little money.

Tips to cut costs:

- Buy smaller plants. A plant in a 2-inch container is much less expensive than the same plant in a 1-gallon container. And within a year or two, you won't be able to tell the difference.
- Check home improvement stores and discount department stores for more common plants. Be careful to check cold hardiness (climate zones 1 through 5) of the plants to make sure they'll survive our harsh winters.
- Start plants from seed. A little patience can save a lot of money.
- Be proactive. Many plants can be easily started from cuttings. Others need to be divided periodically. Ask friends and neighbors if they want to share the cost of smaller containers (flats) or if they have any surplus plants they'd like to get rid of.
- Plan for low-maintenance yards. Use a shrub palette when designing perennial beds to reduce the total number of plants covering an area. Space plants according to the space needed at the plant's maturity.



TIPS TO CUT COSTS

Watering times

Use this chart to help determine the number of minutes to water each zone on the days you water. Keep in mind that these times are averages. Your water use should vary depending on rainfall and type of grass or plants, as well as shade and other characteristics of your yard.

Remember, watering is not allowed between 10 a.m. and 6 p.m. in Denver Water's service area. There are no assigned watering days, but never water a zone more than three days a week. Plan to "water, rest, water" by watering zones in increments, with rest periods to give water time to travel toward the grass roots.



WATERING MONTHS	MINUTES TO WATER PER ZONE (for lawn, based on three days per week)			
	Fixed Spray Heads	Rotor Heads	Rotary Nozzles	Manual Sprinklers
MAY	12	24	30	18
JUNE	17	35	43	26
JULY	18	36	45	27
AUGUST	14	27	34	20
SEPTEMBER	11	23	28	17

EFFICIENT

Watering methods

Using efficient watering techniques is the best way to green up your summer while using water wisely. The type of sprinkler head on your automatic irrigation system controls both coverage and application rate (speed of water delivery).

The two most common types of heads are:

Fixed spray head

- Pops up from the lawn's surface and sprays a fixed pattern; head does not rotate
- Ideal for smaller, fragmented, hard-to-reach areas
- Typically covers a radius of 5 feet to 17 feet
- Averages 1 ½ to 2 inches of water per hour (application rate)

Rotor head

- Pops up from the lawn's surface and rotates to cover the pre-set area
- Slowly waters within the arc of its rotation
- Covers a radius of 16 feet to 75 feet
- Averages ½ inch of water per hour (application rate)

Rain sensors

Rain sensors are a useful tool to avoid water waste. A typical residential rain sensor interrupts the circuit of an irrigation system's zone valves when a predetermined amount of rainfall is collected. When set and maintained correctly, rain sensors will prevent your irrigation system from operating in the rain and save water.

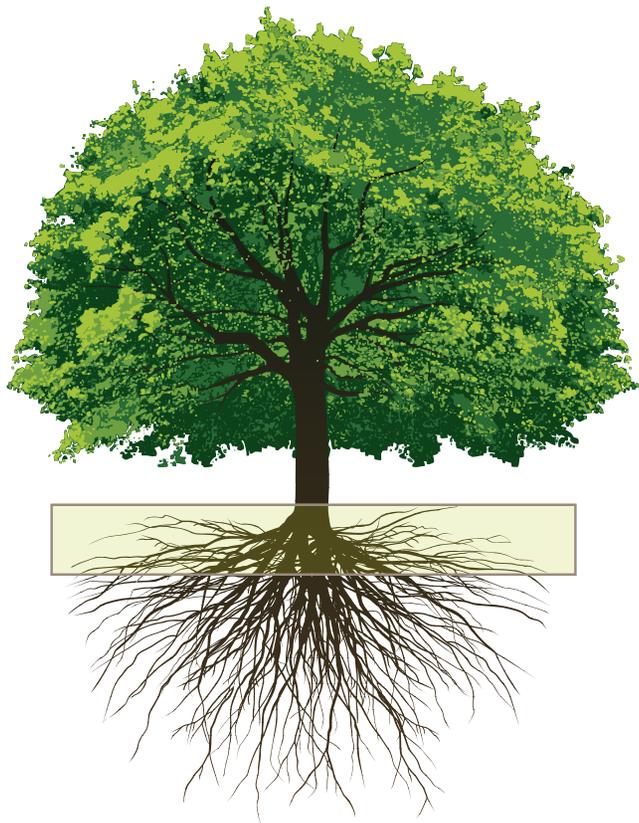


Fixed Spray Head



Rotor Head

LAWN WATERING



The boxed area is the drip line, or critical root zone.

Sometimes your trees could use a drink. Prolonged dry periods and high winds can dry trees and soil, and watering your trees will help ensure their optimum health. Moisture also prevents trees from becoming stressed. Stressed trees are more vulnerable to disease, insect infestations and branch death.

Tree roots are not like carrots

Tree root systems can spread two to three times wider than the height of the tree. Most of the tree's absorbing roots are in the top 12 inches of soil. Water should be applied within the drip line (the critical root zone shown at left).

Water deeply and slowly

Apply water so it moistens the soil in the critical root zone to a depth of 12 inches. Water with a deep root fork, soaker hose, 5-gallon bucket or soft spray wand. Apply water to many locations under the drip line. If you use a deep root fork or needle, insert the device no deeper than 8 inches into the soil.

How much water to apply

April through September: In normal precipitation years, trees located in irrigated turf areas do not need additional water. When watering restrictions prohibit turf watering, or when trees are not in turf areas, trees need water based on the trunk's diameter. Water small trees four times per month, medium trees three times per month and large trees two times per month. Refer to the schedule at right.

During a drought, reduce the frequency and amount of water for larger trees (10 inches in diameter and above) because their extensive root systems can gather and hold water for longer periods of time.

October through March: During prolonged dry periods, water once or twice a month, using 10 gallons of water for each inch of the tree's diameter. Water only when the temperature is above 40 degrees and there is no snow on the ground.

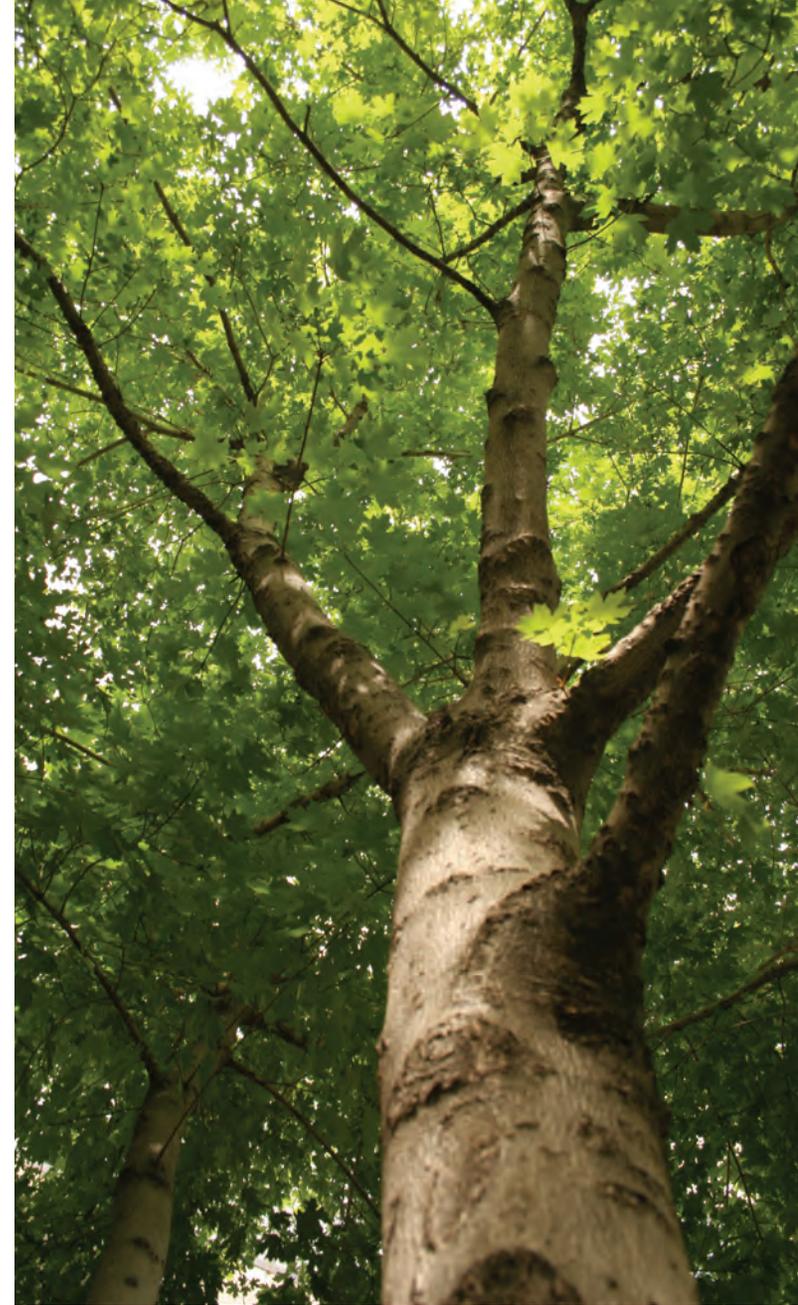


TREE CARE



APRIL – SEPTEMBER TREE WATERING SCHEDULE

Trunk size in diameter (inches)	Small Trees			Medium Trees			Large Trees		
	Weekly (10 gallons/inch)			Three times a month (10 gallons/inch)			Two times a month (15 gallons/inch)		
1"	2"	3"	4"	6"	8"	10"	12"	14"	
Watering Device  Deep root needle 2 gal/min	5 min	10 min	15 min	20 min	30 min	40 min	75 min	90 min	105 min
 Soft spray wand 4 gal/min	3 min	5 min	8 min	10 min	15 min	20 min	38 min	45 min	53 min
 Soaker hose 2 gal/min	5 min	10 min	15 min	20 min	30 min	40 min	75 min	90 min	105 min



Composting

Most soils can be improved by adding compost, which helps retain water in the soil and at the plant's roots. You can add compost to flower beds and gardens, as well as to soil before laying sod or planting trees and shrubs. You also can use compost as a top dressing on existing lawns.

Compost is 100 percent organic matter. You can buy it, or you can create it from leaves, lawn clippings and vegetable-waste products, such as cucumber peels and coffee grounds. Compost can be made with a pile of leaves in a stray corner of the yard, or with a bin that has air circulation and paddles to turn the pile. It also can be left alone under a black plastic cover (to protect it from Colorado's arid climate) and turned and watered frequently.

Compost can reduce outdoor watering by an estimated 25 percent. Buy compost with a stable material that will not burn your lawn or planting beds (class I and II composts are best).



SUSTAINABLE

Vegetable gardens

Does a vegetable garden use more water than a lawn?

A healthy vegetable garden can use less or about the same amount of water as a lawn does. If you replaced your lawn with a vegetable garden, and watered the garden efficiently by hand or with a soaker hose, you wouldn't see much difference in water consumption.

What's the best way to water a vegetable garden?

Vegetables can grow in an efficient manner if they are irrigated properly. We suggest watering your garden by hand to ensure water goes only into the soil where the plant roots can use it. It is a good idea to check your soil moisture by using a small trowel prior to watering.

Does Denver Water limit the number of days I can water my vegetable garden?

No. While we ask that you water any area (zone) of your lawn no more than three times a week, we do not restrict the number of days you water your vegetable garden.

Does Denver Water limit the time of day I can water my vegetable garden?

No. We ask that you not water your lawn between 10 a.m. and 6 p.m., when the daytime heat causes spray irrigation to evaporate. When vegetable gardens are watered with soaker hoses or by hand, evaporation isn't as problematic. Still, cool mornings are the best time to water your vegetable garden. You'll use less water, and the plants will be ready for a day in the sun.



GARDENING



Denver Water's website includes more detailed information and tips on outdoor watering and landscaping. Visit denverwater.org/Conservation for more information, or call Denver Water Customer Care at 303-893-2444.

Other resources include:

- The Alliance for Water Efficiency is a nonprofit organization dedicated to the efficient and sustainable use of water.
allianceforwaterefficiency.org
- The American Water Works Association has a variety of resources regarding water conservation and efficiency.
awwa.org/Resources
- Denver Botanic Gardens has a blog with helpful information on low-water landscapes.
botanicgardens.org/blog/xeriscape
- The California Urban Water Conservation Council and the Environmental Protection Agency created an interactive tour with tips on how to save water in and around your home.
h2ouse.org
- EPA WaterSense promotes water efficiency and water-efficient products, programs and practices.
epa.gov/watersense

RESOURCES



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