

Rain Gardens

Benefits of Rain Gardens

- Less imported water used for yard irrigation
- Lower water bills
- Reduces flooding and erosion
- Less polluted stormwater runoff
- Attractive yard feature



This rain garden demonstrates rainwater retention while making an attractive addition to the yard.

Capture rain and let the benefits flow

Rain gardens collect rain water and beautify a yard. They provide a simple form of rainwater harvesting, allowing homeowners to save valuable rain water. Although more commonly found in wetter climates, rain gardens are beneficial in water-thirsty California where local rainfall often does not meet water demand and imported water supports the majority of the population. As water prices climb and the threat of droughts loom large, homeowners and municipalities

are looking toward conserving and utilizing water that falls on-site. Rain gardens offer an attractive and inexpensive option.

Basically, rain gardens receive rain that falls on a roof or other collection surface. The water is channeled, via rain gutters, pipes, swales or curb openings, into a depression in the yard where it soaks into the ground and waters vegetation. Contrary to what many people think, a rain garden is not a pond feature. A properly functioning rain garden holds water for only a short period of time. The purpose is to retain water just long enough for it to percolate into the soil. Most of the time, the bed of the rain garden is dry.

Rain water has been collected by numerous cultures since ancient times, but the concept of a residential rain garden is recent. Pioneered in Prince George's County, Maryland in 1990, the purpose of a rain garden is not only to allow rain water to permeate the ground, but to clean the water naturally.

Rain gardens are basically home bioretention basins. They slow the flow of water, allowing it to percolate into the ground, where plants and soil microorganisms break down and remove pollutants such as phosphorus, nitrogen, heavy metals and hydrocarbons. By keeping water on-site and preventing it from flowing onto the pavement, less contaminated water enters storm drains and local water bodies (rivers, streams, lakes and/or the ocean). Damage to local aquatic ecosystems from erosion and pollution is avoided. Furthermore, rain gardens provide a host of other attractive benefits to homeowners: drinking water used for irrigation is decreased, less money is spent on landscape irrigation and if designed correctly, the likelihood of property flooding is reduced.

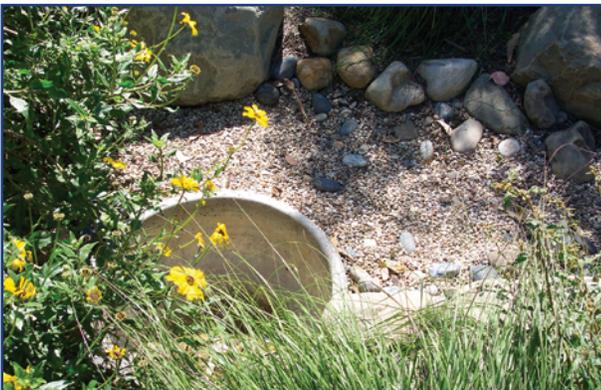
This *Green Sheet* provides rain garden information specifically for the Southern California homeowner. It will get you started constructing a home rain garden. For more details and related information see the *Resources* section on page 4.

SITE SELECTION GUIDELINES

- Down-slope rainwater collection surface
- Minimum five feet from structures without a basement; minimum ten feet from structures with a basement (check with your local jurisdiction for specific code requirements)
- Not over a septic system
- Not in a place that is already soggy
- Ideally in full or partial sunlight
- Avoid large tree roots



Neighborhood residents pitch in to create a community rain garden.



To help prevent erosion, decomposed granite and rocks can be used to disperse and slow the water flow in the rain garden.

Catching and channeling the rain

Water is usually harvested from a roof, driveway or other impervious surface. Typically a gutter system and downspout are employed to direct water off the roof; rain chains are another decorative option. If the runoff from a roof directly hits the soil, cover the area with a bed of rocks to prevent soil erosion. For both roof and ground-level catchments, water is channeled toward the garden using downspout extensions (gutter pieces attached to the end of downspouts), pipes (often underground) or vegetated swales. If heavy water flow is expected, a ditch lined with rock is a good option. Also, swales can be fortified with landscape fabric and stones. Additionally, rock or stones are used to stabilize the area

Planning a Rain Garden

Location, location, location...

To select a good location, observe your landscape during a rain storm and identify existing drainage patterns. Collect water from high points and let gravity move it. A down-slope area that naturally receives water from a roof or over-land flow is ideal. Locate the rain garden in a natural depression or on a flat surface. The rain garden can be constructed on a hill but more digging will be necessary to produce a level bottom. Areas where the water table is high or the land is often water-saturated are not good options. Rain gardens should not be located over a septic system. Remember, the idea is for water to soak into the ground and not pond. Be aware that any trees or large plants may not adapt well to a new watering regime. For this reason large tree roots should be avoided; also, they may be damaged during rain garden installation and can hinder the process. Furthermore, avoid any underground pipes or utilities. Lastly, if possible, site the garden in full or partial sunlight where plants will thrive.

Size and shape

Be creative when designing the rain garden: oval, round, long and narrow or kidney-bean shaped are all possibilities. Choose one complimentary to the layout of your yard. Determine the size of the rain garden based on the collection surface; it should be a minimum of 20% of the catchment area. For example, a 1000 square-foot roof top requires at least a 200 square-foot garden. As a rule of thumb the rain garden should be large enough to hold an inch of rain (this first-flush rain water carries the most contaminants). If the catchment area is a vegetated surface, such as a hillside where percolation will occur, then the rain garden can be much smaller relative to the catchment area. Refer to *References and Resources* on page 4 for more details.

Mosquitoes?

Rain gardens are not ponds. Appropriately designed, they allow water to soak into the ground within 24 hours. Since mosquito larvae need over seven days to develop from an egg into an adult, well-designed rain gardens won't harbor them. If for some reason ponding occurs for more than 72 hours, mosquito dunks should be employed. These hockey-puck-shaped disks contain bacteria that kill mosquito larvae, yet are nontoxic to people and pets. They are available at local hardware and garden stores.

where water enters the garden and to prevent erosion. For good water flow channels should have a minimum 2% slope (1/4" per foot). The sides of the channel should have a slope with a depth-to-width ratio of no more than 2:1 (for example if the swale is one foot in depth, its width should be no greater than two feet across). To hold rain water, the center of the garden should be between six and twelve inches at its deepest point in the center, with nine inches as a standard depth. The edges of the garden gently slope to the center with approximately a one-inch drop per foot to prevent erosion. Rain gardens on a slope will need a berm on the lower end to create a depression. On the down-slope side of the rain garden, use the soil removed from the center of the garden to make a berm three to six inches high and eight to twelve inches wide with gently sloping sides. The berm may be planted with drought-tolerant plants.

Overflow

Since most rain gardens are built to hold water from a one-inch rain event, they can handle water volume from the majority of California rain storms; it is, however, necessary to build an overflow route so when large storms hit, flooding does not occur. Often an overflow route can be directed off-site to a conventional stormwater drainage route (e.g., a driveway that drains to a storm drain in the street).

Plant Selection

In California's Mediterranean climate there is no rainfall during six months of the year so, in the absence of irrigation, all plants will need to be drought tolerant. Native plants are a good option since they are well adapted to seasonal, short-duration water supply and long periods of drought. Different types of plants may be necessary for the the rain garden. Those located in the bottom and on the sides of the garden will need selected species that can withstand complete inundation as well as extended drought conditions (see list on page 4). Plants on the berm will not need to tolerate extended wet conditions, so this area can be planted with a variety of drought-tolerant or native plants including: colorful annuals, grasses and herbaceous plants (see the Green Sheet *Drought Tolerant Plants* for more information).

Planting

Plant the rain garden when the soil is dry, preferably in the fall when the air temperatures are cooler, but the soil is still warm. Wet soil is more easily compacted, reducing permeability. Loosen the soil to a depth of approximately two feet to allow roots to grow and easier water seepage. Plant plants according to the needs of the particular species. Immediately after planting, but before mulching, water the garden thoroughly. Mulching is very important; apply two to four inches without covering small plants. Mulch should be re-applied each year until the plants have matured; use a dense organic mulch that won't float away—shredded wood or coarse wood chips. Although the plants in the rain garden are drought-tolerant, you will need to water them during the first year while they are becoming established. After this, minimal or no watering is necessary.



Runoff from surrounding areas flows into the rain garden basin, inundating the plants.

A Rain Garden in Clay Soil

If your soil is mostly clay or another low-permeability soil type, increase the rain garden area. Add soil amendments such as compost, pumice or perlite one-half to two feet below the ponding area. Do not use mason or ballfield sand. Mix in three inches of compost on the surface.



This rain garden consists of drought-tolerant annuals, perennials and grasses.

Rain Garden Maintenance

Rain gardening is a dynamic process. It is important to test your system during a rain event. Observe if water is flowing where you want it to go and make necessary adjustments.

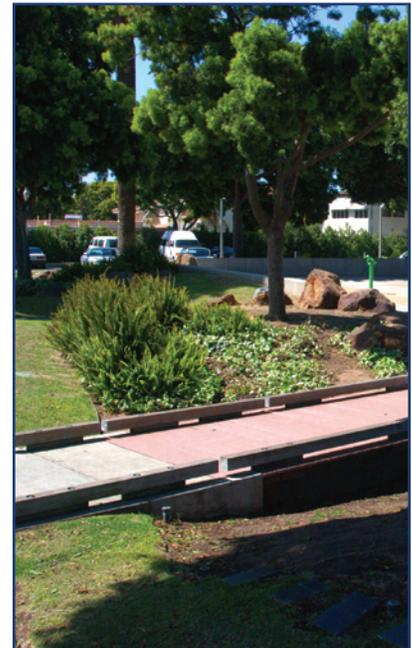
- Keep holding areas free of debris
- Prevent erosion; block erosion trails
- Clean, repair channels, berms and moats
- Keep gutters and downspouts free of debris
- Dense shrub growth is desirable – generally, pruning is not necessary
- At the end of the rainy season remove accumulated sediment
- Collect seeds and cuttings from successful plants; use them next season
- Continually reassess functionality



Plants for Southern California Rain Gardens **S = can be used in shade**

Water Need: High	Water Need: Medium	Water Need: Low
Creeping Wildrye (<i>Leymus triticoides</i>)	Clustered Field Sedge S (<i>Carex praegracilis</i>)	Hummingbird sage (<i>Salvia spathecea</i>)
Yerba Mansa (<i>Anemopsis californica</i>) S	Salt Grass (<i>Distichlis spicata</i>)	California Polypody Fern (<i>Polypodium californicum</i>) S
NZ bush sedge S (<i>Carex solandri</i>)	Common/Spreading Rush (<i>Juncus patens</i>)	Common Yarrow (<i>Achillea millefolium</i>)
Basket Rush (<i>Juncus textilis</i>)	Blue Sedge S (<i>Carex glauca</i>)	California Fuschia (<i>Zauschneria californica</i>)
	Mexican Rush (<i>Juncus mexicanus</i>)	
	Southwestern Spiny Rush (<i>Juncus acutus</i>)	

***Some of these plants might be challenging to locate: You may need to special order some species or visit a native plant nursery.**



What to do Next

Explore these References and Resources

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