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The Watersmart Garden



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## Introduction

All gardeners know that plants vary widely in the amount of water necessary to maintain them in top landscape appearance. Ferns, anthuriums, and heliconias, for example, must be heavily and frequently watered, while oleander, adeniums, and aloes require but minimal irrigation. Unhappily, gardenwide sprinkler systems are usually programmed to cater to plants of the highest water need. The result is wasteful and costly, with the least thirsty plants often receiving just as much water as the most thirsty. This problem may readily be solved by adopting the water-saving techniques of xeriscape gardening.

The term "xeriscape" was first coined by the Denver, Colorado, Water Department in 1981 and describes a set of remarkably simple actions that can save up to 80 percent of water use. Xeriscape techniques have been widely and successfully used in dry parts of the Pacific Southwest. Despite Hawai'i's reputation as a lush paradise, our islands have many hot, dry areas where the ever-increasing cost of water makes the thoughtful use of drought-tolerant plants essential for sustainable gardening. The time has come for Hawai'i to embrace the watersmart techniques of xeriscaping.

While this publication is not a "how-to" guide, it is essential that the xeriscaper have a



This beautiful Diamond Head property has incorporated the zoning principles of xeriscape gardening as well as careful plant selection to reduce water usage by 60 percent. THE MECHLER CORPORATION

basic understanding of its components. This will greatly enhance the ability of the gardener to make the best choices of plants from the lists found in the following text. Appendices provide quick access to plant suggestions for special uses such as color or beach gardens, and suggested readings list publications providing detailed information on how to plan and implement a xeriscape garden.

There are five simple steps leading to a successful xeriscape. While the following instructions assume that we have a new residential property in a warm, dry location, these techniques are adaptable to an existing garden space.



### Step One: Plan Water Usage by Zone

Allot spaces in your garden: on a plot plan of your property, sketch in several areas. We are electing to have four areas, known as zones. The smallest is Zone 1, which will receive the greatest amount of water to accommodate the plants needing the most: the ferns, heliconias, anthuriums, and other thirsty plants. Each succeeding zone is larger in total area, and each will receive successively less water. The adjacent diagram may assist in understanding this step.

10%	ZONE 1
20%	ZONE 2
30%	ZONE 3
40%	ZONE 4

WATER CONSERVATION CHART

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INCREASING AREA

### Step Two: Prepare Your Site

Prepare the entire site by removing all weeds and rocks and other debris, cultivate the soil and add soil amendments if needed, and grade to lessen runoff and prevent erosion. Parallel, low berms running across a slope will slow water movement, reduce erosion, and assist in water infiltration. Ground cover plantings will assume that role with maturity. Shallow water catchment areas can hold downspout and pavement runoff. Soil amendments usually refer to various composted organic materials. Helpful in "opening" nonporous soils such as clay, these organic materials rather quickly break down, releasing valuable nutrients. More compost may be added and will be beneficial.

### Step Three: Zone Plan the Sprinkler System

Design and install separate sprinkler systems for each zone. Each system is to be programmed to deliver decreasing amounts of water for zones 2, 3, and 4. Most areas will have several excellent firms locally available and capable of designing and installing such automated systems, including the timers (some are solar powered), and a more sophisticated step: soil moisture sensors that shut down the system in the event of rain or high soil moisture. Such sensors add to the basic system cost but pay for themselves in terms of water savings. The entire system can, of course, be hand controlled, but this requires the presence of a knowledgeable operator during the owner's off-island periods. Sprinkler supply firms are usually willing to teach the gardener how to do the work himself if materials are purchased from that firm. One of the benefits of zoning is that irrigation systems can be installed one at a time as the budget permits, thereby avoiding a high one-time cost. Keep in mind that designing zones in the simplest configuration possible makes sprinkler design and

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installations easier. Although automated systems are an enormous convenience, it is important to test the system frequently. Your parts/design firm will provide information as to how and when.

#### HOW MUCH WATER IS ENOUGH WATER?

An important note: there is no practical means of determining beforehand exactly how much water each zone should receive. The question of how much water is enough water is frequently asked. Trial and error is the best answer. Engineers at the Honolulu Board of Water Supply or your local water supply company can give you your meter size, pressure, and gallons per minute delivered, information that will help you to set initial watering amounts. The avid xeriscaper, however, may refer to a professional procedure called ET: evapotranspiration (see appendix E). This is a fairly complicated procedure, not generally advised for the typical home gardener.

Your watering plan should take into account the water available through natural rainfall. You can find reliable data on rainfall for Hawai'i in *The Rainfall Atlas of Hawai'i*, published in 2011 by a team composed of the Commission of Water Resource Management and the U.S. Army Corps of Engineers (rainfallgeography@hawaii.edu). Data provided is an important tool for the landscape industry.

#### CONSERVING ADDITIONAL WATER THROUGH RECYCLING

An interesting program started by the Honolulu Board of Water Supply in 2008 provides a way to conserve even more water and may be considered an extension of the principles of xeriscaping. Called the "Rain Barrel Program", it simply recommends the collection of rain

water from downspouts. This water may be used for watering potted plants, grassed areas and other non-potable water uses thereby reducing the overall amount of City water usage.

For more information on the "how-to" of designing a sprinkler system, please see the suggested readings at the end of this book.

### Step Four: Select Your Plantings

Look carefully through the recommended list of one hundred great plants for the watersmart garden. Plants are arranged in order of use: ground covers, shrubs, trees, and vines. Plant descriptions and a list of important features aid in the selection process. Keep in mind the size of mature growth and leave plenty of room for your new xeriscape to grow. Overplanting is wasteful and costly. A take-it-slow approach will yield better results. Give careful thought to what you want from your garden. Remember that turf grasses are excessive water users and should be limited as much as possible. Maybe paving is a substitute. Do you want color? Look to the handy color note provided with each plant description or to appendix C for some great color ideas. Will it be a childrens' play space? Any hazards, such as thorns or poisonous plants, are noted in the plant descriptions to help you to plan a safe and fun garden.

### Step Five: Maintain the Garden

Weeding, fertilizing, pruning, mulch addition, regular testing of irrigation systems, insect control, and replacement of species not thriving with those that may be more adaptable to any particular zone will keep the xeriscape in top condition. Regular maintenance is an integral part of the success of any landscape.

Mulch is an essential tool for good maintenance of the xeriscape garden. There are



Large stone pavers and pebbles reduce the water-thirsty lawn area in this Diamond Head garden. THE MECHLER CORPORATION

two basic types of mulch: inorganic (cinders and gravel) and organic (wood chip and bark products). The authors, by far, recommend organic mulch. Two to three inches of mulch, renewed occasionally, will absorb water, increase water infiltration, maintain soil coolness and reduce water loss, significantly lessen erosion, and ultimately the mulch will break down and increase soil fertility. Inorganic mulch made of gravel and cinders, in our view, produces an unwelcome dry "xeric" look. Such mulches may become very hot in full sun, increase water loss, and do not enrich the soil.

The most important part of any garden is the creation of a carefully thought-out plan. Decide. Stick to it. Piecemeal plantings can be made if you have a plan. With a plan, costs can be spread over a period of time. As you place new plants in the garden, some hand watering may be necessary until the entire zone is planted and under automated irrigation. To help you plan and implement your watersmart garden, you will find zoned suggestions for hedges, beach plantings, windbreaks, and color in the appendices at the end of this book.

### Converting an Already Existing Garden to Xeriscape

If the homeowner has a mature garden and wishes to convert it to a xeriscape, the same basic steps noted above may be used. The major difference is in placing on the plot plan the location of existing plants, determining their probable zones, and if possible, shaping zones to accommodate those plants the gardener wishes to keep. You may plan to relocate treasured plants to accommodate the zone layout, but transplanting is labor intensive and results are not always successful. Unless a plant has some very special meaning for the owner and family, transplanting should be avoided. The purchase of new nursery stock is far less expensive, and young, vigorous stock is more likely to succeed.



This colorful garden makes excellent use of watersmart plant choices and natural stone for an appealing curbside garden. FRED RAUCH

### **Understanding and Avoiding Invasive Species**

All gardeners should be aware of any invasive tendencies in the plants in their gardens. To help you avoid using these risky imports, plant lists in this book are in conformity with the Hawai'i-Pacific Weed Risk Assessment (HPWRA) Project, a joint project of the University of Hawai'i, the State Department of Land and Natural Resources, Division of Forestry and

Wildlife, and the U.S. Department of Agriculture, Forest Service. Plants currently under evaluation as potentially invasive are marked in the text as "H(HPWRA)" and "(Evaluate)." Their final status has yet to be determined, but they may be used in the xeriscape garden with caution. See appendix F. Similar restrictions published by the Landscape Industry Council of Hawaii (LICH) have also been incorporated in the text.

### Garden Safety

Plants produce a wide range of chemical substances as well as physical properties that must be considered in selecting landscape plants. Some have thorns, irritating hairs, and toxins. Even fragrance can produce allergic reactions in some people. We are not recommending their nonuse but rather awareness of those properties. We teach our children to avoid touching a hot stove, looking both ways before crossing a street, and not to pick up an angry cat. They can be taught not to touch, pick, smell, chew, or ingest an unknown plant or plant part.

The following text indicates several excellent xeriscape species known to cause problems. They are marked with (T) following the common name for species having thorns or spines; (S) for species possibly containing irritants for the mouth, skin, or eyes; (P) for species with toxic sap, leaves, flowers, or fruit. A (+) indicates species deserving special care in handling.

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