

## Landscape Design for Water Conservation<sup>1</sup>

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Water conservation is becoming an important part of Florida's overall water management program. Saltwater intrusion and pollutants threaten Florida's limited water resources, and increasing urbanization and periodic drought are placing greater demands on water supplies. For these reasons, nursery growers, landscapers, and homeowners should be conscious of water use and should strive to minimize waste and consumption of water. One of the best means of conserving water is to design or modify the landscape to reduce its water requirements.

### LANDSCAPE STYLES

The "traditional" or "conventional" landscape is characterized by large areas of turf accented by well-manicured trees and shrubs. This traditional landscape is typical of the cool, temperate regions of the northeastern U.S. and was brought to Florida as people moved here from the North. Unfortunately, this traditional type of landscape is not well-adapted to Florida's sandy, porous soils; hot, sub-tropical climate; and well-defined wet and dry seasons. As a result, traditional landscapes in Florida require large amounts of water and maintenance.

In response to drought and limited water resources a number of new landscaping ideas have

evolved to reduce water and maintenance requirements while still providing aesthetically-pleasing landscapes. Collectively, landscaping concepts that reduce water requirements can be called **xeriscape**<sup>TM</sup> landscaping or **xeriscaping**<sup>TM</sup>. Xeriscape<sup>TM</sup> is a new word coined from the Greek **xeros**, meaning dry and the word landscape. Xeriscaping<sup>TM</sup> was originally conceived in the southwestern U.S., although it was inspired by the gardening traditions of Spain, north Africa, and the Mid-East and by the natural landscapes of the Southwest.

One component of water-conserving landscapes is the concept of natural or ecological landscaping. Natural landscaping involves plant selection that is based on climate and environment of the area as well as site characteristics of exposure, light intensity, soil pH, soil aeration, soil mineral analysis, site drainage, and irrigation water quality. Proper plant selection based on site characteristics should enhance the plants' likelihood of becoming established in the site and reduce potential incidences of low vigor, excessive maintenance, disease, or death.

Native species are often preferred for natural landscapes but plant selection should take into consideration the microclimate and topography of the

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site. In some cases, native plants will not be the most appropriate choice because man's development of a site can greatly alter the microclimate and topography. Development can result in man-made deserts (i.e. parking lots), swamps (i.e. retention ponds, waterways), and artificially-shaded areas. Thus, effective xeriscaping™ should match plants with the microclimatic features of the developed landscape site. For example, plants adapted to wet soils should be used in low spots, waterways, retention ponds, spillways, and areas with poor drainage; drought tolerant plants should be used in dry spots, windy areas, exposed areas, plantings on berms, and plantings in areas against unshaded south or west walls of buildings.

Since natural landscaping is a rather abrupt change in U.S. landscaping philosophy, it may be difficult for the public to accept natural landscaping because of their preconceptions of what a landscape should look like. One way to satisfy the desire for traditional landscapes and the need for low water requiring, low maintenance landscapes is to use the "oasis" approach to landscape design. Oasis designing involves placing high water requiring, high maintenance, and showy plants in the areas with the most visual impact, i.e., entranceways, primary views, patios, courtyards, etc. The oasis area has the most elaborate irrigation system and requires the most water and maintenance.

Other areas with less traffic or less visibility use lower water requiring, low maintenance plants for example, sides of buildings, service areas, and more remote areas of the landscape. A transition zone exists between these two areas which uses plants that require less water than the oasis planting but more than the natural area. The oasis concept improves water management practices because it concentrates water resources in plantings close to main use areas. An additional benefit is that it reduces irrigation costs by concentrating irrigation equipment and by placing the systems in areas that are usually closer to water lines.

## **OTHER ASPECTS OF DESIGN**

Aside from these landscaping philosophies, landscape design for water conservation can include

grouping plants in the landscape according to their water requirements. By grouping plants with similar water needs, the irrigation system can be zoned so that each group receives only the amount of water required to maintain the plants. This technique has the additional advantage that plants on the same irrigation set will not be under or over watered at the expense of other plants.

An additional way to reduce maintenance and water use is to increase the use of mulches. A three- to four-inch layer of mulch should be used in planting beds to reduce evaporation from the soil surface, moderate soil temperatures, and suppress weeds. Mulches can sometimes replace turf or groundcovers in areas where they require extensive watering or do not cover an area completely. In these situations, mulches provide the additional benefits of requiring less maintenance and not consuming water.

Two more aspects of design that reduce irrigation needs are the use of drought tolerant plants and windbreaks. Drought tolerant plants inherently require less water because they are adapted to arid areas or to regions with frequent drought or with soils of low water holding capacity.

If using turf in the landscape, consider using one of the more drought tolerant species. Grasses with excellent drought tolerance include: bahiagrass, Bermudagrass, and zoysiagrass. A good drought tolerant plant is centipedegrass while St. Augustinegrass has a fair rating. Carpetgrass has a very poor drought tolerance rating (Augustine and Peacock, 1985). Another alternative with bahiagrass is to allow turf to go dormant during dry periods; bahiagrass will turn green again when rains resume.

Windbreaks can be formed by walls, fences, shrub beds, or hedges. Windbreaks reduce wind velocity and can greatly reduce water loss that occurs by evaporation during irrigation and by evapo-transpiration from plants. Properly constructed, windbreaks can reduce wind velocity by 75% to 85% and should be strongly considered for areas that experience steady winds or frequent gusty winds. Effectiveness of windbreaks is determined by height, density, and shape, with height having the greatest influence. The area protected by the windbreak extends downwind the distance of five

times the height of the windbreak. For optimum effectiveness, the windbreak should be continuous (unbroken by gaps) "stair-step" in shape, at least head-high, moderately dense (not impenetrable), and evergreen.

## SUMMARY

Water requirements of landscapes can be reduced by using the design principles of natural landscaping or oasis landscaping. Other methods of conserving water in the landscape include grouping plants in the landscape according to water requirements, increasing the use of mulches, selecting drought tolerant plants, and using windbreaks.

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