Conserving Water in Your Landscape

Water is a precious natural resource that should be conserved in all endeavors concerning landscape management. In urban areas as much as 60% of all water usage goes to maintaining landscapes. Much of this water is applied to high water-demanding landscapes or wasted through inefficient use. To stop excessive water use, landscapes should be designed to be as water-efficient, as possible.

A drip irrigation system reduces water waste.
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These water-efficient landscapes should incorporate seven basic principles:

- good water conserving design
- thorough soil analysis and preparation
- limiting the number of high water use shrubs and turf areas
- use of adapted, low water use plants
- effective and efficient watering systems
- use of mulch in flower and shrub beds
- proper landscape management practices

By incorporating these basic principles into your landscape, you can help to preserve a valuable resource.

Start with a Water-Wise Plan

Water efficient landscapes need not be barren areas, or planted with cacti and loaded with rocks. They can be colorful, cool landscapes full of beautiful plants maintained with water-wise practices. One can develop a pleasing, functional landscape and still preserve water quantity and quality.

Begin with a Well Thought Out Plan: Make a sketch of your entire site and locate existing trees, shrubs and grassy areas. If possible, begin working with your site from the very beginning even before a structure is established. Also note any areas that may have drainage problems and be sure to correct these spots. Once a master layout is finished, consider the landscape budget, desired appearance, maintenance, and water requirements. Make use of local landscape architects, nurserymen and the Home & Garden Information Center in your decision making process. The implementation of your master plan need not be done in one year. The landscape can be planted over several years as money dictates.

Laying Out Your Landscape: Once the location of all structures is decided, begin the process of placing plants into your design. Use the process of creating rooms in your design. This can include a grassy area for family use, flower gardens with roses or azaleas, butterfly rooms using butterfly-friendly plants and possibly a wildflower area. Each of these rooms, or planting beds, should contain plants of equal water use. This will allow you to design a watering system that will deliver the water need of each room. Try to minimize the amount of high water-use plantings and maximize those rooms that are designed for low water-use.
Plant Selection: After you have determined the location of your landscape rooms, select plants that will thrive with little input. Trees, shrubs, flowers and turf should be selected based on their adaptability to your local site. This will include adaptability to the region’s climate as well as the climate at your particular site. The use of native plants is highly recommended as these plants will have a lower water demand, lower management requirements and will be more resistant to pest problems. Combining native plants with well-adapted exotic plants is the key to a beautiful, yet interesting landscape that conserves water. The Home & Garden Information Center has several fact sheets to use in designing a water-wise landscape, such as:

- HGIC 1716 Plants for Shade
- HGIC 1717 Plants that Tolerate Drought
- HGIC 1718 Plants for Damp or Wet Areas
- HGIC 1723 Creating an Environmentally Responsible Landscape
- Rain Gardens: A Rain Garden Manual for South Carolina
- EC 672 Xeriscape: Landscape Water Conservation in the Southeast
- HGIC 1725 Landscape Renovation

You may also consult the Carolina Yards Plant Database for assistance with plant selection. The database contains nearly three hundred plants suited for landscapes in South Carolina. A customized list of plants is generated based on the site conditions and plant characteristics chosen by the user.

Turfgrass Selection: When considering a water-wise landscape it is important to note that turfgrasses require more frequent watering and maintenance than most other landscape plants. When designing, carefully plan your turf areas for their intended uses. Grassed areas should be limited to places that will have constant traffic such as seen with cooking and eating or gaming.

The turfgrasses adapted to coastal South Carolina include centipedegrass, bermudagrass, St. Augustinegrass and Zoysiagrass. These grasses vary in their responses to drought conditions but will require approximately the same amount of water to remain green. Bermudagrass is the most drought-tolerant of these turfgrasses. To conserve water, allow drought tolerant grasses to go "off color" during dry periods. Once the droughty conditions are over and moisture is added through rainfall or irrigation, these grasses will become green again.

Turfgrasses can be hardened to drought conditions by establishing a water conservative irrigation program from the outset of greening in the spring. Lawns should be watered deeply and infrequently. One inch of water should be applied during each irrigation, and then allow the turf to dry thoroughly between waterings. It is also important to know both the fertility level and mowing height needed for your turf grass and to not overdo these management practices.

Achieving a significant reduction of water usage as well as reducing the management needs of your landscape involves reducing the size of water-sensitive areas through the use of permeable patios, decks, shrub beds and ground covers. Be sure all areas not designed as beds or turf be made of permeable materials such as mulch, rock or permeable pavers. Using these materials will allow water entering the site to flow through the soil eliminating runoff and reducing the potential for downstream pollution.

Lastly, when designing your turf areas, avoid odd-shaped lawns such as narrow strips as these will be hard to maintain. Even though turfgrasses are considered high water users and require a high level of management, they still have their place in a well designed water-wise landscape.

Soil Preparation: Once your design has been completed and has been put on paper, actual site preparation can begin. To preserve plant health and help to conserve moisture, most soils will need to be amended with organic matter. On sandy soils, water and nutrient retention will be increased while in heavy soil drainage will improve with the addition of organic matter. As a rule-of-thumb, incorporate 4 inches of compost into ornamental beds. The decision to amend soils in turf areas will depend on budget size and existing soil condition. It is generally not recommended to amend soil for turf unless the existing soil condition is extremely poor. It is always recommended to have your soil tested to determine its nutritional content and soil pH.
**Landscape Maintenance:** An added benefit to designing a water-wise landscape is a reduction in the amount of maintenance that will be needed to keep it healthy. A well-designed landscape can decrease maintenance by as much as 50% through reduced mowing, elimination of weak or unadapted plants, reduced pest problems and more efficient water techniques.

**Watering:** Much of the tremendous amount of water applied to landscapes is never absorbed by plants and put to use. Water not used by plants is lost by infiltration through and below the root level, evaporation or runoff. This usually occurs when too much water is applied at one time or applied too frequently. An efficient irrigation system will only apply water to specified areas of the landscape as needed. The varying water-use areas should also be separated so that high use plants are located in one irrigation zone while low use areas are located in separate zones. This way the irrigation system can be used in a very efficient manner.

**Irrigating Lawns:** Most lawns will receive twice the amount of water needed to maintain a healthy appearance. The key to irrigating turf is to water deeply and infrequently. This will create a deep root system that can efficiently use water and nutrients in the soil. Watering for short durations every day will create a turf that has a shallow, weak root system. Promoting this type of growth will set your lawn up for failure during stressful periods.

To know when to irrigate, simply observe your turf every day. Wilting and discoloration are signs of water stress. At the first sight of wilting, you have 24 to 48 hours to apply water before serious injury occurs. At this sign, apply one inch of water early in the morning hours. Avoid runoff if possible. Check for localized dry spots that can be watered by hand independently of the entire system. There is no need to run an entire irrigation system for one dry spot. Only irrigate the entire lawn when the entire lawn is dry.

**Irrigating Trees & Shrubs:** Newly planted trees and shrubs require more water and more frequently than they will need once established. It may take several years for a plant to become established and will require frequent watering during this period. Once established, water-efficient plants can be weaned to tolerate more droughty conditions. As with turf, trees and ornamentals will benefit from a deep, infrequent irrigation. In the absence of rain, a good soaking twice a month should be sufficient. An adequate mulching of the root zone will help to conserve moisture as well. When mulching, be sure not to place mulch against the trunks of plants and maintain mulch at no more than 2 to 3 inches deep. Use less mulch on poorly drained soils. Remember that the frequency of normal lawn watering is not the same for trees and shrubs.

**Irrigation Systems:** The goal of any irrigation system is to give plants a sufficient amount of water with as little waste as possible. Proper zoning of in-ground systems is extremely important for efficiency to occur. The landscape should be zoned for high and low water use areas, and the irrigation system should be designed so they can be watered separately. Either drip or sprinkler irrigation, or a combination of the two can achieve this.

**Smart Irrigation Technology**

Smart irrigation technology refers to equipment that uses weather or soil moisture information to adapt irrigation schedules. There are numerous advantages associated with smart irrigation technology including:

- Water conservation
- Cost savings
- Reduced wear and tear on the system
- Reduced disease pressure
- Water quality protection
**Types of Smart Technology:**

**Rain Sensors:** Rain sensors or rain shutoff devices will turn the system off during rainy weather. There are three basic types of rain sensors that can be wired to an irrigation controller: weight-based, electrical conductivity, and expanding material. The expanding material type sensor is the most popular since it is very reliable and requires little maintenance.

A rain sensor will turn off the irrigation system during rainy weather.

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**Smart Controllers:** Soil-moisture based controllers use soil sensors to control irrigation. The sensors estimate the water content of the soil. The water content then either allows for or bypasses the scheduled irrigation.

**Weather-based or Climatologically-based Controllers:** These weather-based controllers are also known as evapotranspiration controllers. Evapotranspiration (ET) is the process of transpiration by plants combined with evaporation from plant and soil surfaces. There are three types of ET controllers:

1. Signal type controllers calculate ET using local weather data from publicly available sources or weather station networks, which is then used to adjust the irrigation schedule.
2. Historical controllers use pre-programmed crop water use data specific to the area. Since actual weather may vary from historical conditions, onsite temperature or solar radiation sensors may be needed.
3. On-site weather measurement measures weather conditions at the controller to calculate ET continuously and adjust irrigation based on actual weather conditions.

**Programs:** When selecting smart irrigation technology, consider consulting the Smart Water Application Technologies website and/or the EPA’s WaterSense website.

**Smart Water Application Technologies**, a national partnership initiative to promote landscape water use efficiency, was established in 2002. Their website contains performance test reports for rain sensors, soil-moisture based controllers, and weather-based controllers.

**EPA’s WaterSense** was established in 2006 to protect the nation’s water supply. WaterSense product labels indicate a product has been independently certified to meet EPA’s water efficiency and performance specifications. Visit the outdoor section of their website for information about WaterSense labeled controllers, professional certification programs, and other smart outdoor practices.

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