WRC11

UNIVERSITY OF FLORIDA

IFAS EXTENSION

Conserving Water in the Home Landscape[1]

Robert J. Black[2]

Water is the lifeblood of plants. It is required for seed germination, plant growth, photosynthesis, nutrient transport and temperature control. Water also maintains turgidity, which enables leaves to retain their shapes.

As Florida's population grows and the state becomes more urbanized, the demand on limited water resources steadily increases. Saltwater intrusion into freshwater wells further reduces the state's available water supply. Homeowners who want to continue watering their landscape plants must practice water conservation now rather than waiting until an emergency arises (see Figure 1).

Figure 1. Practice water conservation in the home landscape before an emergency arises.

The average volume of rainfall in Florida ranges from nearly 52 inches on the central and northern peninsula to almost 65 inches in the panhandle west of Tallahassee, and along the southeast coast below Lake Okeechobee. More than half of Florida's total annual rainfall is concentrated in the central and southern peninsula between June and September. During the winter and spring, lack of rainfall may seriously compromise plant development. But even during the rainy season evapotranspiration (i.e., water loss from plants and soil) may mandate supplemental watering. Soils with a limited capacity to retain moisture must be irrigated during periods of low rainfall.

Variables such as plant species, soil type, time of year and weather conditions determine when and how much plants should be watered; consequently, it is difficult to offer specific watering procedures. However, the following guidelines should help to answer some important questions.

When to Water

Irrigate only when plants need water. During the summer, established plants need no water for three to five days after a rainfall or water application that distributes at least three-fourths of an inch of water. You can wait much longer during the winter or when watering soils of finer texture, such as muck or clay.

Many landscape plants demonstrate their need for water by wilting. If they continue to wilt during

1. This document was originally published May 1993 as Fact Sheet WRC-11, a series of the Water Resources Council, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Reviewed/revised October 2003. Please visit the EDIS website at http://edis.ifas.ufl.edu

2. Robert J. Black, associate professor, Environmental Horticulture Department, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL 32611.

the evening, water them the following morning. Some herbaceous plants, such as impatiens and coleus, typically wilt during the heat of the day, even though the soil contains adequate moisture. These plants transpire (i.e., they lose water vapor from their leaves and stems) faster than their root systems can absorb water from the soil. There is no need to water these plants unless they remain wilted during the evening.

Some plants show no early symptoms of drought stress. If drought conditions continue, however, they may exhibit injury symptoms, such as browning of leaf margins or tips and/or leaf drop. Plants should be watered before the appearance of injury symptoms, because at this stage of drought stress they may become severely damaged or even die.

Plants in sandy soils exposed to full sunlight may need water every three to five days. The same plants placed in some shade or in soils of finer texture may need water only once a week, perhaps less often.

Monitor the lawn closely. If it shows signs of wilting, it needs attention. Water immediately if grass leaves curl at the edges or turn a dull bluish-gray.

Lawns should be watered early in the morning, when wind and temperature levels are low. Irrigating during the late morning, at midday and during the afternoon usually results in increased water loss from evaporation. Strong winds that create unequal water distribution are also more likely at these times.

When you decide it is time to water, be sure to comply with local and regional water regulations. In many areas, irrigation is allowed only on certain days and during specified hours. Also check local weather channels for rain forecasts before irrigating. You can save a lot of water by following these guidelines.

How Much Water to Apply

When watering, soak the soil thoroughly. Frequent, light sprinklings waste water and do little to satisfy the water requirements of a plant growing in hot, dry soil. Plants watered in this way often develop shallow root systems, increasing their susceptibility to damage if watering is interrupted for a few days.

For most of Florida's sandy soils, one-half to three-fourths of an inch of water is sufficient to wet the root zone. Because not all soils and plants are alike, however, some adjustments in the amount of water applied may be necessary.

To determine when a sprinkler system has delivered three-fourths of an inch of water, place cans or cartons at intervals within the spray pattern and continue watering until the average water level in the cans reaches three-fourths of an inch, as shown in Figure 2.

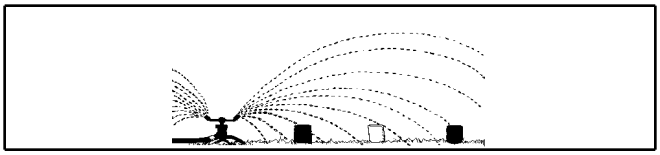

Figure 2. Measuring water levels in containers placed in a sprinkler's spray pattern helps determne how much water is being applied.

Watering Methods

Water should be applied only as fast as the soil can absorb it. Using a hose with water pressure at full force can do more damage than good. Fast-flowing water runs off quickly, carrying away soil and exposing plant roots to direct sunlight. Watering with sprinklers is more efficient (see Figure 3).

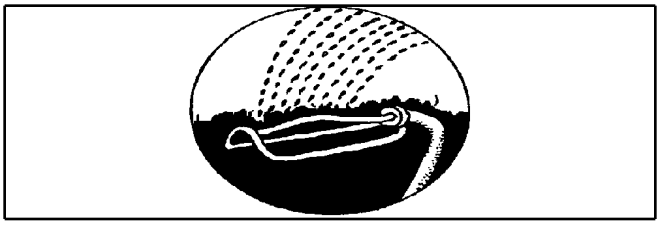

Figure 3. Sprinkler

Whether you are using a sprinkler attached to a hose (e.g., a hose-end sprinkler) or an automatic sprinkler system in the ground, the efficiency of the system depends on how well it is managed. A hose-end sprinkler may be placed anywhere in the landscape and allowed to run until it has delivered three-fourths of an inch of water. If the sprinkler is moved too soon, water will not reach the root zone. If the sprinkler runs too long, water passes through the root zone and is wasted.

In-ground sprinkler systems may be operated with a time clock or soil sensor; they may also be

manually controlled. Scheduling irrigation with a time clock is easy but wasteful. The time clock turns on the system in rain or sunshine, irrespective of whether the plants need water. Soil-moisture sensors often require a lot of maintenance or are inaccurate. A sprinkler system may be manually controlled by setting the time clock to the "off" position and switching the system on when the plants need water. The automatic position on the time clock is useful when you are away from home for more than a few days. By installing a shutoff device that overrides the system when rain falls, you can make the clock operate even more efficiently.

Another watering method is drip or trickle irrigation. Drip irrigation provides plants with a constant supply of water by means of plastic tubing located on or below the ground surface (see Figure 4). Low-pressure emitters (i.e., nozzles) attached to the plastic tubing slowly release water into the soil around a plant. Wetting only the root zone results in dramatic water savings, limits weed proliferation and accelerates plant growth. Since the plant is not subjected to the wet and dry cycles typical of other irrigation methods, it develops more rapidly.

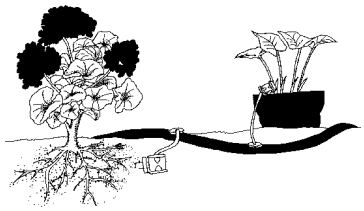

Figure 4. Drip irrigation

Drought-Tolerant Plants

Using drought-tolerant plants is another way of conserving water in the home landscape. In areas where it is difficult to apply enough water, such as on sandy soil or terrain from which water drains rapidly, drought-tolerant plants offer an alternative. They are also a good choice in areas of the yard that cannot be reached with a hose.Table 1 lists some drought-tolerant plants that may be suitable for your yard.

Tips for Conserving Water

1. Remove thatch from turf. A thick-thatch layer restricts the movement of water into the soil.
2. Increase mowing height of lawns to allow plants to develop deeper root systems.
3. Keep the lawn mower blade sharp. Sharp mower blades make cleaner cuts that cause less water loss than cuts from dull blades.
4. Control all weeds. Weeds use water that would otherwise be available for desirable plants.
5. Reduce the number of fertilizer applications. Fertilizer promotes plant growth, increasing the need for water.
6. Prune. If the water supply is so limited that plant survival is uncertain, substantial pruning can be done at the peak of a water shortage.
7. Apply wetting agents to the soil to allow it to absorb water uniformly and to prevent dry spots.
8. Use 2-3 inches of mulch on entire beds of shrubs, trees, annuals and perennials.
9. Extend the number of days or weeks between water applications to the longest suitable interval.
10. Soak deeply.
11. Cull plants that are growing poorly. Don't waste water caring for marginal or undesirable plants.
12. Use wastewater free of harmful compounds (e.g., borax and trisodium phosphate).
13. Adjust sprinklers to avoid spraying water on sidewalks and streets or into gutters.
14. Keep sprinkler heads clean to ensure uniform water distribution.
15. Check the hose and faucet washers annually, replacing them when worn.

Table 1. Drought-Tolerant Plants.

Common Name	Scientific Name	Section of State to Which Adapted[1]
Trees		
Box elder	*Acer negundo*	N
Chaste-tree	*Vitex agnus-castus*	NC
Chinese elm	*Ulmus parvifolia*	NC
Crape myrtle	*Lagerstroemia indica*	NC
Eastern red cedar	*Juniperus virginiana*	NCS
Laurel oak	*Quercus laurifolia*	NCS
Live oak	*Quercus virginiana*	NCS
Podocarpus	*Podocarpus* spp.	NCS
Shumard oak	*Quercus shumardii*	NCS
Siberian elm	*Ulmus pumila*	NC
Tree-of-heaven	*Ailanthus altissima*	N
Turkey oak	*Quercus laevis*	NCS
Washington palm	*Washingtonia robusta*	NCS
Shrubs		
Chinese photinia	*Photinia serrulata*	N
Firethorn (pyracantha)	*Pyracantha coccinea*	NC
Japanese privet	*Ligustrum japonicum*	NCS
Juniper	*Juniperus* spp.	NCS
Leatherleaf mahonia	*Mahonia bealei*	NC
Red-leaf photinia	*Photinia glabra*	N
Shining sumac	*Rhus copallina*	NCS
Strawberry bush	*Euonymus americana*	N
Yaupon holly	*Ilex vomitoria*	NCS
Yellow elder	*Tecoma stans*	CS
Ground covers		
Junipers	*Juniperus* spp.	NCS
Mondo grass	*Ophiopogon japonicus*	NCS
Weeping lantana	*Lantana montevidensis*	NCS
Vines		
Chinese trumpet creeper	*Campsis grandiflora*	NCS
Cross vine	*Bignonia carpreolata*	N
Dutchman's pipe	*Aristolochia durior*	CS
English ivy	*Hedera helix*	NCS
Japanese clematis	*Clematis dioscoreifolia*	NCS
Trumpet creeper	*Campsis radicans*	NCS
Trumpet honeysuckle	*Lonicera sempervirens*	NCS
Perennials		
Blanket flower	*Gaillardia aristata*	NCS
Periwinkle	*Vinca minor*	NC
Yucca	*Yucca* spp.	NCS
Annuals		
Annual phlox	*Phlox drummondii*	NCS
Baby's breath	*Gypsophila* spp.	NCS
Black-eyed susan (coneflower)	*Rudbeckia hirta*	NCS
Blue-eyed African daisy	*Arctotis stoechadifolia*	NCS

Table 1. Drought-Tolerant Plants.

Common Name	Scientific Name	Section of State to Which Adapted[1]
Calendula	*Calendula officinalis*	NCS
California poppy	*Eschscholzia californica*	NCS
Coreopsis	*Coreopsis* spp.	NCS
Cape marigold	*Dimorphotheca sinuata*	NCS
Chinese forget-me-not	*Cynoglossum amabile*	NCS
Cornflower	*Centaurea cyanus*	NCS
Cosmos	*Cosmos bipinnatus*	NCS
Gazania	*Gazania linearis*	NCS
Globe amaranth	*Gomphrena globosa*	NCS
Mexican sunflower	*Tithonia rotundifolia*	NCS
Moss rose	*Portulaca grandiflora*	NCS
Strawflower	*Helichrysum bracteatum*	NCS
Verbena	*Verbena hybrida*	NCS
Succulents		
Aloe	*Aloe* spp.	CS
Carrion flower	*Stapelia* spp.	S
Century plant	*Agave americana*	NCS
Crown of thorns	*Euphorbia milii*	CS
Hottentot fig	*Carpobrotus edulis*	CS
Ice plant	*Mesembryanthemum crystallinum*	S
Lawngrasses		
Bahia	*Paspalum notatum*	NCS

[1]State sections: N = north Florida, C = central Florida, S = south Florida