

One of the most important steps in maintaining a healthy landscape is effective irrigation. A properly watered lawn and garden is more resistant to pests and other lawn problems. However, much of the water used to maintain our landscapes is wasted through inefficient watering techniques. By developing a water-efficient lawn and garden, you can maintain a healthy and beautiful yard that benefits the environment.

Water-Efficient Landscapes

A water-efficient landscape starts with plant selection. Choosing plants adapted to the area will help your landscape be both beautiful and water-efficient. Plants native to your area typically require less maintenance and smaller amounts of pesticides, fertilizers, and supplemental water.

Keep in mind, though, that newly established landscaping will require more water than an established area. Adjust your watering schedule according to the needs of your plants.

Watering Mistakes

Much of the water applied to lawns and gardens never gets absorbed by the plants. Common ways that water is wasted include:

- **Runoff.** Applying water too rapidly causes runoff, because grass and plants can only absorb so much water at a time. When runoff occurs, soil, fertilizers, and pesticides can be carried to nearby streams.
- **Evaporation.** Watering in the middle of the day or using a sprinkler that sprays a fine mist causes much of the water you apply to be lost through evaporation. Plants don't have enough time

to absorb the water before it is evaporated by the sun.

- **Underwatering.** Watering too little is wasteful because it does little to alleviate any drought stress that the plants may have.
- **Overwatering.** Applying too much or too often causes the greatest waste of water. In addition to overwatering the plant, excessive irrigation can leach nutrients deep into the soil away from plant roots, which increases the chances of polluting the groundwater. Overwatering also contributes to runoff pollution.

Good Watering Techniques

The key to watering lawns is to apply water infrequently, yet thoroughly. This creates a deep, well-rooted lawn that efficiently uses the water that is stored in the soil. To know when to water your lawn, simply observe the grass. Wilting and discoloration are signs of water stress. At the first sign of wilting, you have 24 to 48 hours before serious injury occurs.

To water properly, apply 1 inch of water to the lawn as rapidly as possible without runoff.

- An easy way to measure your application of water is to place a 6-ounce tuna can on your lawn. When the can is full, you have applied enough water.
- If you start to notice runoff before the can is full, turn off the water. Then, wait for approximately one hour to allow the grass to absorb the water, turn the water on again, and wait for the tuna can to fill.

Water early in the morning, before 10 a.m. Avoid watering from



mid-morning to late afternoon, when you can lose one-third of your water to evaporation. Also avoid watering in the evening, because lawns and plants that are left wet overnight are more prone to disease.

Irrigation Systems

The goal of any irrigation system is to give plants a sufficient amount of water without wasting any. You can effectively achieve water conservation in your landscape using either sprinkler or drip irrigation systems.

To make sure your irrigation system works properly and also conserves water, discuss your landscaping needs and plans with a licensed irrigator. To locate a licensed irrigator in Texas, visit <www5.tceq.state.tx.us/lic_dpa>.

Please note that all built-in irrigation systems are required to be connected using an approved backflow-prevention method.

Sprinkler Irrigation

Sprinkler irrigation is the most popular and common watering method. Sprinkler systems can consist of

Rainwater Harvesting

Rainwater harvesting can offer you another effective way to conserve water in your yard. An easy way to begin harvesting rainwater is by directing a gutter downspout into a barrel and using the collected water in gardens or on potted plants. Rainwater is free, and it's better for your plants than treated water, because it does not contain hard minerals.

For more information, see the TCEQ publication *Rainwater Harvesting with Rain Barrels: A "Take Care of Texas" Guide (GI-383)*.

"hose-end" sprinklers that you can set up and move around the yard, or can consist of built-in irrigation systems. Keep in mind that your area may have specific requirements for built-in irrigation systems, including obtaining a permit for the system and installing the appropriate backflow-prevention assembly.

Make sure that the sprinkler heads are adjusted so as to avoid watering sidewalks and driveways or other hard surfaces. A sprinkler head should spray large droplets of water instead of a fog of fine mist, which wastes water by evaporation and wind drift. Set a timer, so that you remember to turn off the sprinkler.

When used properly, automatic sprinkler systems can help you water effectively. Many irrigation systems use timed controllers that turn off the system when a measured amount of water is used. Rain shut-off devices help prevent watering in the rain and are now required in most Texas counties. Check with your local water supplier to make sure your irrigation system meets the requirements that are in place for your area.

Built-in sprinkler systems require maintenance and adjustments.

Don't just set the system in the spring and leave it on all season. Check your settings periodically to make sure that water is being applied properly, and make adjustments as needed. Many times, you can reduce the amount of time that your irrigation system is operating by 25 percent without affecting the health of your plants.

Check your sprinkler heads regularly. Remove any dirt or debris that may be clogging the nozzle and make sure that water is flowing at the proper pressure. Check for leaks, and repair them promptly.

Not all areas of your yard will necessarily have the same watering requirements. Some plants and trees may require less water than grass does; make sure you reduce the sprinkler run time for these areas.

For more information on irrigation systems, see *Landscape Irrigation: A Consumer's Guide to Landscape Irrigation in Texas (GI-390)*.

Drip Irrigation

Drip irrigation can offer a more efficient method of watering than a sprinkler can, particularly in small areas. Installation can be inexpensive and, with



maintenance, a drip system can last as long as other irrigation systems. You can install drip irrigation systems on or below the ground's surface, so consider the use and care of the area being irrigated. Consult an irrigation professional to determine the appropriate type of drip irrigation system for your needs.

Drip irrigation applies water to the soil slowly. The water flows under low pressure through emitters, bubblers, or spray heads placed at intervals. Because drip irrigation systems distribute water slowly, the run time may be significantly longer than that for a traditional sprinkler system. However, there will be less evaporation and loss due to runoff.

There are many benefits to using drip irrigation:

- With proper management, drip irrigation reduces water loss by 60 percent or more, compared with traditional watering methods. Because drip irrigation applies water just where it is needed, there is little chance of waste through evaporation or runoff.
- The soil moisture remains relatively constant.
- Water contact with the leaves, stems, and fruit of plants is minimized, preventing disease.

- Rows between plants remain dry, which reduces weed growth.
- Once installed, there is little labor required to operate or maintain a drip irrigation system.

Operating a drip system is mostly a matter of deciding how often to turn it on and how long to leave it on. The object is to maintain adequate soil moisture without wasting water by applying too much.

- For newly seeded gardens, the system should run only a short time every day for a few days, to keep the surface soil from drying out.
- Plants loaded with fruit will need an inch of water every other day.

Use drip irrigation for watering vegetables, ornamental and fruit trees, shrubs, vines, and container-grown plants outdoors. Drip irrigation is not well suited for solid plantings of shallow-rooted plants such as grass and some ground covers.

Soaker Hoses

Soaker hoses can offer an easier and cheaper alternative to drip irrigation. A soaker hose is a porous hose that you can connect to an outside faucet, garden hose, or rain barrel and lay out along the base of plants. This system works well with plants that are close together, like ornamental beds with clumped flowers or groundcovers.

However, you should not use a soaker hose to irrigate plants, trees, or shrubs that are spaced far apart, because the area between the plants will be excessively watered, which wastes water and could lead to weaker plants.

Cross-Connection Control and Backflow Prevention

To help maintain the quality of our drinking water supplies, it is important that all Texas homeowners and landscapers help ensure the proper control of cross connections and the prevention of possible backflow when using any irrigation system.

What is a cross connection?

A cross connection is a physical connection between drinkable water and a liquid or gas that could make the water unsafe to drink.

What is backflow?

Backflow is water flowing against its intended direction, which can result in contamination of the water supply. Backflow can be caused by either a loss of pressure in the supply lines or an increase in pressure on the customer's side.

There are several ways that you can prevent backflow in your irrigation system:

- Make sure that the end of your garden hose is never submerged in a nonpotable substance.
- Install a hose bibb vacuum breaker on each of your outside faucets. These inexpensive devices are available in most hardware stores and are designed to allow water to flow in only one direction.
- Schedule a licensed tester of backflow-prevention assemblies to perform a test to confirm that your backflow-prevention assembly is operating properly. Keep in mind that you must have the licensed tester examine all backflow-prevention assemblies upon installation. Check with your water provider about more stringent regulations that may apply, which could require annual testing of backflow prevention assemblies.



For More Information

Title 30, Texas Administrative Code, Chapter 344, provides all the requirements for licensed landscape irrigators and for irrigation systems installed by the property owner.

The TCEQ's *Landscape Irrigation Program: Implementation* (RG-466) explains the new rules (effective Jan. 1, 2009) relating to landscape irrigation for both licensed professionals and customers.

The Environmental Protection Agency's *Cross-Connection Control Manual* offers information on cross-connection controls and methods of backflow prevention.

Always contact your local water supplier prior to planning or installing an irrigation system to ensure that you comply with any requirements.

Landscape Irrigation complements the "Take Care of Texas" *Guide to Yard Care*, which is meant to be a general overview of environmentally friendly practices for your yard. For more detailed information, see the following other TCEQ "Take Care of Texas" guides at <www.takecareoftexas.org/publications>:

- *The "Take Care of Texas" Guide to Yard Care* (GI-28)
- *Mulching and Composting* (GI-36)
- *Rainwater Harvesting with Rain Barrels* (GI-383)
- *Managing 10 Common Texas Yard Pests* (GI-405)
- *Managing Lawn Problems in Texas* (GI-407)

Additional Resources

General Information

Texas Commission on Environmental Quality
www.tceq.state.tx.us

Texas Water Development Board
www.twdb.state.tx.us

U.S. Environmental Protection Agency
www.epa.gov

Texas AgriLife Extension Service
<http://agrilifeextension.tamu.edu>

Sustainable Yard Care

U.S. Environmental Protection Agency
www.epa.gov/epawaste/conserv/rrr/greenscapes/index.htm
www.epa.gov/greenacres

YardWise
www.yardwise.org

Texas AgriLife Extension, EarthKind
<http://earthkind.tamu.edu/>

City of Austin, Grow Green
www.ci.austin.tx.us/growgreen

Publications

Earth-wise Guide to Products Toxicity Ratings. Austin: City of Austin and the Texas Cooperative Extension, 2008. (8 pp.)
www.tceq.state.tx.us/goto/wiseguide

Natural Gardening. Portland, Ore.: Portland Metro and Oregon Department of Environmental Quality, 2007. (70 pp.)
www.oregonmetro.gov/index.cfm/go/by.web/id=645

Organic Gardening (monthly magazine).
Published by Rodale, Inc.
www.organicgardening.com

Rodale's Ultimate Encyclopedia of Organic Gardening: The Indispensable Green Resource for Every Gardener. Edited by Fern Marshall Bradley, Ellen Phillips, and Barbara Ellis. Emmaus, Pa.: Rodale Books, 2009. (720 pp.)

For more information, contact:

Pollution Prevention and Education, MC 113
Texas Commission on Environmental Quality
PO Box 13087
Austin TX 78711-3087
512-239-3100
www.tceq.state.tx.us