

WATER IS THE ISSUE

Water is a limited natural resource. Learning about smart water practices is becoming increasingly important to homeowners due to rising water costs and watering restrictions, or complete bans on outdoor watering.

Unfortunately, too many people rely on guesswork when watering their lawns and gardens, resulting in overwatered landscapes and unhealthy turf and plants. Studies in Denver show the average single-family home uses 45% more water than lawns really need. Inefficient watering costs time and money.

Smart water solutions help you save time, decrease your water bill, and help the environment all at the same time. By following these proven techniques and suggestions, your lawn and garden will look better than ever.

The outdoor beauty that surrounds us—whether lawns, flowers, vines, trees, and shrubs—is more valuable than we realize. It soothes our souls. It cools us from the hot sun. It cleans the environment. It provides beautiful and safe play areas for our children.



Water is a scarce commodity and will continue to become more scarce in the United States. With a little care and prior planning, water can be conserved when used for home plantings.

-Washington State University

Proper watering methods are seldom practiced by most gardeners.

*They either **under-** or **overwater.***

-Texas A&M University

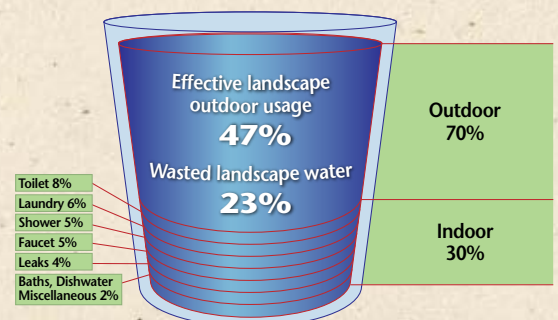
Of all yard care tasks, watering is often the most misunderstood of efforts. Water must arrive at regular intervals and in quantities that will sustain the plant throughout its entire life. As simple as this may sound, far too many plants die from overwatering and incorrect watering practices than from a lack of water. This means that homeowners are not only wasting their time and killing their plants but, worst of all, squandering a valuable resource.

Adding more plants to your yard—trees, shrubs, perennials, annuals, bulbs, and even lawn—is a good thing. By being focused on smart water usage, it is likely that you can have healthier lawns and gardens while being a steward of the environment and using less water—the best of all worlds.

WHAT'S INSIDE...

- Smart Water Checklist
- Why Automatic Irrigation
- Tips for Effective Watering
- Benefits of Plants for the Landscape
- Technology on the Move

TOTAL RESIDENTIAL WATER USE



Soil moisture was about 25% higher and soil temperatures were about 7°F cooler around mulched compared to unmulched beds.

- Clemson University

It's 15°F cooler in the shade than in the sun; plants growing in the shade require 30% less water than their sun-basking counterparts.

GETTING STARTED: A WATERSMART CHECKLIST

- **CHECK THE LIGHT**

Note how many hours of direct sun each area of your yard gets. This will influence how often you need to water. More than 6 hours of sun a day means you have a sun garden. Four to 6 hours of sun or 6 to 8 hours of dappled sunlight means you have partial shade. One to 4 hours of sun or 3 to 6 hours of dappled sunlight means you have a shade garden.

- **CHECK YOUR SOIL**

Do the “fist test.” Grab a handful of soil and squeeze it gently with your fingers. Don’t do this when the soil is very wet or very dry. Open your fist and gently poke at the soil. If the soil stays tightly in a clump, you have clay soil. This type of soil doesn’t allow water to flow through it. Roots don’t grow well, and plants can get waterlogged. If the soil falls completely apart, you have sandy soil. Water runs right through the large particles of sandy soil. Plants don’t get enough water and dry out quickly. If the soil gently breaks into small clumps, you have loam. This is the ideal soil because it contains a mix of particles that allow the water to move slowly through the soil.

- **CHECK YOUR COMPOST LEVELS**

No matter what type of soil you have—sandy, loam, or clay—adding organic matter, such as compost, well-rotted manure, humus, or peat moss, allows for the ideal flow of water through the soil. You can easily make your own compost—gardeners call it black gold.

- **CHECK YOUR PLANTS AND PLACEMENT**

Select the types of grass and plants best suited to your climate, the amount of light, and soil type. “Native plants,” those that are naturally adapted to your area, are the best choices. According to the EPA, native plants can reduce outdoor water use by 20 to 50%. Landscape experts recommend incorporating “hydrozones” within your landscape. Hydrozones are areas where you can group plants with similar water requirements.

WHY CONSIDER AN AUTOMATIC IRRIGATION SYSTEM?

If you haven't already considered an automatic watering system, you may want to. The systems eliminate the time and trouble consumers spend hauling hoses around. Most important, the systems are highly water efficient according to turf experts at a number of leading universities.

Experts at Texas A&M state, "An irrigation system can be the most efficient method of watering a landscape if it is correctly designed, maintained and programmed according to plant needs and weather conditions. An owner should be aware of the system's operations and be alert to signs of trouble with equipment or scheduling. It's also important to adapt the system to maturing landscape and to consider improvements that can increase efficiency."

With irrigation systems that deliver exactly the right amount of water at the right time to lawn, plants, and trees, you can be assured of environmentally sound and efficient results. The irrigation industry offers reliable options and affordable technology for water conservation and efficient water distribution to protect landscaping investments.

*In general, many plants can survive—
if not thrive—with 1 inch of water a week.*

Avoid overwatering. A number of plants used in landscaping require little watering once they are established. Always allow the soil around plants to dry out a few inches below the surface before watering again.

- Ohio State University

THE BENEFITS OF A PROPERLY INSTALLED AUTOMATIC IRRIGATION SYSTEM INCLUDE:

- Decreased water consumption
- Improved accuracy of water placement
- Decreased runoff and evaporation
- Easy control of irrigation timing
- Minimized plant loss during drought
- Reduced time and labor for watering
- Full landscape coverage



HOW MUCH WATER ARE YOUR PLANTS ACTUALLY GETTING?

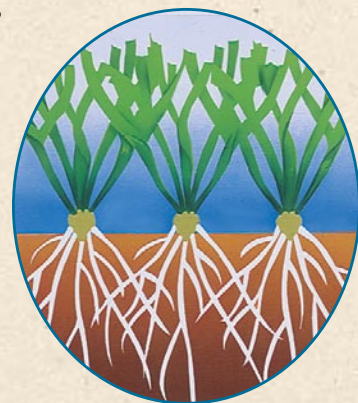
Interacting with your lawn or garden is what gives you the most reliable means of judging its needs. Therefore you become the most important component of any watering system. Without your adjustments, all but the most sophisticated automatic systems may fail. How many times have you seen sprinklers running in the pouring rain?

Obviously, there are more factors than rainfall to consider. Temperature (the hotter the day, the more water plants need), humidity (higher humidity means less watering), and the amount of wind (breezy weather dries plants out) all determine how much and how often you will need to water.

Different grass species have different water requirements. Check with your local Cooperative Extension Service to determine grass species that are best for your region.

*The main mistakes Americans make in their landscape:
cutting the lawn too short, overwatering, and overfertilizing.*

- Princeton University



The Can Test

When you installed your irrigation system, you supposedly knew how much water each sprinkler head was supposed to deliver—often $\frac{1}{2}$ inch an hour. But does it? Here's an easy way to check.

Starting one foot out from the sprinkler head, set a tuna can or other shallow can out in a line every 12 inches extending out as far as the head will reach. Run the system for 30 minutes. Then measure the water in the cans to determine if you're getting the amount you are supposed to. Adjust watering times appropriately. Adjust the nozzle if the water isn't going as far as it should.

Van Cline's Tips for Effective Watering

Van Cline, PhD, is Toro's chief turf care agronomist. He works with leading turf care experts around the world to develop solutions to their turf care problems. You'll be amazed at how much water you can save by following Van's advice.

WATER DEEPLY AND INFREQUENTLY

The objective is to wet the entire root zone and then to let the soil dry down before rewatering. This technique encourages a deeper more efficient turf root system.

WATER WHEN THE LEAST AMOUNT OF WATER IS LOST TO EVAPORATION

Early morning is best when temperatures are cool and winds are usually calm. Watering during the heat of the day results in much higher losses to the atmosphere through evaporation. Early morning watering also washes dew droplets off grass leaves which can reduce the risk of fungal diseases.

CONTROL THE RATE OF TURF GROWTH

Avoid applying too much fertilizer which over-stimulates leaf growth and reduces root growth. Rapid leaf growth consumes more water. Also, use slow release fertilizers which produce more consistent and uniform growth.

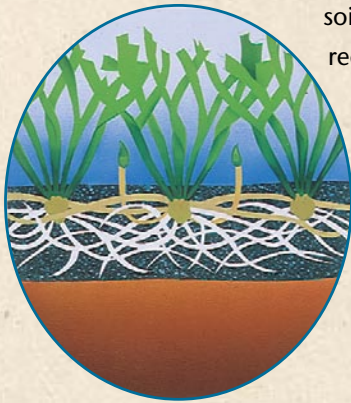
ADJUST YOUR MOWING HEIGHT

Set your mower to a height of 2 to 3 inches, depending on your species of grass. Higher heights of cut tend to produce healthier turf with a deeper more efficient root system. A taller turf canopy also reduces evaporation from the turf surface.

INCREASE MOISTURE RETENTION

Soils higher in organic matter retain more water. Garden soils can be modified using compost, peat or other sources of organic material. Mulching around garden plants can also reduce water lost through evaporation.

Experts at Colorado State University recommend applying enough water to moisten the root zone. Use a soil probe to determine the average root depth of your lawn. If the roots are six inches deep, water to that depth. Various soils require different amounts of water to wet the root zone to a six-inch depth. For example, clay soils requires up to 1-1.5 inches of water; loamy soils require 1 inch of water; and sandy soils require .5 inch of water. Clay and loamy soils hold moisture longer and require watering less frequently while sandy soils hold less moisture and must be watered more frequently.



Conventional wisdom says you should take into account your soil type, the types of plants you've selected and the evaporation rates. New high tech weather-based irrigation scheduling systems improve water use efficiency. The systems feature a computer which calculates water needs based on weather data, and can factor in soil type, and plant species. On most moderate sized yards, for example, this tool can reduce outdoor water use by about 15%, saving up to 37 gallons of water every day. Alternatively, a weather-based irrigation controller can do the scheduling for you, applying the right amount of water to your plants automatically, if adjusted properly.

Water When the Plant Needs It

Lawn: If you walk on the lawn and your footprint persists, it's time to water. Turf that doesn't rebound from footprinting is likely to wilt due to a lack of moisture. If the turf springs right back, leave watering for another day.

Plants: If the plant begins to wilt, give it a good drink of water. If in doubt, stick your finger in the soil. Overwatered plants will sometimes droop. If the soil is moist, let it dry out before watering again.

Despite the concerns about saving water, keeping plants in your landscape can be helpful on a number of fronts. Consider the following:

- Plants filter out many pollutants. A 50- by 50-foot area of lawn releases enough oxygen to meet the needs of a family of four.
- Deciduous shade trees planted on the east or west side of your house can reduce air conditioning bills by 10-15% in summer. Further, they can cut the indoor temperatures by 8° to 10°F. In winter, the sun shines through the bare branches and warms your home.
- Lawns can reduce the temperature by as much as 15°F over asphalt during hot summer months.
- The front lawns of just 8 average houses have the cooling effect of about 70 tons of air conditioning. The average home has an air conditioning system with a 3-ton capacity.
- Trees produce life-giving oxygen and remove pollution—CO₂ from the air. A single tree will absorb one ton of carbon dioxide over its lifetime. Grass is also highly efficient at converting carbon dioxide to oxygen, a process that helps clean the air.
- Evergreen trees along the north or northwest side of your house lower winter heating from 10–25%.
- Trees trap dust particles and absorb gaseous pollutants from the air.
- Lawns trap much of an estimated 12 million tons of dust and dirt released annually into the U.S. atmosphere.
- Lawns help reduce water pollution by acting as a filter to capture and breakdown many types of pollutants.

THE BENEFITS OF PLANTS IN YOUR LANDSCAPE





TECHNOLOGY ON THE MOVE:

TORO WATERSMART SOLUTIONS

The irrigation industry is rapidly developing new technology to make irrigation more efficient. "Smart" technology, such as systems with flow-control nozzles, climate-based controllers, and automatic shutoffs, are beneficial and even required for irrigation systems in some areas. It's important to remember that new technology cannot improve the efficiency of a poorly designed and maintained irrigation system.

For more than 90 years, Toro has been the leader in producing innovative irrigation technologies for residential, professional and agricultural applications. Water conservation is a challenge that Toro takes seriously. **With Toro products, water conservation is easier than ever to achieve.**

Most Americans overwater by 20 - 40%.

By not overwatering, water can be reduced by about 12% during summer months.

- North Carolina State University

CONTROLLER

This timing device allows you to schedule how long and how often you water a particular part of your lawn or garden. The latest innovation is self-adjusting controllers, called ET or smart controllers. ET stands for EvapoTranspiration. Simply put, it is the combination of the amount of water that evaporates from the soil PLUS the amount of moisture that transpires through the leaves of the plants. There are different types of ET controllers, some collect data from mini weather stations installed in the landscape; others download weather information from satellites and others are pre-programmed with historical ET data.

Toro WaterSmart Solution - Intelli-Sense® Controllers

By intelligently applying optimal amounts of moisture for plant health and appearance, Intelli-Sense smart controllers save water, time and money. The controllers use WeatherTRAK-enabled scheduling software which optimizes irrigation with site-specific watering based on soil type, slope, sun, shade, etc. ET-Everywhere downloads daily weather data from NOAA weather satellites, providing accuracy without cost and maintenance issues. These controllers have been proven to reduce water usage and runoff in residential-use studies.



SENSORS ATTACHED TO CONTROLLERS

Rain shut-off sensors stop an irrigation system from running if it rains. The best sensors use hydroscopic disks that swell and close a micro-switch that inhibits system operation in the event of rain.

Toro WaterSmart Solution - Wireless RainSensor® Controllers

Toro's wireless RainSensor controllers automatically shut off the irrigation system when it rains. They save 30% more water than other rain sensors and are designed with the industry's first LCD (digital display) for easy programming. The RainSensor also includes a freeze detector that automatically interrupts scheduled irrigation when temperatures drop below freezing.



VALVES

Valves are the equipment in your irrigation system that release and meter the water. Look for pressure and flow regulation devices and check valves to prevent low head drainage.

Toro WaterSmart Solution

Toro's valves feature patented flow sensing meters which automatically close when the sensor measures a flow rate higher than the normal flow rate. This enables the system to automatically shut itself down in the event of pipeline breaks or broken sprinkler heads.



REGULAR MAINTENANCE SAVES WATER

Regular maintenance of an irrigation system can help ensure that water is distributed evenly on the lawn and does not overspray onto paved areas. A certified irrigation contractor can help you keep your system working efficiently and alert you to the latest developments in water saving technology. The experts at Colorado State University recommend the following tips to help make your irrigation system water efficient:

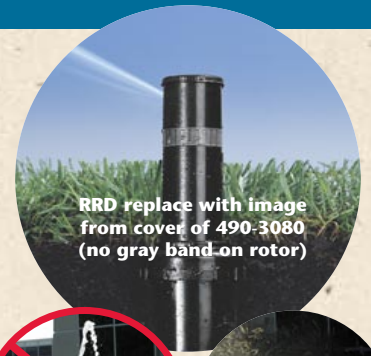
- Adjust the delivery angle of the heads.
- Periodically replace worn heads and nozzles.
- Adjust sprinkler heads to make sure they're vertical.
- Replace leaky valves.
- Make sure sprinkler heads clear the grass height.
- Have a certified irrigation auditor regularly check for leaks, broken heads and other problems.

SPRAYS AND ROTORS

Sprays and rotors are terms used for the sprinkler head that is responsible for distributing the water on the turf. Rotors are sprinkler heads that revolve in arcs. Sprays are fixed sprinkler heads that stay in one place. State-of-the-art heads feature built-in pressure regulators to keep water application consistent among all heads and automatic shutoff valves that restrict water loss if the nozzle is damaged. Some heads are designed with a memory feature that automatically returns the sprinkler to its previously set arc if it is vandalized or changed by unauthorized persons.

Toro WaterSmart Solution - X-Flow®, Smart Arc® and Trujectory®

Toro has developed a variety of water-saving features. The X-Flow® shut-off feature shuts off the flow of water if nozzles are removed or damaged. This prevents geysers of water shooting up into the air and ensuing soil erosion. The X-Flow also includes a patented pressure regulator that keeps water pressures constant. This eliminates fogging and misting problems that waste water. Toro's Trujectory® adjustment system can fine-tune the spray trajectory from 5 to 25 degrees to compensate for wind, low hanging tree branches and throwing water onto slopes. Toro's Smart Arc® memory feature returns the head to its original arc in case of misalignment or unauthorized changes. This prevents the rotor from spraying water onto unintended surfaces such as streets or sidewalks.

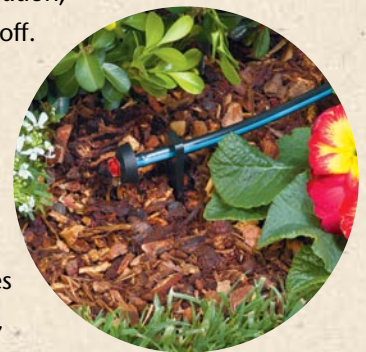


MICRO IRRIGATION

Increased concern about water conservation has prompted many new efforts in the areas of Micro irrigation – a specialized method of applying precise, smaller amounts of moisture directly to the desired plants and their root system. Micro or “drip” irrigation systems distribute water slowly and accurately in residential and agricultural applications. Precise application greatly reduces water loss from wind or evaporation, and minimizes moisture wasted on weeds, unplanted areas or runoff.

Toro WaterSmart Solution

Toro is a world leader in residential and agricultural micro-irrigation technology. The Toro DL2000 system delivers water to plant roots through underground in-line tubing with regularly spaced, pressure-compensating emitters. It features ROOTGUARD: a patented manufacturing process that impregnates the emitters with Treflan® herbicide. ROOTGUARD provides a safe, consistent chemical barrier that prevents damaging root growth.



TIPS FOR EFFICIENT IRRIGATION

Below are Toro's tips for reducing the cost of operating and maintaining an irrigation system:

- Know how to run your irrigation controller and change watering times.
- Adjust the watering times (number of minutes) and the frequency of watering (daily, twice a week, etc.) based on weather conditions.
- Change your settings to adjust for seasonal differences and reset the timer when needed.
- Develop a separate drip watering schedule for trees, shrubs and flowerbeds.
- Install a rain shutoff switch. These devices are inexpensive and effective at preventing watering in rain. Many states and cities require them. A rain shutoff device can be retrofitted to almost any system.
- Toro Recycler® mowers can help increase the water retention of your lawn.





TORO IRRIGATION BACKGROUND

Toro is one of the world's leading providers of outdoor maintenance and beautification products for home, recreation, and commercial landscapes. Toro provides innovative products, agronomic expertise and other services to help consumers and professionals maintain landscapes throughout the world.

Toro is leading the way in water management products and services. For more than 90 years, the company has supplied the residential and professional irrigation industry with high quality products and holds more than 200 patents. Toro offers a full roster of water conservation products including weather-based smart controllers, pressure regulating sprinklers and valves, automatic shutoff devices, nozzle adjusting devices, drip irrigation and more.

FOR MORE INFORMATION ON WATER CONSERVATION

- Contact your local Cooperative Extension Service or your municipal water conservation officials. For state-specific water efficiency and conservation programs, visit: **www.epa.gov/owm/water-efficiency/where.htm**.
- **WaterSense**, a voluntary public-private partnership program sponsored by the EPA, helps homeowners and businesses improve water efficiency and reduce their costs by promoting efficient irrigation technologies such as weather-based irrigation controllers and certification programs for irrigation contractors. For more information, visit: **www.epa.gov/watersense**.
- The Irrigation Association is the professional organization for the irrigation industry. Their members worldwide have worked toward a shared vision—water conservation through efficient irrigation. The consumer section on this site can help you hire the right professional for your property. For more information, visit: **www.irrigation.org**.
- Toro sponsors a community involvement program called Environmental Solutions: WaterSmart. The program teaches homeowners how to have beautiful lawns and gardens while using less water. For more information, call 1.800.527.3187.

INFORMATION FOR THIS BROCHURE WAS PROVIDED BY:

- Climatecrisis.net
- Florida Cooperative Extension Service
- University of Colorado
- Clemson University
- North Carolina State University
- University of Georgia
- Environmental Protection Agency
- Princeton University
- Metropolitan Water District of Southern California

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