

Efficient Watering of Turf

Massachusetts is generally ample, it is not uniformly distributed throughout the year. Thus, it occasionally becomes necessary to provide supplemental irrigation to keep turfgrasses growing well, especially during the summer months. Water is lost from the soil by gravitational drainage, evaporation, and plant use. If plant or soil water content becomes limiting, drought stress and/or turfgrass death may occur.

When is Irrigation Necessary?

Many variables influence the amount of water used by turfgrasses. These include: amount of solar radiation, temperature, humidity, grass species, and rate of growth. Rooting depth and soil texture also affect turfgrass water needs. More deeply rooted grasses can extract water from a greater volume of soil and are thus more drought tolerant than shallow rooted species. Finer textured soils hold more water than coarse soils and require less frequent irrigation.

Because so many factors interact to determine turfgrass water use, it is difficult to give a general estimate of how often to water a lawn. The best technique for determining when to irrigate is to observe both soil and plant conditions in the lawn and then water when the turf needs water rather than on a regimented schedule.

Turfgrass Drought Tolerance

The following turfgrass types are listed in order of their tolerance to drought:

Fine Leafed *High Tolerance*
Fescues

Tall Fescue

Kentucky Bluegrass

Perennial Ryegrass

Bentgrasses *Low Tolerance*

The fine leaved fescues include hard fescue, creeping red fescue and Chewings fescue. Sheep fescue is a fine fescue which has excellent drought tolerance, but which is more suitable for areas which are mown only once or twice per year.

Detecting Wilt and Drought Stress

In order to conserve water and avoid the detriments of overwatering, lawns should be watered just prior to the development of wilting and drought stress. This may be difficult to determine initially, but a little knowledge and experience will make it easier.

Wilting occurs because the plant's internal water content drops so low that the plant cannot remain turgid (stiff), and plant cells begin to shrivel. Turfgrasses undergo a series of visible changes when they begin to wilt. Development of a bluish-green coloration and the rolling or folding of leaf blades are two noticeable changes associated with wilting. If footprints remain visible on the lawn for several minutes after walking on it, the turf is not very turgid and wilting is imminent. These initial symptoms of wilting will not cause permanent injury to the lawn. However, they do indicate that the lawn should be watered soon in order to avoid drought stress and possible turfgrass death. In addition to observing plant symptoms, examining the soil is also helpful in determining when to irrigate. Use a soil probe or garden spade to examine the soil to a depth of approximately six inches. If the soil appears dry, it is time to water.

Effective Watering Practices

Frequent lawn watering often encourages shallow rooting and may predispose the lawn to increased disease and greater susceptibility to stress injury. Watering deeply and less frequently provides for improved turf growth and increased water conservation compared to light, frequent watering.

When irrigation becomes necessary, sufficient water should be applied so that the soil is wetted to a minimum depth of 4 to 6 inches. This amount of water will vary with soil texture, but approximately 1 inch of water should thoroughly wet most soils to a depth of 4 to 6 inches. Placing several empty cans (tuna or cat food cans work well) under the sprinkler will allow you to determine when an appropriate amount of water has been applied. You can then determine how much water to apply to adequately wet the soil to the right depth.

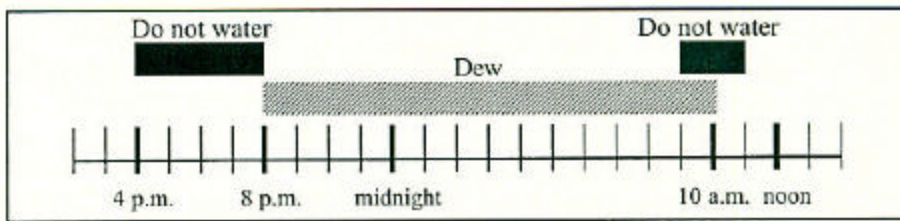
Irrigation can be applied at any time during the day or night. Both day and night watering have advantages and disadvantages. Midday watering can serve to cool the turf and reduce heat stress on hot summer days. However, if drainage is poor, pools of standing water can become very hot and result in turf death due to scalding. Also, midday watering is relatively inefficient due to substantial evaporation losses.

A widely held belief is that night watering will incite or aggravate disease problems. One must consider, however, that the turf is usually wet during the night anyway even if irrigation is withheld because of dew formation. Recent research has suggested that the duration of leaf wetness (the number of hours that the leaf blade is actually wet) has a greater impact on disease incidence than night watering per se. In that case, watering during early evening or late morning (just prior to or following dew formation) could result in increased disease by prolonging leaf wetness. Night irrigation helps to conserve water because of minimal evaporation at night. Night watering should be avoided, however, when disease is present and actively damaging the lawn,

or during periods of very hot humid weather. Late afternoon watering may help to minimize evaporation without aggravating disease activity. Very early morning watering, before dew has dried, will provide for efficient use of water and not contribute unnecessarily to disease pressure.

Summer Dormancy Due to Drought

Under periods of prolonged drought, some turfgrasses have the capacity to avoid death by entering into a state of dormancy. Kentucky bluegrass is the most common turfgrass exhibiting this drought avoidance mechanism. Dormant turf appears straw colored and does not grow. When drought conditions cease, usually due to late summer or fall rains, the turf is capable of resuming normal growth. Although the lawn may recover when water is no longer limiting, during dormancy it is much more susceptible to disease, insect, traffic and wear injury because it is not growing. Also, disease and insect injury may go undetected because the turf is already brown; thus when plants are damaged they are not noticed. This can result in the loss of large areas of turf which may have been prevented if the lawn had not been dormant. Weed infestations can increase because the grass is not actively growing and thus cannot compete with more actively growing weeds. If a quality lawn is your goal, drought induced dormancy should be prevented by timely watering.



When NOT to water turf

Written by the staff of UMass Extension's Turf Program

United States Department of Agriculture cooperating.

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