



## **DROUGHT CONDITIONING YOUR TAMPA BAY AREA LAWN**

When the weather is hot and dry, drought-like conditions can occur in sandy Florida soils after only a few days. Your lawn may require irrigation during these drought periods to maintain its quality. However, rapid development of the state and the prolonged drought are putting pressure on water resources and the amount of water available for irrigation. This has resulted in widespread and stringent watering restrictions throughout the state.

Without adequate water from either rainfall or irrigation, turfgrasses will adopt a water conserving habit. Under these conditions, grasses will roll their leaf blades to stop the loss of water (known as transpiration) from the leaves. New shoot growth slows and roots grow more deeply into the soil in search of water. Some leaves may die and drop, although grasses will generally recuperate upon receiving adequate irrigation. St. Augustinegrass is one lawn grass that can die if it goes too long without water.

As grasses recover from drought, they will be more susceptible to other stresses (cold temperatures, traffic, insects, or diseases) and will not grow as vigorously as non-stressed grasses. In light of increased mandatory watering restrictions in Florida consider management practices that will help enhance the drought-tolerance of your grass.

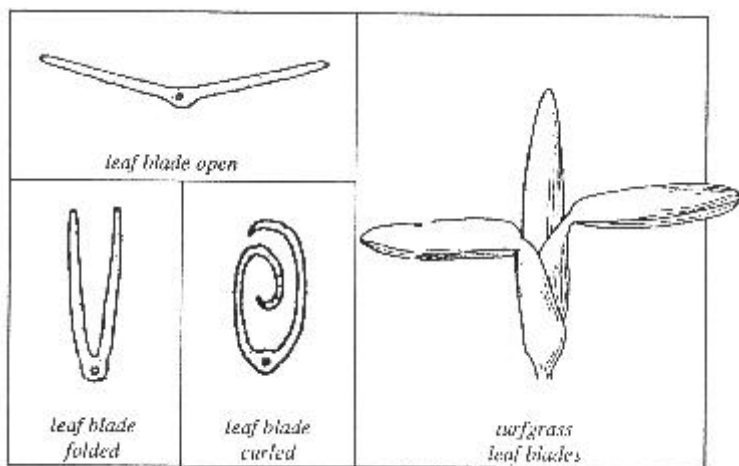
### **Objective of Drought Conditioning**

The primary objective of drought conditioning is to grow a good quality lawn that will survive rainfall and minimal watering. A drought-conditioned lawn can withstand more stress than a lawn that is not conditioned. A properly prepared lawn will have a deep and extensive root system that is better able to access soil moisture.

### **Irrigate Less Frequently for Longer Times**

Proper irrigation is the first step in conditioning a lawn for drought. Many people rely on their automatic sprinklersystems regardless of any rainfall received. This practice is actually detrimental to the grass because it promotes a lawn that requires more water and one that cannot withstand tough times. Less frequent, longer irrigations will assist in establishing a deeper, more viable root system. To develop a deep root system, water your lawn when signs of wilt occur. When the lawn needs water, you'll see spots in the lawn that turn bluish-gray, footprints that remain in the grass long after being made, and many leaf blades folded in half lengthwise. Apply only enough water to wet the soil in the root zone. For Florida's sandy soils,  $\frac{3}{4}$  inch of water is generally

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sufficient. This will moisten the upper 8 to 10 inches of most Florida soils. When you irrigate, the amount of water used is the critical factor, not the amount of time the irrigation system operates. An easy method of measuring the amount of water applied by your irrigation system is to set out several straight-sided cans in the irrigation zone. Monitor how long it takes to fill the cans to a depth of  $\frac{3}{4}$  to 1" of water, and set your irrigation system to run for this length of time.

Do not water the lawn again until signs of wilt reoccur. This technique works regardless of turfgrass species, soil type, season, or other environmental conditions. It may take up to 6 weeks to condition your turf to survive several days

**Figure 3.** Grass leaves will be flat or "open" when they have plenty of water. When in need of irrigation, grass blades fold together lengthwise to reduce water loss.

or more without wilting between irrigations or rainfall. During this time the root system is developing and growing deeper into the soil. In time, your lawn will establish a more uniform appearance with less thatch and a deeper root system.

## Irrigate Uniformly

Many irrigation systems are improperly designed and do not apply water evenly. Dry areas become apparent during a drought because there is insufficient rainfall to mask the design problems. You can confirm this by doing the catch-can test described above. Place a can in each declining area and also in the healthy areas and compare the amounts of irrigation they are receiving. If you find that you have irregular irrigation output, contact a qualified irrigation contractor to evaluate and fix your irrigation system.

## Irrigate Effectively

Beyond applying the correct amount of water uniformly to a lawn, the water applied must be efficiently absorbed to be effective. Areas with slopes or graded to provide drainage may allow water to run off before it has sufficient time to soak in. Since these areas are often designed to allow water to run off quickly during periods of frequent rain, changes to a sprinkler system or watering technique may be necessary to help correct this type of problem. A heavy layer of thatch can also create a barrier to water absorption. You can check the amount of thatch by digging a plug out of the grass to see how thick the layer is. One technique you can use to check how deep water is soaking in is after watering the lawn, stick a shovel into the ground to burying the blade vertically into the soil, and then pull the handle forward to show the soil profile. You should then be able to decide if additional action needs to be taken to correct a water absorption problem. Occasionally there are dry areas that do not allow water to soak in. Corrective action may as simple as aerating an area with tool like a hay or manure fork to create pathways for water, air and nutrients. Drenching the area with a mild soap solution afterward may also help water penetrate. For additional information on thatch or dry areas contact your local Extension service for details.

## Irrigate Early

Irrigate early in the morning so that excess moisture on the leaf surfaces will dry quickly. Irrigating late in the day can promote disease by prolonging the time that the grass blades stay wet. Irrigating during late morning and afternoon (when higher temperatures and wind are likely) will waste water to evaporation, and is not allowed under water use restrictions.

## Micro-Environmental Effects in the Landscape Affect Irrigation Requirements

Not every part of your lawn will have the same irrigation requirements. For instance, if grass is planted close to the house, it will be in shade for some portion of the day. Trees or large shrubbery can also cause shade, and some mature canopies actually shade a portion of the lawn for an entire day. In these cases, it is very difficult to grow an acceptable stand of turf, and a different ground cover may be a better choice. If you choose to grow grass in the shade, you must reduce irrigation to this part of your lawn. Soil conditions will also influence water requirements. Sandy soils do not hold water for long, and dry out faster than soils with more mineral content. Climatic conditions such as wind, temperature, and humidity also alter water requirements. Adjusting your watering practices to accommodate these factors can save water and improve turf quality.

## Mowing Practices

Proper mowing practices are essential for good quality and drought-tolerant turf. Every time a lawn is mowed, the metabolic activities of the grass are stressed, which reduces root growth. Using the highest cutting height on the mower will promote drought conditioning. This approach increases the grass leaf area, allowing for more photosynthesis. The resulting increase in carbohydrates (food) aids root growth and recovery from stress. The higher the mowing height, the deeper and more extensive the root system will be. Although transpiration (water loss through leaves) will be slightly greater with higher mown turf, the expanded root system proves more advantageous.

Turfgrass Species	Optimal Mowing Height (inches)	Mowing Frequency (days)	Preferred Mower Type
Bahiagrass	3.0 - 4.0	7 - 17	Rotary/flail
Bermudagrass	0.5 - 1.5	3 - 5	Reel
Seashore Paspalum	1.5-3	5 - 10	Rotary/reel
St. Augustinegrass	2.5 - 4.0*	5 - 14	Rotary

\* Dwarf varieties of St. Augustinegrass (Seville, Jade, Palmetto, and Delmar) are cultivars that should be mowed at less than 3".

Mowing should be done often enough to minimize the shock of cutting. Never mow off more than one-third the height of the leaf blade at any one time. If the lawn is allowed to grow to 4 inches, do not mow it lower than 3 inches. Adjust the frequency of mowing to the growth of the turf. In the summer, it may be necessary to mow more than once a week, but in the winter, once a month or less may be enough. Keeping the mower blades sharp and properly balanced is also important. A leaf cut by a sharp blade will heal over more quickly and lose less water than a leaf blade shredded by a dull mower blade.

## **Fertilization Practices**

The right fertilization practices can also enhance drought tolerance of turfgrasses. All of the drought conditioning accomplished by proper irrigation and mowing practices can be defeated by excessive nitrogen fertilization. Too much nitrogen enhances shoot growth but root growth is reduced. Leaf blades become more lush as nitrogen fertilization increases which requires more water to support. Drought conditioning can only be accomplished by applying just enough nitrogen to obtain a small but continuous amount of growth. Supplemental iron applications can provide desirable green turf without promoting succulent shoot growth. Iron applications have also been shown to increase turfgrass rooting.

Fertilizing with potassium can also help a lawn increase its tolerance to many stresses, including drought. Potassium promotes increased root growth and thicker cell walls. Turfgrasses require potassium in nearly the same amount as nitrogen, especially in sandy soils where both readily leach out. Other macro and micronutrients, as well as the soil pH should be kept at recommended levels for optimal growth.

## **Pest Control**

Pesticide chemicals should be applied to lawns with a great deal of care because they can add the extra stress of phytotoxicity (chemical damage to plants). A healthy lawn is the best defense against weeds, insects, and diseases. The irrigation, mowing, and fertility practices outlined above will promote a healthy, dense turf and reduce the need for pest control measures. However, if a pest problem has been diagnosed, it should be promptly treated following recommendations from your local Cooperative Extension office. Spot treatment of a pest problem is usually as effective as treating the whole lawn.

## **SPECIAL CARE DURING A DROUGHT**

### **Postpone or Reduce Fertilizer Applications**

Since grass growth decreases during a drought, fertilization should also be reduced or postponed until adequate rainfall is available. Trying to maintain a green lawn through nitrogen fertilization at this time will place the grass under additional stress and may affect recovery. Also, many fertilizers have a high salt content and can actually burn the grass.

### **Postpone Herbicide Applications**

Herbicides or weed killers can stress a lawn even under good conditions. During a drought, that stress can reduce turf growth and the ability of a lawn to compete with weeds. In addition, some herbicides aren't as effective during a drought since the grasses metabolic functions are decreased and the herbicide isn't distributed well throughout the weed. Avoid using lawn herbicides as a spray application or as a component of a "weed and feed" fertilizer during the hot summer months between May and September.

### **Spot Treat Lawn Pests Only if Needed**

Chemicals (pesticides) should only be applied as needed and then only to the affected area of the lawn. Chemicals can cause damage to the grass, which can increase stress to the turf. Keep an eye out for increased chinch bug activity on St. Augustinegrass during droughts, and spot treat for them as necessary to reduce damage.

## Consider Using a More Drought-Tolerant Turf Species

St. Augustinegrass is the most widely used lawngrass in Florida, but it performs best with supplemental irrigation. Other grass species, such as bahiagrass and seashore paspalum have better drought tolerance. Although these grasses will turn brown during a drought, they are more likely to resume growth and turn green when water is applied or rainfall resumes. Bermudagrass, zoysiagrass, and seashore paspalum can usually recover from drought-induced dormancy because they have underground rhizomes that are protected from drying out in the soil. St. Augustinegrass doesn't have rhizomes, which decreases its ability to recover from stresses such as drought. Additionally, deep root systems, which enhance recovery from drought, are found in bahiagrass, bermudagrass, and seashore paspalum.

Choosing a grass that is drought tolerant is complicated because each species has its particular set of problems. Bermudagrass and zoysiagrass tend to have trouble with nematodes (minute, worm-like animals that feed on plant roots), although both provide good quality turf when nematodes are controlled. Bahiagrass is susceptible to mole crickets, but these insects are easier to control than nematodes. If a person can accept an open growth habit and not over-manage the turf, then bahiagrass may be the best selection. Bahiagrass is adapted to a wide range of soils and can survive under minimum management, however it has poor shade and salt tolerance. Seashore paspalum has good tolerance to drought, salinity, insects, and diseases and provides an attractive, high-quality turfgrass.

## Alternatives to Turfgrass

People often attempt to grow grass where it will not survive without extraordinary care. High-quality turf cannot be maintained without supplemental irrigation, although a lower-quality turf may persist. In landscapes where unsightly turf may detract from the design, alternatives to turf should be considered. Mulched beds or groundcovers may be more suitable. Plant materials that do not require frequent irrigation should be chosen. Consult your local Cooperative Extension office for the plants that grow well in your area.

This document was compiled for the citizens of Hillsborough County from University of Florida/IFAS publications by L.E. Trenholm, H.C. Jones, and C.S. Lippi. Editing by JoAnn Hoffman and Sydney Park Brown

For further information on Florida lawn care, contact your local Extension office or consult the Florida Lawn Handbook online at: [http://edis.ifas.ufl.edu/TOPIC BOOK Florida Lawn Handbook](http://edis.ifas.ufl.edu/TOPIC_BOOK_Florida_Lawn_Handbook)

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