



# Q&A

## Coping with Drought

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### Have Questions?

SEND THEM TO GRADY MILLER AT UNIVERSITY OF FLORIDA, P.O. Box 110670, GAINESVILLE, FL 32611, OR E-MAIL: GLMI@UFL.EDU. OR, SEND THEM TO DAVE MINNER AT IOWA STATE UNIVERSITY, 106 HORTICULTURE HALL, AMES, IA 50011, OR E-MAIL: DMINNER@IASTATE.EDU.

**I**oversee the management of a number of fields in Florida. As I am sure you currently know, we are having a severe drought and are being limited by the Water Management District on how often we can irrigate. My fields were built with a typical Florida sand and during normal times I irrigate every day for about 20 minute per zone. Some of my "customers" are asking if there is anything I can do to keep my fields from turning brown. I have discontinued fertilization based on the advice from my local extension agent, so some of the brown color may be due to lack of fertilization. If we don't get some rain soon I am afraid my bermudagrass fields may die. What do you suggest I do? Is there anything I could have done earlier to prepare my fields for the drought?

—Via e-mail, Florida

**Y**our questions have been asked a lot in the last couple of months. I know in Gainesville, Florida we have not had rain in over 45 days and our yearly total to date is holding steady at 8 inches. Sandy soils with high infiltration rates and low water retention capacity make the situation even worse. If I knew the steps to a rain dance, I would probably be outside right now wearing holes in the soles of my shoes. Even though there is overlap, let me address your questions separately.

### Preparing for Drought

First, bermudagrass is a pretty amazing grass. In fact, most agronomists consider it a very difficult-to-kill weed. Without adequate water from either rainfall or irrigation, it will roll its leaf blades to conserve water and send its roots deeper into the soil to find water. During an extended drought, leaf tissue may die and drop from the plant, although the grass will generally recuperate from stolons and rhizomes upon receiving adequate water. So, how do you improve the "drought conditioning" of the grass?

Less frequent, longer irrigations throughout the year will assist in establishing a deeper, more viable root system. The deeper the root system, the greater volume of soil for the plant to pull water from during a dry-down. Apply enough water to wet the soil in the rootzone and then don't water again until about 30% of the turf shows signs of wilt. Check your irrigation system frequently to make sure it applies water uniformly and is in good working order. Poor design/installation, broken heads, or a busted valve all can contribute to an inefficient system. While checking out your system, determine how long the zones have to run to put out .75 inch of water. This will come in handy when setting your watering times during the year (based on ET). If you have some dry spots, you may want to add a commercial wetting agent to those locations so the soil will absorb

water uniformly. Addition of some of the porous soil amendments to sandy soil may also reduce dry spots and improve water holding capacity. The impact of these amendments varies depending on the amendment, base soil type, amount used, and how they are utilized (all beyond the scope of this discussion).

Mowing height can impact drought conditioning. Use the highest mowing height that you can. If you have a very demanding clientele, you may only be able to go from .75 to 1 inch. If you can get away with it, I would mow Tifway bermudagrass at no less than 1 inch if water is limiting, and 1.5 to 2 inches would be even better. The greater the leaf area, the deeper and more extensive the root system will be.

Fertilization practices can enhance drought tolerance of bermudagrass. Excessive nitrogen (N) enhances color and shoot growth but root growth may be reduced. High N rates also promote lush shoot growth that is "water hungry." Potassium (K) is often mentioned as a nutrient that promotes drought tolerance. There has been some research that indicates that K can increase stress tolerance, but there has been little data to support the exaggerated rates that some are using. Potassium can leach in sandy soils, which should also be a consideration when determining rates and timings. A general recommendation that I use is to apply about

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the same amount of K as N. When high N plus high K rates are combined with low soil moisture, salt levels within the soil may become high and actually reduce water uptake. Other nutrients, should be kept at recommended levels according to soil tests for optimum growth. Supplemental iron applications can provide desirable green turf without promoting succulent shoot growth.

Pests can weaken turf and make it more susceptible to drought, so try to reduce pest problems when necessary. This is particularly true for root feeding insects such as grubs and mole crickets. Weeds also compete with turf for water, so timely weed control is important.

### Managing Under Drought Conditions

So now you are in the middle of the drought, your water authority has dramatically limited your irrigation, and you are wondering what to do with those parched fields. First, be a good citizen and follow mandated water restrictions. You don't want the wrath of an angry concerned citizen because you broke the rules, nor do you want to pay any levied fines if you are caught in violation of irrigation restrictions. Irrigate to moisten the upper 10 to 12 inches of soil. For Florida's sandy soil, that is about .75 to 1 inch of water. Irrigate late at night or early in the morning to maximize the water. Second, post some signs and make some phone calls to let the "proper" people know that the fields are currently under imposed water restrictions. This way they know it is not your fault that the fields begin browning.

The turf will reduce growth without adequate water, so mowing needs will be reduced. You will need to mow less often and at the highest height when you mow. Research has shown that turf maintained at a greater height of cut will lose more water per day than turf maintained at a lower height. But, the same studies also indicated that turf mowed lower lost its quality quicker under drought stress because the shallower root system of the more closely mowed turf could not obtain sufficient water under moisture stress. So, raising the mowing height is good insurance because it increases the ability of grass to respond and adapt to stressful conditions.

Postpone or reduce fertilization. Apply low rates of nitrogen to keep color. No more than 0.5 pounds of N per 1000 square feet per application. You don't want to promote lush growth. Recuperation from damage will be dramatically slower than when adequate water is available. This is a good justification to limit the use of the field. If this is not possible, at least keep the decision-makers informed about the damage that may result from excessive use.

I would also suggest that herbicide applications be postponed. Most post-emergence herbicides used on athletic fields can stress a turf even under good conditions. A wise field manager once told me that weeds take on field paint a lot better than dirt.

At this point, there is not much you can do. Everything has its weakest link. Without adequate water, no amount of fertilization, wetting agent, soil amendment, etc., is going to do much good.

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