Water management during extreme heat
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The extremely high air temperatures, both during the day and night, have many turfgrass managers rethinking their irrigation programs. Here are some things to remember:

First, plants use water to cool off. This process is called transpirational cooling and it is common in biology (humans sweat, dogs pant their tongues, etc.). The efficiency of this cooling is greatest when the surrounding air is dry and moving. Periods of high relative humidity act like a barrier to transpirational cooling and reduce cooling efficiency.

From another perspective, too much water can lead to rapid turfgrass decline. Both foliar diseases like brown patch and *Pythium* blight and root diseases like *Pythium* root rot and summer patch thrive under high heat, relative humidity and soil moisture. Additionally, high soil moisture can put significant stress on turfgrass roots and lead to different types of physiological root dysfunction (i.e. wet-wilt, and iron deficiency).

The goal of a turfgrass manager is to provide adequate moisture for the plants to cool, without adding too much additional moisture to increase biotic stress (caused by pathogens) and abiotic stresses (caused by non-living organisms like heat stress).

Here are some tips to help keep your turfgrass healthy during high heat stress:

- Make sure the soil contains enough soil moisture to get through the day without wilting. That can be accomplished with a soil moisture probe or a knife/screw driver inserted into the soil. There is still some "management art" required because the manager needs to have an idea of a goal soil moisture to make it through the day.
- Water in the early morning for maximum efficiency. Winds are generally lightest during this time of the day and the air is coolest. This means there is less evaporation during the irrigation cycle. The surface is also coolest during this time. That means the water entering the soil isn't warmed by a hot surface (i.e. afternoon irrigation) that draws the surface heat deeper into the soil.
- Water turf right at the start or during wilt. If you can see wilt or your moisture probe indicates you are at the wilt point, then water it. It doesn't matter what time of day it is. The plant can't cool itself because it is out of water and the surface temperature will quickly rise. That can be lethal during this time of the year. Think of heat stoke when a victim is dehydrated and cannot sweat anymore.
- Don't water turf that *is not wilting* during the afternoon to cool it. This adds water to the turf system, which reduces the rate of transpirational cooling, brings heat down into the top of the soil, and is very conducive for *Pythium* and other types of diseases.
- Verify the soil is dry before adding water during the day. Root diseases like *Pythium* root rot damage turf roots, hence the name root rot. In these situations, the soil may be wet yet the canopy looks dry because the turf can't move water up to the leaves. Adding more irrigation water can actually intensify the root disease. In these cases, chemical control with active ingredients like cyazofamid, ethazole, fosetyl-A, phosphite, azoxystrobin, fluoxastrobin, and propamacarb can help with the disease. These products do need to be watered in to move the product to the pathogen. Venting can also help to dry out the surface and improve the disease symptoms. Read more about chemical control from North Carolina State.
- Improve airflow to maximize transpirational cooling. Yes, this increases turfgrass water needs, but that is fine because it means the plant is cooling more efficiently. Adding fans is another huge benefit to turf health during extreme summer heat.

Bill Kreuser, Extension Turfgrass Specialist, wkreuser2@unl.edu