

Defining Drought Tolerance

By Stacie Zinn, Environmental Turf, Inc.

As Zoysia grasses gain in popularity in Florida (partly because of the grasses' noted drought tolerance), it may be necessary to understand what "drought tolerance" truly means. Ask 100 people, and -- most likely -- get 100 different answers. Does it mean it will survive on just a little bit of water? No water at all? Will it stay green through a drought? Will it lose its color, but remain alive?

The University of Florida, in the online publication "Selecting a Turfgrass for Florida Lawns," by L.E. Trenholm, J.B. Unruh and J.L. Cisar, defines drought tolerance as "a measure of how well turf will survive extended dry periods."

If survival under low water conditions is the main definition of drought tolerance, what does this mean for Florida homeowners who expect their lawns to look the same at all times, no matter the environmental conditions? Many homeowners may think that just because their new lawn is drought tolerant, it won't show signs of stress or change in appearance under low water conditions. But that is not reality.

"It is important to note that 'drought tolerant' turfgrass does not necessarily provide a lush green turf under limited irrigation. Most drought-tolerant turfgrasses go dormant, lose color and stop growth under droughty situations. They do, however, have the capability to resume growth when moisture becomes available. Nondrought-tolerant turfgrasses have a much shorter drought-induced dormancy period before they die," according to an article from the University of

California Cooperative Extension by M. Ali Harivandi, et. al, called “Selecting the Best Turfgrass.”

Although most warm-season turfgrass species have the ability to survive short periods of drought stress, information provided by Texas A&M University further explains what a drought-tolerant grass may look like when its built-in mechanisms kick-in under drought conditions.

“When grass is under severe drought stress, it may go dormant. Dormant grass will be brown and may appear dead. Once watering or rain begins again, grasses will recover, assuming the drought has not been too severe.”

While Zoysia japonica (such as UltimateFlora™ Zoysia) is identified as a grass that will go dormant, the Texas A&M research stated that St. Augustinegrass, by comparison, “may be severely injured or die if exposed to extended periods of drought.”

A demonstration conducted by Dr. J. Bryan Unruh at the University of Florida showed the drought-tolerance mechanism in action.

Dr. Unruh and Assistant Researcher Rex Lawson tested UltimateFlora™ Zoysia, Palmetto® St. Augustine, Meyer Zoysia and Common Centipede to see how many days the turfgrasses could go without irrigation.

Five sets of the grasses were put into pots. Each set had a different water regimen. Water was turned off at intervals of 13-days prior to the field day demonstration, 10-days prior, 7-days prior, 4-days prior, 2-days prior, and zero-days prior (it was watered every day up to the day of the demonstration).

As expected, the sets with the most water faired best and stayed green. It was at the 10-day interval with no water that the results became evident.

At the 10-day interval, Dr. Unruh said, “the UltimateFlora™ Zoysia looked better than the St. Augustine.”

Dr. Unruh explained that the UltimateFlora™ Zoysia looked better because of its built-in “self defense mechanism.”

“The physiology of the leaf blade rolls up like a straw” and traps moisture in the leaf tissue, he said.



Test at 10 days without irrigation

In photos, the UltimateFlora™ Zoysia is in the large tray on the left. On the right side of the photo, Palmetto® is in the back, Meyer in the center, Common Centipede is in the front.

At 13-days, the UltimateFlora™ Zoysia was turning brown. But rather than a sign of impending death, Dr. Unruh said the brown color was a symptom of the grass “slipping into a dormant state.”



At 13 days with no water, the UltimateFlora™ Zoysia has slipped into dormancy as a self-defense mechanism. It is not dead.

Pointing to a tray of UltimateFlora™ Zoysia, Unruh said, “From a defense mechanism, this one here will survive a drought.”

Moving forward, Florida homeowners looking for a drought tolerant grass to replace St. Augustine grass in their yards may consider a Zoysia grass variety, with the revised expectation that retaining green color under drought conditions may not be possible if the lawn is to survive long-term.