



## **Bermudagrass responses to temperature. – Spring ahead, fall back !**

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Summer is right around the corner. That's what we have been saying for the last 6 weeks. In fact 6 weeks ago, the unusually warm weather was the casual conversation topic, as it fit right into the never ending global warming debate. However, in the last 4 weeks, we have had "cool weather" for essentially all of April. It almost wants to make you move to Arizona!

Springtime months on the calendar and our time clocks never change, but the weather does, and sometimes anticipated responses of lawns to maintenance don't occur, leading some to ask "how come what I did does not show any results?" Examples include a fertilization event, extra irrigation, or vertical mowing of the lawn in early spring.

Well, that's often because the average person does not have information on how bermudagrass shoots and roots respond to temperatures. We all know that bermudagrass likes our bright sunny days. But, that's only half the picture. For bermudagrass to be in "full bermudagrass season" it requires high soil temperatures, and high night time air temperatures as well.

When we have moderate daytime temperatures in the high 70's or low to mid 80's, the nighttime temperature are often in the lower 50's. This night temperature is too cold for the "bermuda season" to kick in. The soil temperature at a depth of 3½ inches is essentially the average of the daytime high and nighttime low. Therefore, cool night time temperature plays a role in decreasing the soil temperature, which slows bermudagrass growth.

Even when the bermudagrass greens up in early spring, during cool nights, the temperature at the surface of the grass leaves the temperature in the top inch of soil can also be low. The surface stolons of bermudagrass reside in this layer, and their physiological growth processes are dramatically limited by the cool night temperature they experience.

In a nutshell, the bermudagrass is full steam ahead when the night time low temperature is at least 60F for seven nights in a row. That's when bermudagrass will respond most favorably to,

- nitrogen fertilization
- vertical mowing (removal of thatch)
- aerification of any kind
- establishment from plugging, seeding, or sprigging

During the first weeks of this past April, applying anything over ¼ lb. of nitrogen per 1000 sq. ft. on bermudagrass gave mixed results. At first the grass may have turned greener with some top growth, followed by the same turf turning lighter green with lesser amounts of growth 2 weeks later. A follow up with more nitrogen also has essentially no added benefit. Here's why.

The bermudagrass combines applied nitrogen with stored carbohydrate reserves, making proteins, the building blocks of leaves and stems. When the nighttime temperature is low (less than 50F), only a small amount of new carbohydrate is being made and stored, even if the daytime temperature is 80F or more ! The end result is that the bermudagrass slows down its overall growth, as no appreciable amounts of new food is being stored when night time temperatures are below 60F. Additional nitrogen has no effect when it's too cool for the plant to process and use it efficiently. Nitrogen efficiency and grass growth increase as the night time temperatures, along with the soil temperature, rise accordingly. While we sweat at 80F daytime temperatures, the bermudagrass is really only on "green standby".

In early spring when the night temperatures are in the low 50 F range, apply iron as a spray solution, to hasten green –up and color retention, as opposed to nitrogen applications.

So remember that our spring weather often shows tremendous day and night time temperature swings, sometimes as great as 30F! In the spring, the bright sunlight and daytime temperatures are warm enough to get bermudagrass leaves green, but the nighttime temperatures are cool (50-55F). "Pushing" the plant for more growth

is not beneficial to the health of the bermudagrass at such times. Avoid applying nitrogen at normal “summer time rates” (0.5lbs. or more per 1000 sq. ft.). Also avoid “early season cultivating of the soil/turfgrass (vertical mowing for removing thatch, or aerification of any sort) which also is a stress on the bermudagrass lawn at “green-up”. When done in the heat of the summer, these maintenance items are beneficial to bermudagrass. While we never change our clocks in Arizona, the weather certainly changes, and so does the appearance of bermudagrass, especially in the spring !

**The table below lists the temperature responses of bermudagrass shoots and roots to soil or air temperature.**

**Bermudagrass Growth Parameters and the influence of temperature.**

Temperature (F)	Measurement	Bermudagrass Parameter
80 to 95	air	Optimal for Shoots
75 to 85	soil	Optimal for Roots
> 100	soil	Heat stress for roots
110 to 120	leaf	Lethal for leaves
58 to 65	air	Cold hardiness– leaf elongation
54 to 60	air	Plant chill stress
0 to 18	leaf	Lethal low temperature

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