

## Preventing cold temperature damage

*It seems we dropped down into the 20s at night earlier this year than normal. It got me thinking about winterkill. I have not had any true winterkill since the 80s, but was wondering if there is anything I should be doing to minimize the potential to have winterkill if this is the year?*

—Myrtle Beach, South Carolina

Damage to bermudagrass in the Carolinas from low temperatures is certainly a possibility any year. Like most of the other damages from “natural causes,” it is very difficult to predict when it may happen. Also, cold temperature injury is just as likely to happen in the early spring, just after greenup, as it is to happen in during the winter dormancy period.

Generally, low temperature injury is caused by crown hydration, direct low temperature exposure, desiccation, or some combination of these three. Additional stresses such as traffic or pests may increase low-temperature injury.

There are some cultural practices that you control that can influence your turf’s susceptibility to low-temperature stress. These include things such as shade, drainage, fertility, irrigation, mowing, pest control, and thatch level. Of course turfgrass cultivar has a significant influence, but that is not easy to influence in the short-term. So a turf manager can certainly manipulate their management practices to minimize or reduce the low temperature damage.

Shade should be eliminated. While most fields are out in the open, I still see fields each year that have nearby trees that cause some level of shade. When evaluating shade, some managers like to look at their conditions on December 21 (the winter solstice) which is the shortest day of the year (in terms of daylight) and just as important, the sun is lowest on the horizon. As a

general rule-of-thumb, if bermudagrass turf is shaded on this date by 9 am or before 3 pm, expect some problems. The greatest shade problems usually occur in the southeastern, southern, or southwestern directions due the sun’s angle. There are also phone applications (e.g. Sun Seeker) that can help you evaluate shade.

Get a handle on your soil water status since too much or too little soil moisture during low temperatures can be lethal, especially for insufficient soil moisture. It is better to have a bit too much soil moisture than too little. Damage from excessive soil moisture is typically confined to low lying, poorly drained areas[—normally on side lines of fields. However, insufficient soil moisture typically causes extensive turf damage. This is especially true during windy, low humidity days when the sun is brightly shining.

Relieve soil compaction since insufficient soil oxygen and buildup of carbon dioxide combine with shade and traffic stress to cause damage especially along the highest wear areas (e.g. between hash marks on football, goal mouths on soccer, etc.). Develop and stick to an aggressive aeration program in the summer. Use smaller diameter solid tines during the less active growth periods for additional oxygenation around the roots.

Prevent or reduce thatch accumulation since excessive thatch accumulation can cause plant crowns to be elevated in the thatch layer which reduces their protection from low temperatures. Thatch also dries easily, contributing to desiccation. Topdressing, vertical mowing, and aerifying are mechanical means to moderate thatch accumulation.

If reasonable, raise the mowing height. Usually about September the days become shorter and extensive cloud cover occurs resulting in a growth habit change. The turf

plants respond to reduced daylight /daylength by stretching or elongating in an attempt to gather more light energy. Allowing the plant to go into winter with a little greater leaf length can increase its carbohydrate production. Some managers counteract the stretching by applying a plant growth regulator.

Provide adequate soil potassium since it has been shown to help with moderating weather extremes. Apply sufficient potassium so levels are in the adequate or sufficient soil report range prior to winter. Levels higher than these have not been shown to be sustainably beneficial. Most research has suggested that applying more potassium than nitrogen (over the years’ time) is not beneficial. But since potassium does not encourage growth and is readily soluble in the soil, applying more potassium than nitrogen before winter may be beneficial.

Cover your field. I know that covers are expensive and may be perceived as a luxury by some. But covers can be great “insurance” against winterkill. Covers help retain heat in the soil and more importantly, help prevent soil desiccation. Numerous theories exist on when covers should be used. A common one is to use them if temperatures are projected at night to be below 23 degrees, especially if the next day’s temperatures are forecasted to stay below 40 degrees and/or if excessive windy conditions are expected.

So, how many of these can you do? Each one can help and alone may be enough to prevent cold temperature damage. But there are still no guarantees against damage even if you could do them all. At some point the turfgrass may just be susceptible or the temperatures too low. So, try to do as many as you can, but do not ever get too confident that you outsmarted Mother Nature. She may prove otherwise. ■



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### Questions?

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