

Sudden Bentgrass Decline On New Putting Greens

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Courtesy of Kentucky Pest News

With the onset of hot weather several weeks ago, a number of new creeping bentgrass putting greens have suffered sudden deterioration of roots. Without a good root system, these greens quickly suffered extensive turf loss.

Symptoms

Under the microscope, the seedling roots and adventitious roots of these plants exhibit deterioration of the outer tissues. Specifically, the cortex, epidermis and root hairs become disorganized, collapse and slough off from the stele, the interior "plumbing" of the root. To the naked eye, these roots still appear more or less viable, since one can find light tan "roots" that go three inches deep or more. However, the outer tissues of these "roots" have lost their integrity, resulting in a significant reduction in water-absorbing surface area. Once this happened, the greens wilt and rapid death of tillers occurs.

Possible Causes

We have not found infectious microorganisms to be associated with this condition. Pythium root dysfunction is always suspected, but although we have conclusively diagnosed that disease in some circumstances, that disease does not appear to be involved in these greens. Thus, we believe the rapid loss of root cortex is due to an environmental condition.

At this time, we cannot say for certain which factors are directly responsible. We strongly suspect two factors,

which perhaps interact. During hot weather, photosynthetic efficiency of cool-season grasses declines, yet cellular respiration increases. Bentgrass must "go to the bank" and withdraw food reserves from stolons and crowns. These closely mowed new greens probably suffer from a rapid energy deficit during the hot weather. Bent tillers on new greens are very upright and have few stolons, especially when seeded at a heavy rate of 1-2 lbs/1000 sq. ft. And initial establishment is very rapid. Because they are young in age, individual tillers may not have enough leaf surface to maintain adequate photosynthesis, and they may have insufficient stolon and crown development to provide an energy bank for cellular respiration during hot weather. Although we observed that some of the largest tillers died, those tillers that were still alive were among the larger ones with robust pseudostems and sometimes attached to a significant stolon, which is consistent with this hypothesis.

Another factor that may be involved is the observation of some layering in these greens. Frequent topdressing and irrigation can create a surface layer about 3/8" to 1/2" that holds water readily, compared to the root zone mix below. Test it for yourself: Remove a core from a new green with a cup cutter, pour water through it, wait five minutes, gently tear open the core, then tear out some of this top layer with thumb and forefinger and squeeze. Plenty of water is there! Try

this again with some of the root-zone mix, and it is already at field capacity. This tendency to "pond" water in the top half-inch may create an oxygen-poor environment during hot weather, by sealing the root zone from the air above. Microbial activity in the root zone and root respiration may deplete the roots of oxygen during weather in which their oxygen demand is quite high.

Many new greens are constructed with sand that does not completely stabilize for a year or two. When these new greens become very wet from frequent watering and when much of the root system is lost during hot weather, the lack of structural stability is very obvious as one walks on the green. The physical injury that occurs to the root system from soil abrasion probably places additional stress.

It is very possible that these factors interact. A low energy reserve, reduced oxygen in the root zone and high respiratory demand caused by hot weather may cause roots (a "sink" for photosynthate) to lose out to leaves, which didn't have enough to share.

What to Do?

While we don't fully understand this condition at this time, we feel that the following recommendations will provide the best chance of recovery for creeping bentgrass greens in which roots have suffered loss of the cortex and associated tissues. It may

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GCSAA Conference and Show Registration Available Online

This year, you can register online for GCSAA's International Golf Course Conference and Show in Anaheim, Calif.

Beginning Aug. 1, the members-only area of the GCSAA Web site has had complete information about the conference and show, including the latest on seminars, education programs, the golf tournament, special events and the trade show. All the forms you need to register are available in an easy-to-use format.

If you are paying for registration by credit card, simply complete the forms and submit them electronically. Your registration will be processed, and you'll receive a confirmation letter by mail within 10 business days.

Your confirmation is an important document. Watch for it in the mail, review it upon receipt and take it to the

conference and show. Your confirmation will list the events in which you are registered. If you request a seminar and it is full, your confirmation will list this as well. Remember that if you select a seminar, you must always list your first, second and third choices.

Even if you do not register online, the Web site will be your best source of information on the availability of seminars. The list of open seminars and hotels will be updated several times a week, or daily if needed.

Be sure to check out the conference area frequently after you have registered. New information will be added as the annual event approaches, including in-depth information on education programs, an itinerary planner and a trade show booth locator.



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also be possible to prevent this condition.

Curative

Don't go crazy with fungicides, since infectious fungi don't appear to be involved. These greens must be allowed to grow new roots at a time of year when roots don't really grow well. *Aerify* the greens (solid tines, 1/4" hollow tines, a Hydroject with the platform raised, whatever will punch holes with as little damage as possible). *Raise the mowing height* and reduce the mowing frequency, to allow for as much photosynthesis as possible. A 3/16" to 1/4" height is recommended until the turf recovers and cooler weather returns. Re-seed bentgrass. This is not a good time to try to get it established, but the general management of plants without roots will tend to favor the new seedlings. Provide light/frequent irrigation, preferably hand-watering. "Spoon-feed" the green with soluble fertilizer (1/8 to 1/10 lb. nitrogen every 10-14 days). Use preventive Pythium control to protect the new seedlings during sustained periods with nighttime temperatures above 70° F.

Preventive

When establishing new greens, make sure they are well-aerified by Memorial Day, and do not lower the mowing height quickly during the first summer. Depending on surface smoothness, 3/16" to 1/4" may be advisable during the first summer.