



COOLING CREEPING BENTGRASS PUTTING GREENS

BY USGA GREEN SECTION

- Fans reduce soil temperature and improve creeping bentgrass rooting during summer, even without syringing.
- Syringing improves turf quality during summer when fans are used but can decrease rooting without fans.
- Irrigation timing – i.e., morning or afternoon – may not affect rooting and turf quality if fans run continuously.
- Without fans, morning irrigation reduced soil temperatures more than afternoon irrigation, but there has been variability in this response from year to year.

Hot and humid weather contributes to creeping bentgrass decline and often results in poor putting surfaces during summer. Further, high soil temperatures – i.e., 95 degrees Fahrenheit and above – often accompany hot and humid weather and reduce both root and shoot growth of bentgrass. Prolonged periods of heat stress can result in thin putting greens with shallow roots and turf that is more susceptible to disease and algae. Two methods to mitigate bentgrass decline are oscillating fans and syringing - i.e.,

applying light amounts of water to cool the turf canopy. Researchers at Auburn University have conducted several studies over the years to document the role fans and syringing play in cooling putting greens during periods of summer stress.

The first project examined the effects of fans and syringing on a bentgrass putting green. Fans ran for five hours each day, and syringing was applied three times per day. The two-year study concluded that the combination of fans and syringing effectively cooled the bentgrass putting green, resulting in lower soil temperatures and increased root-length density.

A second, two-year study evaluated the effectiveness of running fans for 24 hours with and without syringing on a new bentgrass putting green. This study demonstrated that the use of fans, in combination with or without syringing, increased root length and weight while simultaneously reducing soil temperatures. Also, syringing when fans were not used sometimes decreased root length.

The last study examined irrigation timing and fan cooling to determine the combined effects on soil temperature and root length density in a bentgrass putting green. Fans ran 24 hours per day, except during half-hour irrigation applications every third day in the morning (8:00 a.m.) or afternoon (3:00 p.m.). Evapotranspiration (ET) was estimated each day and totaled every three days. Rainfall was subtracted from total ET to determine the irrigation requirement.

As with the previous studies, the last project showed the cooling potential of fans. However, it differed from the previous studies because ET-based irrigation was evaluated instead of frequent syringing. All treatments that received 24 hours of fan cooling had lower soil temperatures one-half inch below the soil surface than treatments that did not receive fan cooling. There were no soil temperature differences between the morning or afternoon irrigation treatments. However, when not using fans, morning irrigation resulted in lower soil temperatures than afternoon irrigation in some years.

Fans, syringing and irrigation are only three management practices that can help bentgrass putting greens through periods of summer heat and humidity. Selecting a heat-tolerant bentgrass, rolling one or two days instead of mowing, core aeration, regular sand topdressing, summer venting and disease control are all management practices that can help get bentgrass putting greens through the summer.

Source: Dr. Beth Guertal and Dr. David Han, Auburn University

Additional Information:

[Timing of Irrigation for Cooling Bentgrass Greens With and Without Fans](#)

[Fan and Syringe Application for Cooling Bentgrass Greens](#)

[Understanding Wet Wilt](#)

[Getting to the Root of Summer Bentgrass Decline](#)

[Summer of 2010: From bad to worse](#)