

Reducing ultradwarf bermudagrass putting green winter injury with covers and wetting agents

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As ultradwarf bermudagrass (*Cynodon dactylon* x *Cynodon transvaalensis*) putting greens move further north in the transition zone, there is an increased risk of sustaining winter injury from low temperature exposure and crown desiccation. The benefits of utilizing covers for winter protection are well documented but there are significant labor costs associated with covering and uncovering greens during the winter to allow for play during favorable weather. While the current recommendation is to cover bermudagrass greens when the low temperature is forecasted to drop to -4 °C (O'Brien and Hartwiger, 2013), it may be possible to lower this forecasted temperature, resulting in fewer covering events, reduced labor costs and more days open for play.

Localized dry spot (LDS) is a common problem on sand-based putting greens and can lead to desiccation of the turfgrass crown and even death of the plant. Symptoms of LDS are easily recognized when turf is actively growing but may not be apparent while the turf is dormant. Wetting agents are commonly applied during the growing season to combat effects of LDS but little information exists on the effects of a late-fall/early-winter wetting agent application on winter survival and spring green-up of ultradwarf bermudagrass.

Objectives:

- Examine predicted low-temperature thresholds for covering Tifeagle, Champion, and Mini-Verde ultradwarf bermudagrass putting greens
- Investigate the effects of a late-fall wetting agent application on soil moisture and winter survival of ultradwarf bermudagrass

Materials and Methods:

This trial was conducted at the Arkansas Agricultural Research and Extension Center in Fayetteville, AR. The treatments included three ultradwarf bermudagrass cultivars ('Champion', 'Mini-Verde', and 'Tifeagle'), five cover treatments based on forecasted low temperatures (-9.4, -7.8, -5.6 or -4.0 °C and an uncovered control), and two wetting agent treatments (Revolution applied at 1.9 ml m⁻² on Dec. 7, 2015 and an untreated control) The experimental design was a strip split plot, where cover treatments were applied as strip plots across cultivars and cover x cultivar plots were further split with the wetting agent treatments (Photo 1). Data to be discussed includes % turfgrass coverage (collected using digital image analysis) during spring greenup.

Results:

It should be noted that Fayetteville, AR experienced an unseasonably warm winter for 2015-2016, so the extent of winter injury was atypical for this location.

- 'Tifeagle' and 'Mini-Verde' experienced less winter injury and better spring greenup than 'Champion' (Figure 1, Photo 2)
- The use of protective covers enhanced spring green-up and recovery for all cultivars (Figure 2)
- A late season wetting agent application improved spring green-up of ultradwarf greens (Figure 3, Photo 3)



Photo 1. Overview of the trial site, showing the various cover treatments stripped across the three cultivars of ultradwarf bermudagrass

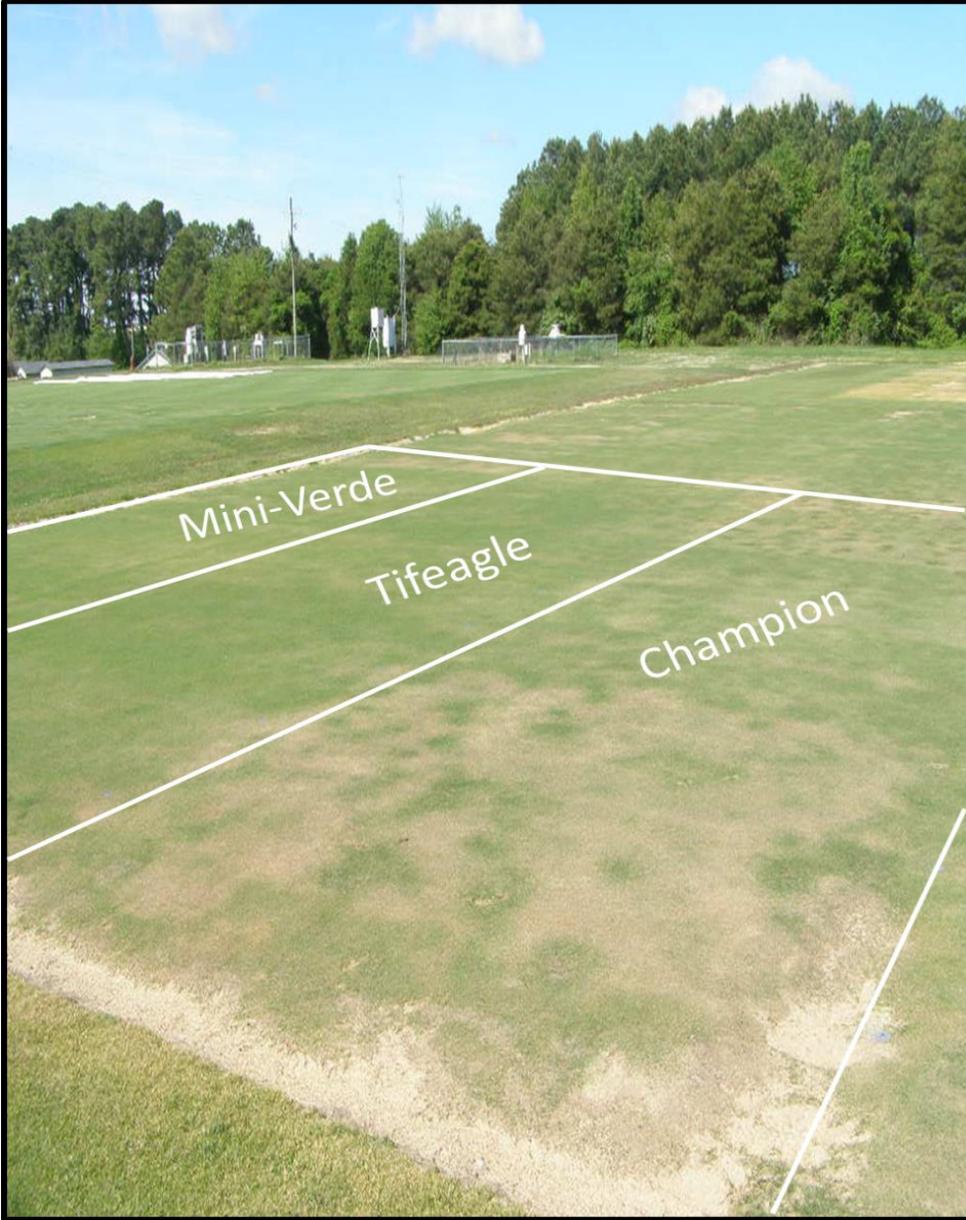


Photo 2 – Spring greenup of three ultradwarf bermudagrass cultivars – Photo taken on 21 April 2016

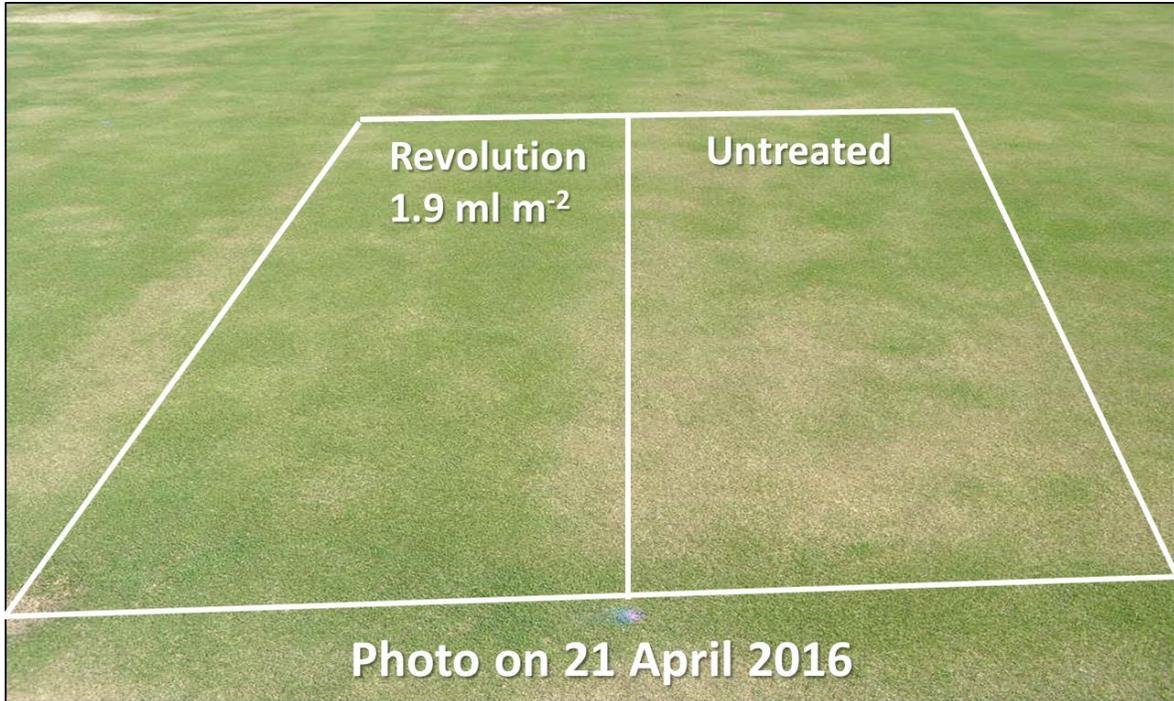


Photo 3 – Spring greenup of ultradwarf bermudagrass, as affected by a late-season wetting agent application.

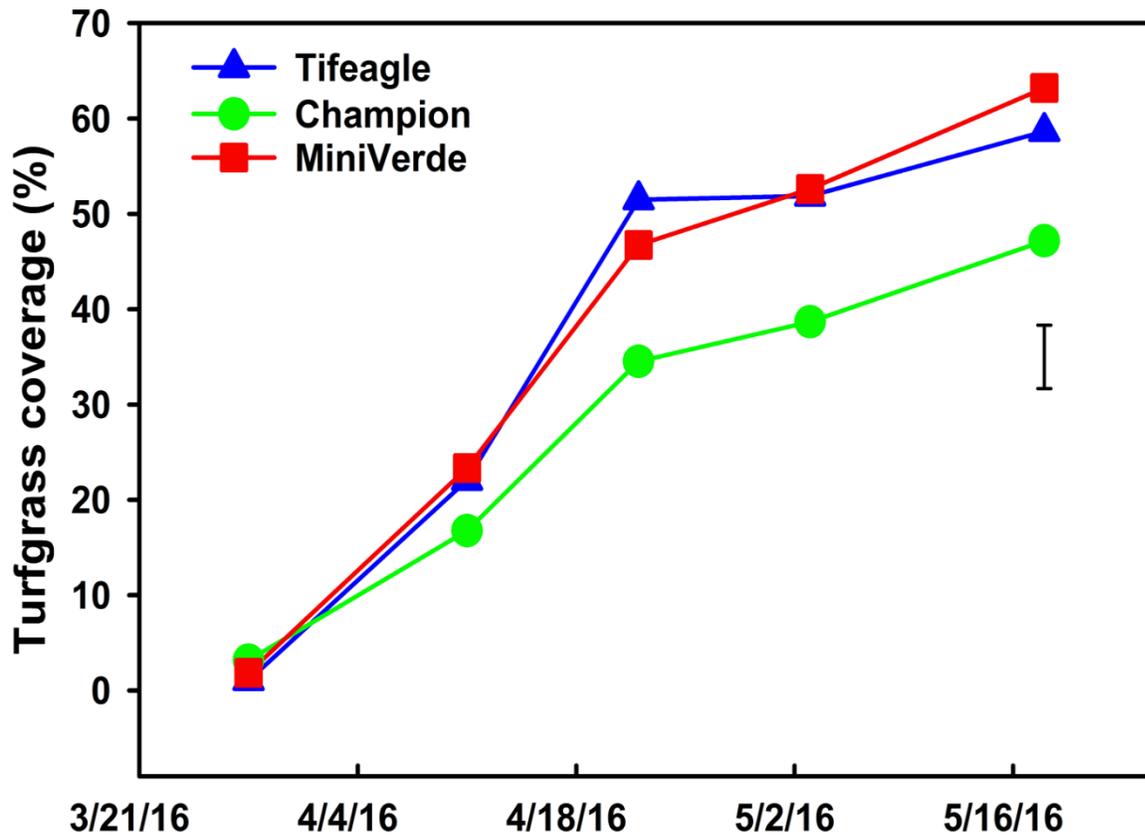


Figure 1. Effect of cultivar on spring greenup of ultradwarf greens. Error bar represents the least significant difference ($P=0.05$) for comparing treatments.

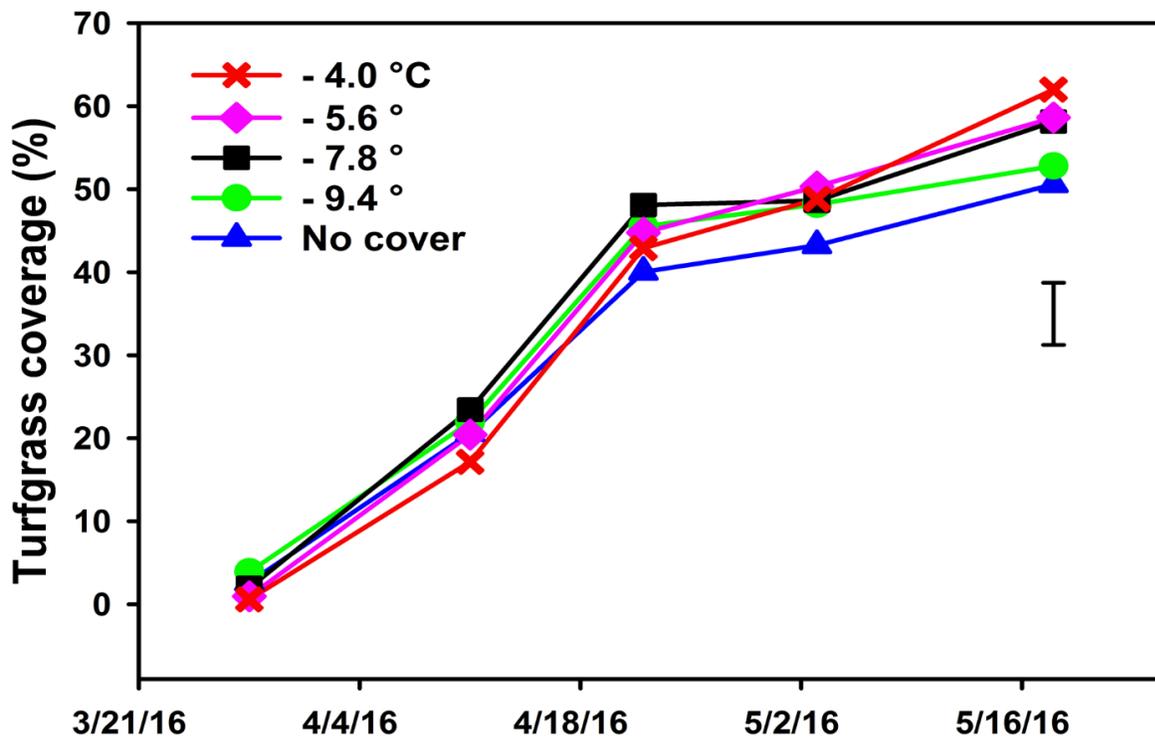


Figure 2. Effect of cover treatments on spring greenup of ultradwarf greens. Error bar represents the least significant difference ($P=0.05$) for comparing treatments.

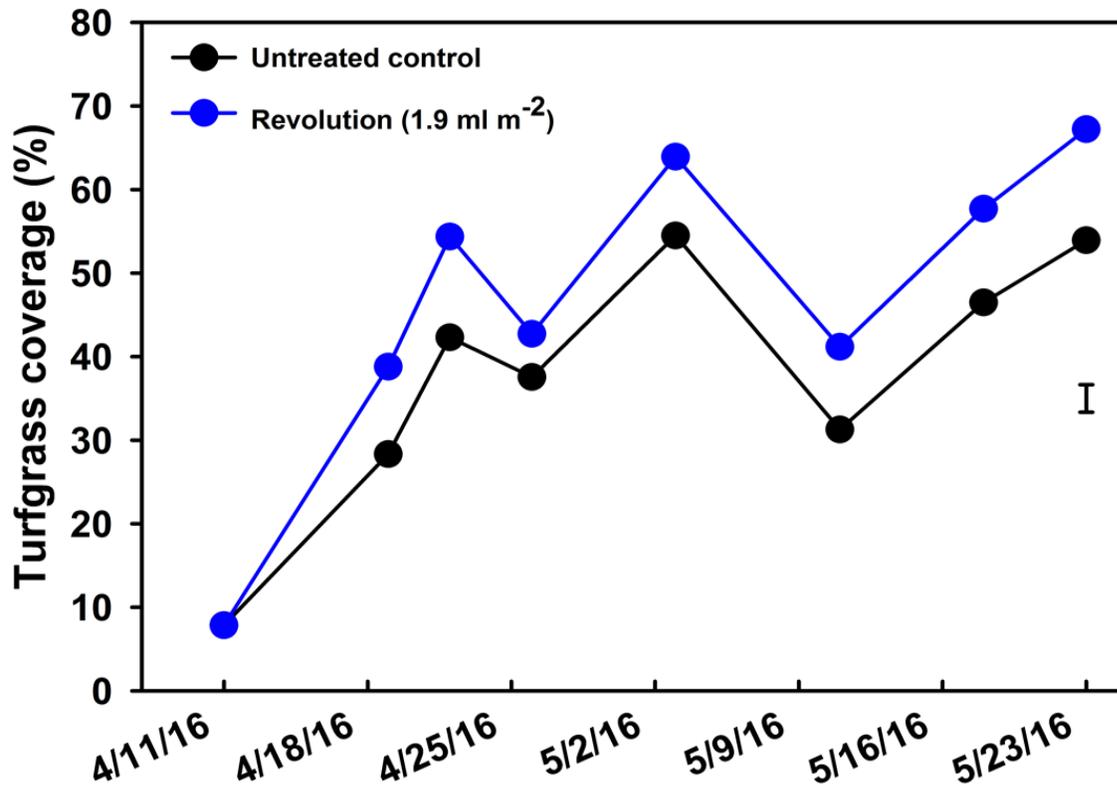


Figure 3. Effect of a late-season wetting agent application on spring greenup of ultradwarf greens. Error bar represents the least significant difference ($P=0.05$) for comparing treatments.