

Application Timings of Cascade Plus Wetting Agent Affect Season-Long Control of Localized Dry Spot

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Photo by Doug Karcher

Irregular dew patterns on putting green turf afflicted with localized dry spot

Additional index words: creeping bentgrass, sand-based, putting green, turf quality

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Summary. Cascade Plus is a commonly used wetting agent for treating localized dry spot (LDS) on putting greens; however, the suggested application timing on its current label may not provide season-long LDS control in the transition zone. The objective of this research was to determine how various Cascade Plus application timings affected season-long LDS control and turf quality on a sand-based putting green. Three Cascade Plus application timings (7 days after initial treatment (DAIT); 60 DAIT; and 7, 60, 90, and 120 DAIT) and an untreated control were applied on an 'SR 1020' creeping bentgrass putting green

from May through September of 2008. Visual quality and LDS incidence were evaluated bi-weekly throughout the 2008 growing season. Cascade Plus applications at 60 DAIT significantly reduced LDS incidence and improved turf quality compared to applications at 7 DAIT and the untreated control. Late-season applications did not result in excessive phytotoxicity when the treatments were applied during early morning hours and immediately irrigated following application.

Abbreviations: DAIT, days after initial treatment; LDS, localized dry spot

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Localized dry spot is a prevalent problem on golf course putting greens throughout world. The most common treatment of LDS is wetting agent application and there are many commercially available products that are effective in reducing LDS symptoms (Karcher et al., 2008; Karcher et al., 2009). Cascade Plus is a wetting agent that is commonly used to treat LDS and, according to label instructions, should be applied early in the growing season in sequential applications (7 to 10 d apart) for season-long LDS control (Precision Laboratories, Inc., 2009). However, previous research has demonstrated that this timing does not provide season-long LDS control in a transition zone climate where LDS pressure is intense (Karcher et al., 2008). Successive applications of Cascade Plus later in the growing season may be necessary for season long control of LDS in transition zone and more southern climates. The objective of this research is to determine the effects of various application timings of Cascade Plus on season-long control of localized dry spot and turf quality on a sand-based putting green.

Materials and Methods

This experiment was conducted from May through October in 2008 at the Arkansas Agricultural Research and Extension Center in Fayetteville on a creeping bentgrass (*Agrostis stolonifera* cv. SR 1020) putting green built according to United States Golf Association specifications. The green was maintained under typical golf course conditions for the region (Table 1).

Cascade Plus application timing treatments consisted of the label timing, two experimental timings, and an untreated control (Table 2). Each treatment was applied to five replicate plots (6 by 6 ft) and irrigated with 0.25 inch of water following application. Initial treatments were applied on 9 May 2008 and all treatments were applied with a CO₂-powered boom sprayer.

Treatments were evaluated for LDS incidence and visual turf quality. Localized dry spot incidence was rated biweekly as a visual estimate of the percentage within each plot affected with LDS. Visual quality was rated biweekly using a

1 to 9 scale, where 9 represents ideal dark green, dense, uniform turf and 1 represents dead turf.

Results and Discussion

Localized dry spot. Treatments did not affect LDS incidence early in the growing season due to an abundance of rainfall at that time; however, treatments significantly affected LDS incidence from 31 July through the end of the trial (Fig. 1). On 31 July, there were no significant differences among treatments receiving a Cascade Plus application. From 14 August through 11 September, the 7 DAIT timing had significantly more LDS formation than the other two timing treatments (Fig. 1 and 2). On the final evaluation date (2 October), the 7 DAIT and 60 DAIT timing treatments were not significantly different from each other; however, the 7 DAIT treatment had significantly more LDS formation than the 7, 60, 90, and 120 DAIT timing on 2 October. Throughout the trial, there were no significant differences between the 60 DAIT and the 7, 60, 90, and 120 DAIT timing treatments with regard to LDS formation.

Turf quality. Turf quality was mostly affected by LDS formation; so treatment differences in turf quality were similar to those for LDS formation (Fig. 3). Treatments significantly affected turf quality from 31 July through the end of the trial. During that time, the control treatment had significantly lower turf quality than the other three treatments. From 14 August through the remainder of the trial, the 7 DAIT treatment had significantly lower quality than treatments receiving an application at 60 DAIT. Throughout the trial, there were no significant differences between the 60 DAIT and the 7, 60, 90, and 120 DAIT timing treatments with regard to visual turf quality. Cascade Plus applications did not result in severe phytotoxicity in this trial, even when applications were made later in the growing season. However, care was taken to apply treatments when temperatures were relatively cool (early in the morning) and irrigation was applied within 30 minutes of wetting agent application.

Conclusions

These results corroborate previous findings that Cascade Plus applications are likely necessary later in the growing season to provide season-long control of LDS. Applications at 90 and 120 DAIT did not significantly improve LDS control or turf quality compared to an application only at 60 DAIT. However, it is worth noting that the 2008 growing season was cooler and wetter than normal and that successive Cascade Plus applications at 90 and 120 DAIT may be more effective during more stressful growing seasons. Finally, late-season applications of Cascade Plus should be made during early morning hours or overcast conditions and then irrigated immediately to minimize phytotoxicity.

Literature Cited

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Table 1. Maintenance of the experimental area.

Maintenance practice	Description
Mowing	Six times per week at a 0.125 inch mowing height.
Fertility	0.5, 0.1, and 0.5 lb of N, K ₂ O, and P ₂ O ₅ , respectively, per 1000 ft ² per month of active growth. Other nutrients applied according to soil test recommendations.
Irrigation	As needed to prevent severe drought stress symptoms.
Growth regulation	Primo Maxx (trinexapac-ethyl) applied at 1/8 oz. per 1000 ft ² per month of active growth.
Wetting agent application	Applied as treatment (see Table 2).
Cultivation	Hollow tine cultivation performed to affect 7% of the surface in the spring and fall.
Sand topdressing	Sand topdressing applied every 14 days throughout the growing season at an approximate rate of 4 ft ³ sand per 1000 ft ² .
Pesticides	Applied only on a curative basis.

Table 2. Summary of wetting agent treatments. DAIT = days after initial treatment.

Treatment ID	Description
Control	Untreated control
7 DAIT	Cascade Plus applied on 9 May and 16 May
60 DAIT	Cascade Plus applied on 9 May and 9 July
7, 60, 90, and 120 DAIT	Cascade Plus applied on 9 May, 16 May, 9 July, 9 Aug., and 9 Sept.

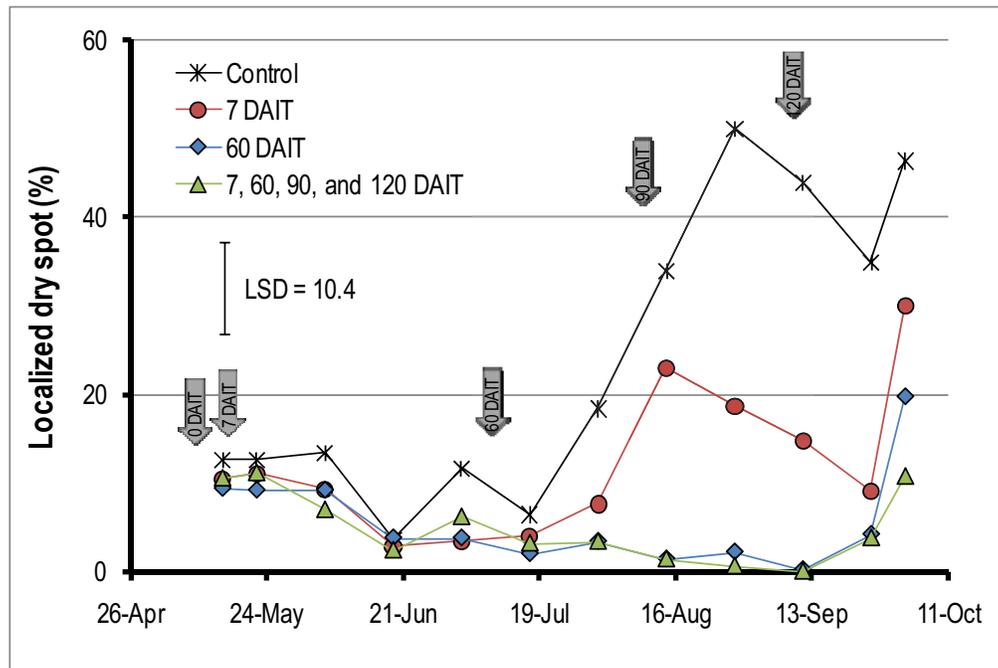


Fig. 1. Localized dry spot formation as affected by Cascade Plus timing treatment. Error bar represents Fisher's least significant difference value ($\alpha = 0.05$). Arrows indicate treatment application dates. DAIT = days after initial treatment.

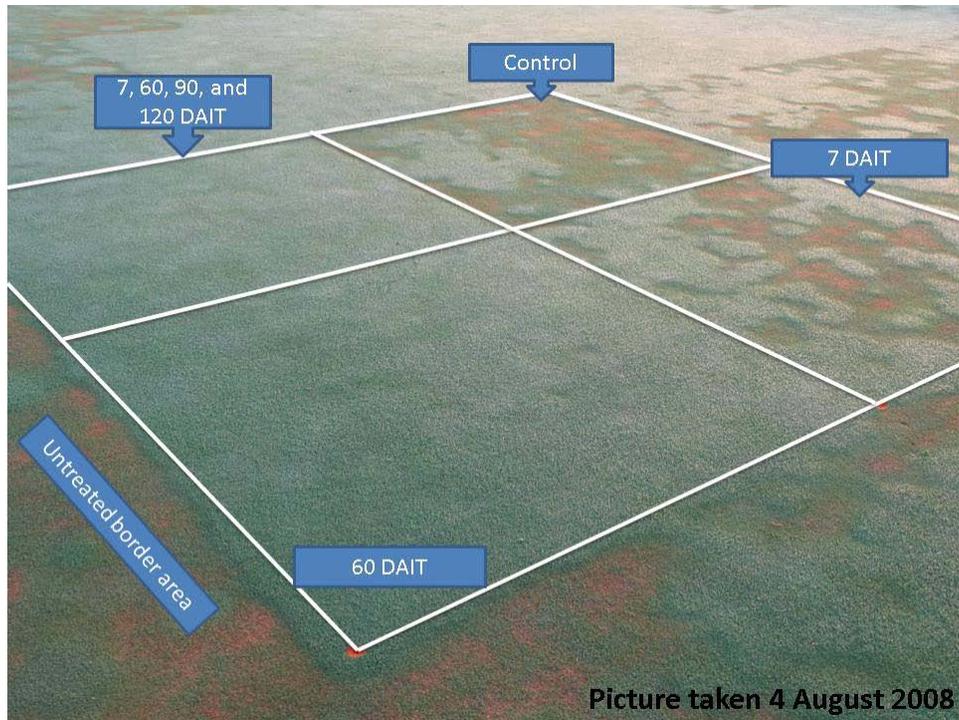


Fig. 2. Differences in localized dry spot formation among four plots with different application timings of Cascade Plus. Picture was taken early on the morning of 4 August 2008.

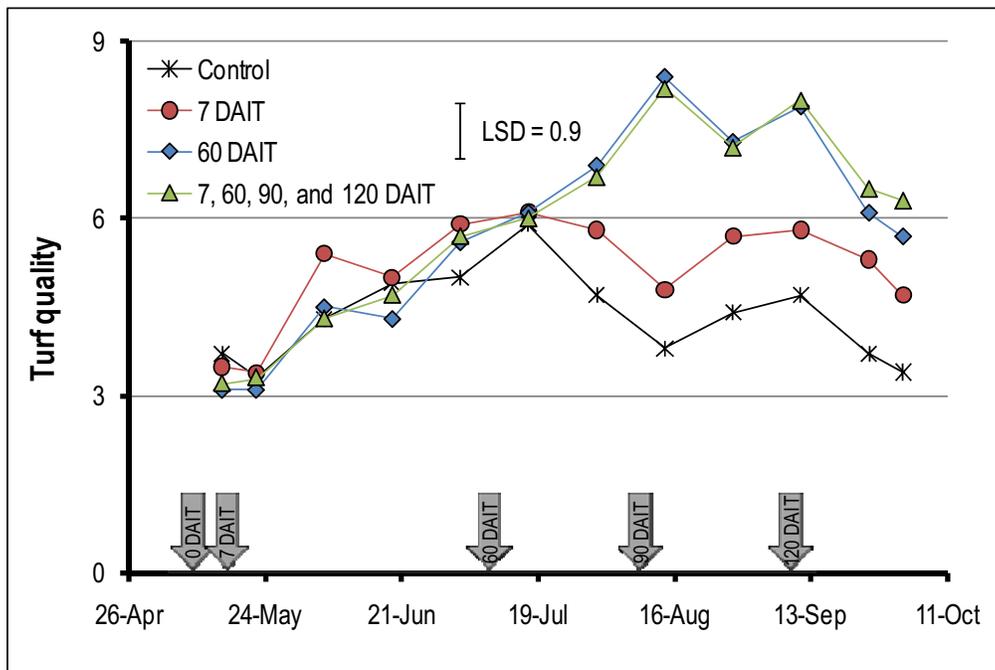


Fig. 3. Visual turf quality as affected by Cascade Plus timing treatment. Error bar represents Fisher's least significant difference value ($\alpha = 0.05$). Arrows indicate treatment application dates. DAIT = days after initial treatment.