

Can Fungicides Mitigate Summer Stress and Mechanical Injury in an Immature Creeping Bentgrass Green?

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Objectives:

Evaluate Chipco Signature, Fore Rainshield, and Insignia fungicides alone or in combination for their impact on summer injury, turf color, and overall turf quality in an immature creeping bentgrass stand maintained as a putting green.

Start Date: 2011

Project Duration: 2 years

Total Funding: \$6,000

The objective of this study was to evaluate the three fungicides alone or in combination for their impact on summer injury, turf color, and overall turf quality in an immature creeping bentgrass stand maintained as a putting green. The treatments were as follows: Chipco Signature 4.0 oz; Fore Rainshield 4.0 oz; Fore Rainshield 6.0 oz; Insignia 0.5 oz; and Insignia 0.9 oz/ 1,000 ft² applied alone or tank mixed with Fore Rainshield (4.0 oz/1,000 ft²).

This study was conducted on an immature (i.e., < one year old) stand of an 'Penn A-1'/'Penn A-4' blend maintained under putting green conditions. June and July were very stressful with daily temperatures often exceeding 90° F and night temperatures frequently above 70° F. It also was this period when plots were frequently double-cut during the heat of the day. Temperatures moderated in mid-August and particularly following hurricane Irene on August 28. September was very cool and rainy, and there was no heat stress during the period plots were verticut August 22 and 24.

The AUQC for the period of July 15 and August 19 were most descriptive of the appearance, and therefore the visual stress tolerance, of the putting surface. These and all other data showed that Fore alone (6.0 oz.) and especially Signature + Fore were the most beneficial performance treatments during the period of excessive heat stress.

The AUIC data reflect the effectiveness of treatments in ameliorating the effect of brushing, topdressing, and vertical cutting (i.e., the mechanical stresses). As previously noted, this was performed during a period of little or no environmental stress. These data also showed that Fore (6.0 oz) alone and Signature + Fore were



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the most effective treatments in minimizing the effects of mechanical stress.

Insignia alone did improve overall quality during the period of environmental stress, but had minimal effects when subjected to mechanical stress. For unknown reasons, plots treated with the low rate of Insignia (0.4 oz) + Fore tended to out-perform the high rate of Insignia (0.7 oz.) + Fore during the period that the mechanical stresses were imposed. None of the treatments influenced root length and root surface area significantly, which was attributed to variability in sampling. Signature, Fore, and Signature + Fore reduced algal colonization, but Insignia alone did not.

It was assumed that an immature stand would be damaged more by environmental and mechanical stress than a more mature stand. The resiliency of the 'Penn A1'/'Penn A4' blend was much greater than anticipated and efforts were made to inflict stress such as reducing mowing heights while double-cutting on afternoons when air temperatures exceeded 90° F and

in some cases 100° F. Plots even were top-dressed and rolled on one occasion (July 27) while being double-cut at 0.130 and lowered to 0.125 inches two to three days prior and after application of the sand.

Despite these and other efforts, it was difficult to injure the stand. Hence, vertical cutting was performed in two directions in late August to inflict more injury, but at this time temperatures moderated and there was frequent overcast weather and rain. Unlike what normally would be expected, little additional data could be collected since environmental stress did not return in Sept.

In conclusion, this study confirms previous field studies conducted in Maryland, which demonstrated that Fore RainShield, Signature, and particularly Signature + Fore Rainshield effectively ameliorated environmental and mechanical stress injury as well as suppressed algal growth in an immature creeping bentgrass stand maintained under putting green conditions.

Summary Points

- June and July 2011 were marked by extended periods of heat stress with daily air temperatures typically $\geq 90^\circ$ F and night temperatures $\geq 70^\circ$ F. August was relatively cool and rainy.
- All fungicide treatments exhibited improved turfgrass quality versus the control in June and July during periods of heat stress and double-cutting.
- Fore Rainshield alone and especially the tank-mix of Chipco Signature + Fore Rainshield provided the best combination of improved turf color and overall quality in response to heat stress, as well as the mechanical stresses imposed.
- No differences in root length or root surface area were detected among the treatments.
- Chipco Signature and Fore Rainshield reduced blue-green algal colonization, but Insignia did not.