

Best Management Practices for Anthracnose Disease on Annual Bluegrass Putting Greens



James Murphy, Bruce Clarke, Charles Schmid,
James Hempfling, and Ruying Wang
Rutgers University

Turfgrass and Environmental Research Online
Volume 13, Number 2 | March–April 2014

Objectives:

Trials were initiated in 2009 or 2010 to address the objectives of evaluating programmatic aspects of N fertility, topdressing, and cultivation that may impact anthracnose severity including 1) N source, 2) rate of summer N fertilization, 3) autumn and spring vs. summer topdressing, and 4) mid-season cultivation (grooming, verti-cutting, scarification, and solid tining).

Findings from these and other trials were used to initiate studies in 2012 with the objective (5) of determining the effect of best management practices (BMPs) on fungicide efficacy and playing quality of turf.

Anthracnose, caused by *Colletotrichum cereale*, is a devastating disease of ABG turf throughout the United States and Europe. Previous research has shown that management practices significantly influence the severity of anthracnose; however, further research will enhance our understanding of how BMPs interact and affect fungicide efficacy and playing surface quality.

Objectives 1 and 2. Research studies initiated to determine the effect of N source on anthracnose severity (objective 1) and identify the optimum N rate for summer fertilization (objective 2) were completed autumn 2012 and autumn 2011, respectively. Results were provided in previous years' summaries and are being written for peer review publication.

Objective 3. A field trial was initiated in October 2010 to evaluate the impact of autumn, spring and summer topdressing programs on anthracnose severity. Results indicate that spring topdressing rates had the greatest effect on disease and topdressing at 8 ft³ per 1000–ft² reduced disease to a greater extent than 4 ft³ per 1000–ft². Autumn topdressing provided some suppression of disease severity early in the growing season but typically there was very little effect later in the season. Biweekly topdressing (¼ or ½ ft³ per 1000–ft²) during the summer had little effect on disease probably due to low rates applied; over the 3 years of this study, summer topdressing reduced disease on 2 observation dates in late 2012.

Objective 4. Research on the effect of scarification depth on anthracnose disease severity was completed in 2011 and is being written for peer review publication. A trial initiated in 2011 to determine



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whether anthracnose severity was affected after verticutting (VC) suggests that VC did not increase disease severity; the majority (>95%) of yellowing caused by VC was attributed to injury (defoliation or wounding) and not disease. This study will be continued in 2014.

Objective 5. Two field trials were initiated in 2012 to investigate whether BMPs interact to affect



Anthrachnose first appears on annual bluegrass as 1/4 to 1/2-inch diameter spots of yellow to orange-brown turf. In a short time, the small spots can progress into large, irregularly shaped areas on infected putting greens, tees, or fairways. Infection often occurs first on older leaves of plants, causing yellow leaf lesions.

anthracnose severity, fungicide efficacy, and playability of ABG turf.

Trial I examined the effects of mowing height, N fertility, and fungicide programming on anthracnose severity. All treatment factors impacted disease severity; however, N fertility and fungicide programming and the interaction between these factors accounted for 84 to 90% of the disease response during the 2 years of this study. Acceptable disease control was achieved with reduced fungicide rates or fewer threshold-based applications of fungicides when BMPs (greater N fertility and higher mowing height) were applied.

Trial II examined the effects of mowing height, N fertility, and sand topdressing on anthracnose severity and playability of ABG turf. Similar to trial I, N fertility had the greatest impact on disease severity (was

reduced with greater N), while mowing height and topdressing had much smaller effects on reducing disease severity. The relative importance of treatment factors for playability [ball roll distance (BRD); Stimpmeter] was mowing height (62 to 70% of the BRD response) followed N fertility and sand topdressing, which had the smallest impact. Across all treatments, an acceptable BRD (9.5–10.5 ft. or greater) occurred on 69 to 97% of evaluation dates in 2012; whereas in 2013, BRD was acceptable less frequently (19 to 94% of evaluation dates) due to persistent rains during early summer, especially at a higher mowing height.

Summary Points

- Topdressing during the spring caused a greater and longer term reduction of anthracnose severity than autumn; autumn topdressing reduced anthracnose severity more than summer topdressing. Spring topdressing at 8 ft³ per 1000 –ft² provided the greatest suppression of disease.
- Research to-date indicated that VC does not greatly increase anthracnose severity, if at all, and superintendents should not forego the benefits of VC on ABG turf.
- Greater N fertility (4.1 vs. 2.05 lbs. per 1000 –ft² annually) reduced disease severity more than either higher mowing (0.125 vs. 0.09 in) or greater sand topdressing. Greater N fertility also enabled reduced fungicide inputs (reduced rates or fewer threshold applications) to provide acceptable disease control.
- Mowing height had the greatest effect on BRD while N fertility and sand topdressing effects on BRD were smaller and probably would not be detected by golfers. Thus, our data suggests that the priority for adjusting BMPs to improve playability (green speed), when needed, should be given to lowering mowing height rather than lowering N fertility or reducing sand topdressing.