

Evaluating Management Practices Influencing Anthracnose Severity of Annual Bluegrass Putting Green Turf

Bruce B. Clarke, James A. Murphy, and John C. Inguagiato
Rutgers University

Objectives:

1. Determine the impact of cultural management practices for annual bluegrass putting green turf on anthracnose severity.
2. Develop a comprehensive set of best management practices to improve the control of anthracnose on annual bluegrass putting greens and subsequently reduce reliance on fungicides for the control of this disease.

Start Date: 2006

Project Duration: two years

Total Funding: \$60,000

Anthracnose is a destructive disease of annual bluegrass and bentgrass putting green turf throughout the United States. The disease, caused by the fungus *Colletotrichum cereale*, begins as small areas of yellowed turf (1 to 2 inches in diameter) with individual leaf blades eventually senescing. The frequency and severity of anthracnose outbreaks on golf course putting greens has increased over the past decade.

Two studies examining the effects of various management practices on anthracnose have been completed. The first study determined the impact of nitrogen fertilization rate, plant growth regulation (Primo and Embark), and verticutting on disease severity. In this three-year study, nitrogen (N) had the most profound effect on disease development, with weekly applications of 0.1 lb N 1000 ft⁻² reducing anthracnose 25 to 73% compared to the same N rate applied monthly.

Primo was applied throughout the growing season and occasionally reduced disease severity but otherwise had little effect. Embark initially increased anthracnose activity, but this effect was small and was only evident for 4-6 weeks post-treatment. However, turf treated with both Primo and Embark exhibited a dramatic reduction in anthracnose in years two and three of the study. Verticutting every 14 days had little effect on anthracnose.

The second study evaluated mowing height, mowing frequency, and lightweight vibratory rolling effects on anthracnose severity and ball roll distance over a two-year period. Disease severity was most pronounced at the lowest mowing height (0.110 inch) and decreased at higher heights of cut (0.125 and 0.141 inch). Mowing frequency had little effect on



Lightweight rolling every other day slightly reduced anthracnose and increased ball roll distance.

anthracnose; however, daily double-cutting at 0.141 inch often yielded ball roll distances equivalent to a single-cut at 0.110 inches.

Lightweight rolling every other day slightly reduced anthracnose and increased ball roll distance. Thus, anthracnose severity can be minimized at higher mowing heights and acceptable ball roll distance (= 10 ft.) can be attained by increasing mowing frequency and/or employing lightweight rolling at the higher heights of cut (0.125 or 0.141 inches).

Plant growth regulation strategies were evaluated in 2006 for possible effects on anthracnose disease of annual bluegrass putting greens. Nineteen treatments including various rates, intervals and combinations of Primo, Embark and Proxy were applied and evaluated. The incidence of anthracnose declined linearly with increasing rate of Primo (0.10 to 0.20 fl.oz. 1000 ft⁻²). The disease was less severe when Embark was applied in combination with Primo compared to Embark applied alone. Proxy reduced anthracnose severity regardless of whether it was applied with or without Primo; however, turf quality

was generally better when Proxy was applied with Primo.

Four additional field studies were initiated in 2006 to assess the impact of topdressing (rate, frequency, incorporation method, and sand type), irrigation, and lightweight rolling (vibratory vs. sidewinder) on anthracnose disease. Data analysis from 2006 is not complete, but it appears that light-frequent sand topdressing reduced anthracnose, while neither sand shape or method of incorporation affected disease development.

Summary Points

- Adequate nitrogen fertility to sustain moderate growth of annual bluegrass throughout the growing season (0.1 lb-N 1000 ft⁻² every 7 days) has been the single most effective cultural practice that can reduce anthracnose disease.
- Bimonthly applications of the chemical growth regulator trinexapac-ethyl (Primo) at rates ranging from 0.10 to 0.20 fl.oz. 1000 ft⁻² throughout the season have reduced anthracnose severity.
- The growth regulators mefluidide (Embark) and ethephon (Proxy) had an inconsistent effect on anthracnose over the past four years. However, turf treated with Embark or Proxy in the spring, with subsequent Primo applications throughout the summer, generally had less anthracnose and superior turf quality.
- Turf managers can use daily-double cutting and/or lightweight rolling every other day to attain acceptable Stimpmeter readings without the need to lower the height of cut. A lower height of cut intensifies damage from anthracnose, while double cutting and rolling do not encourage the disease.
- Four new field studies were established in 2006 and will continue through 2007 to evaluate the impact of sand topdressing, irrigation, and lightweight rolling on anthracnose disease.