

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. The multiple objectives of this research were organized into three field studies on annual bluegrass putting green turf that were designed to evaluate the main effect and interactions of : a) nitrogen fertility, chemical growth regulation, and verticutting; b) mowing and rolling practices; and c) types and combinations of chemical growth regulation on anthracnose severity.

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 condition worsens resulting in an overall thinning of the turf canopy. Management practices employed to improve playability and increase ball roll distances on putting greens may be responsible for increased incidence of anthracnose observed in recent years.

The impact of nitrogen fertilization rate, plant growth regulation (mefluidide and trinexapac-ethyl), and verticutting on disease severity was assessed over three years. Nitrogen (N) had the most profound effect on disease development, with applications of 0.1 pound /1000 ft² of N every 7 days reducing anthracnose 5 to 24% compared to the same N rate applied every 28 days.

Mefluidide applications in April increased anthracnose severity, but this effect was small and was only evident early in the season (8 to 10 weeks post-treatment). Trinexapac-ethyl was applied every 14 days throughout the growing season and occasionally reduced disease severity but otherwise had little effect. Turf treated with the combination of mefluidide in April and sequential applications of trinexapac-ethyl from April through August had a dramatic reduction in anthracnose severity by the end of the growing season during the last two years of the study. Verticutting every 14-days had little effect on anthracnose.

Evaluations of mowing height, mowing frequency, and lightweight vibratory rolling effects on anthracnose severity



Anthracnose, caused by the fungus *Colletotrichum cereale*, begins as small areas of yellowed turf with individual leaf blades eventually senescing.

and ball roll distance were conducted over a two-year period. As expected, disease severity was most pronounced at the lowest mowing height (0.110-inch) and decreased at higher mowing heights (0.125- and 0.141-inch). Mowing frequency had little effect on anthracnose; however, daily double-cutting at 0.141-inch often produced ball roll distances equivalent to a single-cut at 0.110-inch. Lightweight rolling every other day slightly reduced anthracnose and increased ball roll distance. Thus, anthracnose severity can be minimized at higher mowing heights (0.125- or 0.141-inch) and acceptable ball roll distance (i.e. 10 feet) can be attained by increasing mowing frequency and/or employing lightweight rolling at these higher mowing heights.

Plant growth regulation strategies were evaluated over three years for possible effects on anthracnose disease of annual bluegrass putting green turf. Nineteen treatments including various rates, intervals, and combinations of trinexapac-ethyl, mefluidide, and ethephon were evaluated. Applications of trinexapac-ethyl alone did not affect anthracnose regardless of rate or interval except in 2006 when trinexapac-

ethyl reduced disease 11-27% compared to untreated turf.

During this same year, anthracnose declined linearly with increasing trinexapac-ethyl rate (0.10 to 0.20 fluid ounces per 1000 ft² applied every 7 days). Annual bluegrass putting green turf treated with a combination of seedhead (mefluidide or ethephon) and vegetative (trinexapac-ethyl) regulation typically had less anthracnose and better turf quality by July of each year. It is thought that growth regulation programs that combine seedhead suppression and season-long vegetative regulation improve turf vigor thereby reducing anthracnose severity.

Summary Points

- Adequate nitrogen fertility to sustain moderate growth of annual bluegrass from May through August (0.1 pound/1000 ft² of N every 7 days) was the single most effective cultural practice that can reduce anthracnose disease.
- Mefluidide (Embark) and ethephon (Proxy) growth regulators used to inhibit seedhead expression in the spring had an inconsistent and generally small effect on anthracnose over the four years of this research project. Repeat applications of trinexapac-ethyl (Primo MAXX) to regulate vegetative growth from spring through summer either had no effect or slightly decreased the severity of anthracnose.
- Annual bluegrass putting green turf treated with a combination of seedhead (mefluidide or ethephon) and vegetative (trinexapac-ethyl) regulation typically had less anthracnose and better turf quality by July or August.
- A lower height of cut intensified anthracnose severity, while double-cutting and rolling did not encourage the disease.
- Verticutting to groom (0.125-inch depth) the leaf canopy without wounding crowns or stolons had little effect on disease severity.