

# Relationship of Environment, Management, and Physiology to Bermudagrass Decline

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## Objectives:

1. To determine the relationship between several environmental, cultural, and physiological factors to the development of bermudagrass decline.

**Start Date:** 2000

**Project Duration:** 3 years

**Total Funding:** \$74,984

**B**ermudagrass decline is a devastating root disease of highly managed bermudagrass turf, especially turf used for golf greens in the southern United States. It is caused by an interaction of predisposing abiotic stresses and the soil-borne, ectotrophic, root-infecting fungus *Gaeumannomyces graminis* var. *graminis*.

The objective of this research is to determine the relationship between several environmental, cultural, and physiological factors for the development and management of bermudagrass decline.

Summer fungicide applications did not control bermudagrass decline. The phytotoxic effects of several fungicides, due in part to application when summer temperatures were high, may actually have been counter productive to recovery from bermudagrass decline.

Mowing is extremely important in the maintenance of high quality putting surfaces. Decreasing mowing height did not

increase bermudagrass decline symptoms. During 2000, symptoms were more severe at 0.188 than at 0.125 inch.

Vertical mowing had a major impact on the expression of bermudagrass decline symptoms and frequent, light vertical mowing during late summer was devastating to Champion, Floradwarf, and Miniverde bermudagrasses. Routine defoliation and mechanical stress caused by frequent, light vertical mowing increased bermudagrass decline symptoms.

Nitrogen nutrition affected bermudagrass decline severity in a complex manner. Increasing N increased bermudagrass decline severity in Champion and Miniverde, and decreased severity in Floradwarf bermudagrass.

Nitrogen source may also be important in management of bermudagrass decline. An acidifying N source reduced and nearly eliminated symptoms of bermudagrass decline when applied to Floradwarf growing on a golf green with an alkaline soil pH.

Although we have not documented resist-



The effect of management practices on the occurrence of bermudagrass decline on ultra-dwarf bermudagrasses is under evaluation at Texas A&M University.

ance of bermudagrass to *G. graminis* var. *graminis*, we did observe differences in expression of bermudagrass decline symptoms among 15 bermudagrass cultivars. Bermudagrass decline symptoms were less severe in Tifdwarf than in several of the newer dwarf bermudagrass cultivars.

## Summary Points

- Summer fungicide applications did not control bermudagrass decline.
- Fungicide phytotoxicity when summer temperatures were high may have been counter productive to recovery.
- Decreased mowing height did not increase decline symptoms and in one season were more severe on 0.188 than 0.125 inch mowing height.
- Vertical mowing increased decline symptoms and light frequent vertical mowing during the summer was devastating to Champion, Floradwarf and Miniverde.
- Increasing nitrogen increased bermudagrass decline on Champion and Miniverde.
- An acidifying N source reduced and nearly eliminated symptoms of bermudagrass decline when applied to Floradwarf growing on a green with an alkaline soil pH.



Poor management can lead to the decline of new ultra-dwarf bermudagrass cultivars.