

Do Endophytes Enhance Drought Tolerance?

Do endophytes enhance the survival of water stressed tall fescue? That was the question addressed by researchers from North Carolina State and Texas A&M Universities. It is known that the presence of endophytes in tall fescue will confer resistance to insect pests, enhance growth, and improve tall fescue persistence under high temperature. Three cultivars of infected and non-infected tall fescue were subjected to water stress. Few plant parameters related to water stress were affected by the presence of the endophyte. Total tillers, tiller survival, plant survival, and recovery weights were similar for endophyte-infected and endophyte-free cultivars. Therefore, there was no evidence of endophyte mediated drought tolerance in this study.

(From: R.H. White, M.C. Engelke, S.J. Morton, J.M. Johnson-Cicalese, and B.A. Ruehmele. 1993. *Acremonium Endophyte Effects on Tall Fescue Drought Tolerance*. *Crop Science* 32:1392-1396.)

Urease Inhibitors to Increase Nitrogen Efficiency

A major loss of nitrogen from surface applications of urea fertilizer is through volatilization, or gaseous losses. Urease is an enzyme that occurs naturally in the soil that breaks urea down into carbon dioxide and ammonia gas. This must occur for the urea nitrogen to become available. If this breakdown can be slowed down, perhaps less nitrogen will be lost to the air. Researchers in Iowa have been looking at chemicals that inhibit urease activity for reducing gaseous loss of urea nitrogen. In greenhouse experiments, they found that nitrogen losses from volatilization were as high as 49% of the applied nitrogen within a week after application. The inclusion of a urease inhibitor reduced the losses down to as low as 20%, depending on the material and rate. In field trials, however, they found little difference between straight urea applications, and where a urease inhibitor was included. The researchers concluded that these materials still have potential, but that more research is needed.

(From: Y.K. Joo, N.E. Christians, G.T. Spear, and J.M. Bremner. 1993. *Evaluation of Urease Inhibitors as Urea Amendments for Use on Kentucky Bluegrass Turf*. *Crop Science* 32:1397-1401.)

Natural Preemergence Weed Control

Preemergence herbicides are commonly used on turfgrasses to control annual weeds, including crabgrass. Iowa State researchers have conducted studies in the past that have shown that corn gluten meal contains a substance that inhibits root formation in certain grass species, including crabgrass. Used as an animal feed, corn gluten meal contains about 10% nitrogen, so it can be considered as a natural organic fertilizer as well. Control was better when the material was applied one week before germination. Much higher rates were required to obtain crabgrass control when applied four weeks before germination. The highest rates of corn gluten meal provided up to 95% control of crabgrass, when applied one week before germination. A patent was issued a couple of years ago on the use of corn gluten meal as a preemergence herbicide. Marketing agreements are under negotiation.

(From: N.E. Christians. 1993. *The Use of Corn Gluten Meal as a Natural Preemergence Weed Control in Turf*. *International Turfgrass Society Research Journal* 7:284-290.)



Scanning the Journals

A review of current journal articles

Few plant parameters related to water stress were affected by the presence of the endophyte.

In greenhouse experiments, inclusion of a urease inhibitor reduced nitrogen losses. In field trials, little difference was found.

The highest rates of corn gluten meal provided up to 95% control of crabgrass, when applied one week before germination.

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