Identification of Bacteria Associated with Etiolated Bentgrass and Evaluation of Management Factors that Influence Its Development

Lane Tredway
North Carolina State University

Objectives:

Identify bacteria associated with etiolated bentgrass and evaluate chemical control options for suppression of bentgrass etiolation.

Start Date: 2011
Project Duration: 1 year
Total Funding: $5,000

Bacteria were isolated from creeping bentgrass samples submitted to the Turf Diagnostics Lab at NC State that exhibited etiolation symptoms or foliar decline combined with bacterial streaming from cut leaves or leaf sheaths. Fifty samples were received between June 1 and September 1 that fit these criteria. Symptoms observed in each sample were described and photo-documented. Repre-sentatives of each colony type were selected from nutrient agar isolation plates, photo-documented, and transferred to separate plates for identification using DNA sequencing and morphological characteristics.

Acidovorax avenae was isolated from 9 of the 50 samples. The symptoms observed in samples containing *A. avenae* were variable, ranging from chlorosis and etiolation to minor dieback of older leaf tips. *Xanthomonas translucens* was isolated from 6 of the 50 creeping bentgrass samples, and again the symptoms were variable and ranged from chlorosis and etiolation to dieback and water-soaking of older leaves. Neither *A. avenae* nor *X. translucens* were isolated from several creeping bentgrass samples showing prominent chlorosis and etiolation. In addition to *A. avenae* and *X. translucens*, bacteria from at least 10 other genera were also isolated from the 50 samples.

Growth chamber inoculation studies are underway with the isolated bacteria to determine if they are pathogenic to creeping bentgrass. Based on the fact that no single bacterial species is consistently associated with etiolated bentgrass, we suspect that either bacteria are not a cause of the problem or that more than one bacterial species is capable of inducing these symptoms.

Field research was conducted in 5 locations in North Carolina (3 in Raleigh

The disease caused significant damage to creeping bentgrass greens from Maine to South Carolina. In some cases, golf courses were forced to close for weeks at a time to allow for turf recovery.

and 1 each in Greensboro and Charlotte) to evaluate chemical control options for suppression of bentgrass etiolation. Evaluated products included Mycoshield, FireWall, Agrimycin 17, FireLine, Zerotol, Consan 20, Greenshield, SA-20, Junction, Camelot, Copper-Count-N, Signature, Daconil Action, Kasumin, and an experimental formulation of fluazinam.

Mycoshield was phytotoxic to creeping bentgrass after 1 application at rates of 10 lbs. product per acre or higher, and Agrimycin 17 was phytotoxic at rates of 20 lbs. product per acre or higher. No chemical treatments consistently reduced the expression of etiolation and thinning symptoms in our studies, and in fact in some cases treatments with antibiotics or copper compounds exacerbated the problem, presumably due to phytotoxic reactions.

We are investigating the influence of growth regulators and biostimulants, either alone or in combination, on the severity of bentgrass etiolation.

Preliminary data collected in the fall during relatively cool weather showed that biostimulants neither increased or reduced the severity of the problem, while trinexa-pac-ethyl treatments significantly reduced the symptoms.

Summary Points

● Field research was conducted in 5 locations in North Carolina to evaluate chemical control options for suppression of bentgrass etiolation.

● Mycoshield was phytotoxic to creeping bentgrass after 1 application at rates of 10 lbs product per acre or higher.

● Agrimycin 17 was phytotoxic at rates of 20 lbs product per acre or higher.

● No chemical treatments consistently reduced the expression of etiolation and thinning symptoms in our studies, and in fact in some cases treatments with antibiotics or copper compounds exacerbated the problem, presumably due to phytotoxic reactions.