

Bacteria Associated with Creeping Bentgrass Disease Syndrome in the Southern and Southeastern United States During the Summer of 2010

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Objective:

To identify the causal agents associated with creeping bentgrass disease syndrome in southeastern U.S. golf courses.

Start Date: 2010

Project Duration: 1 year

Total Funding: \$5,000

During the summer of 2010, the Clemson University Commercial Turfgrass clinic received samples of bentgrass (*Agrostis stolonifera* L.) on putting greens from 15 golf courses in the southern and southeastern United States. The samples were submitted on suspicion of Pythium blight or Pythium root dysfunction.

Additional samples were received and described as healthy turf. On the samples suspected of having disease, symptoms varied from yellowing of lower leaves to wilt and desiccation of entire plants. Microscopic observations revealed streaming of bacteria from infected yellow leaves and from newly emerging leaves. In addition, there was no evidence of Pythium oospores or zoospores in the specimen.



Pathogenicity tests of *Acidovorax avenae* isolates; 18 and 19 on bentgrass (cone assay).

Following surface disinfection, bacteria were isolated by maceration of infected leaves in nutrient broth and streaking the suspension on nutrient agar.

Pure cultures of predominant bacterial colonies growing on plates from serial dilutions were transferred to nutrient agar medium. Samples from individual

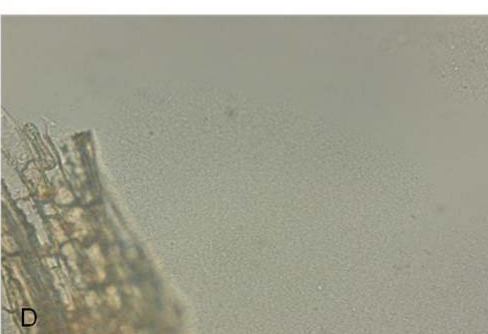
colonies growing on nutrient agar were used to establish pure cultures. Based on color, morphology, and appearance of bacteria on several media including yeast dextrose calcium carbonate, we were able to distinguish 16 different bacterial morphologies. Pathogenicity testing of each culture was conducted on creeping bentgrass (*Agrostis stolonifera* L.) cv. Penn G-2.

There were 11 pathogenic isolates belonging to 10 different bacterial morphologies. Sequence analysis of 16S rDNA of pathogenic bacteria revealed the highest similarity (>98%) to *Xanthomonas translucens* pv *poae*, *Acidovorax avenae* subsp. *avenae*, and a similarity of (> 93%) to *X. campestris* pv *campestris* and *X. oryzae* pv *oryzae* for all the 11 pathogenic isolates.

Summary Points

● During the summer of 2010, we at the Clemson University commercial turfgrass clinic isolated several bacterial isolates from diseased bentgrass.

● Two of those isolates were tentatively identified as *Xanthomonas translucens* and *Acidovorax avenae* based on morphology and DNA sequence of their 16 SrRNA. Pathogenicity tests have shown that those two bacteria are pathogenic to bentgrass.



Symptoms of bentgrass disease syndrome caused by *Xanthomonas translucens* and *Acidovorax avenae*. (A) Symptoms and incidence of the disease in putting greens; (B) close up of yellowing plants; (C) elongation of infected plants; (D) bacteria streaming from infected tissues.