UPDATE ON BACTERIAL WILT OF TORONTO CREEPING BENTGRASS

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The C-15 problem has been a controversial and unpredictable disease of Toronto creeping bentgrass for many years in many midwestern states. In 1980, transmission electron microscopy disclosed the association of a bacterium in the xylem vessels of diseased Toronto creeping bentgrass and represented a break through in the unresolved C-15 problem. Subsequent applications of Mycoshield (oxytetracycline-Pfizer Corporation) at the rate of 2.5 lbs. per 50 gallons water per 1000 $ft.^2$ provided excellent control of the disease for at least 3-4 weeks. Applications of oxytetracycline not only demonstrated outstanding disease control but also presented additional evidence that a bacterium was the cause of the C-15 problem.

If the bacterial wilt-C-15 problem is suspected, application of Mycoshield to only half or part of the Toronto creeping bentgrass putting green is recommended. This part-area treatment allows comparison of treated and non-treated areas, permitting accurate diagnosis of the bacterial wilt. Estimates suggest approximately $1200.00 for one treatment of oxytetracycline per 18 holes. While this may seem expensive, oxytetracycline does provide adequate control while allowing time for renovation considerations.

Other current research involves characterization of the bentgrass bacterial pathogen. Bacteria are characterized according to morphological, physiological and serological tests. Morphological characteristics of the bentgrass bacterium include: rod-shape, 0.3-0.5 x 1.0-1.5 um size and rippled cell wall. Physiological considerations generally imply nutritional characteristics of bacteria. The bentgrass bacterium exhibits: starch hydrolysis, gelatin liquefaction, casein utilization, obligate aerobic, H_2S production, Gram-, oxidase-, catalase+, and growth at 36°C. These attributes resemble the bacterial genus Xanthomonas which contains many species of plant pathogenic bacteria.

Serology is a relatively recent method of characterizing bacteria. The procedure involves injection of a white New Zealand rabbit with the bentgrass bacterium. The rabbit is stimulated to produce antibodies, much in the some way people produce antibodies to foreign agents such as cold germs. These antibodies are very specific for the bentgrass bacterium and can be used for comparison with other known bacteria. Thus far, the bentgrass bacterium shows no serological relationship to several Xanthomonas species. Further testing is necessary before the true relationship of the bentgrass bacterium to other bacterial species can be established.