

Evaluation of Golf Turf Management Systems with Reduced Chemical Pesticide Inputs

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Objectives:

1. Evaluate the aesthetic and functional performance of golf putting greens managed with few or no chemical pesticides.
2. Determine the environmental and economic impact of golf putting greens managed with few or no chemical pesticides.

Start Date: 2001

Project Duration: 3 years

Total Funding: \$87,000

This project was designed to provide information on the feasibility and performance of golf course putting green turf managed with few or no chemical pesticides, and is being conducted on the Green Course at the Bethpage State Park, Long Island, NY. Current golf course pest management practices ("unrestricted") are compared with IPM and nonchemical management. Further comparisons are made between standard cultural practices and "alternative" practices that we believe will reduce turfgrass stress and thereby minimize pest problems. This project explores total management systems, as practiced by turf managers, rather than focusing on individual technologies and isolated practices.

Alternative cultural practices included mowing at 0.150 - 0.188 inches, increased N rate, and use of organic N sources, frequent hydrojecting and vertical mowing, reduced frequency of clean-up passes, and hand watering of known dry spots prior to wilting. As a result of failure of several nonchemical treatments, the three alternative culture, nonchemical greens were stripped and resodded to (5-month-old)



Project Leaders Frank Rossi and Jennifer Grant on a velvet bentgrass green that has been managed without chemical pesticides.

velvet bentgrass in November, 2001. The velvet bentgrass (SR 7200) was installed because it is less susceptible than *Poa*/creeping bentgrass greens to most diseases encountered in the Northeast. For pest management, cultural and biological practices were employed specifically to prevent or reduce pest problems on some or all of the nonchemical and IPM greens. In 2002, we kept fertility levels high to aid recovery from dollar spot injury, applied the beneficial microorganism *Trichoderma harzianum* (TurfMate™) to suppress diseases, and manually removed weeds. We also covered IPM and nonchemical greens (except the newly sodded velvet) with a winter cover of compost to prevent snow mold outbreaks.

In 2001, dollar spot was the primary pest in all treatments throughout the season and was the target of most pesticide applications. Other pests of less significance included annual bluegrass weevils, black cutworms, anthracnose, crabgrass and goosegrass. In 2002, compost-covered treatments were the first to green in mid-March and, as a result of the mild winter, some of the compost could not be removed and created a layer in the profile. Compost may have contributed to reduced dollar spot incidence on the IPM and nonchemical greens, but fairy ring greatly increased to the point of becoming hydrophobic and causing turf loss in some areas.

In 2001, pesticide applications on the IPM greens were 27-30% less than on the unrestricted pest management greens, and quality on 5 of the 6 IPM greens equaled that of the unrestricted pest management greens. In 2002, the IPM greens received 50% less pesticide applications than the unrestricted greens as of mid-summer. The nonchemical velvet bentgrass greens remained at or near acceptable quality throughout the season, whereas their *Poa*/creeping bentgrass



Dollar spot has been the predominant pest problem on *Poa*/creeping bentgrass greens.

counterparts were marginally acceptable or below acceptable quality for much of August and early September.

The three nonchemical *Poa*/creeping bentgrass greens received one rescue spray in mid-August when all collaborators agreed they were well below acceptable quality and in an effort to preserve *Poa*/bentgrass surfaces for the future of the study. The weather in 2002 was more severe with more than twice as many days of >90°F temperature. To date, rounds of golf are well below 2001 numbers—partially related to US Open activities. However, anecdotal reports suggest that, if given a choice, golfers will choose the Green Course last of the five available at the Park.

Summary Points

- IPM greens received 27-30% fewer pesticide applications than the unrestricted pest management (current standard) greens in 2001, and 50% fewer in the first half of 2002.
- Velvet bentgrass greens outperformed *Poa*/creeping bentgrass greens when managed without chemical pesticides.
- Nonchemical *Poa*/creeping bentgrass greens were marginally acceptable or below acceptable quality for much of August and early September, 2002.