

Golf Course Study At Four Courses Identifies Environmentally Responsible Turf Management

By the Suburban Hennepin Regional Park District

Hennepin Parks staff recently completed two pioneering research studies designed to determine if the pesticides and fertilizers used on golf courses affect the quality of adjacent waterbodies. The research was conducted from 1990 to 1994. One study measured the amount of nitrogen, phosphorus and selected fungicides infiltrating through a green at Baker National Golf Course. The second study measured surface runoff from two private and two public metropolitan area golf courses: Baker National Golf Course, Meadowbrook Golf Course, Woodhill Country Club and The Minikahda Club.

The results of the studies were very surprising relative to the small amounts of fertilizers and pesticides running off of the courses. For instance, the loss of phosphorus from golf courses was very small, about 0.13 pounds per acre annually. By comparison, the loss of phosphorus from urban

residential areas averages 0.94 pounds per acre annually. The loss of nitrogen from the four golf courses was also lower than the loss from urban residential areas, 1.54 pounds per acre annually and 4.8 pounds per acre annually respectively. The total quantity of phosphorus, nitrogen and fungicides infiltrating through the green at Baker National during the three-year study was less than 0.1 percent of the amount of each chemical applied to the green. This data indicates that there was no significant movement of chemicals from the green to the underlying groundwater table.

Two factors were identified which contributed to the runoff water quality. Contrary to popular belief about golf courses, these four facilities did not receive massive amounts of fertilizer. In fact, records show that, on average, the four courses received **80 percent less** phosphorus than most urban lawns. All four of the golf courses regularly test their soils to determine fertilizer needs, and apply only the amount recommended by the test.

Secondly, three of the study sites were on golf courses which are Audubon Cooperative Sanctuaries. The Audubon program promotes integrated pest management, which may have reduced chemical use, and therefore chemical runoff, from these courses. Turf areas were inspected daily during the growing season for evidence of disease problems. Chemicals were used only when diseases were found, and then applied only to problem areas, not indiscriminately over the entire course.

The four golf courses demonstrate that high quality turf can be maintained without constant applications of phosphorus fertilizer and herbicides. By adopting some of the management practices of these four golf courses, such as soil testing, aeration and addition of organic matter, golf course managers can reduce nutrient and fertilizer runoff from their courses.

For a complete report of these studies or further information, contact John Barten, Hennepin Parks Water Quality Manager at (612) 473-4663.

The following organizations provided funding to implement the studies: Legislative Commission on Minnesota Resources (LCMR), Hennepin Parks, Lake Minnetonka Conservation District, Minnehaha Creek Watershed Management District, Elm Creek Watershed Management Organization, Pioneer Sarah Creek Watershed Management Commission, Riley Purgatory Creek Watershed Management District, Hennepin Conservation District, and the Minnesota Golf Course Superintendents' Association.

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