DATA
2003 (continues through 2005), Dan Potter, Ph. D., University of Kentucky

SOURCE
Jeff L. Nus, Ph.D., United States Golf Association, *2004 Turfgrass and Environmental Research Exective Summary*

MORE INFORMATION
http://usgatero.msu.edu

Biologically-based management of white grubs and ants

Root-feeding white grubs and cutworms are widespread and destructive insect pests of turfgrasses on golf courses in the cool-season and transitional turfgrass climatic zones. Ants are abundant in turfgrass habitats where they are beneficial by preying upon the eggs and other life stages of pest arthropods. Ants become pests, however, when their nesting and mound-building occur on closely-mowed turf of golf courses.

Researchers at the University of Kentucky are conducting research focusing on factors that determine the abundance and distribution of white grubs, cutworms and mound-building ants on golf courses. Parasitic wasps belonging to three different families were discovered attacking BCW eggs or larvae, causing mortality as high as 27 percent. A baculovirus isolated from BCW cadavers has the potential to provide season-long BCW control from a single application. Studies to characterize its activity, host range, residual activity and potential as a bio-insecticide are planned for 2004. Mound activity of *Lasius neoniger* ants started in late winter, peaked in May and declined steadily thereafter. Nearly all mounds on sand-based greens were located within two meters of the outer edge. *Lasius* queens were active in late summer with synchronized emergence periods. Planting peonies as a nectar source for spring-active *Tiphia* wasps significantly increases parasitism rates of white grubs in nearby turf.

DATA
2003 (continues through 2005), Bingru Huang, Ph. D., Rutgers University

SOURCE
Jeff L. Nus, Ph.D., United States Golf Association, *2004 Turfgrass and Environmental Research Exective Summary*

MORE INFORMATION
http://usgatero.msu.edu

Physiological and molecular basis heat tolerance in bentgrass

Summer deciline in turf quality is a persistent problem for creeping bentgrass (*Agrostis stolonifera*).

The overall goal of this project is to improve heat tolerance of creeping bentgrass by identifying mechanisms of heat tolerance in *Agrostis*. Researchers are determining whether any specific gene can be identified and used for direct genetic manipulation, and if heat-stress proteins or other genetic components can be used as genetic markers for heat tolerance.

The study examined thermal *Agrostis scabra*, non-thermal *Agrostis scabra, A. rossiae*, and *Agrostis palustris* cv. L-93. Soil temperatures were 20 (control), 35 and 40 C, while air temperature was held at 20 C. Treatments were imposed for 70 days. After 10 days, all plants grown at 42 C had lower chlorophyll content than plants grown at 35 and 20 C. Differences in chlorophyll content between 35 and 20 C were not significant. Both ecotypes of thermal *A. scabra* had greater chlorophyll content than other *Agrostis* species at 35 C. Canopy temperature for all species at 35 and 42 C increased over time as much as 6 and 8 C respectively. These physiological measurements showed that thermal Agrostis scabra species had superior tolerance to elevated soil temperatures. These species had better cooling mechanisms and produced large numbers of roots at 5 cm at 35 C soil temperatures, while root growth declined for creeping bentgrass.

DATA
2003 (continues through 2005), Bruce Marin, Ph. D. and Paul Peterson, Ph. D., Clemson University

SOURCE
Jeff L. Nus, Ph.D., United States Golf Association, *2004 Turfgrass and Environmental Research Exective Summary*

MORE INFORMATION
http://usgatero.msu.edu

Rapid Blight biology and integrated management

Rapid Blight, presumably caused by an undescribed species of Chytridiomycete fungus, has caused extensive and costly damage to golf course greens, tees and fairways with rough bluegrass, perennial ryegrass, annual bluegrass and creeping bentgrass in several western states and in the southeastern United States.

Researchers at Clemson University have recently initiated research to investigate the identification and basic biology of the causal organism, including elucidation of the life cycle of the pathogen and disease epidemiology. They are also determining the influence of irrigation water (salinity, sodicity, and bicarbonates) and soil edaphic properties on disease severity and epidemiology. Preliminary data indicate that salinity linked to irrigation water quality plays a major role in disease development. Rapid Blight has been diagnosed primarily in the fall, winter and spring months, suggesting that cooler temperatures also may promote the disease. Additional preliminary results indicate a high degree of susceptibility in cultivars of rough bluegrass and perennial ryegrass, while certain cultivars of alkalingrass and creeping red fescue appear to contain levels of resistance. GCN