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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, Cook College, Rutgers University in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. It also allows these professionals to reach a more general audience, which includes the public. Articles appearing in these proceedings are divided into two sections.

The first section includes lecture notes of papers presented at the 1995 New Jersey Turfgrass Expo. Publication of the New Jersey Turfgrass Expo Notes provides a readily available source of information covering a wide range of topics. The Expo Notes include technical and popular presentations of importance to the turfgrass industry.

The second section includes technical research papers containing original research findings and reviews covering selected subjects in turfgrass science. The primary objective of these papers is to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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RECENT ADVANCES IN THE CONTROL OF TAKE-ALL PATCH

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Take-all patch, caused by the ectotrophic root-infecting fungus *Gaeumannomyces graminis* var. *avenae*, is an extremely destructive disease of turfgrasses in Australia, Europe, and North America. Although the disease has been reported on annual bluegrass (*Poa annua*), rough bluegrass (*P. trivialis*), Kentucky bluegrass (*P. pratensis*), and velvetgrass (*Holcus lanatus*), it is most troublesome on bentgrass (*Agrostis*) species. Take-all is most severe on bentgrass growing under conditions of cool temperatures (40 to 60°F), ample soil moisture, and high soil and rhizosphere pH. Several researchers have reported dramatic reductions in the incidence and severity of this disease in the field through the use of acidifying fertilizers or the application of sterol inhibiting or mercury-based fungicides. Little is known, however, about the factors that govern fungicide efficacy (e.g., chemical mode of action, optimum rates, timing, methods of application) or the effect of nitrogen sources and pH on disease development and reduced fungicide usage.

To evaluate the impact of selected fungicides and nitrogen sources on take-all in the field, two bentgrass fairways naturally infested with *G. graminis* var. *avenae* were utilized from 1993 to 1995 at the Metedeconk National Golf Course in Jackson, NJ. Fungicides were applied as either surface or subsurface (0 to 3 inch depth) treatments using a commercial Chem Pro (2 gal H_2O/1000 ft^2 @ 30 PSI) or Toro Hydroject (11.2 gal H_2O/1000 ft^2 @ 5000 PSI) sprayer. Six timing regimes (1 to 4 applications yr^{-1}) were compared utilizing fenarimol (Rubigan), which was the only fungicide labeled for the control of take-all. Nine additional fungicides, representing six distinct chemical groups, were evaluated on an April, May, September, and October spray schedule. Strongly acidifying and weakly acidifying nitrogen sources, ammonium sulfate and milorganite, respectively, were applied to turf as split-plot treatments.

Over the three year study, ammonium sulfate and milorganite treatments reduced soil pH from 6.7 to 5.6 and 6.1, respectively. Compared to milorganite-treated turf, ammonium sulfate reduced disease severity 33% in 1994 and 42% in 1995. After one year of application, only phenyl mercury acetate (PMA), strobilurin (Heritage), triadimefon (Bayleton, 4.0 oz/1000 ft^2), and tebuconazole (Lynx, 3.0 oz/1000 ft^2) provided an acceptable level of control (82 to 97%). At the end of the second season, however, cyproconazole (Sentinel) and propiconazole (Banner) were also as effective as PMA in suppressing take-all. Although fenarimol (Rubigan) provided a fair to good level of disease control, thiophanate-methyl (Cleary 3336) and fluazinam were not effective in reducing the incidence and severity of this disease.

Compared to untreated controls, subsurface applications of fenarimol were 23 to 36% more effective in suppressing take-all than surface applications. Throughout the study, fenarimol was most effective when applied in April and September (4.0 oz/1000 ft^2) or in April, September, and October (2.0 oz/1000 ft^2). The relationship between soil pH, reduced fungicide rates, and disease severity will be examined more closely in the future.

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