

inches from the edges of existing disease patches. To a lesser extent the pathogen could be also identified as being present in the thatch of asymptomatic areas, but, contrary to isolated reports, it was not present in the roots of the same plants. This study confirmed that the *Rhizoctonia solani* pathogen is primarily concentrated on turfgrass foliage surfaces and that it can exist there in substantial numbers in an area that appears asymptomatic. The data from this study should provide the basis for further studies that attempt to formulate new control strategies. Additionally, this information bolsters the argument used in the already existing practice aimed at reducing the periods of leaf gutation by syringing with water and the applications of wetting agents to turf foliage.

Biological controls are studied

Dr. Yuen also conducted a study of two promising strains of antagonistic fungi, one a non-pathogenic, binucleate form of *Rhizoctonia* and the other an isolate of *Giocladium virens*, to see if the suppression of *Rhizoctonia solani* demonstrated in the lab would transfer into the field. In the lab, the binucleate *Rhizoctonia* spp. (GM 460) had reduced expression on tall fescue seedlings by 74% and the *G. virens* (TRBG) strain had reduced symptoms by 40%,

when rated 10 days after the introduction of the pathogen.

In a field test of the GM 640 strain, one application, consisting of colonized millet seed, made one week before the introduction of the pathogen, reduced the level of disease expression by 46% 27 days after inoculation. When a second application of GM 640 was made at the time of the inoculation the disease expression was reduced by 63%, just a few percentage points short of the rating set for the uninfested control plot in the study.

When both strains were applied singly, at multiple rates, and mixed, they showed only marginal improvements in disease suppression over the two months of the study. Single and multiple applications of GM 640 were slightly better at disease suppression than the corresponding applications of TRBG. But the combination applications of triple rates of both strains produced results that averaged a 37% reduction in disease severity compared to the untreated inoculated control over the nine weeks of the test. Also the disease reduction averaged 49% when the turf was rated 7 to 10 days after each application.

The results of these tests produced good and bad news. The good news was that at least one strain, GM 460, could survive on leaf surfaces for periods longer than 30 days thereby approximating existing fungicide reapplication schedules. The bad news was that the level of disease control of these two strains did not approach the commercial threshold of 80%. ■

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