

UNIVERSITY OF RHODE ISLAND

Use of Mycorrhizae in the Establishment and Maintenance of Greens Turf

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Dr. Noel Jackson
Dr. R.E. Koske
Dr. J.N. Genna
Principal Investigators

Most of the research on mycorrhizae, fungi which have a beneficial association with plant roots, has focused on crop plants. Lack of research on turfgrasses may be due to an unsubstantiated theory that plants with fine roots and abundant root hairs do not benefit from mycorrhizae, especially if soil phosphorus is adequate. In fact preliminary investigations in this lab indicate that turfgrasses have up to 80% of their root systems colonized by mycorrhizal fungi.

SURVEY OF TURFGRASS SOILS FOR MYCORRHIZAL FUNGI.

Two different methods have been employed to determine what species of mycorrhizal fungi are present in soils from established plots of *Agrostis palustris* cv. Penncross, *A. canina* cv. Kingstown, and *Poa annua*.

Direct Soil Isolation. Turf soils are examined each month for spores of mycorrhizal fungi. This method indicates what species are present and their relative abundance in the soil at the time of collection.

Pot Culture Technique. Because mycorrhizal fungi are obligate symbionts, they can only be cultured when grown with a host plant ("pot culture"). Pot cultures of turf soils are established each month. These cultures are harvested after four to six months to check for spore production. Species of fungi vary in their ability to sporulate, and some species sporulate more readily in pot culture than in the field. Thus by combining data from pot culturing and direct soil isolation, we will obtain a more complete survey of the fungal community in turf soils.

MYCORRHIZAL INOCULATION EXPERIMENTS

Greenhouse: The mycorrhizal fungus *Glomus intraradix* produced a significant increase in shoot dry weight in both species of bentgrass (*A. palustris* and *A. canina*) as compared to non-inoculated plants. A mixed culture of mycorrhizal fungi isolated from turf soils did not increase shoot dry weight. Techniques to generate inoculum on a large scale are being investigated.

Field: A small sand green (USGA specifications) was installed in the field in September 1990. The effect of mycorrhizal inoculation with *Glomus intraradix* and different levels of phosphorus on *A. palustris* and *A. canina* will be evaluated. The green was divided into 288 square-foot plots using a plywood grid. Some plots are being used to examine the interaction of two different peat sources, sedge and

sphagnum, on bentgrass growth and mycorrhizal inoculation. A parallel study will be established in the greenhouse by December 1990.

Laboratory: A new method of inoculating bentgrass plants with mycorrhizal fungi under monoxenic conditions in liquid culture has been developed. Attempts to establish root organ cultures of bentgrass have not been successful to date.