Endophyte-enhanced Turfgrasses: Are They Worth Their Weight?

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Endophytes are mutualistic symbionts; they are beneficial fungi that live between the cells of plants. Endophytes produce toxins that protect plants, but are not harmful to the plant itself. Acremonium endophytes are the predominant endophyte used in turfgrasses. Plant breeders enhance turfgrasses with endopyhytes to reduce maintenance costs, conserve and improve precious soil and water resources, ultimately enhancing the environment. Endophyte-infected turfgrasses have consistently shown dramatic enhancement of resistance to several foliage-feeding insects including armyworm, billbug, chinch bug, and sod webworm. However, because most (> 90%) of the toxins produced by endophytes are mainly located in above-ground plant tissues (i.e., above the crown), white grubs are not affected. Endophytes also provide valuable drought and stress tolerance as well as disease resistance. For these reasons, endophyte-enhaced turfgrasses are definitely worth their weight, especially since they have the ability to improve turfgrass performance.

Unfortunately, perennial ryegrass, *Lolium perenne* L., hard fescue, *Festuca longifolia* Thuill, Chewings fescue, *Festuca rubra* L, and turf-type tall fescue, *Festuca arundinacea* Schreb are the only commercially available endophyte-enhanced turfgrasses. As a result, unless you are managing and maintaining one of these aforementioned turfgrass species, the use of an endophyte-enhanced turfgrass is not an option. Moreover, not all insects are susceptible to endophytic turfgrasses; the black cutworm (i.e., an important insect pest of golf course turf, especially putting greens) has relatively low susceptibility to endophyte-infected turfgrasses. The good news is that turfgrass breeders are continuing to work on developing other endophte-enhanced turfgrass species such as creeping bentgrass, *Agrostis palustris* Hudson. Should they attain success, managing sod webworm larvae on golf course turf (i.e., creeping bentgrass) may be achieved with little reliance on conventional insecticides.

Now more than ever, especially due to the growing public concern as well as the banning of the use of pesticides in some U.S. cities, endophyte-enhanced turfgrasses should be considered when applicable. However, endophytes are not the end-all-cure-all, they are merely another turfgrass management option. Always consider the most environmentally responsible, effective, and economical approach when making a turfgrass management decision.