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Soil Water Repellency in Golf Course Soils – Water Use and Environmental Implications.

S.J. Kostka (1), J.L. Cisar (2) , C.J. Ritsema (3), L.W. Dekker (3), M.A. Franklin (1), S. Mitra (4), and S.E. McCann (1)

(1) Aquatrols Corporation of America, Paulsboro, NJ, USA, (2) University of Florida, IFAS, Fort Lauderdale, FL, USA, (3) Alterra, Land Use and Soil Processes, Wageningen, NL, (4) California State Polytechnic Institute, Pomona, CA, USA (stan.kostka@aquatrols.com / Fax: 1-856-537-6018 / Phone: 1-856-537-6003)

Golf courses are highly conspicuous consumers of surface and ground waters for irrigation purposes. As such, golf courses receive considerable public scrutiny on water use as well as on the impacts of management practices on surface and groundwater quality. Soil water repellency (SWR) is a well established phenomenon in all soils supporting highly managed turfgrass stands. On newly constructed golf courses, this phenomenon develops rapidly (usually within three years) with visible symptoms occurring seasonally under periods of high evaporative demand. Symptoms include turf

wilting and development of dry areas, often impervious to water. These water repellent areas (referred to as localized dry spots or dry patch) are associated with degrading organic matter of plant or microbial origin (including basidiomycete fungi that cause fairy rings). Management strategies have traditionally focused on alleviation of dry spot symptoms or control of fairy rings in order to improve localized turf quality and performance. With the worldwide realization of the fragility of water supplies and the occurrences of several prolonged regional droughts, the golf course industry has recognized that options must be developed to more effectively utilize available water resources. While SWR is a recognized problem in turfgrass culture, its hydrological impact and influence on irrigation efficiency is poorly understood. The use of soil surfactants is well documented for the management of water repellency in thatch and soils for the reduction of localized dry spots (dry patch), and for management of fairy ring symptoms. It is the objective of this paper to use recent findings from research conducted on irrigated, water repellent soils (with and without surfactant treatments)

to illustrate the effects of soil water repellency on distribution uniformity and irrigation efficiency and its influence on maximization of irrigation inputs and minimization of losses from evaporation, runoff (overland flow), and leaching below the rootzone. Cost-benefit analyses will be presented for management of soil water repellency and the concomitant potential for water conservation.