



2008 USDA-CSREES National Water Conference
Sparks, NV

Leaching of PPCPs in turfgrass soils irrigated with reclaimed water

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Abstract Text:

Abstract: The practice of irrigation with reclaimed water on landscape has been employed for many years in many areas of world. The fate and transport of trace organic contaminants in the reclaimed water in the irrigation activity, such as endocrine disruptors, steroid hormones, pharmaceutical and personal care products (PPCPs), have not been well documented. In this study, leaching experiments were conducted at the experimental fairway facility at University of California at Riverside. Water was spiked with certain levels of PPCPs and mixed thoroughly in a 5000-gallon tank. Two irrigation rates (1.1~1.2ET₀ and 1.5~1.6ET₀) were applied on two types of soils (sandy loam and loamy sand), and the leachates were continuously collected after each irrigation campaign and analyzed for the targeted compounds. Turfgrasses on four plots (two of each soil type) were stripped and irrigated, in order to determine the effect of sod on the leaching behavior of chemicals during the irrigation activity. After the 3-month experiment, core soil samples from each plot were collected, sliced and analyzed for the compounds in the soil profiles. This study produced the first hand field measured information on degradation and leaching potential for the most commonly detected PPCPs of reclaimed wastewater under typical Southwest soil-climate conditions.

Impact Statement:

This project will improve our understanding of the bio-filter function of turfgrass, and risks associated with PPCBs when the reclaimed water is land applied.