



USDA-CSREES 2006 National Water Quality Conference

Use of Chicken Manure for Biostimulation of Microbial Reduction of Perchlorate in Different Soils

Perchlorate has been found to contaminate water in 18 states and believed to exist wherever rocket fuel or rockets are made or tested, 39 states in all. Salts of perchlorate are extremely soluble and remarkably stable in water. Perchlorate in drinking water and food poses serious potential health concerns because it is taken up preferentially by the thyroid gland in place of iodide, a necessary nutrient. Perchlorate is used as a terminal electron acceptor (TEA) by some bacteria in the soil for cellular respiration and is slowly degraded to chloride. Chicken manure has been reported to be one of the most effective organic electron donors. Dissolved organic carbon (DOC) from chicken manure was used to biostimulate soil and rhizosphere of willow (*Salix babylonica*) plant cuttings grown in soil bioreactors. Two soil types (humic and sand loam) were used in eight 2-gallon plastic soil bioreactors. Each bioreactor was spiked with between 30 to 70 mg L⁻¹ perchlorate in form of sodium perchlorate. Six of the eight bioreactors were amended with 300 mg L⁻¹

WILLIAM MwegoHA* AND ODEMARI S. MBUYA, ‡, †

*Environmental Sciences Institute, Florida A&M University; ‡Center for Water and Air Quality, Florida A&M University, Tallahassee, Florida 32307

†Corresponding author [tel. (850) 599 3428; e-mail: odemari.mbuya@famu.edu]