



## USDA-CSREES 2005 National Water Quality Conference

### Feasibility of Constructed Wetlands to Treat Herbicides Runoff

*Abstract: Situation: Pesticides entering into the surface and ground water may cause problems to human health and water pollution. However, tillage practices, amount and intensity of rainfall, soil type, and soil hydraulics play a vital role in losses of herbicides from agricultural fields. Trapping the runoff water in constructed wetlands may offer a cost effective technology to remove herbicides in runoff water from agricultural fields.*

*Objectives: 1. Investigate the effectiveness of no-till and conventional till in reducing herbicide losses. 2. Exploring the possibilities of using constructed wetlands to treat herbicide contaminated water.*

*Methods: The study was conducted at the North Carolina A&T Farm, Greensboro, NC. The treatments were conventional tillage and no-tillage. Before planting corn, atrazine was applied at the rate of 3.1 kg/ha. Runoff water and eroded soil was collected after each rainfall for atrazine analysis. Simulated wetland microcosms with bulrushes were batch treated with 3.5 ppm atrazine. The retention time was four weeks. Atrazine diffusion, Adsorption/desorption and biodegradation of atrazine were conducted in microcosms.*

*Partnerships: USDA/ARS*

*Resources: NC A&T Farm*

*Integration of Research, Teaching, and Extension:*

*Research and teaching*

*Results: Loss of atrazine was six times higher in conventional tillage than in no-till. More than 90% of atrazine had dissipated from the water column to the soil in microcosms. Atrazine metabolites were found in water samples indicating the microbial biodegradation. Adsorption of atrazine is one of the main processes of atrazine removal. Constructed wetlands can be used as a best management practice to treat runoff agricultural chemicals from farm lands.*

Author: Gudigopuram Reddy