



## **USDA-CSREES 2006 National Water Quality Conference**

### [Treatment of Agricultural Chemicals Runoff in Simulated Constructed Wetlands](#)

When fertilizers and pesticides are applied to an agricultural land, a significant concentrations of these chemicals are subjected to runoff and will pollute surface waters. It is our goal to use constructed wetlands to capture these runoff chemicals and treat them. Constructed wetlands have been used to treat municipal, mine drainage, and animal wastewaters. However, a significant work was not done in treatment of agricultural runoff chemicals in constructed wetlands. The objectives of this study was to determine 1) the removal rate of N, P, atrazine and metolachlor in simulated constructed wetlands and 2) the biodegradation capacity of wetlands. The simulated constructed wetland cells (2.4 m length, 0.76 m width, and 0.3 m depth) were planted with either bulrushes or cattails. The batch system application of simulated runoff water containing 3.5 mg/L atrazine and a mixture of chemicals (20 mg/L N-urea, 20 mg/L P and 1 mg/L metolachlor) were introduced into simulated constructed wetland cells. Weekly outflow water samples were collected and analyzed for total-N, total-P, NH<sub>3</sub>, ortho-phosphate, atrazine and metolachlor. The study showed that 70 to 85% N, 90% atrazine, and 85% metolachlor can be removed from these wetland systems. Most of the removal processes for nitrogen was nitrification and denitrification. Whereas, herbicides were removed through biodegradation process. The biodegradation process was confirmed by measuring their metabolites in water and soil. This technology is feasible to introduce as a ditch wetlands on farms to reduce runoff contamination of surface waters.

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