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## Reactive Stream Stabilization for Minimizing Transport of Phosphorus and Nitrogen from Agricultural Landscapes

PDF (Size: 1116KB) PP. 504-512 DOI: 10.4236/jwarp.2011.37060

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### ABSTRACT

A reactive stream stabilization (RS2) system based on aluminum as the adsorbent and garden mulch as the organic matter source was designed to minimize release of agricultural nonpoint source pollutants and installed along the bank of the Little Bogue Creek, MS in 2008. The scope of this research was to design, install and assess the performance of a field scale RS2 structure based on results from previous lab scale studies. Concentrations of alum and total organic carbon (TOC) in the RS2 test barrier and surrounding area were measured to evaluate design parameters of RS2 and the removal effectiveness was examined from soils and monitoring wells that were sampled in 2009. The mean concentration of Al from the reactive barrier was 2.1 mg/g and organic matter from the monitoring wells was 4.7 mg/L, values significantly greater than the surrounding area ( $p < 0.05$ ). Soil Mehlich-3 P and total phosphorus (TP) were decreased by 55% and 30%, and 40% of the TN and 51% of the nitrate in the ground water were removed through the RS2. The design objectives have been satisfied with the installed RS2 system and the initial sampling data shows effective nutrient removal.

### KEYWORDS

Phosphorus, Non-Point Source Pollutant, Best Management Practice, Aluminum

### Cite this paper

J. Son, C. Watson, D. Biedenbarn and K. Carlson, "Reactive Stream Stabilization for Minimizing Transport of Phosphorus and Nitrogen from Agricultural Landscapes," *Journal of Water Resource and Protection*, Vol. 3 No. 7, 2011, pp. 504-512. doi: 10.4236/jwarp.2011.37060.

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