



Effects of Conservation Reserve Program on Runoff and Lake Water Quality in an Oxbow Lake Watershed

R. F. Cullum^{*}, M. A. Locke, S. S. Knight

Agricultural Engineer, Soil Scientist, and Ecologist, USDA-ARS, National Sedimentation Laboratory, P.O. Box 1157, Oxford, MS. 38655

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Abstract: A case study of Beasley Lake Watershed, located in the Mississippi Delta region of the U.S., was used to evaluate runoff from edge-of-field sites under either row crop management practices or planted in trees under the Conservation Reserve Program (CRP). Beasley Lake Watershed, with a history of long-term ARS natural resource research, was selected as one of fourteen watersheds for participation in the Conservation Effects Assessment Program (CEAP), a nationwide assessment by USDA-Agriculture Research Service (ARS) and USDA-Natural Resources Conservation Service (NRCS) regarding the effectiveness of USDA conservation programs. Approximately one-third of the Beasley Lake watershed (ca. 280 ha) was converted from cropped land to CRP beginning in 2003, and the remainder of the cropland is managed for soybean, cotton, or corn production. Sub-drainage areas (1.2 to 6 ha) with similar topography and soil types were either cropped (three reduced tillage sites) or placed in CRP (three CRP sites) and were instrumented in 2005 to collect water samples from field drainage slotted-inlet pipes during all surface runoff events. Runoff samples were analyzed for sediments and nutrients. This paper reports on runoff, sediment, and nutrient losses from each sub-drainage area. Establishing trees within areas adjacent to the oxbow lake reduced the total sediments by 85% and nutrients by greater than 28% leaving the watershed as compared to reduced-till crop management techniques. The impact of converting the cropped area into trees has reduced the sediment load entering the lake by an order of magnitude resulting in improved water quality in Beasley Lake based on reductions in nutrient and sediment losses and increases in water visibility.

Keywords: Runoff, Sediment Yield, Water Quality, Conservation Reserve Program (CRP), Reduced-Till.

^{*}Corresponding: E-mail: bobby.cullum@ars.usda.gov; Tel: (662)232-2976; Fax: 662)232-2988