Assessing the Efficiency of Native Plants in Inactivating Escerichia coli (E.coli) in the Lower Minnesota River Watershed

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The purpose of this study is to evaluate the efficiency of three species of prairie plants in inactivating Escherichia coli (E. coli). The species of plants included: Asclepias incarnate-Swamp Milkweed, Schizachyrium scoparium-Little Bluestem, and Panicum virgatum-Switchgrass. To simulate an authentic river bank, dirt and water from the North Branch of the Rush River was used. Pollutants at six sites along two rivers in the Lower Minnesota Watershed were monitored from Spring through Fall of 2015. Although sites were analyzed to determine various pollutant levels, this research focused on neutralizing E. coli. To establish a baseline, three readings were taken of the river water using a Coliscan E. coli Testing Kit, which calculates in colony-forming units (CFUs), and then samples were sent to the Minnesota Valley Testing Laboratories each week from May through October of 2015, resulting in consistent E. coli readings above 500 MPN/100 mL. River water was filtered through 12 pots—three of each plant species and three controls (containing only soil). After three filtrations, the water was tested for E. coli. This was repeated after two weeks. After analyzing the number of E. coli CFUs per 100 mL of filtered water, it was concluded that Switchgrass, which has the greatest root biomass, is extremely effective at inactivating E. coli, filtering out all of the E. coli in two of three tests. After evaluating test results, It was concluded that water quality in the Lower Minnesota Watershed would drastically improve if buffer strips of Switchgrass were to be implemented.

Awards Won: