

Installation and Early Data of Saturated Buffers

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Ethan Thies, agricultural specialist
Ag Engineering/Agronomy Research Farm

Introduction

Two saturated buffers were installed on the Uthe Farm (Boone County) beginning fall 2016, and installation was completed spring 2017. Four field tile outlets were intercepted, and the water was redirected using control structures to a perpendicular distribution line of perforated tile. These distribution lines were placed underneath a grass buffer strip along Big Creek. Tile water from the field tile is redirected to the distribution lines, allowing water to seep into the soil beneath the grass buffer. Nitrates are removed by plants and microorganisms before the water enters Big Creek.

Materials and Methods

Installation began November 2016 with the locating of existing tile and intercepting these lines with Agri Drain control structures. Issues arose with the existing tile being different sizes and depths than planned and caused needed modifications to the control structures, which delayed installation. Installation of the control structures was completed in November, and distribution lines were installed the following spring. Three of the control structures were connected by distribution lines. The fourth box has its own distribution line due to slope. A monarch habitat native mix was seeded over sections of the saturated buffer following the distribution tile installation.

Concentration of NO^3 is being measured at the control structures, in three sampling wells

between the buffer and the creek (one near the distribution line, one near the stream, and one in the middle), and in the stream itself.

Results and Discussion

Installation of saturated buffers could have been improved by exploratory digging to identify tile size and depth, and building each control structure to match. Although changes had to be made to some control structures, installation was a simple process using standard tiling equipment.

Initial concentration of tile water entering the control structures averages 11 ppm (Figure 1), which is typical of corn or soybean fields in the area. Samples from the wells nearest the distribution lines show average concentrations near 8 ppm and concentrations less than 2 ppm in the middle wells. The wells nearest the stream show a slight increase to just above 2 ppm, likely due to water from the stream entering the stream bank. Initial estimates show the buffer is removing 77 percent of the nitrates entering the saturated buffer.

At this time, it seems the buffers are effectively removing enough nitrates that the water from the tile lines entering Big Creek has a lower nitrate level than the water in the stream. NOTE: This is preliminary data and should not be used to draw any conclusions.

Acknowledgements

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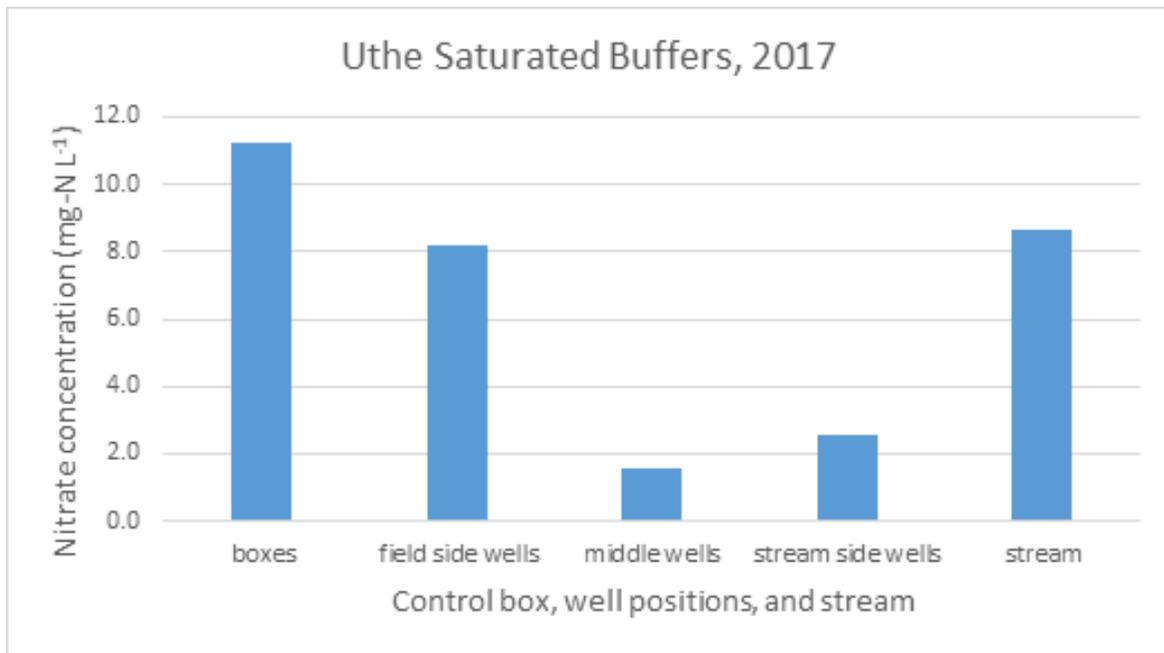


Figure 1. Nitrate concentrations from samples taken at the Uthe Farm saturated buffer in 2017 (1 mg/L = 1 ppm).