Water Quality Projects at the Uthe Farm

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Introduction

The Committee for Agricultural Development, along with the USDA-NRCS, IDALS, USDA-NLAE, Iowa Soybean Association, and ISU Research Farms, has begun the installation of three water quality projects at the Uthe Farm in Boone County, Iowa. The projects are located along Big Creek, and will focus on nutrient removal of tile water entering Big Creek, and the water already in Big Creek. The projects include a saturated buffer, oxbow wetland, and bioreactor. With multiple conservation practices in close proximity, there will be great opportunity for field days that show the practices to landowners and farmers. Allowing the participants to see and evaluate multiple water quality improvements allows participants to see which practices could best be applied to their own land. Extension has an important role in marketing conservation practices to landowners, and when working together with the NRCS and other agencies, it can help better disseminate the information. Working together to develop trust with landowners and advocates, identifying high risk areas, and active collaboration between all agencies is key to successful water quality initiatives, and this project will be key in that success.

Materials and Methods

Saturated buffer. A saturated buffer is a structure that denitrifies tile water by redirecting the flow through perforated tile in a buffer area near the outlet. The saturated buffer installation was completed March 23, 2017. Four tile lines were intercepted, and over 1,500 ft of perforated tile stretched from these lines, parallel to the creek. The parallel lines will allow for tile water to saturate into the buffer area next to the creek. The water then will be denitrified as it seeps towards the creek, along with nutrient uptake by plant material. In similar sites, almost all of the NO_3 diverted was removed before the stream.

Oxbow wetland. An oxbow wetland is a reconstruction of previous bends in the creek allowing some creek flow to slowly pass through. Construction of an oxbow wetland is planned to begin spring 2017. The wetland will be in the location of an original oxbow of Big Creek. Creek water will flow into the shallow wetland during high flow events, and slowly pass through the wetland, returning to Big Creek. Nitrate concentration has been shown to be reduced between 40-94 percent when passed through a wetland.

Bioreactor. A bioreactor is a structure that denitrifies tile water by having it pass through a medium containing microorganisms that remove the nutrients. There are plans to construct a bioreactor on the southern edge of the farm. The bioreactor will intercept multiple tile lines, and direct the tile water through buried wood chips. Microorganisms in the woodchips will reduce the nutrient load in the tile water before it enters Big Creek.

Monarch habitat. Plantings of milkweed and native plants are being planned above the water quality practices to provide habitat for monarch butterflies and other wildlife. Blooming flowers throughout the year may provide an aesthetic appeal, which may influence adoption of conservation practices.

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