Installation Costs of Saturated Buffer and Oxbow Wetland

RFR-A17106

Ethan Thies, agricultural specialist
Ag Engineering/Agronomy Research Farm

Introduction
In 2017, two water quality conservation projects were installed adjacent to Big Creek on the Uthe and North Reynoldson farms, Boone County, Iowa. The farms both are owned by the Committee for Agricultural Development (CAD), an ISU College of Agriculture and Life Sciences (CALS) affiliate organization.

Materials and Methods
On the Uthe Farm, a saturated buffer was installed. Tile water from four drainage tiles that outlet to Big Creek was diverted into saturated buffer distribution tiles. The tile water soaks into the soil beneath a grass buffer along the creek. The distribution tile lines are parallel to the creek and perpendicular to the intercepted drainage tiles. Four control structures were installed fall 2016, and the distribution tile lines were installed the following spring. Once the structures were in place, installation of distribution lines connecting the structures progressed quickly. Table 1 shows a cost breakdown of the saturated buffer. Control structures were manufactured by Agri Drain Corp., Adel, Iowa.

Results and Discussion
The cost of the saturated buffer was approximately half materials and half installation costs (Table 1). Two thirds of the material costs were the custom control structures used to divert flow from the tile lines to the distribution lines. Nearly half the installation costs were the installation of the control structures. Through Iowa Department of Agriculture and Land Stewardship (IDALS)

programs, the project received 50 percent cost share, bringing the net cost of the project to $4,230.33. With a drainage area of about 85 acres, the cost per acre was approximately $50/acre.

Construction of an oxbow wetland that collects field and tile runoff, as well as water from Big Creek during high flow events, was completed summer 2017. Trees and soil were removed from a former oxbow of Big Creek to create a shallow pool with an inlet/outlet on the upstream end. Approximately 3,247 cubic yards of soil was moved to create the oxbow, at a cost of $4.27/cubic yard. A 6-in. tile was rerouted from an outlet on Big Creek to direct outlet in the oxbow wetland. Including tree removal before construction, the total cost was $15,377.00 (Table 2). This practice also was eligible for 50 percent cost share, bringing the total cost to $7,688.50. Native aquatic plants will populate the wetland.

Acknowledgements

Table 1. Installation costs of a saturated buffer, Boone Co., IA, 2016-2017.

Materials		Labor	
Control structures (4)	$2,680.22	Fall installations of control structures	$1,500.00
Tile and fittings	$1,339.03	Spring installation to control structures	$525.00
		Installation of distribution lines	$2,416.40
Materials total	$4,019.25	Labor total	$4,441.40
		Total cost	$8,460.65
		Less IDALS 50% cost share	$4,230.32
		Net cost	$4,230.33
		Cost per acre @ 85 acres	$49.77

Table 2. Installation costs of oxbow wetland, Boone Co., IA, 2017.

Construction costs	
Tree and soil removal*	$13,877.00
Oxbow construction labor	$1,500.00
Tile work	$972.00
Total cost	$16,349.00
Less 50% IDALS cost share	$8,174.50
Net cost	$8,174.50

*3,247 cubic yards of soil.