

## OSU-Lima Branch Campus Agricultural Runoff Treatment System Project

**Watershed:** Lost Creek (041000070305)

**Location:** 40°44'37", -84°01'38"; 2.7 miles east of Interstate 75 on Harding Highway

### Project Description:

The Ohio State University's Lima Branch Campus has farmland consisting of rented crop fields surrounding the campus that drain to the Lost Creek HUC12 watershed, a headwater area of the Maumee River Watershed (see the maps of fields below). This agricultural runoff water retention project will convert some portions of cropland into floodplain, wetlands and water retention that will be used to retain and passively treat runoff before recycling back onto the fielded for the purpose of irrigating crops. Additionally, OSU proposes to monitor the hydrology and water quality of these systems by installing needed weirs and flumes and sampling equipment. The following are the specific proposed conceptual practices.

**Convert a portion of field 4 to water retention and use to provide irrigation water to fields 7 and 27.** This project will develop floodplain access by converting low-producing areas near the channel via berm/dike installation and/or excavation. It will also develop a water retention and treatment wetland, with irrigation equipment for cropland runoff re-use (with electrical service). The farming enterprise has agreed to allow this low yielding production field 4 to be utilized for the floodplain access and the agricultural runoff treatment and retention with a forebay (to assist in future maintenance and longevity), a wetland, and a pump "vault". Access for maintenance, and irrigation equipment (to recycle/irrigated runoff back onto growing crops) will be installed. This aspect of the project (recycling agricultural runoff) corresponds to producer concerns regarding changes in climate and timing of rainfall for production and provides positive trade-off for taking land out of production. Utilizing runoff through irrigation is a new and direct means of reducing nutrients by applying the captured water and nutrient load during the period that crops are most in need of moisture and nutrients. Approximately 3-4 acres will be converted to floodplain retention. An estimated 40 acres of row crop runoff will be captured, treated and/or reused in a combination of wetland, retention and buffer that will comprise approximately 5 acres.

*In this regard, we are currently taking bids to construct a 2.6 acre retention pond (refer to the blue color in the image). Public bidding will commence on the 28th of July. All bids MUST be received by Tuesday, August 15, 2023 at 1:00pm when these bids are opened by the staff of the Allen Soil & Water Conservation District. Design plan and material specifications are on file at the Allen Soil & Water Conservation District, 1870 Slabtown Road, Lima, Ohio 45801. If interested, contact Albert Suniga at 419.222.0846 ext. 1005 or email at [albert@allenswcd.com](mailto:albert@allenswcd.com).*

**Saturated Buffer on OSU-Lima Field 17:** A saturated buffer system was installed in August 16, 2022 to treat and reduce discharge of the drainage tile from field 17. Saturated buffers collect subsurface drainage water using a drainage control structure and divert it to a drainpipe that typically runs parallel to the stream receiving tile discharge under a vegetated buffer. These often substantially reduce the amount of water directly discharging and reduces nutrients carried in subsurface discharge providing denitrification and phosphorus reduction. They require little maintenance and do not negatively affect crop yields. This system will treat approximately 12 acres of cropland drainage water treated through the new saturated buffer.

## Fields Planned

-  Regen No-Till
-  Conv No-Till
-  Conv Till
-  Hay
-  Native Prairie
-  2 yr CC
-  <all other values>



Figure 1: The Ohio State University Lima Branch Farm Fields

**Climate Resiliency Concerns/Benefits:** This project improves climate resiliency of the farm and receiving stream by increasing the ability to store water from more frequent concentrated rain events and to use it during subsequent periods of dry weather, providing both an environmental benefit of reduced discharge of water and nutrients (loading to streams) and an agricultural benefit of water for crops during drought and dry period. Decisions regarding sizing of water conveyances and plant choices will consider opportunities to increase climate resiliency of the practices.

**Monitoring and practice effectiveness –** The majority of this site will be developed so as to monitor practice effectiveness by Ohio State University faculty, Vinayek Shindekar. Installation will include 3 flow and water quality monitoring locations and includes continuous flow measurement and water sampling with ISCO6712 samplers. The cost of monitoring is \$157,000 for a minimum 2 years for fields 4, 7, 27 and 17. Efforts will be made by The Ohio State University to maintain monitoring after the grant period through other sources of funding. Ohio EPA will develop a QAPP in coordination with the OSU principal investigator (Vinayek Shindekar) that directs collection of environmental data regarding the monitoring as well as the other phases of the project such as design and implementation of practices.

**Load Reduction Estimates:** Estimates are provided in the table below.

<b>Practice</b>	<b>#N</b>	<b>#P</b>	<b>#Sed</b>	<b>Volume treated/reduced (MG)</b>
Wetlands, wetland buffer and saturated buffer. Note: Estimated reductions due to increased floodplain access in Field 4 will be added as information is gathered on the project.	583	45	8997	20 million gallons