

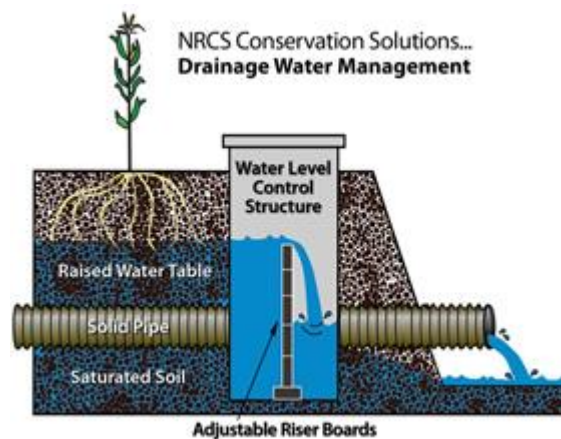
Multi-LCC Mississippi River Basin / Gulf Hypoxia Initiative
High Impact Conservation Practices – Fact Sheets

Practice #2 – Drainage Water Management

Updated 12 February 2016 (draft for review)

WHAT IS DRAINAGE WATER MANAGEMENT?

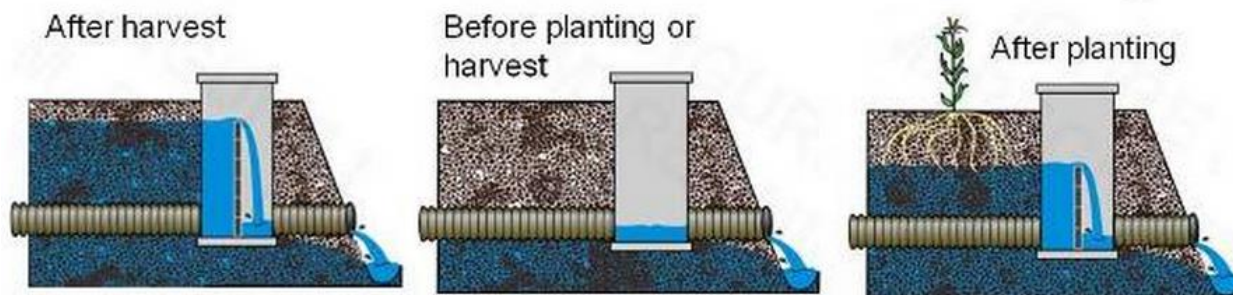
The term “drainage water management” can refer to a variety of tools and technologies. Most generally, however, it refers to the integration of drainage control structures into existing agricultural drainage systems in order to allow for more precise manipulation of field conditions. Drainage control structures can be installed at edge-of-field and within field on existing agricultural subsurface drainage systems. This active management of the drainage systems allows farmers to either retain or bleed water out of their fields, allowing them greater control over the water and nutrients leaving their tile lines and entering into larger streams and tributaries.



WHY DRAINAGE WATER MANAGEMENT

Agricultural drainage systems (e.g., subsurface drainage tiling) contribute to the excessive nutrient loading that is at the root of the hypoxia problem. Effective drainage water management can help address this issue. The main benefit of controlled drainage is to reduce drainage discharges in the period between field operations in the fall and the spring.

Research strongly supports that controlled drainage management on an annual basis can produce up to 50% or more reduction in average annual drainage discharge. Reductions in nitrate and phosphate loads are expected to be proportional to the reduction in total annual outflow from drainage system—up to 50% or more. In addition to this nutrient reduction, Ohio on-farm crop yield studies over three to four years show about a 3% and a 6% increase in soybean and corn yields, respectively.



WILDLIFE BENEFITS

Drainage water management could provide crucial stop-over and staging habitat for migratory birds and waterfowl (e.g., American golden plover, blue-winged teal) that require or prefer standing water and wetland habitats. By keeping more water on the fields (especially soybean fields) into the early spring, farmers can create this crucial habitat in their own fields. This is especially important for species like the American golden plover and other migratory shore birds that rely on these make-shift wetlands and mudflats for feeding before making their final push to their arctic breeding grounds and completing their extensive, intercontinental migratory cycle

INSTALLATION & COSTS

Typically, each drainage control structure will cost \$1200-\$2,000, including installation, and will serve an area of 20-40 acres depending on the slope (a cost per acre of \$30-\$100). In addition, drainage management requires an extensive drainage system to already be in place. To effectively manage drainage for maximum wildlife benefits, producers need to leave water on their fields for long. This could result in a delay in planting and a subsequent cost to land owners.

MONITORING

(TBA)

LIMITATIONS/CONSIDERATIONS

Factors that might limit adoption are: (1) time investment in changing the management settings in each structure; (2) the suitability of a field for the practice (primary limiting factor is field slope); (3) concerns that the approach might cause unwanted excess soil-water conditions; and (4) cost. Drainage management systems are only effective on fields with less than a 1% slope.

In addition, leaving excess water on fields long enough to provide habitat for migratory birds may result in delayed planting. Because of this additional risk, farmers may not be willing to undertake drainage water management practices that benefit wildlife. An incentive program designed to help offset some of this inherent risk would make such a program much more attractive to producers.

RESEARCH AND MORE INFORMATION

1. The Ohio Lake Erie Phosphorus Task Force II. 2013. Final Report. http://lakeerie.ohio.gov/Portals/0/Reports/Task_Force_Report_October_2013.pdf
2. Skaggs, R. Wayne, Norman R. Fausey, and Robert O. Evans. 2012. Drainage Water Management. *Journal of Soil and Water Conservation*, 67(6):167A-172A.

Websites:

- <http://www.ars.usda.gov/Main/docs.htm?docid=2804>
- <http://hostedweb.cfaes.ohio-state.edu/usdasdru/ADMS/ADMSindex.htm>
- <http://agcrops.osu.edu/specialists/soil-and-water-management>

OSU Experts: Larry Brown (FABE), Norm Fausey (USDA-ARS), Kevin King (USDA-ARS), Andy Ward (FABE). Norm Fausey and Larry Brown are international/national leaders on subsurface drainage and controlled drainage.

A special issue of Journal of Soil and Water Conservation (67.6) is on Drainage Water Management and provides a wealth of information.

OPPORTUNITY AREAS

(TBA)

SOURCES

The Ohio Lake Erie Phosphorus Task Force II. 2013. Final Report.

http://lakeerie.ohio.gov/Portals/0/Reports/Task_Force_Report_October_2013.pdf

Skaggs, R. Wayne, Norman R. Fausey, and Robert O. Evans. 2012. Drainage Water Management. Journal of Soil and Water Conservation, 67(6):167A-172A.