



Northern New York Agricultural Development Program News



Installing tile drainage in NNY. Photo: Miner Institute

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NNYADP Research Report: Tile Drainage Benefits Crops and Environment

A Northern New York Agricultural Development Program (NNYADP) project report encourages farmers to consider the benefits of tile drainage to both crop production and environmental stewardship. The research is especially timely as farms face changes to the environmental standards they are required to meet and at a time when federal and state funding is available for installing the tile drainage.

“As many states refine their phosphorus management requirements for farm nutrient management plans, it is critical that the models they use are based on representative field conditions and sound data,” says project leader Eric Young, research agronomist at W.H. Miner Agricultural Research Institute, Chazy, NY.

Young estimates the return on investment from installing tile drainage on farms with slow or very slow permeability is from seven to 12 percent over five to 10 years.

The goal of the most recent tile drainage research funded by the farmer-driven NNYADP was to compare phosphorus losses between tile drained and undrained test plots designed to simulate field-scale conditions typical of northern NY dairies.

“Undrained conditions resulted in greater surface water runoff and phosphorus losses compared to tile drained plots,” says Young.

The test plots at the Lake Alice Wildlife Area, Chazy, were managed as reed canarygrass in 2012-2013 planted to corn in 2014. Tile drainage and instrumentation was installed during 2012-2013 to capture real-time changes in both surface and subsurface runoff. Automatic water samplers track changes in phosphorus concentration and sediment over

storm events. The 2014 season was a wet year and included two major storm events in June, another in August, and one large precipitation and snowmelt event in December for measurement.

“The vast majority of runoff that occurred in the tile-drained plots was through the tiles with only three percent of the total runoff volume occurring as surface water runoff,” Young says, “and erosion that occurred from tile-drained plots was half that of the undrained plots.”

Although the trial size of only two replications limits the ability to show significant statistical differences, tile drainage showed a clear advantage in reducing surface water runoff and total phosphorus leaving the field.

The results of this project were presented at the 2014 Southern Extension and Research Activity 17 meeting in Des Moines, IA; 2014 Soil Science Society of America meeting in Long Beach, CA; and a University of Vermont Extension meeting on tile drainage in January 2015 in St. Albans, VT.

“Given the multiple potential agronomic and environmental benefits of tile drainage to agricultural producers in Northern New York, and other regions, there is a critical need to better quantify the environmental aspects of tile drainage to support cost-effective best management practices to maximize both economic and environmental crop production aspects,” Young explains.

Miner Institute has received a Northern New York Agricultural Development Program grant for 2015 to characterize tile drainage water nutrient concentrations and flow rates for several farms in the NNY region. The 2015 project work will assess the relative importance of nitrate-N and phosphorus in drainage water at different times of year and compare nutrient concentrations in tile drainage flows to levels in surface water runoff and ponded water on the same field.

Funding for the Northern New York Agricultural Development Program is supported by the New York State Senate and administered through the New York State Department of Agriculture and Markets. For a complete list of NNYADP 2015 projects and results of past projects, visit the website at www.nnyagdev.org.



Miner Institute Research Agronomist Eric Young presents tile drainage research results at an NNYADP meeting.