USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service
Conservation Effects Assessment Project

Key Findings from the CEAP-Cropland Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Ohio-Tennessee River Basin

January 2012

The voluntary, incentives-based conservation approach is achieving results. Farmers have made good progress in reducing sediment, nutrient, and pesticide losses from farm fields through conservation practice adoption throughout the Ohio-Tennessee River Basin. Structural practices for controlling water erosion are in place on 40 percent of all cropped acres in the region and on 59 percent of the highly erodible cropland. Ninety-three percent of the cropland acres meet criteria for no-till (52 percent) or mulch till (41 percent), and all but 4 percent have evidence of some kind of reduced tillage on at least one crop in the rotation. Producers use either residue and tillage management practices or structural practices, or both, on 98 percent of the cropped acres.

Adoption of conservation practices has reduced edge-of-field waterborne losses of sediment by 52 percent, losses of nitrogen with surface runoff by 35 percent, losses of nitrogen in subsurface flows by 11 percent, and losses of phosphorus (sediment attached and soluble) by 33 percent. NRCS determined these losses by computer simulations comparing conditions on the land during the period 2003 to 2006 to conditions that would be expected if no conservation practices were in place.

Additional simulations show that reductions in field-level losses resulting from the use of conservation practices have reduced loadings from cultivated cropland to rivers by 55 percent for sediment, 26 percent for nitrogen, and 32 percent for phosphorus. *When considered along with loads from all other sources,* conservation practices in use during the period 2003–06 have reduced total instream loads from the region to the Mississippi River by 16 percent for sediment, 15 percent for nitrogen, and 21 percent for phosphorus.

Opportunities exist to further reduce sediment and nutrient losses from cropland. The study found that 24 percent of cropped acres (6 million acres) have a *high* level of need for treatment for sediment or nutrient loss, or both. Forty-six percent (11.5 million acres) have a *moderate* level of need for additional conservation treatment. Acres with a high level of need consist of the most vulnerable acres with the least conservation treatment and the highest losses of sediment and nutrients.

Model simulations suggest that adoption of additional conservation practices on these high- and moderate-need acres would, compared to the 2003–06 baseline, further reduce edge-of-field losses of sediment by 83 percent, losses of nitrogen with surface runoff by 58 percent, losses of nitrogen in subsurface flows by 37 percent, and losses of phosphorus (sediment-attached and soluble) by 61 percent.

Comprehensive conservation planning and implementation are essential. *Excessive loss of phosphorus from farm fields is the most critical agricultural conservation concern in the Ohio-Tennessee River Basin; about 20 percent of the cropped acres have a high need to address excessive phosphorus loss, and another 43 percent have a moderate need.* About 14 percent of the cropped acres have a high need to address sediment loss, 29 percent have a high need to address nitrogen loss with surface runoff, and 17 percent have a high need to address nitrogen loss through leaching.

Targeting enhances effectiveness and efficiency. Targeting critical acres significantly improves the effectiveness of conservation practice implementation. Use of additional conservation practices on acres that have a high need for additional treatment—acres most prone to runoff or leaching and with low levels of conservation practice use—can reduce sediment and nutrient per-acre losses by about twice as much on average as treatment of acres with a moderate level of conservation treatment need.