

# Key Findings from the CEAP-Cropland Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Arkansas-White-Red Basin

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These findings represent the baseline conservation condition, using conservation practices reported in the 2003–06 NRI-CEAP Survey. *Wind erosion is the most pervasive conservation concern in the western part of the region, and nitrogen loss through leaching is the most pervasive concern in the eastern part.*

**Voluntary, Incentives-Based Conservation Approaches Are Achieving Results.** Farmers have reduced sediment, nutrient, and pesticide losses from farm fields through conservation practice adoption throughout the Arkansas-White-Red Basin, compared to **losses** that would be expected if no conservation practices were in use. Structural practices for controlling water erosion are in place on 46 percent of all cropped acres in the region, and structural practices for controlling wind erosion are in place on 7 percent. Forty-four percent of cropped acres meet criteria for mulch till. However, only 14 percent meet criteria for no-till, which is much lower than the other regions in the Mississippi River Basin. Thirty-four percent of cropped acres are conventionally tilled. Still, 87 percent of cropped acres have structural or management practices, or both. Farmers meet criteria for high levels of nitrogen management on more than 34 percent of the cropped acres and high levels of phosphorus management on 50 percent. About 31 percent of cropped acres are gaining soil organic carbon—29 percent in the eastern part of the region and 32 percent in the western part. Application of these practices has reduced edge-of-field sediment and nutrient losses as well as loadings to rivers and streams and to the Lower Mississippi River Basin, as follows:

Reductions in edge-of-field losses of sediment and nutrients from cultivated cropland through conservation treatment in place during 2003–06, in percent, Arkansas-White-Red Basin

Location	Sediment		Nitrogen			Phosphorus *	
	Windborne	With runoff	Windborne	With runoff	Through leaching	Windborne	With runoff
----- Percent reduction -----							
Eastern part of region	21	51	22	42	60	33	54
Western part of region	33	76	28	65	54	42	64
Entire region	31	61	27	51	57	40	57

\* Phosphorus lost to surface water includes sediment-attached and soluble phosphorus. Soluble phosphorus includes not only phosphorus in runoff but also leaching to loss pathways such as tile drains and natural seeps, that eventually return to surface water.

Reductions in loadings of sediment and nutrients to rivers and streams and to the Missouri River outlet through conservation treatment in place during 2003–06, Arkansas-White-Red Basin

Loadings to	Sediment	Nitrogen	Phosphorus
----- Percent reduction -----			
Rivers and streams from cultivated cropland	64	59	59
Lower Mississippi River Basin, from all sources	5	27	17

**Opportunities Exist to Further Reduce Soil Erosion and Nutrient Losses from Cultivated Cropland.** The need for additional conservation treatment in the region was determined by imbalances between the level of conservation practice use and the level of inherent vulnerability. Three levels of treatment need were estimated:

- **A high level of need** for conservation treatment exists where the loss of sediment and/or nutrients is greatest and where additional conservation treatment can provide the greatest reduction in agricultural pollutant loadings. *Some*

1.3 million acres—4 percent of the cultivated cropland in the region—have a high level of need for additional conservation treatment.

- **A moderate level of need** for conservation treatment exists where the loss of sediment and/or nutrients is not as great and where additional conservation treatment has less potential for reducing agricultural pollutant loadings. *Approximately 9.1 million acres—30 percent of the cultivated cropland in the region—have a moderate level of need for additional conservation treatment.*
- **A low level of need** for conservation treatment exists where the existing level of conservation treatment is adequate compared to the level of inherent vulnerability. *Approximately 20.1 million acres—66 percent of the cultivated cropland in the region—have a low level of need for additional conservation treatment.*

The top table below shows potential reductions in edge-of-field losses sediment, nitrogen, and phosphorus through application of additional conservation treatment on high- and moderate-treatment need cropland. The bottom table shows reductions in delivery of sediment and nutrients to rivers and streams in the Arkansas-White-Red River Basin and reductions in delivery from all sources to the Lower Mississippi River Basin. Potential reductions from existing levels could be achieved through implementation of suites of conservation practices on cropped acres having high or moderate levels of treatment need.

**Potential for further reductions in edge-of-field losses of sediment and nutrients from cultivated cropland through comprehensive conservation treatment of high- and moderate-treatment-need cropland, Arkansas-White-Red Basin**

Location	Sediment		Nitrogen loss—		Phosphorus *
	Windborne	With runoff	With runoff	Through leaching	
----- Percent reduction -----					
Entire region	26	36	21	21	21

\* Phosphorus lost to surface water includes sediment-attached and soluble phosphorus. Soluble phosphorus includes not only phosphorus in runoff but also leaching to loss pathways such as tile drains and natural seeps, that eventually return to surface water.

**Potential for further reductions in loadings of sediment and nutrients to rivers and streams and to the Missouri River outlet through comprehensive conservation treatment of high- and moderate-treatment-need cropland, Arkansas-White-Red Basin**

Loadings to	Sediment	Nitrogen	Phosphorus
----- Percent reduction -----			
Rivers and streams from cultivated cropland	25	21	13
Upper Mississippi River Basin from all sources	1	5	2

### **Targeting Enhances Effectiveness and Efficiency**

The practices in use during the period 2003 to 2006 achieved about 64 percent of potential reductions in sediment loss, 72 percent of potential reductions in nitrogen loss, and 63 percent of potential reductions in phosphorus loss. Significant per-acre reductions in sediment and nutrient losses could be achieved by focusing on the 10.4 million high- and moderate-treatment-need cropland acres.