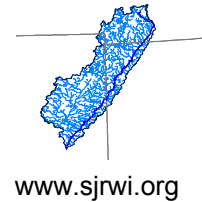


St. Joseph River Watershed Initiative

3718 New Vision Drive • Fort Wayne, IN 46845
260-484-5848 x120 Fax: 260-484-5080



St. Joseph River Sediment, Pesticide, and Nutrient Reduction Project

Final Report on Agronomic and Economic Performance

January 24, 2006

Compiled by **Jeremy Palmer, Agronomist**
Jane Loomis, Executive Director

The St. Joseph River Watershed Initiative introduced zone-tillage equipment into the watershed equipment rental project during the Fall of 2005. The equipment included a John Deere 9520 tractor equipped with a GPS navigation and auto-pilot system from Agri-Motive Products. It pulled a Brillion Zone Commander tillage unit.

Zone tillage is officially considered a no-till system by the Natural Resource Conservation Service (NRCS) and has many benefits. The zone tiller makes a deep slot into the ground to help crop roots grow deeper and have easier access to water. The tool leaves a berm – a tilled strip approximately 7 inches wide. Soils outside the strip are undisturbed. The concept behind zone tillage is that the strip will warm up and dry out faster in the spring and producers will sow their crop into that strip, or zone. The surface between the zones remains undisturbed and the residue that is left in place between the planting zones helps to reduce runoff of sediment and fertilizers. The zones are installed and later planted accurately by using an auto steering guidance system on the tractor which allows sub one-inch accuracy. This equipment will be available for rent under Phase II of this grant, expected to begin in Spring, 2006.

This system costs more than any of the other types of tillage we have compared, as shown in the graph in Figure 1, below. The higher cost calculated for use of this type of conservation tillage is due to higher fuel prices during 2005 as well as the investment in the high-tech equipment required. However, higher yields are expected to offset the higher cost of production, and the fact that producers can rent and test this expensive equipment is part of the reason for this program.

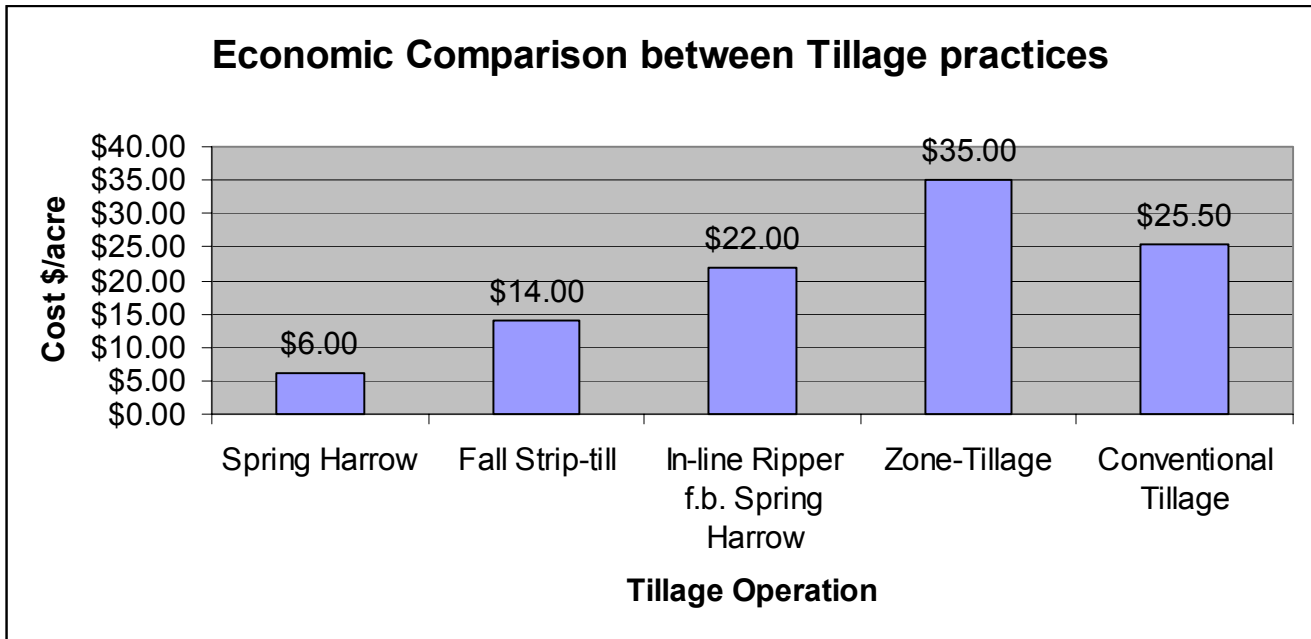


Figure 1 Relative cost of tillage operations per acre. Compiled by Jeremy Palmer, agronomist for the Allen County Soil and Water Conservation District

The impact of the project on pesticide reduction in the area is less clear; levels in runoff are closely associated with rainfall at the time of application. The fields on which the equipment was used are scattered across the lower watershed area. However, outreach education encouraging conservation tillage practices covered the entire watershed. Conservation tillage practices help to reduce the runoff, and atrazine is particularly vulnerable to runoff since it is water soluble. Years 2003 and 2004 were generally wet; year 2005 was much drier.

As illustrated in Figure 2, below, average levels of atrazine generally were higher in 2004 than in 2003, and significantly higher than in 2005. Some of the variation can be directly related to rainfall, particularly during application season. However, rates of application and increases in conservation tillage also affect the amount of the pesticide that enters the streams through runoff water.

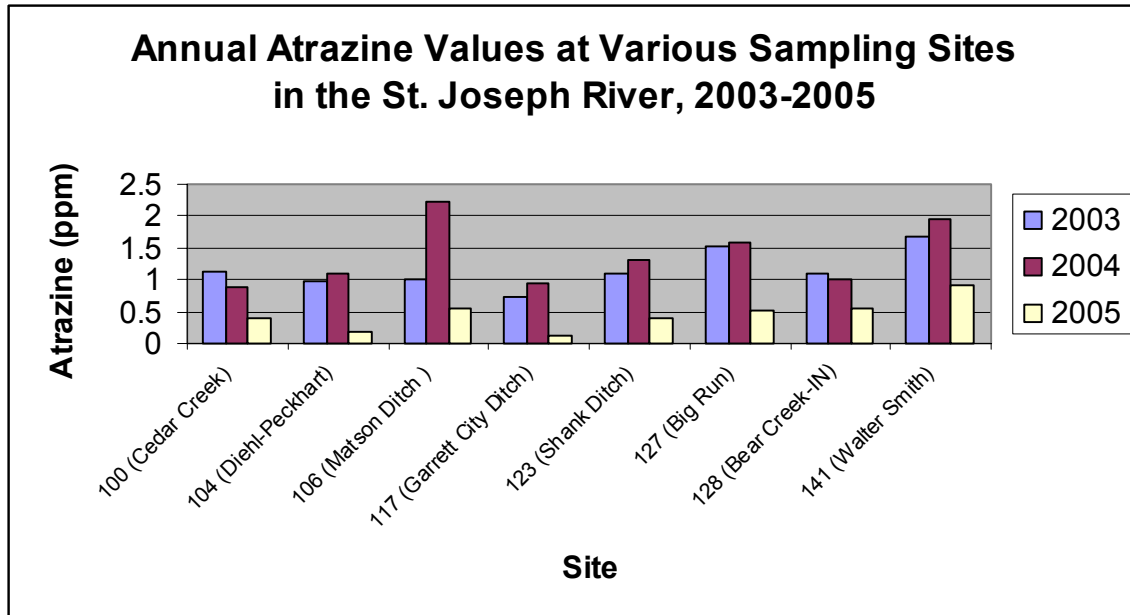


Figure 2 Atrazine values at selected sites in the lower St. Joseph River watershed, 2003-2005

2005 Review

Equipment used in Fall 2005 was different than that used during Spring 2005 and prior to that. The grant program was extended beyond the September 30, 2005 deadline in order to complete the St. Joseph River watershed management plan (WMP) and to preview the auto-guidance equipment that is to be used on Phase II of the grant. Phase II is expected to begin in Spring 2006.

The equipment which was leased through the St. Joseph Project was used on 265 acres in the spring, 2005, and on 1,771 acres in the fall. Conservation tillage used on these acres is calculated to reduce sediment loads by 2,757 ton/year. Reduction of phosphorus is reduced 3,489 lbs/year, and nitrogen is reduced 6,974 lbs/year, based on the load reduction model used by the Indiana Department of Environmental Management (IDEM). Reduction is based upon soil type and slope as well as total acreage

Conservation tillage practices promoted by this grant include the spring harrow, fall strip-till, in-line ripper followed by spring harrow, and zone tillage. While the zone-tillage operation has been the most costly of the programs, there is an economic advantage to other types of conservation tillage compared to a conventional tillage. Increased yield supported by the zone-tillage concept is expected to lower the production cost per bushel using the higher-cost zone tillage.

2004 Review

During 2004, the equipment which is leased through the St. Joseph project was used on 902 acres in the spring and 948 acres in the fall. Equipment included the spring harrow, fall strip-till, and in-line ripper followed by the spring harrow. Use of this equipment resulted in a 1,388 (ton/year) sediment load reduction, a 1,713(lbs/year) phosphorus load reduction and a 3,421 (lbs/year) nitrogen load reduction based on the load reduction model used by the Indiana Department of Environmental Management (IDEM).

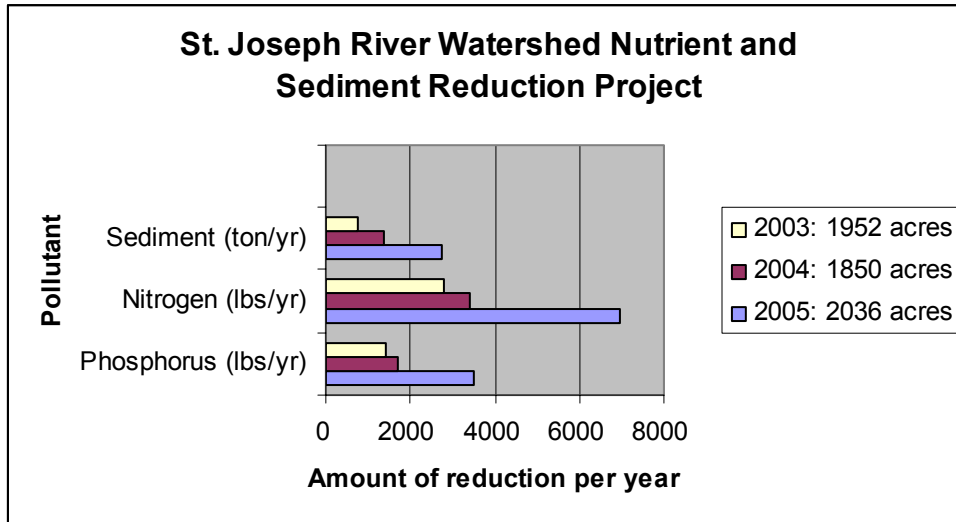


Figure 3 Comparison of pollution reduction by year for the St. Joseph River Sediment, Pesticide and Nutrient Reduction Demonstration Project

2003 Review

During 2003, the equipment leased through the project was used on 1,411 acres in the spring and 541 acres in the fall. The wet weather that occurred during Fall, 2003 accounted for the significant reduction in use of the equipment.

This equipment included the spring harrow, fall strip-till, and in-line ripper followed by the spring harrow. Economically, the cost per acre of conservation tillage practices is lower than conventional tillage, as demonstrated in Figure 1.

Reduction in pollutants based on the use of this equipment on these acres is estimated at 770 ton/year sediment, 1,401 lbs/year phosphorus, and 2,796 lbs/year of nitrogen, based on the load reduction model used by IDEM.