

Beaver Creek Study



Final Report



Making

A

Splash



Background

- The Beaver Creek story is unique in several ways:
- started by a local farmer who wanted to know the truth about whether agriculture was damaging water quality
 - became, what may have been, the largest voluntary, multi-agency research project in the state
 - became a landmark study: many have used Beaver Creek's scientific methods of stream sampling/evaluating as a model

The Beaver Creek Hydrologic Unit Area (HUA) is located in four West Tennessee counties: Fayette, Haywood, Tipton and Shelby (see map, above). That's an area of approximately 95,000 acres, 2/3 of which are croplands: primarily cotton, soybeans, small grains and corn.

The project, which began in 1991, included intensive monitoring to analyze the effectiveness of best management practices. Practices that require planning, effort and money; practices that farmers voluntarily implement; and practices that can protect our finite supply of water.

Remember, the study was designed to scientifically determine whether agriculture in the Beaver Creek HUA was damaging water quality. The findings were remarkable—keep reading!



Pictured above is one of the 12 monitoring stations used in the Beaver Creek study.

Scientifically Speaking

With a baseline established, the testing began with 12 monitoring stations in the watershed. Samples were taken at regular intervals **and** every 5 to 15 minutes during rainfall. The samples were then packed in ice and shipped to various laboratories for testing.

Conclusions

- The water coming off no-till fields was remarkably clean.
- "Hungry water" factor.
- No-till does an excellent job keeping soil in place.
- BMPs really work.

With BMPs in place, water from the fields reach tributaries so clean, and moving at such a velocity, that it picks up sediment and silt from the sidewalls and bottoms of creek channels—hungry water. This is the reason the creek continues to look muddy.

Why was the water coming off the fields so clean? Because farmers have been voluntarily using BMPs to keep soil in place. This is significant as sediment is the primary problem in Beaver Creek, and across the nation. The top soils in the Beaver Creek HUA, which are 20-30 feet deep, are loess soils that are erosive in nature. Some describe the soil as "melting" in the rain. That is why keeping the soil, or sediment, in place is so important. The study confirmed that no-till (see picture, left) does an exceptional job keeping the soil in place.



Natural Resources Conservation Service documented (in the Beaver Creek HUA):

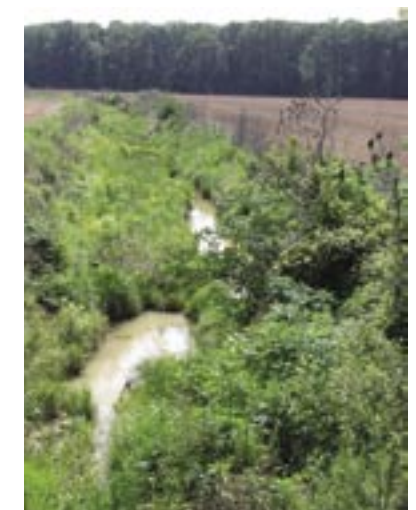
- the amount of soil loss, when treated with various BMPs, was **reduced from 22 tons per acre per year, to 2 tons**
- 75% of producers used no-till by end of study
- 480,000 feet in terraces (that's more than 90 miles!)
- 40,000 feet of diversions
- 280 sediment basins

Studies also found that pesticide/nutrient levels spiked when applied immediately before rainfall (although no hits above EPA standards occurred during the study). That tells farmers to watch weather reports and hold off applying pesticides and fertilizers when rainfall is predicted. By doing this, pesticides are kept in the field instead of being washed into the creek. This protects water quality and saves the farmers money.

Community Improvements

The Beaver Creek study proved that BMP implementation by farmers in the HUA greatly reduced soil loss, which reduced nutrient and pesticide loads into the streams. As a result, Beaver Creek has improved aquatic habitat, wildlife and recreational opportunities within the watershed.

BMPs such as constructed wetlands and riparian buffers (right) were exhibited as cost-effective practices to the community. Today, these practices are commonplace in the HUA.



Riparian buffers can now be found throughout the HUA.

Spreading the News

Scientific determinations mean very little if the only people who know and understand the results are the scientists. The partners in the study met this challenge by holding successful field days to show and describe the test results and determinations. It was successful because the public was eager to know the results: the farmers were eager to find out if their efforts were really making a difference, and visitors were eager to determine if they could use the study as a model for their own regions. Approximately 400 people toured Beaver Creek to see first-hand what happened in this landmark study.

Fact: the farmers in the Beaver Creek HUA were doing an outstanding job keeping the soil on their fields. Science confirmed what agricultural specialists have always believed: best management practices work!



Beaver Creek Field Day: explaining test results and lessons learned.

Even today there is a tremendous amount of interest in the Beaver Creek study. In fact, the study has made such an impact that people from all over the world still come to take a look. The study revealed a commitment to truth; a commitment to the environment; and a commitment to the future. Farmers are still the truest stewards of the land.

Partners

- University of Tennessee Agricultural Extension Service
- USDA, Natural Resources Conservation Service
- USDA, Farm Service Agency
- USDI, Geological Survey
- Tennessee Department of Agriculture
- Tennessee Division of Forestry
- Tennessee Department of Environment and Conservation
- Shelby County Soil Conservation District
- The University of Memphis
- Clemson University
- The Tennessee Soybean Promotion Board
- Tennessee Farm Bureau Federation

Publications

A variety of publications have resulted from the Beaver Creek project. The following is a sampling of such publications:

- *Beaver Creek Hydrologic Unit Area Project, Fact Sheet.* U.T. Agricultural Extension Service. AE&RD No. 87.
- *Beaver Creek's Redemption.* Wilbert, Korina. U.T. Agriculture. Summer 1997.
- *The Beaver Creek Story.* Byl T.; W.H. Doyle, G.F. Smith and B.G. Whitworth. USGS Report 96-398.
- *The Beaver Creek Story: Making a Splash,* VHS & DVD. Johnson, T. and G.F. Smith. U.T. Agricultural Extension Service. Fall 2002.
- *Instream Investigations in the Beaver Creek Watershed in West Tennessee, 1991-95.* U.S. Geological Survey. Water-Resources Investigations Report 96-4186. 1996.
- *Nutrient, Sediment, and Pesticide Data Collected at Four Small Agricultural Basins in the Beaver Creek Watershed, West Tennessee, 1990-1995.* U.S. Geological Survey. Report 96-366. 1996.
- *Protecting Wells from Contamination: Results from the Beaver Creek Watershed.* Smith, George. U.T. Agricultural Extension Service. SP 392-F. January 1995.

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Agricultural Extension Service
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