



2008 USDA-CSREES National Water Conference  
Sparks, NV

## **BMP Effectiveness Assessment for a Pasture Dominated Watershed: Results from Two Years of CEAP Assessment**

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### Abstract Text:

The Lincoln Lake CEAP watershed is located in the Ozark Highlands of Northwest Arkansas. The predominant land use in the watershed is pasture that produces forage for numerous beef and dairy cattle. In addition, a number of poultry farms are located in this watershed resulting in an abundance of animal manure. The predominant use of manure in the area has been as a fertilizer for perennial forage crops. There is growing concern that excess land applications of the manure can lead to surface and ground water pollution due to increased runoff losses of sediment, nutrients, and pathogens. The overall goal of this CEAP project is to quantify the effects of best management practice (BMP) implementation, timing, and spatial distribution on sediment and nutrient loss reduction in Lincoln Lake watershed. We will present the results obtained from the first two years of the project. In summary, we have completed a detailed database development of land use and water quality data from various studies conducted since 1992. We have also developed a detailed land use map for 1992, 1994, 1996, 1999, 2001, and 2004 to quantify land use changes in the watershed and to differentiate BMP effectiveness in water quality improvements from land use change effects. We have also developed detailed Soil and Water Assessment Tool (SWAT) models for the watershed for various land use conditions. Currently, we are using the SWAT model to evaluate effectiveness of various BMP combinations (a total of 172 BMP scenarios) in relation to the weather stochasticity in improving water quality. We have surveyed agricultural and nonagricultural watershed residents as well as water quality regulators/specialists to evaluate their perceptions of water quality and factors affecting water quality in the watershed. The results of the stakeholder surveys suggest that discrepancies exist in different group perceptions of water quality, the sources of water pollution, and the roles of local county, state, and federal officials in meeting water quality objectives. Various outreach and education activities involving stakeholders in a participatory manner has been successful in enhancing BMP adoption to improve water quality in the watershed.

### Impact Statement:

The project has evaluated effectiveness of various agricultural BMPs in improving water quality in a pasture dominated watershed. Successful outreach and extension activities have increased participation of stakeholders in implementing BMPs in agricultural areas.