

CEAP RELEVANT RESEARCH WATERSHED STUDY

Name of Project Sources, Survival and Transport of Fecal Bacteria in Streams and Survival in Land-Applied Poultry Litter in the Upper Shoal Creek Basin, Missouri	Location (State, River, HUC) Upper Shoal Creek, Missouri
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Purpose of Project (Goals and Objectives) The purpose of this study is to document the survival, transport, and sources of fecal bacteria in Shoal Creek, which contains numerous fields on which poultry litter is applied, during 2001-2002. A combination of techniques was used to determine the possible sources of increased coliform densities, including survival or "die-off" rates in the stream, a dye-trace study to determine travel times and dispersion characteristics in the stream reach, and a field study to monitor the quantity and survival of bacteria in land applied poultry litter. Fecal coliform and E. coli bacteria were measured and additional water-quality samples were collected from the stream for nutrients, wastewater organic compounds, and pharmaceutical compounds. In addition, studies were conducted on four test plots for survival of fecal coliform and E. coli bacteria in fields where poultry litter was applied. Relative densities of bacteria were measured for up to eight weeks following poultry litter applications.
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Description of Project (Landscape, Models, Practices) Stream chemistry, fecal bacteria fingerprinting and survival rate measurements, stream seepage, and time-of-travel, dilution, and dispersion studies done in 2001-02. Field tests of fecal bacterial survival in poultry litter. Cattle, horses, and humans were predominant sources of fecal bacteria in Shoal Creek. Half of E. coli in Pogue Creek were matched to poultry. High concentrations of fecal coliform bacteria not related to simple advection and dispersion. Mass balance of bacteria densities indicates large sources between sites 2 and 2a, and between sites 2c and 3. Pastured cattle likely source at site 3. Fecal bacteria in poultry litter can survive up to eight weeks after application. Human waste water likely source of some organic compounds, but thiabendazole, used to treat worms in cattle, was found at sites 2 and 2a.
