



USDA-CSREES 2007 National Water Quality Conference

Optimal Transportation Analysis for Animal Waste Management through GIS-Based PLDSS

Alabama's poultry production results in about 2 million tons of manure and litter. Application of poultry litter to pastures and row crops serves as a cheap alternative to commercial fertilizer, and in many cases, results in higher production. However, over the years, excessive poultry litter application to perennial forage crops in the Appalachian Plateau region of North Alabama has resulted in P build-up in soils. Even though P is an essential nutrient for plant growth, runoff of P can accelerate eutrophication resulting in severe impairment of water bodies that support aquatic, recreational and drinking water uses. A comprehensive nutrient management plan (CNMP) is often used as one of the best management practices (BMPs) to properly land apply litter so that water quality impacts can be minimized. Because nutrient management planning is often not done for animal feeding operations (AFOs), and also because, in case of excess litter, litter transportation infrastructure has not been developed, over application of poultry litter to near by area is a common practice. To minimize over application of litter in the concentrated poultry production areas a comprehensive litter management system and transportation infrastructure needs to be developed for sustainable on- and off-farm poultry litter utilization in Alabama. The objective of this study is to develop a GIS-based poultry litter decision support system (PLDSS) to quickly develop nutrient management plans for AFOs and to conduct transportation analysis so that litter can be transported and land-applied to desire locations within the Appalachian Plateau Region or to Black Belt Region (a nutrient-deficient area) in the most economical and environmentally-friendly manner. The presentation will focus on the development of the PLDSS and the utility of the system for poultry producers and certified animal waste vendors.

Author: Moon Seong Kang

University Affiliation: Auburn University

Co-Author(s): Puneet Srivastava, John Fulton, Ted Tyson, Frank Owsley, and Kyung H. Yoo