

Hill Farm

U.S. Department of Agriculture Accomplishments Report AD-421 U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month, Day, Year) 03/20/2012
1. Accession 0224176	Agency Identification No. 2. NIFA 3. LA,B	5. Work Unit/Project No. LAB04072	6. Status Annual Report
7. Title Carbon Sequestration and Greenhouse Gas Emissions Associated with Cellulosic Bioenergy Feedstock Production on Marginal Agricultural Lands in			
12. Investigator Name(s) (Last Name and Initials) Blazier, M. A.; Liechty, H. O.; Pelkki, M. H.; West, C. P.; Wang, J. J.; Schuler, J. L.; Brye, K. R.			
20. Termination Date 12/31/2015		40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011	
Outputs: This project generated outputs targeted at the scientific and policymaker community in the form of a presentation given at the annual North American Agroforestry Conference, one presentation given at the University of Missouri Agroforestry Symposium, and a poster presented at the AFRI project directors meeting. This project also produced a presentation targeted to environmental law policy-makers and students at the Tulane Environmental Summit. Results were shared with forest owners, farmers, and natural resource management professionals at landowner workshops and a field day. This project provides information on the implications of biofuel production practices of forest, agroforest, and pasture management on ecosystem nutrient cycling processes.			
Outcomes/Impacts: In a study on biofuel agroforest establishment on retired agricultural soils at three sites in the Lower Mississippi Alluvial Valley, soil was a larger pool for carbon than aboveground biomass of switchgrass, cottonwood, and grain sorghum. Sorghum sequestered more C in aboveground biomass than switchgrass and cottonwood; nearly 70% of sorghum biomass was in residue. Switchgrass had greater aboveground C sequestration than cottonwood. These results were likely affected by stage of development of each crop; cottonwood and switchgrass had not yet reached maturity, whereas grain sorghum matured within the year of observation. NO ₃ -N in soil water was greater in the sorghum crop than in an adjacent natural bottomland hardwood forest, whereas NO ₃ -N levels were similar among the natural forest, switchgrass, and cottonwood. Sorghum was also associated with higher NH ₄ -N in soil water than the natural forest, switchgrass, and cottonwood. Switchgrass and cottonwood may be more effective at sequestering N than sorghum. Investigators met twice to coordinate study activities, soil respiration and root elutriation equipment were purchased, and a graduate student was hired to conduct greenhouse gas emission evaluation.			
Publications: No Publications Reported			
Participants: Michael Blazier (PI), Brad Osbon, Kenny Kidd, Jim Wang, Montgomery Alison, LSU AgCenter; Hal Liechty, Matthew Pelkki, Kenneth Formby, Stacy Wilson, University of Arkansas-Monticello; Chuck West, Kristofer Brye, University of Arkansas-Fayetteville.			
Target Audiences: Forestry and soil scientists, natural resource management professionals, forest landowners, farmers			
Project Modifications: Nothing significant to report during this reporting period.			
Approved (Signature)		Title	Date
			