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1. Accession 0215893	Agency Identification No. 2. CSREES 3. LA.B	5. Work Unit/Project No. LAB93930	6. Status Annual Report
7. Title Improving the Sustainability of Livestock and Poultry Production in the United States			
12. Investigator Name(s) (Last Name and Initials) Theegala, C. S.			
20. Termination Date 09/30/2013		40. Period Covered (mo/da/year): 01/01/2011 TO 12/31/2011	
Outputs: <p>Waste treatment alternatives offer potential economic benefits to dairy farmers and poultry producers. The outputs generated from this project include: one non-provisional patent issued (Patent # 7,942,943) on a downdraft gasifier with features to hold a tar cracking catalyst internally within the oxidation zone; licensing of a dairy manure/sand separator design, four journal publications and two presentations.</p>			
Outcomes/Impacts: <p>The two waste sources that were targeted for this project are dairy wastes and poultry litter. The proposed project focused on separating the solid portions from liquid slurry pumped to dairy lagoon using an in-house manure separator. The proprietary separator has a sand cleaning component, which allows collection and recycling of bedding sand. The self cleaning manure and sand separator collects larger organic particles in the manure (or approximately 50-60% of excreted wastes) and more than 80-90% of the sand in the waste slurry as two separate piles. A unique drying protocol was developed to simultaneously dry manure in about three summer days and eliminate bacterial populations. Poultry litter is traditionally collected dry and dispersed, often leading to over application of manure and pathogen contamination over fields. A large-size hammermill and pelletmill was used to generate compact fertilizer pellets. The pelletized litter was tested for nutritive value and suitability for use as a soil amendment and fertilizer. The pellets also were tested for suitability in energy production using several techniques, including biomass gasification and hydrothermal liquefaction. A novel gasifier was developed with a provision to hold a tar cracking catalyst internally within the gasifier.</p>			
Publications: <p>Theegala, C.S. 2011. Midgett, J.S. Hydrothermal liquefaction of separated dairy manure for production of bio-oils with simultaneous waste treatment. Bioresource Technology, doi 10.1016/j.biortech.2011.12.061.</p> <p>Gutierrez-Wing, MT., Rusch, K.A., Negulescu, I., Stevens, B., Theegala, C.S. 2011. Aerobic Biodegradation of Polyhydroxybutyrate (PHB) in Compost. J. of Environmental Engineering Science. Volume 28, Number 7, pp.477-488.</p> <p>Dassey, A. and Theegala, C.S. Optimizing the Air Dissolution Parameters in an Unpacked Dissolved Air Flotation System. Water 2012, 4, 1-11; doi 10.3390/w4010001. Published online: 12/27/2011.</p> <p>Davis, T., R. Sheffield, S. Hall, B. LeBlanc, and C. Theegala. 2011. Development of a Biological Filter Utilizing Organic Growth Media for Wastewater Treatment and Nitrogen Fixation. 2011 ASABE International Meeting. ASABE Paper No. 111603.</p> <p>Davis, T., R. Sheffield, S. Hall, B. LeBlanc, and C. Theegala. 2011. Development of a Phosphorus Treatment System for Alligator and Dairy Parlor Wastewater Utilizing a Hydrated Lime Precipitation System. 2011 ASABE International Meeting. ASABE Paper No. 111610.</p> <p>Sharma, Akshya. MS Thesis titled -Assessing the Suitability of Various Feedstocks For Biomass Gasification (MS Thesis). May, 2011.</p>			
Participants: Theegala, C. S., (PI), LSU AgCenter.			
Target Audiences:			

Dairy and Poultry industries, biofuel processors, and fertilizer companies.		
Project Modifications:		
Nothing significant to report during this reporting period.		
Approved (Signature)	Title	Date