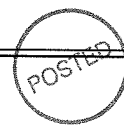


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U.S. Department of Agriculture <b>Accomplishments Report AD-421</b> U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month, Day, Year)  01/10/2013
1. Accession  0212868	Agency Identification No.  2. CSREES 3. LAB	5. Work Unit/Project No.  LAB93884	6. Status  Final Report
7. Title  Microwave Technologies for Postharvest Processing of Biodiesel Feedstock			
12. Investigator Name(s) (Last Name and Initials)  Boldor, D.			
20. Termination Date 09/30/2012		40. Period Covered (mo/da/year): 10/01/2007 TO 09/30/2012	
Outputs:  Dissemination of the findings from this work include multiple presentations of research results at national and international conferences, local and regional symposia, scientific papers published in peer-review journals, and ACE meeting presentations. Multiple collaborations have been initiated and enhanced across multiple disciplines, including chemical engineering, civil and environmental engineering, plant sciences, and agronomy.			
Outcomes/Impacts:  Dielectric properties of biodiesel precursors significantly affect the biodiesel production in the presence of microwaves, as demonstrated by numerical models and experimental results. The scale-up of this process was demonstrated with excellent results compared to laboratory scale and to traditional methods. Ethanol production from sweet sorghum was improved following microwave pretreatment compared to the control. A non-food biodiesel feedstock was thoroughly characterized for its properties relevant to biodiesel production. This project will further the knowledge base required for successful development and implementation of low-cost technologies for biofuel and bioproducts production from a variety of feedstock. This project will have both short- and long-term impacts on biofuels derived from both food (i.e. soybeans) and non-food (i.e. tallow tree seeds, algae, lignocellulosic biomass) feedstock. Design of new equipment, processes, and numerical models will expand and improve the intellectual property portfolio, which can be further leveraged toward developing new businesses, improving rural economies, and generating a significant number of jobs in the agricultural sector in Louisiana and other rural areas.			
Publications:  Picou, L.A. and D. Boldor. 2012. Thermophysical Characterization of the Seeds of Invasive Chinese Tallow Tree: Importance for Biofuel Production, Environ. Sci. Technol., 2012, 46 (20): 11435-11442.  Muley, P.D. and D. Boldor. 2012. Multiphysics Numerical Modeling of the Continuous Flow Microwave-Assisted Transesterification Process, Journal of Microwave Power and Electromagnetic Energy. 46 (3), 2012, pp. 141-164.  Chen, C., D. Boldor, G. Aita and M. Walker. 2012. Ethanol production from sorghum by a microwave-assisted dilute ammonia pretreatment. Bioresource Technology, 110: 190-197.  Muley, P. D. and D. Boldor. 2012. Modeling of Methyl Ester Production in a Continuous Flow Microwave System. In: Proceedings of International Microwave Power Institute (IMPI) 46th Annual Symposium. June 19-21, 2012. Las Vegas, NV.  D. Boldor. 2012. Microwave Transesterification. In: Encyclopedia of Agricultural, Food, and Biological Engineering. Editors: Dennis R. Heldman and Carmen I. Moraru. Taylor and Francis Group. New York, NY. DOI: 10.1081/E-EAFE2-120045377. ISBN: 978-1-4398-1111-5.  D. Boldor and C.M. Sabliov. 2012. Continuous Microwave-Assisted Isoflavone Extraction. In: Isoflavones. Editor: Victor Preddy. Royal Society of Chemistry, Thomas Graham House, Cambridge. UK.  Boldor, D. 2012. Biofuel Production using Electromagnetic Technologies. Henan Academy of Science Delegation from Zhengzhou, China (Henan province). February 17, 2012. Baton Rouge, LA  Muley, P.D. and D. Boldor. 2012. Modeling of Methyl Ester Production in a Continuous Flow Microwave System. IMPI 46th Annual Meeting. June 20-22, 2011. Las Vegas, NV.			



Picou, L.A. and D. Boldor. 2012. Dielectric Properties of Sorghum (*Sorghum bicolor* (L.) Topper) Bagasse at Microwave Frequencies. IMPI 46th Annual Meeting. June 20-22, 2011. Las Vegas, NV.

Picou, L.A. and D. Boldor. 2012. Rapid Microwave Drying of Non-food Agricultural Feedstock for Improved Biofuel Production: Sweet Sorghum Bagasse. 105rd ASABE Annual International Meeting. July 29-August 1, 2012. Dallas, TX.

Picou, L.A. and D. Boldor. 2012. Thermal Properties of Chinese Tallow Tree Seeds. 105rd ASABE Annual International Meeting. July 29-August 1, 2012. Dallas, TX.

Muley, P.D. and D. Boldor. 2012. Numerical Modeling of Temperature Profiles During Continuous Flow Microwave Assisted Transesterification Process. 105rd ASABE Annual International Meeting. July 29-August 1, 2012. Dallas, TX.

Participants:

D. Boldor (PI), Cristina Sabliov, Giovanna Aita, Chandra Theegala, Marybeth Lima, Michael Mailander, Gary Breitenbeck, Vadim Kocherghin, Sundar Balasubramanian, Michael Salassi, Claudia Leonardi, LSU AgCenter; Kerry Dooley, LSU A&M; Kamran Abdollahi, Southern University.

Target Audiences:

Other researchers in plant sciences, physics, chemistry, and engineering; research and development personnel in all agricultural field (production, harvesting, logistics, processing) and food and biological engineering, microwave equipment manufacturers, other related industries are also included in the target audience for this project. Audience also includes stakeholders in Louisiana agriculture, and various state and federal governmental agencies and other policy makers.

Project Modifications:

Nothing significant to report during this reporting period.

Approved (Signature)	Title	Date
