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## Thermal Properties of Loblolly Pine from Naturally Regenerated Stands

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### Abstract

Eight samples of loblolly pine, from different parts of the trees (bole, slabs, tops and branches, and whole tree) were obtained from three naturally regenerated forests in Arkansas. The thermal properties of the samples have been characterized using oxygen bomb calorimetry, thermogravimetric analysis, and gravimetric ash analysis. The objectives of the study are concerned with evaluating the properties of the various components and impact of tree age, tree component, and stand conditions on energy density, thermal sensitivity and applicability for combustion and gasification systems. The ash contents of the 'whole tree' and 'tops and branches', were predictably the highest at 0.86 and 0.38%, respectively. The higher heating values ranged from 16.8 to 18.8 MJ/kg, with the 'tops and branches' sample accounting for the lowest energy content among all the wood samples. Proximate analysis showed that the fixed carbon and volatile matter content varied between 79 to 83% and 15.8 to 19.8%, respectively, with the 'whole tree' sample representing the extremes for both values.

Keywords: loblolly pine, natural regeneration, calorimetry, proximate analysis, TGA



# CONVENTION PROGRAM



**JUNE 9-11, 2013 AUSTIN, TEXAS**

**FPS 67<sup>TH</sup> INTERNATIONAL CONVENTION  
AND SWST 56<sup>TH</sup> INTERNATIONAL CONVENTION**





## SWST PROGRAM

### ➤ SUNDAY, JUNE 9

6:30 – 8 am Continental Breakfast – Tejas Dining Room – 2nd Floor

8 am

New Technology and Marketing Practices in Biofuels – Amphitheatre 204

Opening Remarks by Sheldon Shi, University of North Texas, Denton, TX USA

8:05-8:50 am

Biorefinery Value Chain Outputs

Keynote Speaker: Dr. Paul Smith, Pennsylvania State University, University Park, PA USA

8:50-9:15 am

Advances in Hardwood Forest Plantation Systems: Implications for Bio-energy Feedstock

Dr. Jeff Wright, Arborgen Inc., Ridgeville, SC USA

9:15–9:40 am

Production of Polyhydroxyalkanoates in Plastids and Peroxisomers of High Biomass C4 Grasses

Stevens Brumbley, University of North Texas, Denton, TX USA

9:40-10 am

Refreshment Break – Tejas Dining Room and Level 2 Meeting area

10–10:25 am

Liquefaction Processes of Biomass for the Production of Valuable Chemicals and Biofuels: A Review

M. Hakki Alma, Kahramanmaras Sütçülmam University, Kahramanmaras, Turkey

10:25–10:50 am

Thermal Properties of Loblolly Pine from Naturally Regenerated Stands

Les Groom, USDA Forest Service, Pineville, LA USA

10:50–11:15 am

Cultural Sustainability as an Independent Dimension of Sustainability Reporting – Case Forest-Based Bioenergy in Finland

Katja Lähtinen, University of Helsinki, Helsinki, Finland

11:15–11:30 am Questions

11:30–12 pm Business Meeting

12–1:00 pm  
Floor

FPS and SWST Joint Annual Excellence Awards Luncheon - Salon C-3rd