Agricultural Equipment Technology Conference

January 10-13, 2010

Orange County ConventionCenter - West Building – Orlando, Florida

Continuing Professional Development

MONDAY, JANUARY 11

8:00AM-10:30PM CPD #1 – Bioenergy Feedstock Logistics - Modeling and Practice

Instructor(s) Sandra Eksioglu, Mississippi State University
Melanie Kelly, Agi Logistics LLC
Shahab Sokhansanj, Oak Ridge National Lab

Organizing an efficient and economical system to move, assemble, store and distribute a wide range of material types is a complex task. Modeling tools would enable one to analyze various options and to examine the most efficient strategies to assemble a least-cost supply chain. This workshop is designed to provide attendees with a review of the principles of logistics, and to allow them to hear from logistics practitioners and to become with modeling tools. The workshop begins with an overview of logistics outlining elements and characteristics of supply chains. Dr. Sandra Eksioglu, education coordinator of the National Center for Intermodal Transportation, and chair of the Transportation Working Group at the Mississippi State University, will be the lead instructor for this topic. The next segment of the workshop will cover commercial examples of logistics networks. Ms. Melanie Kelly of Agi Logistics International will be the lead instructor for this session. The last segment of the workshop covers a new approach to modeling and optimization of logistics network. Examples will be drawn from handling biomass feedstocks and bioproducts. ASABE member Dr. Shahab Sokhansanj of Oak Ridge National Laboratory, the developer of the IBSAL (Integrated Biomass Supply and Logistics) modeling environment, will outline the internal structure of this model and its user interface with practical examples.

About IBSAL – The Integrated Biomass Supply Analysis and Logistics (IBSAL) model was developed to simulate biomass supply chains from the field to the biorefinery. The model, written in ExtendSim (www.imaginethatinc.com), consists of a network of operational modules threaded into a complete supply chain. Each module contains mathematical equations to describe a process or event. The process modules are drying, wetting, and dry matter loss. The events are operations such as cutting or chipping, loading, transporting, stacking, densifying and storing. Modules interact with an external Excel spreadsheet to receive input data and write output data. Biomass flows from one module to the next through a connector. To date, more than 60 modules have been developed. Additional modules to simulate advanced harvesting operations and new biomass feedstocks are planned.

Logistics Primer
Dr. Sandra Eksioglu, Mississippi State University

An Overview of Commercial Logistics of Perishable and Non Perishable Commodities: Truck, Rail, Shipping
Melanie Kelly, Agi Logistics LLC

Simulation and Analysis Tools for Logistics (IBSAL)
Shahab Sokhansanj, Oak Ridge National Lab

8:00AM-11:30AM CPD #2 – Hydraulic Basics

Instructor(s) Dennis Buckmaster, Purdue University
Walter Hull, SunSource Mobile Hydraulic Systems (retired)

This 3-hour CPD will cover general principles of fluid power systems. Relationships and equations dealing with pumps, motors, cylinders, and lines will be presented in a practical context. Following an introduction to schematic reading and an overview to proper hydraulic system design procedure, components and examples from open-loop and closed-loop systems will be presented. Some information on fluid quality and design life will be included. The target audience includes equipment designers and technicians without formal fluid power training, as well as those who could benefit from a refresher workshop.

continued

General principles and equations
• Equations and relationships (power, pump/motor, cylinder, force, velocity, flow, pressure, etc.)
• Importance of starting design at the load
• How to read schematic symbols
Open-loop systems
• Pumps
    • Types (gear, vane, piston)
    • Controls (fixed, manual variable, pressure-compensated, load-sense, power-limited)
• Valves, some focus on EH capability
• Cylinder circuits and sizing
• Briefly discuss hose, tubing, and fittings (primary emphasis on safety)
Break
Closed-loop systems
• Differences from open-loop
• Key circuit features
• Often-overlooked factors
• Sizing principles: stationary example
• Sizing principles: traction example
Fluid quality and component life
• Filtration
• Heat rejection