Editor's Note

The Council on Forest Engineering had its annual meeting June 6-9, 2010, on the campus of Auburn University, Alabama, USA, organized by Tom Gallagher, with about 70 attendees. Although the proceedings are available at www.cofe.org, I rarely see a report from these meetings on what was seen and heard, so I will take the liberty of doing so in this column. What I am about to write does not necessarily describe those things that are the most important or impressive. I am merely going to describe some things about which I managed to take notes and can try to relay here.

One of the first speakers in the plenary session was Tom Kelly, a retired logging engineer formerly with Scott Paper in Mobile, Alabama. His operations experimented with biomass utilization back in the 1970s. When utilizing everything, they found they had 70% stems, 17% tops, and 13% saplings. When finished, "there was nothing out there – like logging a golf course." Moisture content of the biomass was a problem. They tried running the feller buncher six months ahead of the rest of the operation, but that did not work. They were trying to get the biomass down to 30% MC. They yielded 50 tonnes/ha (22 tons/acre) from first thinnings plus 10-12 t/ha (4-5 t/ac) of topwood. (I failed to note whether Tom was talking about pine or hardwood, but these numbers all sound like southern pine). Tom's final advice: "Time to work with our minds; we've been working with our asses for 45 years. (It's) time to figure out how to do it differently."

Bruce Narveson of Caterpillar (they have a skidder assembly plant in nearby LaGrange, Georgia) emphasized that young people getting into this industry need to understand that this is a global industry. Half of Cat's business is overseas. Latin American and SE Asian markets are "very strong." Russia is "coming on in its own way." North American markets are staying strong because "China has been taking the wood fiber." Material handling is not the challenge – identifying the need and making a profit is the challenge. Logger profitability is Cat's main goal, and logging safety is important to them because it affects the machines, as well. Using attachments to create specialized tools is effective, such as a stump puller and waste wood grapples.

Sam Houston of Forest2Market spoke of biomass supply and demand. Global oil demand has doubled since 1970 and is outpacing new supply. The EU's renewable demand is expected to be 120,000,000 tonnes by 2020. This is more than ten times the world's installed capacity. Much of this might come from the US South, but bankers require a 7-15 year term wood supply along with price assurances. Bankers are unwilling to take price risks. Although there is much biomass available in the US South, practical experience shows that it is difficult to identify a wood basket that can sustainably supply a new large pellet plant or chip mill.

Bryce Stokes with Navarro Research and Engineering spoke about some of the biofuel government policies and about the new Billion Ton Report coming out. It is being improved by developing cost curves for all feedstocks at a county level. This allows for an analysis of feedstocks by costs to roadside at various spatial scales with aggregation up to national estimates. It also provides land use change and acreage estimates for energy crops. In the future, logging operations are expected to be more integrated, producing about 70% primary products and 30% residues.

Tim West of John Deere stated that the JD Bundler has been demonstrated all over North America. A trailer-mounted bundler is "on the horizon." Developing partnerships is important in developing biomass markets. Reducing moisture content not only improves net energy value, but reducing the moisture content also reduces the total number of bundles. For example, a tract may contain 79 bundles at 50% mc, but if the same logging slash is allowed dry to 20% mc before bundling, it will produce 69 bundles.

Bill Waller of Green Circle BioEnergy in Cottonport, Florida, buys 825,000 tons of "pelletwood" per year. Pelletwood has no specifications as to size or species. Their 450,000 tonnes/yr pellet mill exports primarily to Europe. The bark is used to dry the chips to 7-8% mc, and the chips are ground to 4mm before being pelletized. Although their contract specifies 17.3-17.8 Gj per tonne, they are actually able to produce 18 Gj.

Joseph Parnell, a logger from Maplesville, Alabama, has two clearcut crews, two tree-length crews and one whole tree/logging slash crew. His 23 trucks are light weight – 11,793 kg (26,000 lbs.) including fuel and trailer (chip van). At first, he used a horizontal grinder with hammers. Later, he found that a horizontal drum chipper worked better because the knife wear was less, especially in dirty fuel. By 2006, his company owned 96 trailers, each 12.2m (40 feet) long, but they were capable of holding only 34.5-36.3 tonnes (76,000-80,000 lbs.) GVW. So, he "parked" them in favor of possum-belly trailers that are also top-loading. When he thinned overstocked planta-

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tions (> about 2000 trees/ha or 800 per acre; southern pine), he found a "lack of contaminants," which was very good news. The current market trend is toward micro-chips; currently these micro-chips are 19 x 3mm (3/4" x 1/8") and as small as 13 x 3 mm (1/2" x 1/8'). We "cannot do 3/8 inch" (9.5mm). His contracts are generally long-term, which is "good for loggers" because financing is difficult. Only Caterpillar, John Deere and Wells Fargo are willing to finance loggers, and they want statements covering the last 3-5 years.

John Garland of Oregon State University talked about how "ideas fuel the future." In other words, the role of forest engineers and foresters is constantly changing, so a key to success is innovation. We must manage our own careers. Individually and collectively, professionals need to: (1) assert their contributions are important to society; (2) perform in an ethical, competent, and caring fashion on important operations that are technically feasible, economically viable, and environmentally sound; and (3) let employers, society, supporters, and detractors know that professional performance is in everyone's interest. The people around us need to understand that the forester they know as a really good person, helping out with community events, volunteering to help others, and so forth, is the same person taking care of the forest.

The field tour of the meeting included a stop at the Auburn Biofuels Lab's Biomax mobile gasifier, which generates electricity from gasified biomass using a Chevy 350 engine. To prevent problems, the wood chips need to be under 30% mc.

Another stop in the field tour was at Southern Company, an electric utility that operates in the southeastern US. They determined that biomass is currently their most economical option for green energy, and they are testing different biomass options at various generating plants, mostly by co-firing with coal/lignite. With pulp and paper size wood chips they encountered feed system problems. The chips need to be less than 13 mm, and they prefer 6mm. In the long-term, they need a better way to dry the wood. Wood pellets work better, but are clearly higher-cost, must be kept dry, and require added capital for material handling and storage. A direct injection system using switchgrass (native to US prairies) has the greatest potential. Two 450-kg bales generate 1150 kW-hrs of electricity. It allows a co-fire rate of 5-10%. A primary economic limitation on the size of some power units may be the cost of transporting the biomass supplies. Some of their major feedstock research issues/topics are fuel sustainability, energy crops, torrefied wood, and algae.

This description does not cover a tenth of what was learned at this meeting. Clearly, there is a strong trend in forestry and forest engineering research toward using trees for biomass for energy. In my opinion, this is good. And, the cost of harvesting and transporting is a major limitation. However, I repeat what I often tell my students: Any time we consider using biomass for energy, we should ask ourselves, "What other products can we make from this material?"

Cornelis F. "Niels" de Hoop
Technical Editor

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