



FOREST RESOURCES ASSOCIATION INC.

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MODIFIED PRECISION-HUSKY PROGRIND H-3045 FOR CHIPPING BIOMASS

October, 2008

Chippers: biomass

www.forestresources.org/members/serpub/08-R-32.html

INTRODUCTION: A specific size of whole tree chip was needed to co-mill wood chips with coal. The specifications are stringent because chips must be mixed with coal, as opposed to a co-firing process. In co-firing, two raw products are conveyed separately to a boiler. In co-milling, such as at Alabama Power's Plant Gadsden, the chip and coal mix must pass through a series of conveyors, a pulverizer, and pipes to the furnace. Handling specifications require smooth cut edges, as opposed to shredded edges. In a partnership involving several entities, including the National Forests in Alabama, Alabama Power Company, Forest-Based Economic Development Services, Precision-Husky, the USDA Forest Service Southern Research Station, and others, a trial was conducted to determine if wood chips could be created in a one-step in-woods process that would meet the stringent requirements of the power plant. Precision-Husky, of Leeds, Alabama, volunteered to work with the partnership to manufacture a machine that would create the chips to the stringent specifications needed.



Fig. 1: Fuel chip output.

GENERAL FEATURES: A 500-horsepower ProGrind H-3045 was modified to produce the specified biomass chip. The major modification was the cutting mechanism. Instead of grinder teeth, the ProGrind was outfitted with ten drum-mounted planer-style knives. The planer knives were used because they could create wood chips with clean edges as opposed to the shredded, coarser chips typically produced by grinder teeth, or hammers. A knuckle-boom loader was used to feed the raw material to the ProGrind, with an operator remote-controlling the ProGrind safely from within the loader cab.



Fig. 2: Modified ProGrind H-3045..

A 37-acre stand of 16-year-old loblolly pine from the Shoal Creek Ranger District was used for the trial demonstration. All stems up to eight inches DBH, including pines and hardwoods, were removed. The average DBH was four inches.



Fig. 3: ProGrind H-3045 planer knives (inset shows scale).

OPERATION: The prototype ProGrind was delivered to the woods and began producing chips just two days after it was built. The in-feed conveyor was used to adjust the feed-rate speed of wood to the knives. The planer knife holders allowed for adjustment of the chip length by changing the distance of the cutting edge from the drum. As the knives were pulled further from the drum, chip length increased. Through the course of the two-week trial, a few adjustments were made on the knives.

The loader fed whole trees into the ProGrind. The loader operator was experienced, but he was not familiar with working with horizontal chippers or grinders. After operating the machine for just an hour or two, he was comfortable enough with the machine to start making adjustments in how the loader interacted with the conveyor in-feed.

FINDINGS: Production data were collected on the ProGrind for producing small and large chips. For small chips (3/8 to 1/2 inches in length), the ProGrind produced an average of 27.3 green tons per productive machine hour (PMH). For larger chips (1/2 to 3/4 inches in length), an average production rate of 38.2 green tons per PMH was observed.

Results were very positive for the chips from this new proto-type machine. All partners were pleased with the results and are awaiting power plant trial reports.

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08-R-29: NEW SIZING HEAD FOR PROCESSING SLASH PILES

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08-R-30: FRA WESTERN REGION'S SHORT-NOTICE FIELD TRIP PROGRAM

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08-R-31: FIBER EXCHANGE

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LP in Wisconsin and Sappi in Minnesota have established protocols for arranging reciprocal shipments of wood they respectively control, to obtain transport savings.

08-R-32: MODIFIED PRECISION-HUSKY PROGRIND H-3045 FOR CHIPPING BIOMASS

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Public and private partners collaborate to develop and test a unit to create, in one pass, a biomass chip meeting Alabama power plant's strict quality specs.

08-R-33: PLANTATION TRAILER ADAPTED TO MULTI-PRODUCT TRAILER

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Georgia logger finds a small modification can adapt a dedicated "plantation trailer" to haul double-bunked loads when necessary.

08-R-34: PROVIDER PALS: A DECADE OF GROWTH

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Bruce Vincent's program for connecting urban kids with the mysterious folks who grow, mine, or harvest basic products has innovated its way into a second decade.

08-R-35: 3LOG: DATA ANALYSIS, BUSINESS INTELLIGENCE FOR FOREST COMPANIES

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Wood supply chain management product provides real-time data to procurement and contractors on wood inventory movement and transactions, among other capabilities.

Security Alerts



08-Q-5: LOG SECURITY HAMMERS

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MealWestvaco in West Virginia has modified a welder's hammer to emboss an inconspicuous brand on valuable logs to settle custody questions in fraud or theft cases.

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08-S-13: LOAD BOOM TOUCHES POWER LINE, ELECTROCUTING SKIDDER OPERATOR

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08-S-14: LOG TRUCK ROLLOVER FATALITY

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08-S-15: BABBITT POT BURNS DRIVER'S HANDS AND FACE

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Water dripping from hard hat into crucible of molten metal causes hot metal to splash and injure worker.

08-S-16: FORESTER SLICES THUMB WHEN CUTTING SILT FENCE

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08-S-17: "SHORT" FALLING TREE BREAKS CUTTER'S SHOULDER

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Manual feller who neglected to prepare escape path is struck by a falling snag he had miscalculated.