

## **Tracked Harvesters and Centralized Logging Depots: The Potential Future for Southeastern Logging**

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### **Abstract**

Harvesting systems have changed throughout the years in conjunction with the length of the wood being harvested. Historically, trees were felled with axes, then bucked up with saws into manageable lengths for horses, mules, and oxen to drag out (Knight 2012). Only desirable logs were removed from the forest while the remainder of the tree was left in the woods. Machines soon replaced animals, allowing loggers to haul longer pieces of wood, although the timber was still cut to specific lengths. Machines continued to increase in horsepower, size, and capacity in the woods while mills were also improving their technological skills. These advances in technology enabled the mills to optimize the logs that were delivered by cutting marketable dimensions regardless of log length. Higher utilization percentages obtained from processing longer-length logs provided incentives for mills to pay higher stumpage rates for full-length trees over cut-to-length logs, thus instigating whole-tree harvesting in the southern United States.

While a majority of the mills in the south still prefer full-length trees, a select few have come full circle and are starting to provide loggers with incentives and subsidies if they haul processed, dimension-length wood to their mills. Researchers believe there is an opportunity for loading unprocessed full-length trees onto a truck to be hauled to a centralized timber depot where it will then be processed/merchandized by a tracked harvester. This system would allow loggers to maintain their conventional logging system but would remove the necessity of de-limbing, processing, or merchandizing the wood at the landing. Instead entire trees would be loaded directly onto a modified trailer capable of handling this unprocessed wood where it would then be transported to the timber depot. Once at the depot a tracked loader would unload the trees and a swing machine would process, sort, and merchandize the wood to be re-loaded and delivered to their respective mills.

In order to determine the costs and benefits of using a processor attachment on a tracked loader, a time study was conducted to determine productivity. Research took place with a 2154G John Deere Swing Machine with a 622B Waratah processor. This machine and head was chosen for the experiment by the company themselves due to its applicability for this experiment. An economic analysis was calculated from machine productivity using Robert Tuffs before-tax cash flow spreadsheet. Final analysis compare costs of hauling whole trees including tops and limbs to a centralized timber depot for processing and then further transport against hauling whole trees conventionally to the mill.