

THE ECONOMIC FEASIBILITY OF WOODY BIOMASS HARVEST PRACTICES IN
MISSOURI: THE COST OF HARVESTING TOPS AND SMALL DIAMETER TREES

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ABSTRACT

Woody biomass such as tree tops and small diameter trees have potential to be an important source of renewable energy. Their use as an energy feedstock is partly dependent on the cost of harvesting the material. In order to estimate harvesting costs, a whole tree (WT) system that extracted tops and a whole tree system that extracted tops and small diameter trees (WTSD) were compared on 30 acres of Missouri forestland. Each system simultaneously removed woody biomass and conventional solid hardwood products (SHWP) in an integrated harvest. A mechanized system consisting of a feller-buncher, grapple skidder, and loader was used for both harvest systems. Activity sampling and time-in-motion data were collected to determine system efficiency. Joint cost analysis was used to separate costs associated with harvesting SHWP and woody biomass. Marginal cost analysis treated the tops of SHWP as a by-product. Total cost estimates per green ton at the landing assuming a 5% interest rate were \$35.25 for SHWP and \$5.76 for woody biomass in the WT system and \$32.82 for SHWP and \$8.81 for woody biomass in the WTSD system. With the addition of a chipper, woody biomass costs increased to \$11.11 per ton in the WT system and \$14.16 per ton in the WTSD system. A sensitivity analysis tested the effects of changes of different costs on the cost per ton of SHWP and woody biomass.