

Economic Analysis of Woody Biomass Harvesting in the Missouri Ozarks

Abstract

An integrated mechanized timber harvest thinning treatment to remove small diameter trees and merchantable saw logs was conducted on 30 acres of the Missouri, Ozarks in the summer of 2009. Two silvicultural treatments (single tree selection and shelterwood strips) were applied to reduce basal area to different levels. A harvest system feasibility analysis was completed to estimate productivity, costs, and prices needed to attain economic viability (breakeven point). Time in motion data was collected on all system components to understand how the extra efforts to gather small diameter and slash material affect the cost structure of a mechanized timber harvest thinning. A sensitivity analysis was conducted to find breakeven points at varying diesel input costs, equipment purchase costs, hauling distances, stumpage costs and government subsidy. Results indicate that an average of 15.50 tons of fuel chips and 35.72 tons of solid hardwood products was removed per acre. The cost per ton to harvest, skid and process at road side for the fuel chips and solid hardwood products was \$19.20 and \$11.17 per ton respectively. Contracted fuel chips hauling cost was \$12.00 per ton and solid hardwood hauling averaged \$4.16 per ton. Stumpage was assumed to be \$5.00 and \$9.95 per ton, respectively. Average price at the gate for these two products were \$26.00 per ton and \$32.64 per ton leading to a profit/loss of \$-10.20 per ton and \$7.36 per ton for the fuel chips and solid hardwood products respectively. Losses from fuel chips were less than the profits from the solid hardwood products resulting in a net profit of \$3,131.76 dollars.

Keywords: woody-biomass, forest thinning, integrated harvest, single tree selection, shelterwood strips, economic feasibility, sensitivity analysis