

A COMPARATIVE COST ANALYSIS OF LOGISTICS FOR HERBACEOUS ENERGY CROPS AND SHORT-ROTATION WOODY CROPS

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Mandates requiring the use of cellulosic and other advanced biofuels in coming years will establish a demand for dedicated energy crops in addition to residues from agriculture and forestry. Primary energy crop candidates fall into one of two categories: herbaceous crops and short-rotation woody crops. Supply chains for woody crops and herbaceous crops vary in the way that the feedstocks are processed, handled, and stored. Herbaceous energy crops, such as switchgrass, are typically harvested as bales and stored under cover (in a building or tarped) until the material is needed. The bales are delivered to the biorefinery, where they are chopped before being loaded into the reactor. Woody crops, on the other hand, are harvested as needed and chipped at the landing prior to transport to the biorefinery. In this system, handling is minimized and long-term storage of woody materials, other than that required at the biorefinery, is not needed. The objective of this paper is to compare the logistics costs of short-rotation woody crops to herbaceous energy crops. The comparison will include harvesting, forwarding or staging to the landing or farmgate, chipping or packaging, handling, storage, hauling, and unloading at a biorefinery. The effects of yield, which vary by region, on logistics costs will be included in the analysis. The results of this analysis will be useful in identifying areas of improvement in supply-chain logistics and for assisting the cellulosic industry in identifying the best energy crop for various situations.

KEY WORDS: logistics, economics, short-rotation, woody crops, switchgrass

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