

Biofuels from Hybrid Poplar: Using Biochemicals and Wastewater Treatment as Opportunities for Early Adoption

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Abstract : Advanced Hardwood Biofuels Northwest (AHB) is a consortium funded by the United States Department of Agriculture (USDA) to research the potential for a system to produce advanced biofuels (jet fuel, diesel, and gasoline) from hybrid poplar in the Pacific Northwest region of the U.S. An Extension team was established as part of the project to examine community readiness and willingness to adopt hybrid as a purpose-grown bioenergy crop. The Extension team surveyed key stakeholder groups, including growers, Extension professionals, policy makers, and environmental groups, to examine attitudes and concerns about growing hybrid poplar for biofuels. The surveys found broad skepticism about the viability of such a system. The top concern for most stakeholder groups was economic viability and the availability of predictable markets. Growers had additional concerns stemming from negative past experience with hybrid poplar as an unprofitable endeavor for pulp and paper production. Additional barriers identified included overall land availability and the availability of water and water rights for irrigation in dry areas of the region. Since the beginning of the project, oil and natural gas prices have plummeted due to rapid increases in domestic production. This has exacerbated the problem with economic viability by making biofuels even less competitive than fossil fuels. However, the AHB project has identified intermediate market opportunities to use poplar as a renewable source for other biochemicals produced by petroleum refineries, such as acetic acid, ethyl acetate, ethanol, and ethylene. These chemicals can be produced at a lower cost with higher yields and higher, more-stable prices. Despite these promising market opportunities, the survey results suggest that it will still be challenging to induce growers to adopt hybrid poplar. Early adopters will be needed to establish an initial feedstock supply for a budding industry. Through demonstration sites and outreach events to various stakeholder groups, the project attracted interest from wastewater treatment facilities, since these facilities are already growing hybrid poplar plantations for applying biosolids and treated wastewater for further purification, clarification, and nutrient control through hybrid poplar's phytoremediation capabilities. Since these facilities are already using hybrid poplar, selling the wood as feedstock for a biorefinery would be an added bonus rather than something requiring a high rate of return to compete with other crops and land uses. By holding regional workshops and conferences with wastewater professionals, AHB Extension has found strong interest from wastewater treatment operators. In conclusion, there are several significant barriers to developing a successful system for producing biofuels from hybrid poplar, with the largest barrier being economic viability. However, there is potential for wastewater treatment facilities to serve as early adopters for hybrid poplar production for intermediate biochemicals and eventually biofuels.

Keywords : hybrid poplar, biofuels, biochemicals, wastewater treatment

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