Modeling Poplar Growth as a Short Rotation Woody Crop for Biofuels in the Pacific Northwest

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Advanced Hardwood Biofuels Northwest (AHB) is a project involving University and industry partners investigating the development of a sustainable hardwood biofuels industry in the U.S Pacific Northwest. AHB is researching the potential development of a system for growing and converting hardwoods, in particular hybrid poplars, into biofuels, compatible with existing infrastructure. Predicting the economic and environmental viability of a biofuels industry based on poplar requires good estimates of the growth and yield of short rotation woody crops (SRWC) throughout the entire Pacific Northwest region. The Physiological Principles in Predicting Growth (3PG) model was selected and modified for SRWC, particularly for poplar plantation methodologies. The 3PG model was trained against field studies of poplar growth as a SRWC biofuel feedstock. The parameterized model was then applied to the entire Pacific Northwest region, using appropriate climatological and soil input data. Important findings from the model include; validation of the 3PG model for coppiced SRWC plantings, estimates of biomass feedstock yields under different irrigation patterns and weather conditions, and annual estimates for feedstock availability when combined with various crop adoption scenarios. With appropriate input information, the 3PG model can predict yields for the entire Pacific Northwest study region, under various irrigation scenarios. When linked with models of crop adoption, annual feedstock estimates are possible.