# Advanced Biomass Tree Crop Technology

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Many agricultural and forest lands, which have become economicaly marginal and fallen out of production, have the potential to be replanted to produce significant crops of short rotation woody biomaterials. Maximizing yield and modifying the chemical composition of the biomaterials being produced are essential in realizing this potential and making the biomaterials plantations an economically viable alternative to other land uses. We are using an innovative and propriety technology, termed *EliteTree* technology, that features both accelerated stem growth and increased wood density, producing a consistent supply of woody biomass feedstock that can be grown cost effectively on a 2- or 3-year cycle in dedicated plantations on otherwise nonproductive secondary agriculture land not suitable for food crops. Funded by US Department of Energy's STTR project, we are evaluating the *in-field* performance of transgenic poplar trees expressing EliteTree technology. This project aims to provide in-depth analysis (i.e., chemical composition, heat value, and growth rate) and demonstration of the commercial value of this technology. EliteTree technology is expected to supply a highly significant yield boost in both quantity and quality of woody biomass in short rotation poplar, thus enabling lower land use for production and cutting input cost. Additionally, commercial deployment of the technology offers a number of social and economic benefits including cost-competitive production of bioenergy feedstock from non-food crops, thereby reducing impacts on both food prices and access, reducing dependence on foreign oil and the associated environmental impact of its use, increasing energy supply diversity, and strengthening rural economies.

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