

CLEAN RESOURCES

BIOINDUSTRIAL INNOVATION

BIOMATERIALS PURSUIT

FUNDING DETAILS

Wood Biomass Recovery, Pre-processing and Supply Chain Optimization of Short-rotation Woody Crop

Wood biomass will play an increasingly important role in Alberta's growing green economy. To maximize benefits, efficiencies are needed to improve production and reduce costs. Led by the Canadian Wood Fibre Centre, this project captures supply-chain knowledge associated with the recovery, handling, pre-processing, packaging and storage of fast-growing hardwood tree fibre and biomass under intensive management applications. The plantation growing regimes, totaling 18 hectares, were assessed and reported on by cost, production, yield and characterization of the fibre/biomass quality. The project is the first full-life cycle recovery activity originating from the *Forest 2020 Plantation Development and Assessment Initiative*.



RECIPIENT:

**Derek Sidders,
Natural Resources
Canada**



PARTNERS:

**Alberta Pacific, FP
Innovations, UBC,
Biomass
Innovations,
Agriculture and
Agri-food Canada**



TOTAL BUDGET:

\$499,920



AI FUNDING:

\$130,000



PROJECT DATES:

**JAN 2019 –
DEC 2020**



PROJECT TRL:

**Start: 7
End: 8-9**

APPLICATION

The project investigated the economics of growing short-rotation woody crops as an alternative means of producing fibre in support of the forest bioeconomy. Trials were conducted at the Ellerslie SRWC Technical Development Site, which was managed from 2002 to 2019.

PROJECT GOALS

The primary goal of the project was to advance knowledge of fibre production from the first comprehensive, full life-cycle, short-rotation woody crop technical development site established in Canada. This was accomplished by:

- Developing novel management regimes and practices to maximize wood fibre, biomass and related GHG emission reduction production systems, using selected and suitability validated, hybrid poplar (18) and willow clones (33) under 3 to 20-year rotation regimes.
- Quantifying biomass production and validating yields, fibre quality, characteristics and extracts, and above and below ground carbon budgets.
- Examining the efficiencies of various harvesting and processing technologies.
- Analysing the economics of the full supply chain from plantation establishment and management, harvesting, recovery, processing and transportation, plus end-use values and co-benefits.
- Transfer the knowledge gained to private, industry, academic and government stakeholders.

BENEFITS TO ALBERTA

- The project demonstrated that afforestation using fast-growing woody crops can be a viable alternative source of wood fibre in addition to that provided by traditional forestry operations. This would contribute to economic diversification in the province and provide opportunities for rural areas and indigenous communities.
- Best practices were established and/or advanced by the project for species and clone selection, plantation management, harvesting and processing. This helps to decrease risk of adoption for future commercial endeavours in Alberta.
- Important data and information were generated that will help landowners, investors and fibre managers to better understand the value proposition of growing short-rotation woody crops.
- While economic returns that were calculated were low even for the most productive management system tested, higher future carbon prices would improve profitability and attractiveness.
- Opportunities promoting adoption of the best practices are contributing to nature-based climate solution like the 2 Billion Tree Program, a 3.2 billion dollar investment by Natural Resources Canada (2021-2031).



1 Report/Publication



3 Practices

CURRENT STATUS

JAN 2021

The Project was successfully completed and achieved the following: a) three novel management regimes were evaluated – high-yield, mixed-wood, and concentrated woody biomass; b) three harvesting technologies were tested (Feller-Buncher/Processor, Anderson BioBaler and the Claas Jaguar Harvester); c) biomass yields and carbon budgets were validated; and d) an economic analysis was completed.