Production of short rotation woody biomass with and without irrigation with treated municipal sewage wastewater.

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At Whitecourt, Alberta, a short rotation woody crop (SRWC) plantation is being grown with and without irrigation using treated municipal sewage wastewater. This project is part of a nation-wide Canadian Biomass Innovation Network study, led by Natural Resources Canada, which is investigating growing of SRWC's as a bioenergy feedstock. The Whitecourt site was chosen because of its accessibility for demonstration purposes, its proximity to a wastewater treatment facility, and the fact that a potential end user of the wood fibre produced (a waste-wood fired power plant) is located in the community. Five willow clones and two poplar clones are being monitored for their performance with and without irrigation. Growth, survival, biomass yield, insect and disease issues, heavy metal uptake by the willow, accumulation of heavy metals in the soil and ground water are being monitored. The use of wastewater for irrigation offers the opportunity to increase yields of willow biomass by augmenting low rainfall in western Canada, to reduce environmental impacts of waste water disposal and to decrease the need for manufactured fertilizers. This has the potential to reduce operating costs and improve the net carbon budget of plantations. At the end of the first rotation, yield increases up to 30% have been measured for some clones. No adverse effects on soil chemistry have been detected. Ground water sampling is underway. Four new irrigation installations and two biosolids installations are being developed to further test the concept of utilizing SRWC plantations for waste treatment in Western Canada.