

## **Short-rotation Woody Biomass as Alternative Energy Source for Interior and Southcentral Alaska**

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Biomass may potentially be a key component of renewable energy source in Alaska's future, and may have the advantage of being both cheaper than fossil fuels, especially in rural areas, and may result in net sequestration of carbon. However, there has been little study on management of biomass as an energy source in Alaska. We recently began several studies to determine the yield potential and overall carbon balance of willows and poplars under management intensities and practices, ranging from very limited management to intensive farming of biomass. We harvested willows and poplars from several low management areas in Alaska including willows in conservation reserve program (CRP) land near Delta Junction, willows in the Chena Flood Control Project spillway near North Pole, willows planted at the Trans-Alaska Pipeline spill site near Livengood, and poplars and willows on an experimental landfill cap at Joint Base Elmendorf-Richardson (JBER). Wood yields ranged from approximately 1/3 to 1 ton per acre per year (dry weight basis). These yields are equivalent to the energy content of about 0.2 to .5 tons coal and approximately 1 to 2.5 barrels of crude oil. Considering the cost of harvesting, hauling, drying, and processing wood for use as fuel, use of non-intensively managed poplars and willows in Interior and Southcentral Alaska for large-scale energy use is not likely to be economically feasible. However, intensive management such as short-rotation farming may produce much higher yields. We have established several studies at the Fairbanks Experiment Farm (FEF) to determine the feasibility of farming willows and poplars for energy. Rotation periods for farmed, woody biomass usually range from three to ten years; our oldest plots are currently three years old. We plan to begin harvesting a portion of our FEF plots in fall 2011 to measure biomass production on intensively managed lands. At the same time, we will evaluate the plot at JBER to help determine water requirements, biomass production, and carbon sequestration potential of coppiced woody crops.