

Harvesting Willow Rings Around Prairie Marshes

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CSBE08145

A wide variety of grass and wood species grow naturally around potholes, marshes and sloughs across the Canadian Prairies. This natural vegetation plays an important ecological role such as snow trapping and groundwater recharge, erosion control, nutrient interception, and natural habitat for wildlife. Agricultural development in the twentieth century reduced considerably the wetland area by removing the vegetation and draining the marshes. A preferred stewardship is to maintain the wetlands. The occasional removal of woody crops such as willows would rejuvenate the vegetation, thereby providing a source of biomass and maintaining the ecological function of the wetlands. Currently, only very expensive (> \$500,000) self-propelled forage harvesters exist to collect small woody crops in the form of chips. The paper presents an alternative harvest technology, based on a modified agricultural baler nicknamed a "biobaler". The prototype was used in Saskatchewan to harvest natural willow rings around sloughs. It cuts, shreds and bales the woody crop in a single pass. Harvest rates averaged 3.5 and 6.6 t wet/h on two sites of different brush density (11 and 43 t dry matter/ha, respectively). Round bales were typically 1.2 m wide by 1.35 m diameter and weighed between 250 and 350 kg wet (145 to 205 kg wet/m³). Moisture content of the harvested biomass averaged 41%. The biobaler could therefore be used to harvest naturally growing woody shrubs and provide renewable biomass from an inexpensive and currently neglected source.