

Nutrient removal in willow biomass harvested in Northern New York

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The development and commercialization of willow biomass crops for bioenergy and other applications is progressing in the northern region of New York State. Nutrient management for willow SRWC is an important factor in biomass yield, profitability and environmental sustainability, and lack of information on this topic has been an issue. As commercial production of willow expands in the northeast, there is an increasing need for research results related to nutrient management. Although nutrient requirements per unit of biomass harvested are lower for willow than agricultural crops, current fertilizer recommendations for willow can have a large financial, energy, and GHG cost and the response in biomass yield is uncertain. This study measured nutrient removal via biomass yield and nutrient concentrations in stems of 18 willow varieties harvested from two research trials in their second rotation in northern New York. Biomass yield across all plots ranged from 3-17 dry Mg ha⁻¹ yr⁻¹ and nutrient removal in harvested biomass was 19-43, 3-6, 3-12, 15-59 and 1-2 kg ha⁻¹ yr⁻¹ of N, P, K, Ca and Mg, depending on willow variety. The site by cultivar interaction was significant for N, P, K, Ca, and Mg. The cultivar SX61 had the highest average yield (12.8 dry Mg ha⁻¹ yr⁻¹) and nutrients removal of 38, 6, 10, 52, and 1 kg ha⁻¹ yr⁻¹ for N, P, K, Ca, and Mg respectively. These results, along with previous studies, can contribute to the development of nutrient management guidelines useful to commercial willow producers in the northeast.

Keywords: Salix; Short-rotation woody crops; Fertilization; Bioenergy; Shrub willow

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