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Kraft pulping characteristics and pulp properties of warm season grasses

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Abstract

Non-wood fibres are increasingly being used in the pulp and paper industry to help meet the increasing world demand for paper. Their use also helps to reduce demand on declining forest reserves. In this study several warm season grasses, prairie sandreed (*Calamovilfa longifolia* (Hook.) Scribn.), cordgrass (*Spartina pectinata* L.), big bluestem (*Andropogon gerardii* Vitman), and switchgrass (*Panicum virgatum* L. cv. Pathfinder (PF) and New Jersey 50 (NJ50)), were evaluated as potential raw materials for pulp and paper production. Raw material chemical composition, kraft pulp yield and properties, and fibre characteristics were evaluated. All these grasses were easily pulped under a mild kraft process, with pulp yields ranging from 44 to 51%, highest yields were recorded for NJ50 and big bluestem; and kappa numbers ranging from 10 to 16. The weight-weighted fibre length ranged from 1.29 to 1.43 mm, the highest value being recorded for big bluestem. The unbeaten pulp freeness ranged from 275 ml for sandreed

to 411 ml for NJ50. Sandreed, NJ50 and big bluestem had high tear indices of 7.49, 7.12 and 7.07 $\text{mN m}^2 \text{g}^{-1}$, respectively. Cordgrass and sandreed had burst indices above 5.0 $\text{kPa m}^2 \text{g}^{-1}$ (5.68 and 5.22 $\text{kPa m}^2 \text{g}^{-1}$, respectively). Other physical and strength properties are also presented.



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Keywords

Warm season grasses; Non-wood pulp; Kraft pulping; Pulp yield and properties; Fibre characteristics

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