Yield, Morphology, Composition, and Quantity and Quality of Pyrolysis Products from Kenaf Grown in Iowa

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Recommended Citation

Bourguignon, Marie; Moore, Kenneth J.; and Brown, Robert C., "Yield, Morphology, Composition, and Quantity and Quality of Pyrolysis Products from Kenaf Grown in Iowa" (2014). *Agronomy Conference Proceedings and Presentations*. 55.  
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Abstract: Yield, Morphology, Composition, and Quantity and Quality of Pyrolysis Products from Kenaf Grown in Iowa. (ASA, CSSA and SSSA International Annual Meeting)

In a world where efforts are made to become more and more independent from our petroleum economy, agriculture represents one solution to turn our society toward a bioeconomy. Kenaf (Hibiscus cannabinus) is a warm season herbaceous plant mostly used as a fiber-crop in the textile and pulp industry, but also has potential for lignocellulosic bioenergy considering the characteristics of its bast and core fibers. Midwest studies on growth and use of kenaf have been scant; however, kenaf may be promising for Iowa. Eight kenaf varieties were established in Boone County, IA between 2004 and 2007, evaluated, and compared for their production potential in the Midwest. More specifically, our questions were 1) how do kenaf varieties perform in Iowa for yield? 2) how does fiber morphology and quality differ among varieties? and 3) how does kenaf (bast and core) compare with corn and pine fiber for fuel potential from micro-pyrolysis? The results show that Tainung 2 and Whitten were the most productive varieties in Central Iowa. Variety influenced morphology and fiber composition, but each variety was different. Stem diameter, leaf:stem ratio and core:bast ratio was dependent on the year, whereas stem length was greater for Tainung 2 and core:bast ratio was greater for both varieties. Core components were sensitive to climate conditions (year) whereas bast components were more affected by genetic variability for fiber composition. Overall, Tainung 2 and Whitten would be the most promising cultivars for Central Iowa and could likely be used to diversify the Iowa agriculture.