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Abstract Title: Genome-wide Association Study on Biomass Quality Traits in Switchgrass Diversity Panel

Abstract (250 words or less): Lignin in switchgrass causes the recalcitrance in bioethanol productions. Switchgrass varieties and wild accessions provide natural variation in concentrations of lignin and its components for breeding switchgrass with higher biomass quality. Genome-wide association study is a powerful tool for detecting the genetic structure underlying nature variations of the biomass quality traits. A diversity panel of switchgrass was genotyped by exom-capture and next-generation sequencing. The associations of quality traits, including In vitro dry matter digestability, acid detergent lignin, Klason lignon, ester-bond ferulic acid, ether-bond ferulic acid, and p-coumaric acid with genetic polymorphisms were analyzed using mixed linear model with population stratification and kinship. The genomic regions close to the significant SNPs were analyzed for discovering candidate genes. The genomic regions significantly associated with the quality traits would provide insights on the genetic structure of quality traits in switchgrass and facilitate marker-assisted selection and genomic selection for switchgrass with higher biofuel production efficiency.