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**Abstract Title:** Genetic Gain in Biomass Yield of 'Kanlow' Switchgrass from Phenotypic Selection

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**Abstract (250 words or less):** Switchgrass (*Panicum virgatum* L.) is widely recognized as herbaceous bioenergy feedstock. 'Kanlow' is a lowland type switchgrass which has high biomass yield potential in the northern zone of the southern plain. Selection to further improve its biomass yield potential was initiated in 2011 at the University of Tennessee, Knoxville. Vigorous plants were phenotypically selected from four-year-old sward-plots that were previously established at the Holston Unit of East Tennessee Research and Education Center, Knoxville; and open-pollinated half-sib seeds were harvested from selected plants. The objectives of this study were to: (1) evaluate genetic variation among half-sib families and (2) estimate genetic gain in biomass yield from phenotypic selection. The half-sib families along with Kanlow parent were evaluated at two Tennessee locations, Knoxville and Crossville. The field experiment was planted in fall 2012, using a randomized complete block design with 3 replications. Each family in each replication was a single-row-plot comprised of 9 plants with 30 cm spacing between plants, and 90 cm between rows. The biomass yield was recorded in 2013 and 2014. Significant genetic variation was observed among half-sib families. Also, there was a significant genotype  $\times$  environment interaction in family performance. However, some half-sib families outperformed parental check in both locations. Mean biomass yield across environment revealed that up to 14% genetic gain in biomass yield could be achieved by selecting top 10% of superior family. Parental clones of superior families and their best progenies are being recombined to produce cultivar with improved biomass yield.