EVALUATION OF MIDWESTERN AND SOUTHERN SWITCHGRASS CULTIVARS AND GERMPLASM FOR BIOMASS PRODUCTION IN THE NORTHEAST

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Abstract

The potential for switchgrass to be used as a lignocellulosic biofuel crop as well as for direct combustion has received much attention and research because of its wide adaptability and high yields. Evaluation of switchgrass cultivars across similar plant hardiness zones and ecoregions has shown the potential to move high productive cultivars developed in the Midwest to the East. To evaluate germplasm and cultivars developed for bioenergy purposes that may be adapted to the Northeast two studies were conducted at the Big Flats Plant Materials Center on a Unadilla silt loam soil at latitude 45^{o} 07‘ 30”. Thirteen elite breeding lines from the USDA-ARS Central –East Regional Biomass Center in Lincoln, Nebraska was established on 5/22/09. The cultivar Kanlow was seeded as a control. These lines represent improvements in Kanlow and the cultivar Summer for yield and chemical compositional attributes useful for ethanol production to be used in a hybrid population breeding system for improving yield. Third year yields were obtained with no fertilizer inputs. Yields for Kanlow and for germplasm selected out of Summer (both used as parent populations for the hybrid system), and the resulting highest hybrid population line was 5.5, 4.5, and 6.4 t/ac respectively. Three lines improved out of Kanlow averaged 6.1 t/ac. An additional line in the trial is a fourth cycle of selection out of the cultivar Cave-in-Rock for improved IVDMD which averaged 5.6 t/ac. An additional study was established on 5/10/10 comparing four lines developed by the USDA-ARS U.S. Dairy and Forage Research Center in Madison, Wisconsin to cultivars Timber, Bomaster, Kanlow, Cave-in-Rock and two lines from University of Oklahoma.

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