

In-Field Weathering Influences Harvestable Biomass and Biofuel Quality of Native Warm Season Grasses

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Energy derived from direct combustion of biomass requires feedstocks low in nutrients, ash, and moisture concentrations. In-field weathering offers a practical management strategy for improving biofuel quality of the feedstock; however, prolong weathering may decrease harvestable biomass. Objective of our study is to evaluate switchgrass (*Panicum virgatum*), big bluestem (*Andropogon gerardii*), and Indiangrass (*Sorghastrum nutans*) biomass yield and biofuel quality influenced by in-field weathering in the Texas Rolling Red Plains. Replicated plots of 'Alamo' and 'Kanlow' switchgrass; 'Earl' and 9083274 big bluestem; and 'Lometa' Indiangrass were harvested for biomass at 50% seed maturity, then every 6 weeks for approximately 24 weeks (5 total harvests) during 2008-2010. Samples collected from each harvest were used to determine nutrient analyses (N, K, Ca, S), total ash, and moisture concentrations. Weathering did not significantly reduce biomass of Alamo, Kanlow, and 9083274 during 2008-2009 compared to initial harvest. Conversely, biomass was significantly reduced in 2009-2010 harvests except Earl. The greatest biomass loss occurred in the switchgrass cultivars (>50%). Effects of precipitation (rain, sleet, snowfall) received during late fall, winter, and early spring contributed to reduction in biomass. Nutrients, total ash, and moisture concentrations decreased in all grasses after initial harvest. Preliminary results indicate in-field weathering reduces nutrients, total ash, and moisture concentrations in switchgrass, big bluestem, and Indiangrass grown for biomass in the Rolling Red Plains, and biomass loss is influenced by the amount and type of precipitation received during the weathering period.

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