

Field Testing of Engineered Switchgrass with Improved Biomass Yield and Sustainability Traits

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Project Goals: Establish the scientific knowledge and new technologies to transform the maximum amount of carbon available in bioenergy crops into biofuels and bioproducts.

Switchgrass (*Panicum virgatum* L.) is a promising perennial dedicated bioenergy feedstock. It can be grown on marginal lands and produce abundant biomass. Modification of cell wall composition for improved deconstruction is an important strategy for biomass improvement. The JBEI Feedstocks team previously developed engineered switchgrass lines overexpressing rice AT10, an acyltransferase affecting ferulic acid esterification of xylan in biomass, and lines expressing QsuB, a dehydroshikimate dehydratase from *Corynebacterium glutamicum*, which results in low lignin content. These engineering strategies result in increased saccharification efficiency according to our previous studies in switchgrass and other plant species. We now conducted field tests of the engineered plants in two locations. The plants grown in 2018 and 2019 showed changes in biomass composition in general agreement with previous results, although the effects were smaller. In both years we observed that plants expressing QsuB had higher biomass yield than control plants when grown at the Davis, CA, field site.

This work was part of the DOE Joint BioEnergy Institute (<http://www.jbei.org>) supported by the U. S. Department of Energy, Office of Science, Office of Biological and Environmental Research, through contract DE-AC02-05CH11231 between Lawrence Berkeley National Laboratory and the U. S. Department of Energy.