Field testing of transgenic Sorghum variants, overexpressing 4 types of aromatic compounds

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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.

Sorghum is a unique crop for Bioenergy production, as all its parts, the grain and the stover can be used as sustainable feedstocks through various production routes. It also has low input requirements, making it an ideal candidate to improve on those natural qualities to increase feedstock production. Aromatic compounds are of particular interest for biofuel production in plants since they increase Octane ratings and the catalysis in plants provides an economic way to produce such desirable co-products. In this study, we compare the performance of 4 transgenic variants, expressing different aromatic compounds for biomass yield under non-controlled conditions: coumaric acid, Hydrobenzoic acid, Protocatechuic acid and aromatic metabolites from the shikimate pathway. After one growing season in the field, biomass yield of both grain and stover was analyzed by weight. A significant increase in total yield was only determined for lines expressing protocatechuic acid, with the majority of that increase coming from grain. These lines are therefore excellent candidates for large scale biofuel production and analysis of these lines is ongoing.

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