



Purpose

Evaluate biofuel crop productivity on various soils and microclimates across Michigan.

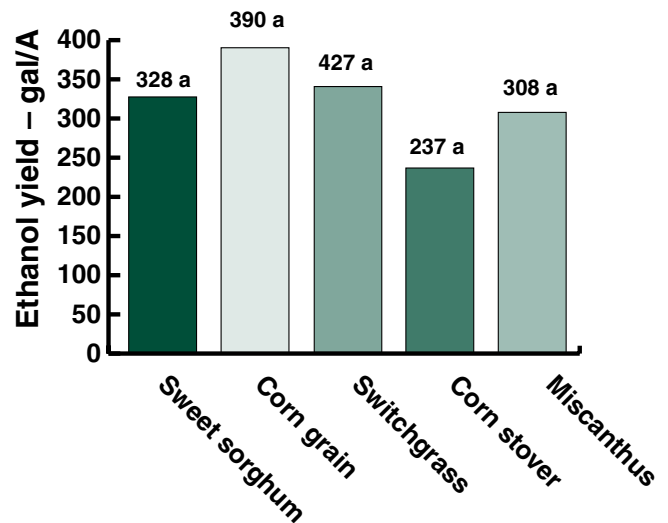
Materials and methods

This experiment was established as a randomized complete block design with four replications. Switchgrass and miscanthus were established in 2008. Whole corn plants were clipped off at 3-4 inches above ground and weighed for total biomass. Ears were separated from the stalk, shelled and grain weight and moisture recorded. Total biomass removed would be comparable to corn silage harvest. Whole plants of sweet sorghum were harvested, much like corn. A walk behind sickle bar mower was used to harvest a 28-inch swath from the center of switchgrass and miscanthus plots.

County	Isabella
Cooperator	Clyde Taylor
Nearest town	Mt. Pleasant
Soil type	Perrinton loam
Planting dates	Miscanthus 2009; switchgrass planted 2008; corn, sweet sorghum May 2010
Weed control	Switchgrass: 8 oz. 2,4-D Miscanthus: 8 oz. 2,4-D + .5 lbs/A atrazine
Fertilizer	Switchgrass and miscanthus: 95 lbs/A N (207 lbs. 46-0-0) Sorghum and corn: 40 lbs. N, P, K (207 lbs. 19-19-19) + 95 lbs. N (207 lbs. 46-0-0)
Exp. design	RCB, 4 replications

Biofuel crop	Biomass yield	Ethanol yield
Sweet sorghum	3.6 tons/A	328 a gal/A ²
Corn grain	139 bu/A	390 a gal/A ¹
Switchgrass	4.8 tons/A	427 a gal/A ²
Corn stover	2.6 tons/A	237 a gal/A ²
Miscanthus	3.4 tons/A	308 a gal/A ²

¹ bu/A X 2.8 gal/bu = gal. of ethanol/A
² tons/A X 72 gal/ton = gal. of ethanol/A



Results and discussion

Forage sorghum yielded the highest amount of ethanol per acre at 421 gallons. Corn grain and ethanol yield was significantly lower due to late planting and early frost. Grain did not reach physiological maturity, was high in moisture and low in test weight. In this study switchgrass just edged out corn stover in gallons of ethanol per acre, although they were not statistically different.

Sponsored by Project GREEN.

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