



Cropping system Other

Saginaw County

County	Saginaw
Cooperator	Bean and Beet Research Farm
Nearest town	Frankenmuth
Soil type	Tappan-Londo loam
Planting date	Miscanthus and switchgrass: May 2009 Corn, forage and sweet sorghum: May 2011
Weed control Sprayed 05/25/10	Switchgrass: 8 oz. 2,4-D Miscanthus: 8 oz. 2,4-D + .5 lb. atrazine
Fertilizer	Miscanthus and switchgrass: 95 lbs. (207 lbs. 46-0-0); Sorghum and corn: 40 lbs. N, P, K (207 lbs. 19-19-19) + 95 lbs. (207 lbs. 46-0-0)
Exp. design	RCB, four replications

Biofuel productivity plots

Purpose

Evaluate biofuel crop productivity on various soils and micro climates across Michigan.

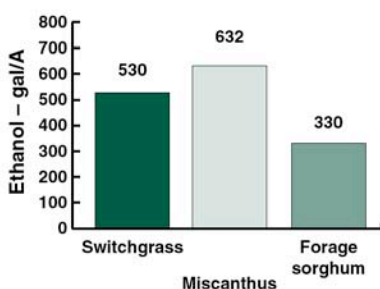
Materials and methods

The plot was established as a randomized complete block design with four replications. This plot started at the old Bean and Beet Farm in 2008 and then moved to the new location northeast of Frankenmuth. Switchgrass and miscanthus were re-established in May 2009. Corn, forage and sweet sorghum were planted 2010. Corn, forage sorghum and tropical corn were planted in May 2011. 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.

Species	2008		2009		2010		2011	
	Yield ¹	Ethanol ²	Yield ¹	Ethanol ²	Yield ¹	Ethanol ²	Yield ¹	Ethanol ²
Switchgrass	–	–	2.6	220	4.8	404	6.2	530
Miscanthus	1	119	1	82	5.5	464	7	632
Tropical corn	–	–	–	–	–	–	a	
Corn grain (bu/A)	215	603	154	432	96	268	a	–
Corn stover	4.6	391	3	261	3	231	a	–
Forage sorghum	–	–	6	513	5	395	4	330
Sweet sorghum	–	–	6	496	8	704	–	–


¹tons of dry matter/A (corn grain = bu/A).

²tons/A X 85 gal/ton = gal of ethanol/A (corn grain = bu/A X 2.8 gal/bu = ethanol/A).



Results and discussion

Switchgrass and miscanthus appear to have reached mature stands. Yields have increased over the last 3 years. These crops offer significant potential as bio-energy crops in this region. Sorghums also appear to have significant potential for ethanol yield per acre. It is important to have alternatives for farmers who might want to grow these crops. Switchgrass and miscanthus are perennial which reduces tillage and planting costs, but they lock you in long term (10 years) in order to get a return on your investment. Sorghums and corn offer more flexibility and can be rotated in or out each year. They also use more nutrients and annual tillage and planting operations. This test plot has demonstrated that a variety of crops can be planted for bioenergy purposes.



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