Miscanthus and Switchgrass Establishment Study – Kalamazoo County

Purpose

To evaluate whether propagating miscanthus and switchgrass in the greenhouse and transplanting live plants reduces the three year establishment window and which method produces the highest yield. A future objective is to add economics to the equation and determine if greenhouse propagation of these crops makes sense from an economic standpoint.

Materials and Methods

The plot was established as a randomized complete block design with four replications. The treatments include:

Miscanthus rhizomes: rhizomes were purchased and planted directly into the plot
Miscanthus transplants: rhizomes were purchased, planted in the greenhouse (6 weeks), then live plants transplanted into the plot
Switchgrass seed: Cave-in-Rock switchgrass was planted using a standard drill
Switchgrass transplants: switchgrass was planted into pots (4 inch square) in the greenhouse and transplanted into the plot

Transplants were watered once at the time of transplanting. Both miscanthus treatments were planted on a 1 meter grid spacing. Switchgrass seed was drilled in 7 inch rows. Switchgrass transplants were planted on 100 cm grid spacing.

Results and Discussion

	Yield (tons dry matter/acre)			
	2009	2010	2011	Total
Miscanthus rhizomes	1.53	3.98	8.33	13.84
Miscanthus transplants	3.72	6.52	10.19	20.43
Switchgrass seeds	1.01	2.27	2.79	6.07
Switchgrass transplants	1.44	2.88	2.62	6.94

Miscanthus transplants have yielded higher than rhizomes in all three year, producing 6.59 tons more total biomass. Switchgrass transplants produced more biomass than seeds in 2009 and 2010, but the seeds treatment caught up and produced slightly more yield in 2011. In total, switchgrass transplants produced 0.87 tons more biomass. However, additional years may prove that even though switchgrass transplants have an initial advantage, there is no overall shortening in the establishment window, indicating that propagating switchgrass in the greenhouse will not be a cost effective way to establish the crop. In order for transplants in either crop to be worthwhile, they must generate enough additional biomass to pay the extra costs associate with greenhouse and transplant operations.

County: Kalamazoo
Cooperator: Kellogg Biological Station
Nearest town: Hickory Corners
Soil type: Kalamazoo sandy loam
Planting dates: June 2009
Weed Control:
Sprayed: June 2009, 3.6 pints/acre of pendamethalin

Fertilizer:

Switchgrass: 152 #/a 46-0-0 (70# actual N) each year
Miscanthus: 207 #/a 46-0-0 (95# actual N) each year

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