January 2015

Adaptability of Miscanthus Cultivars for Biomass Production

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Abstract
In 2014, miscanthus dry matter (DM) did not differ between cultivars, averaging 10,970 lb/a. Total two-year production totaled 15,920 lb DM/a.

Keywords
bioenergy crop, dry matter, establishment

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This Forage Crops article is available in Kansas Agricultural Experiment Station Research Reports: https://newprairiepress.org/kaesrr/vol1/iss4/16
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J.L. Moyer

Summary
In 2014, miscanthus dry matter (DM) did not differ between cultivars, averaging 10,970 lb/a. Total two-year production totaled 15,920 lb DM/a.

Introduction
Miscanthus is a productive, efficient genus of warm-season perennial grass. Because of its growth potential and stalk properties, miscanthus has been identified by the U.S. Department of Energy as a possible dedicated energy crop. This study was established to compare cultivars for adaptation in eastern Kansas and to produce biomass to test for suitability as a bioenergy crop.

Experimental Procedures
Two cultivars were planted on 3-ft spacings on May 24, 2012, in four replications at the Mound Valley Unit of the Southeast Agricultural Research Center. The initial soil test indicated 18 and 280 lb/a of available phosphorus (P) and potassium (K), respectively, with 2.0% organic matter and pH 6.2 in a silty clay loam.

Plots were 3 rows, with seven plants per row. Plants were irrigated occasionally in the summer of 2012, but several were replanted in late May through early June 2013. Cultivation was performed for weed control in the summer of 2012 and once in 2013. No cultural practices were imposed in 2014. The center row of each plot was harvested on December 2, 2013, and on November 26, 2014, at 2.5-in. height, and biomass was subsampled, dried at 140°F for moisture content, and saved for analysis of biomass characteristics.

Results and Discussion
In 2013, dry matter (DM) production of the cultivars was not significantly different ($P > 0.10$) and averaged less than 5,000 lb/a (Table 1). The relatively low yield may have been partly because only 1.40 in. of rainfall was received between June 5 and July 20 in 2013, and stands were not fully established. In 2014, DM did not differ between cultivars but averaged 10,970 lb/a. The two-year production thus totaled 15,920 lb DM/a.
Table 1. Yield and dry matter of miscanthus for 2013 and 2014, Mound Valley Unit, Southeast Agricultural Research Center

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>2013 Yield</th>
<th>2013 Dry matter</th>
<th>2014 Yield</th>
<th>2014 Dry matter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>lb/a</td>
<td>%</td>
<td>lb/a</td>
<td>%</td>
</tr>
<tr>
<td>Freedom</td>
<td>5,298</td>
<td>72.2</td>
<td>11,443</td>
<td>78.8</td>
</tr>
<tr>
<td>IL clonal</td>
<td>4,586</td>
<td>70.5</td>
<td>10,505</td>
<td>78.5</td>
</tr>
<tr>
<td>Average</td>
<td>4,942</td>
<td>71.4</td>
<td>10,974</td>
<td>78.6</td>
</tr>
<tr>
<td>LSD (0.10)</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
</tr>
</tbody>
</table>