

Kansas Agricultural Experiment Station Research Reports

Volume 1
Issue 4 *Southeast Agricultural Research Center
Reports*

Article 16

January 2015

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Recommended Citation

Moyer, J. L. (2015) "Adaptability of Miscanthus Cultivars for Biomass Production," *Kansas Agricultural Experiment Station Research Reports*: Vol. 1: Iss. 4. <https://doi.org/10.4148/2378-5977.1066>

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Adaptability of Miscanthus Cultivars for Biomass Production

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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Adaptability of Miscanthus Cultivars for Biomass Production

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

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