

Kansas Agricultural Experiment Station Research Reports

Volume 2
Issue 3 *Southeast Agricultural Research Center
Reports*

Article 7

January 2016

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Recommended Citation

Moyer, J. L. (2016) "Adaptability of Miscanthus Cultivars for Biomass Production," *Kansas Agricultural Experiment Station Research Reports*: Vol. 2: Iss. 3. <https://doi.org/10.4148/2378-5977.1192>

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Adaptability of Miscanthus Cultivars for Biomass Production

Abstract

In 2015, miscanthus dry matter (DM) did not differ between cultivars, averaging 10,250 lb DM/a. Total three-year production for the cultivars was also similar, averaging 26,170 lb/a.

Keywords

pastures, hay

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Adaptability of Miscanthus Cultivars for Biomass Production

J.L. Moyer

Summary

In 2015, miscanthus dry matter (DM) did not differ between cultivars, averaging 10,250 lb DM/a. Total three-year production for the cultivars was also similar, averaging 26,170 lb/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; however, no further cultural practices have been performed. The center row of each plot was harvested at 2.5-in. height after each growing season, occurring in 2015 on December 10. At harvest, biomass was subsampled, dried at 140°F for moisture content, and saved for analysis.

Results and Discussion

Each year, dry matter (DM) production of the cultivars was similar ($P > 0.10$, Table 1). In 2013, average yield was less than 5,000 lb/a, because only 1.40 in. of rainfall was received between June 5 and July 20, and stands were not fully established. In 2014 and 2015, DM production did not differ between cultivars, averaging 10,970 and 10,250 lb/a, respectively. The three-year production thus totaled 26,170 lb DM/a, for an average yield of 8,720 lb/a/yr.

Table 1. Yield and dry matter of miscanthus for 2013 and 2014, Mound Valley Unit, Southeast Agricultural Research Center

| Cultivar | 2013 | | 2014 | | 2015 | |
|------------|-------|------------|--------|------------|--------|------------|
| | Yield | Dry matter | Yield | Dry matter | Yield | Dry matter |
| | lb/a | % | lb/a | % | lb/a | % |
| Freedom | 5,298 | 72.2 | 11,443 | 78.8 | 10,750 | 70.5 |
| IL clonal | 4,586 | 70.5 | 10,505 | 78.5 | 9,758 | 69.9 |
| Average | 4,942 | 71.4 | 10,974 | 78.6 | 10,254 | 70.2 |
| LSD (0.10) | NS | NS | NS | NS | NS | NS |