

Planting and Managing Giant Miscanthus (*Miscanthus x giganteus*) in Missouri for the Biomass Crop Assistance Program (BCAP)

This fact sheet is a reference to address some of the most common questions and concerns about planting and managing giant miscanthus for the Biomass Crop Assistance Program (BCAP) in Missouri. For more complete information please refer to *Planting and Managing Giant Miscanthus as a Biomass Energy Crop, Technical Note No. 4 – July 2011*. <http://plant-materials.nrcs.usda.gov/pubs/NPMtechnotes/npmpntn4.pdf>



Giant miscanthus that is 13 feet tall in November at Elsberry, Missouri.

Biomass Crop Assistance Program

The BCAP is administered through the USDA-Farm Service Agency and provides financial incentives to eligible landowners and operators to establish and produce biomass crops for heat, power, bio-based products, and advanced biofuels. Certain counties and areas have been identified by the Secretary of Agriculture to be eligible for the establishment of giant miscanthus for energy purposes. Contact your local USDA Service Center for more details and to see if you qualify.

Giant Miscanthus

Giant miscanthus is a sterile hybrid warm season grass that is native to Asia. It is established by planting rhizomes (underground spreading stems).

Site Location

Giant miscanthus can be planted in a wide range of soils. The best production is expected on soils that are well drained, have a pH between 5.5 and 7.5, and have medium to high fertility. However, acceptable yields from more marginal lands are possible assuming they meet appropriate crop growth requirements and Conservation Practice Standards (CPS) are met. Sites

with high water tables in the winter or early spring should be avoided because harvest with large equipment during those times might not be possible. In order to prevent unintentional spread giant miscanthus fields should not be located in flood plains, in areas subject to flooding, in areas of potential gully erosion, or near sensitive natural areas. Fields of giant miscanthus pose a considerable fire risk and adequate field borders (30-100 ft) should be used near structures, utilities, and adjacent fields or wild land areas to prevent accidental fires from escaping.

Prevent Unintentional Spread

Limited information exists on the invasive potential of giant miscanthus in the United States, for this reason best management practices (BMP) should be used. Establish and maintain a minimum 25-foot border around a giant miscanthus stand to monitor and manage any spread. Cover or otherwise contain vegetative planting material (rhizomes) during transportation, planting, and harvest operations when outside the boundary of the production field. When planting or harvesting operations are complete, inspect and remove all residual vegetative material from equipment. Any excess live planting material or material that has the potential to produce a plant should not be disposed of at field edges, field borders, in farm “trash” piles, or in landfills. This material should be hand planted or disposed of in a manner that follows the guidelines in *Planting and Managing Giant Miscanthus as a Biomass Energy Crop, Technical Note No. 4 – July 2011*.

Site Preparation

Field preparation is important for successful field establishment. Planning for the establishment of a giant miscanthus field should begin at least 1 year prior to the planting. A soil test to determine pH and nutrient levels should be taken about a year prior to the planting date. If pH needs to be adjusted, amendments should be included at least 6 months prior to planting. If the soil test indicates that nutrient levels are adequate for grass establishment fertilizer is not recommended for the first two years. If the soil test indicates that nutrient levels are not adequate the fertility can be adjusted to the recommended ranges.

If the site is in crop production then little, if any, site preparation may be necessary. However, herbicide residuals from previous crops may impact the establishment of giant miscanthus and should be

considered. If the proposed site is in pasture or perennial grass an appropriate broad-spectrum herbicide should be applied to kill the existing vegetation and follow-up treatment may be required. Types of herbicides used and timing of application will vary and an application of pre-emergence herbicides registered for biomass production of giant miscanthus may be needed.

Tillage operation (e.g. disking, harrowing, culti-packing) and timing will depend on the site and herbicides used but the goal should be to have the site finely tilled to a depth of 6 inches prior to planting.



Planting of giant miscanthus using a water wheel vegetable transplanter. Picture taken at Elsberry, Missouri.

Planting

Rhizomes that are harvested to establish other fields should be used as soon as possible, but can be stored for some time if kept cool and moist. Fields can be planted anytime after the last frost, which occurs around April 15 in Missouri. Rhizomes should be planted between 2 and 4 inches deep in a moist soil. Planting rates can vary depending on many factors but the desired final population is between 4,000 and 5,000 plants per acre. This usually requires planting 6,000 to 7,000 rhizomes per acre. The recommended spacing in Missouri is 30-inch rows with 30-inch spacing between plants. This spacing can be adjusted depending on desired final stand populations. A modified corn planter, potato planter, or a vegetable planter can be used to plant rhizomes. After planting rhizomes the field should be rolled to ensure good soil contact with the rhizomes.

Weed Management

Weed control is critical during the establishment year and should include a combination of avoidance, cultivation, and both pre- and post-emergence herbicide application. After the establishment year, dense stands of giant miscanthus should suppress weed establishment and further herbicide applications might not be necessary. Consult with your local extension weed specialist for herbicide recommendations for use in establishment of giant miscanthus.

Biomass Harvest

Studies at the NRCS Plant Materials Center in Elsberry, Missouri suggest that yields of 10-12 tons/acre with input of 50-100 pounds of nitrogen after the establishment year are possible with optimal harvest time between November and February for Missouri. Optimum harvest time for giant miscanthus is when it contains less than 20% moisture. Harvesting too late may harm stands by damaging emerging shoots. When harvesting, 2-4 inch stubble should be left to maximize harvest yield yet avoid picking up leaf litter, which may reduce biomass quality.



Emerging shoots of giant miscanthus in early spring. Care should be taken to not harvest too late and damage these shoots by driving equipment over them.

Approved Cultivars

Currently the only giant miscanthus that is approved for BCAP in Missouri is the "Illinois clone" cultivar that is certified by the Ohio Seed Improvement Association quality assurance program.

Referenced Literature

USDA-Natural Resources Conservation Service. 2011. Planting and harvesting giant miscanthus as a biomass energy crop. Plant Materials Program, Technical Note 4. <http://plant-materials.nrcs.usda.gov/pubs/NPMtechnotes/npmptn4.pdf> Accessed 16 August 2011.

Citation

Casey, Allen, J. Kaiser, and R. Cordsiemon. 2011. Fact Sheet for Planting and Managing Giant Miscanthus in Missouri for the Biomass Crop Assistance Program (BCAP). USDA-Natural Resources Conservation Service, Plant Materials Center. Elsberry, MO 63343.

Published: *September, 2011*

For more information about giant miscanthus and the Biomass Crop Assistance Program, please contact your local USDA Service Center or the Plant Materials Program Web site. <<http://plant-materials.nrcs.usda.gov>>