Volume 11, Issue 1

February 2004

Mid-South Plant News

A Jamie L. Whitten Plant Materials Center Publication

Developing Seeding Rates

Do you ever wonder where the seeding rates listed in PMC planting guides or brochures came from? When we release a new plant, we determine its recommended seeding rate based on two factors: 1) the number of seeds per foot of row (or per square foot for broadcast plantings) required to produce an acceptable stand, and 2) the average number of seeds per pound. (Note: seeds per pound can vary from one selection or cultivar to another of the same species.)

First, we calculate the number of seeds required per acre. In this example, we wish to plant 5 eastern gamagrass seeds per foot of row and the spacing between rows is 30 inches. To determine seeds per acre, we multiply the number of square feet in an acre (43,560) by the number of inches in one foot (12). We divide this number by the row spacing (30) and then multiply by the number of seeds per foot of row (3). (43,560 x 12) / 30 x 3 = 52,272 seeds per acre. For a broadcast planting, this calculation is much simpler. If we want to broadcast 100 seeds per square foot of arrowleaf clover, we multiply the number of square feet in an acre (43,560) by the number of seeds per square foot (100) to determine the number of seeds required per acre. 43,560 x 100 = 4,356,000 seeds.

To determine the seeding rate, we divide the number of seeds per acre by the number of seeds per pound. In the first example, we will be using 'Highlander' eastern gamagrass. It averages 3,150 seeds per pound. The seeding rate is 52,272 / 3,150 = 16.6 pounds of seed per acre. In the second example, using 'Meechee' arrowleaf clover (320,000 seeds per pound) the planting rate would be 4,356,000 / 320,000 = 13.6 pounds of seed per acre.

Often seed lots of native plants do not have high germination and/or purity values. To account for this, seeding rates will often be expressed on a pure live seed (PLS) basis. You will need to know how much bulk seed to plant to achieve the recommended pounds of PLS. Assume you want to plant 5 PLS pounds of a little bluestem seed lot with 80 percent purity and 80 percent germination. First, you calculate the percent PLS of your seed lot by multiplying the percent purity (80) by the percent germination (80) and dividing by 100. 80 x 80 / 100 = 64 percent PLS. Then, you divide the PLS seeding rate (5) by the percent PLS and multiply by 100. 5 / 64 x 100 = 7.8 pounds of bulk seed are needed. As a short-cut, you can use the PLS/bulk rate conversion table in Appendix A.2 of the Mississippi Planting Guide. If you would like a copy of this table, contact the PMC.

Bamboo for Pandas Provides Publicity for PMC

The Asiatic bamboo species being harvested at the PMC for the pandas, Ya Ya and Le Le, at the Memphis Zoo have led to a featured article in USDA News and local interest stories on both a local news broadcast and on Ag Day, a program of the Mississippi Educational Broadcasting Network. The cooperative effort between NRCS and the Zoo was also the topic for the winter meeting of the Mississippi Chapter of the Soil and Water Conservation Society. Who would have thought that the plants we have barely tolerated for all these years would provide so much exposure for the PMC?

Inside this Issue:

We're on the Web

Plant-Materials.nrcs.usda.gov

NRCS Natural Resources Conservation Service

Switchcane Propagation Methods

Switchcane (*Arundinaria gigantea*) is a culturally significant plant for the Mississippi Band of Choctaw Indians. Many of the local stands they utilize are declining and restoring these stands is difficult because the plants are not easy to propagate.

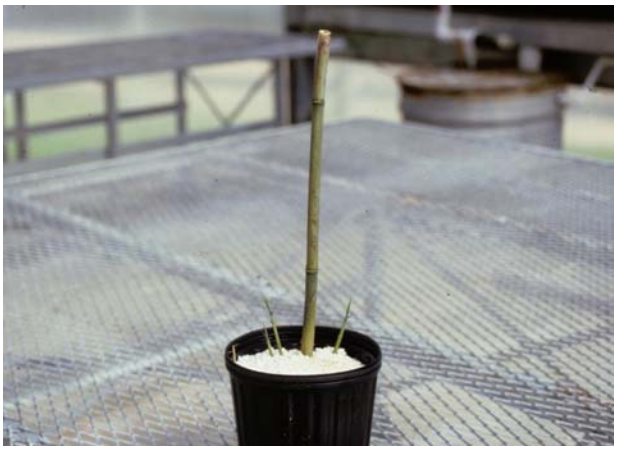
In February of 2001, we attempted to propagate switchcane in the field using two types of propagules, rhizomes with stems (culms) attached and culms with no rhizomes. We included a fertilizer treatment (250 lb/acre of 13-13-13) for each propagule type, because other researchers had seen some benefit from fertilization. We used two selections of switchcane, one was material provided by the Tribe from their stands and the other was a dwarf form (ssp. tecta) that we had previously selected as a good candidate for erosion control plantings. The dwarf forms of switchcane have been shown to be easier to propagate than the larger, species forms.

Culm with attached rhizome of the larger, species form of switchcane

None of the species propagules survived, nor did any of the culms alone of the dwarf form. Rhizomes with attached culms of the dwarf form successfully established at a rate of 37%. There did not appear to be any beneficial effect from the fertilizer treatment. Obviously, we were not going to be able to help the Choctaws restore their stands of the species type with field propagation.

We thought that wet soils may have been the main culprit for the poor field survival, so we wanted to look at greenhouse propagation, where we could better control the environmental conditions. We tested three different growing mediums: perlite; 1:1 (v/v) perlite/peat moss; and Pro-Mix BX commercial potting soil, which contains peat moss, perlite, and vermiculite as the major components. We planted culms with attached rhizomes of the dwarf form in 1 gallon pots in March of 2002 and grew them in the greenhouse.

By June, 100% of the propagules in the Pro-MX medium and 90% of propagules in the other two media had survived and initiated new growth. Plants growing in the perlite medium were slightly more vigorous than those in the other two media, but they would be more difficult to transplant into the field because the perlite would not remain around the root ball when it was removed from the container. There were no differences in the number of new culms produced between the three growing mediums.



Propagule of the dwarf form in perlite growing medium initiating new culms in the greenhouse

Although we did not have propagules of the species form to test in the greenhouse, we do feel that greenhouse propagation might be a feasible method for restoring stands of switchcane. We would recommend that culms with attached rhizomes be grown in a well-drained commercial potting medium, such as the Pro-Mix BX used in this study.

Switchcane plants the year after planting growing in Pro Mix BX, perlite/peat moss, and perlite (l to r)

Bioengineering Techniques Used in PMC Ditch Renovation

In 2003, the PMC was able to address erosion problems that were occurring along our main ditch and around several pipe structures. The pipe structures had been installed in the 1960s and had reached the end of their useful live years ago. The pipes were replaced with new drop-inlet structures and the ditch was cleaned out, graded, and rip rap was installed at the toe and one third of the way up the slope.

Ditch before repairs

Ditch after repairs

The drop-inlets were installed during the summer. The work on the ditch was not completed until December, which limited our revegetation choices. The contractor seeded the upslope with wheat and bermudagrass. Due to the late planting date, little of the wheat became established; however, the wheat straw mulch applied at planting has thus far prevented excessive erosion on the site. The bermudagrass should fill in next summer.

Now that this work has been completed, we have an ideal site at the PMC to demonstrate bioengineering techniques. In January, we took cuttings of the shrub willow, Morton Germplasm, that we released in 2001. A small section of the ditch was planted with unrooted cuttings. Growth and survival of these cuttings will be compared to rooted cuttings that will be planted later this summer. Longer stakes were also taken and bundled in fascines that were also planted along the ditch.

Bundles of unrooted willow cuttings

This is a long ditch and the willow cuttings we took this year will not plant its entire length. Down the road, we would also like to demonstrate other revegetation techniques such as erosion control mats or reinforcement materials and we would also like to incorporate native plant materials. If you have any suggestions for techniques that you would like us to try or if you want to view the results of our plantings, please contact us.

Jon Allison and James Pomerlee planting fascines on ditch bank

JAMIE L. WHITTEN PMC
COFFEEVILLE, MISSISSIPPI

USDA – NATURAL RESOURCES CONSERVATION SERVICE

Jamie L. Whitten Plant Materials Center
2533 County Road 65 Coffeeville, MS 38922
Phone: 662-675-2588 Fax 662-675-2588

PMC Staff

Joel Douglas – Manager
Janet Grabowski – Agronomist
Patricia Taylor – Secretary
James Pomerlee – Gardener
Jon Allison – Gardener

Jon and Lynn Ellison inspecting pecan seedlings

PMC Highlights

July 7	*Janet Grabowski and Joel Douglas gave a tour of the PMC to individuals from the University of Louisiana, Lafayette and provided information on wildflower seed production.*
October 16-17	*Plant Materials Technical Committee Meeting held at PMC.*
October 17-18	*Janet Grabowski gave a presentation on wildflowers at the Fall Field Day at the Truck Crops Branch Experiment Station, Crystal Springs, Mississippi.*
October 10	*Janet Grabowski and James Pomerlee provided plant materials and farm equipment training to new Soil Conservationists from Mississippi Area 1 at the PMC.*
October 21	*Janet Grabowski gave tour of the PMC to the Yalobusha County Homemakers Club.*
November 11	*Joel Douglas gave information on bamboo for the pandas at the Mississippi Chapter of the Soil and Water Conservation Society, Memphis Zoo, Memphis, Tennessee*
December 8-10	*Joel Douglas gave a poster presentation on 'Highlander' eastern gamagrass at the National Grazinglands Conference, Nashville, Tennessee*

Ask the Expert

Q. How do you care for bareroot seedlings of trees and shrubs before planting?

A. Immediately open the shipping containers and inspect the seedlings for signs of damage or disease and to ensure that the seedlings are still fully dormant. It is best to plant the seedlings without delay, but if this is not possible, they can be stored for short periods of time. Ideally, they should be stored at a constant temperature of 33 to 35 °F and 90 to 95% relative humidity. An environmentally controlled cooler is required to maintain these conditions. If a cooler is not available, they can be stored in a cool room or garage, but they can only be stored under these less controlled conditions for 2 to 3 days, whereas they can be stored for up to two weeks in a cooler. PMC Plant Note Number 4 contains more complete information on handling and storing bareroot seedlings before planting. Please contact the PMC if you would like a copy of this publication.