2008 Activities Report

Rose Lake Plant Materials Program

East Lansing, Michigan

2008 Rose Lake Plant Materials
Program Progress Report of Activities

Who We Are:

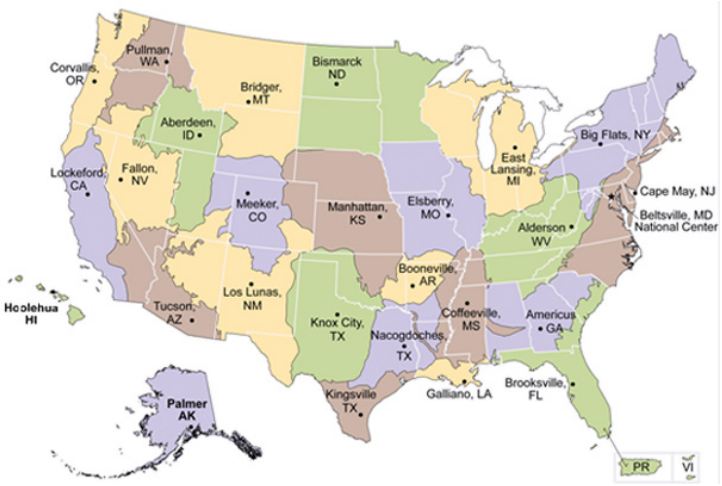
The mission of the NRCS Plant Materials Program is to develop and transfer effective state-of-the-art plant science technology to meet customer and resource needs. The Rose Lake Plant Materials Center (PMC) was established in 1958 to develop plant materials and plant technology for use in natural resource conservation activities.
There are 27 Plant Materials Centers nationwide, each serving a particular geographic area. The Rose Lake Program serves Indiana, Michigan, Ohio, and Wisconsin. It also serves portions of Illinois, New York, and Pennsylvania.

Program Emphasis:

The activities of the Rose Lake PMC are guided by a long-range plan. Priority work areas include

- Plant releases, seed and plant production
- Plant technology development
- Grazing lands enhancement
- Assistance to under-represented groups

This document highlights some of the major activities of the Rose Lake Plant Materials Program during 2008. For detailed information, contact the Rose Lake PMC or the Michigan NRCS Plant Materials Specialist. (see page 10)



Staff:

John W. Leif	PMC Manager	David W. Burgdorf
John Durlng	Agronomist	Plant Materials Specialist
Sergio Perez	Biological Technician	
Elaine Gerona	Administrative Assistant	
Gail Bischoff	Biological Aide	

Tall wheatgrass from Hungary evaluated for energy production.

The Rose Lake Plant Materials Center is evaluating a tall wheatgrass [*Thinopyrum ponticum* (Podp.) Z.-W. Liu & R.-C. Wang] cultivar from Hungary for its potential as an energy crop. The study is part of a multi-center project comparing this cultivar, 'Szarvasi-1' against several commercial varieties of tall wheatgrass and a cultivar of reed canarygrass. The Big Flats PMC (New York) and the National PMC (Maryland) are also conducting this study. Other PMCs across the country are conducting similar studies tailored for their environmental conditions.

The study at the Rose Lake Plant Materials Center was established on September 12, 2007. Mr. Brian Graff, manager of the Michigan State University Agronomy Farm, supplied a plot seeder and operated the planter during establishment of the study. Seed was pre-weighed and organized according to the randomization plan for the trial. The plot seeder uniformly planted the seed in each plot, ensuring planting consistency across the study. Plots were evaluated in 2007 for initial stand establishment and photographs were taken of each treatment.

Data for stand counts, plant height, and biomass production were taken in 2008 and forwarded to the project leader for incorporation into the national database for the project. Similar data is scheduled for collection in 2009 and 2010.

Brian Graff (MSU), John Durling and Sergio Perez (NRCS) planting tall wheatgrass experiment

'Szarvasi-1' tall wheatgrass 4 weeks after planting

Why is Ash preservation important?

That is a question often asked when Plant Materials Center staff or the Plant Materials Specialist presents information on the Ash Seed Collection Initiative. Some answers to that question include preserving genetic diversity within the various *Fraxinus* species; providing genetic resources for developing resistance to the Emerald Ash Borer; providing a mechanism for assuring the survival of important plant species in the landscape; and a host of other good "biological" reasons. One aspect of Ash preservation that is often overlooked is the effect that the loss of Ash, especially Black Ash, would have on the culture of many Native Americans.

Dave Burgdorf, Plant Materials Specialist, presented information on the Ash Seed Collection Initiative at a Tribal meeting last April. At least eight tribes from Michigan, Indiana, and Wisconsin were represented at that meeting. Among the presenters at that meeting were several basket makers, who use Black Ash wood to create the baskets that are as beautiful and artistic as they are practical. The basket makers described the process of locating and harvesting Black Ash trees in the wetlands, making strips of ash wood, and creating the baskets with all the detail of an artisan. A special emphasis was placed on teaching the young people in their tribes the techniques and art of material preparation and basket weaving.

Display of black ash baskets along with demonstrations of basket weaving techniques from Tribal members

Ash Seed Collection Initiative

Statistics for 2005, through 2008. Total number of samples sent to long term storage.

Type of Ash	2005	2006	2007	2008	2008 Tribes
Green	2	24	5	39	9
White	3	68	4	41	
Black	3	22	1	29	24
Other	0	1	2	2	

Rose Lake Plant Materials Center works with Fort Custer Military Training Center to propagate and install native forbs and grasses.

The Rose Lake Plant Materials Center has had an excellent working relationship with Fort Custer Military Training Center, located in Southwest Michigan near Agusta, for the past four years. The PMC has assisted the Fort in efforts to renovate a training area that had become overgrown with woody plants and other undesirable plant species by providing technical assistance in site preparation and propagating warm season prairie grasses for the site.

In 2007 the Fort and the PMC initiated a project to collect and propagate approximately 100 species of forbs, cool season grasses, and sedges that are native to the Fort, and re-introduce those plants onto the training area. In addition to introduction to the training area, the PMC assisted the Fort in establishing seed production blocks of 24 species that were of special interest to the Fort Custer environmental staff. Seeds were collected by cooperators at Native Connections, a native seed supplier in southwest Michigan.

Seeds were sent to the PMC for cleaning, stratification, and propagation. Those efforts resulted in 77 species of forbs, grasses, and sedges being propagated and installed at the Fort in 2008. Plants were installed as plugs into existing vegetation using a modified tree planter. The planter had a no-till coulter and furrow opening system which allowed the plants to be transplanted into existing vegetation. This system provided minimal disturbance of the soil, good root to soil contact, and minimal moisture loss. Timely rains following planting helped insure good plant survival.

Preparing seed production block using weed barrier fabric

Planting seed production block using container grown plants

Planting forbs, grasses, and sedges in renovated prairies at Ft. Custer Training Center

Vegetative Barrier field planting installed in Allegan County, Michigan

In 2007 the Michigan NRCS Plant Materials Committee toured a Vegetative Barrier field planting that was installed in 2002 at the Michigan State University Kellogg Biological Station in Southwest Michigan. As a follow-up to that tour the Committee placed a priority on establishing an additional planting to provide training on planning and installation of the practice, and evaluate the practice under different field conditions. Data from that field planting were presented as a poster at the American Society of Agronomy meeting in Houston, Texas. (see page 7).

In November of 2007 the Rose Lake Plant Materials Center established 900 linear feet of *Miscanthus sinensis* vegetative "sod strips" in the greenhouse. Each sod strip was 3-in wide and 6-ft long. A layer of plastic was installed over a wire frame, and coconut fiber was placed inside the plastic. A peat based potting media was used to grow the *miscanthus. Miscanthus* vegetative material was excavated from a source block maintained at the Rose Lake PMC. *Miscanthus* crowns were placed at 3-in intervals within each sod strip. The *miscanthus* was allowed to grow in the greenhouse until it was transported to the field location for installation in May of 2008. Each sod strip had good root development and the strips did not break apart while being handled.

The field planting in Allegan county was planned according to the NRCS Vegetative Barrier (601) Practice Standard and adjusted to accommodate the landowner's planting and spraying equipment. Two watersheds in the field were treated with the practice, using three vegetative barriers in each watershed. Two trenches, approximately 18-in apart, were created at each barrier location with a walk behind trencher. The vegetative sod strips were placed in the trenches and soil was moved back into the trench. NRCS personnel from several field offices participated in the planting, which took approximately four hours. Survey measurements were taken above and below each barrier on a grid pattern. Survey measurement will be repeated several times over the next five years.

Greenhouse production of Miscanthus vegetative sod strips

Field installation of vegetative sod strips by NRCS Field Office personnel

Anne Marie Chavez, Allegan Co. Field Office surveying site with GPS.

Miscanthus Vegetative Barriers for Soil Conservation: Case Study in a Michigan Corn and Soybean Production System

Authors

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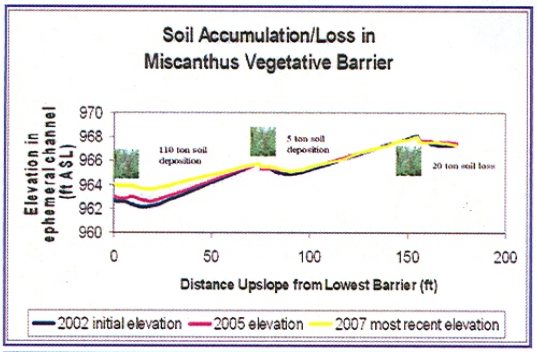
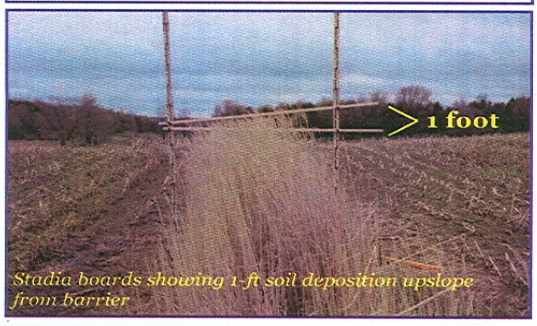
Abstract

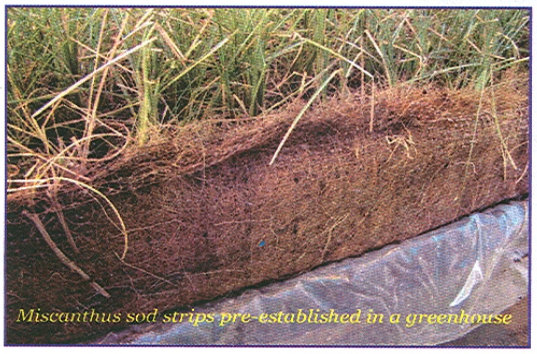
Grassed waterways (NRCS 412 Standard) are a recommended conservation practice for healing ephemeral gully erosion. Waterways convey concentrated-flow water, reduce gully erosion, prevent flooding, and limit sediment and/or nutrient loss to surface water. However, recent increases in commodity prices effectively discourage farmers from using grassed waterways. Vegetative barriers, a less land-area extensive conservation practice, can be a viable option. A designed narrow vegetative barrier (NRCS 601 Standard) of *Miscanthus sinensis* was evaluated for its effectiveness as an alternative to a grassed waterway. Five years of upslope soil deposition data from three vegetated *Miscanthus* barriers installed across a concentrated flow within a small watershed is presented. Technology used for establishing the *Miscanthus* vegetative barriers is also presented.





Stadia boards showing 1-ft soil deposition upslope from barrier

Sod strip is transported to field and inserted in trench



Miscanthus sod strips pre-established in a greenhouse

Vegetative Barriers

Permanent strips of stiff, dense vegetation along the general contour of slopes or across concentrated flow areas designed to:

- Reduce sheet and rill erosion
- Reduce ephemeral gully erosion
- Manage water flow
- Stabilize slopes
- Trap sediment

Results

- *Miscanthus sinensis* accession was not invasive at evaluation sites
  - did not produce viable seed in 15 years of testing
  - did not escape from original plantings
- *Miscanthus* vegetative barriers performed conservation functions
  - managed water flow, stabilized slopes, and trapped sediment
  - removed very little land from production
  - eased farming through concentrated flow areas
  - emerged through sediment and resumed growth from buried nodes
  - remained intact and erect year around
  - provided immediate functionality when installed as sod strips
- *Miscanthus* is long-lived
  - 15 years in field planting at Rose Lake Plant Materials Center
  - 6 years in vegetative barrier at Kellogg Biological Station

Materials & Methods

- *Miscanthus sinensis* evaluated for adaptation and seed production in several eastern and Midwestern states over 15 years
- Erosion-prone corn and soybean field site (Kalamazoo loam, 2-6% slopes and Oshtemo sandy loam, 6-12% slopes) selected at Kellogg Biological Station in Southwest Michigan (42.5° N, 85.4° W)
- *Miscanthus* vegetative sod strips pre-established in greenhouse
- Two parallel trenches dug for sod strips with walk-behind trencher
  - 18-inches between barriers
  - Across concentrated flow areas according to NRCS 601 specifications
  - Spaced to accommodate corn and soybean production equipment
- Soil deposition measured for five years using grid survey

References

Douglas and Mason. 1996. An Alternative Erosion Control Practice for Cropland. USDA-NRCS Whitten Plant Materials Center. Tech. Note Vol. 12 No. 7.

Leif, Durling, and Burgdorf. 2008. Establishment of Vegetative Sod Strips in Greenhouse for Use in Vegetative Barriers. USDA-NRCS Rose Lake Plant Materials Center. Plant Materials Tech. Note No. 3.

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Meyer, Dabney, and Kemper. 2001. Designing Research to Improve Runoff and Erosion Control Practices: Example, Grass Hedges. Pages 447-452. *In* Stott, Mohtar, and Steinhardt (eds). 2001. Sustaining the Global Farm.

Temple and Dabney. 2001. Slowing the Flow: Grass Hedges to Catch Runaway Soil. Agricultural Research/October 2001, p. 21.

USDA-NRCS. 2001. Vegetative Barrier Conservation Practice Standard 601. National Handbook of Conservation Practices.

Plant Materials Program partners with Logan County, Ohio Health Department to address constructed wetland vegetation.

The Logan County, Ohio NRCS Field Office and the Logan County Health Department contacted Plant Materials Specialist Dave Burgdorf for plant recommendations on a residential septic system constructed wetland. Through a series of discussions with the Health Department, Ohio NRCS Plant Materials Committee, and the local NRCS Field Office, a study was developed to evaluate several plant species for effectiveness in a constructed wetland system.

The Rose Lake Plant Materials Center propagated prairie sandreed, prairie cordgrass, sweetgrass, Canada bluejoint, and wool grass for the project. Each species was planted in three different areas of the wetland, representing the inlet, middle, and outlet areas of the wetland. The Ohio NRCS Plant Materials Committee and the Logan County NRCS Field Office, in coordination with the Logan County Health Department installed the plantings in May. Evaluations will be taken on the project for the next five years to determine survival, spread, and vigor of each species.

Ohio NRCS Plant Materials Committee and the Logan County Health Department installing field plantings on constructed wetlands.

Rooting Ability of Dormant Woody Species

A study to document and photographically depict the rooting ability of dormant woody plant materials was conducted in 2007. A follow-up study was conducted in 2008 to evaluate additional materials for their ability to generate roots for soil bioengineering techniques. Dormant cuttings of 45 species were collected by 11 Plant Materials Centers and sent to the Rose Lake PMC in February.

Two-foot long dormant cuttings were placed horizontally below the soil media surface in optimum-growth, greenhouse conditions. Shoot emergence and growth data were recorded. Whole plants, including root systems, were harvested, washed, and photographed. A similar process was used with vertically positioned cuttings. Digital photographs were taken by Brian Buehler, Michigan NRCS Public Affairs Specialist. Brian added titles to each photograph and will help to develop a technical note from the results of this study.

Soil bio- or soft engineers commonly use dormant cuttings of tree and shrub species (e.g. willow and buttonbush) for stream corridor and shoreline stabilization. Dormant plants are placed in the ground as fascines (horizontal bundles of sticks) or live stakes. Rose Lake PMC's study quantitatively and photographically documented the potential suitability of various species for these applications.

A special thanks to the following PMC's for contributing material to this project:

New York PMC
Colorado PMC
West Virginia PMC
Idaho PMC
Oregon PMC
California PMC
Kingsville, TX PMC
Washington PMC
New Mexico PMC
Florida PMC

Equipment Training conducted at Rose Lake Plant Materials Center

The Michigan NRCS Major Land Resource Area (MLRA) soil scientists came to the Rose Lake PMC for training on the use of a Kubota tractor with backhoe they will be using for MLRA activities. A representative from Capital Equipment and Supply provided training on the use of the tractor and backhoe, emphasizing safety aspects of the machine and discussion of the controls. Fred Gasper, NRCS engineer, presented a discussion on trench safety which included determination of utilities, preventing cave-ins, and personal protective equipment. Each participant operated the backhoe in order to become familiar with the machine and its controls.
A representative from the Michigan Truck Safety Council provided training on securing equipment on a trailer. He covered how to determine the capacity of the truck/trailer, methods for securing cargo to the trailer, types of binders (chains, nylon straps, tighteners) and provided hands-on training using the Kubota tractor with a truck/trailer from the PMC. Each participant loaded and unloaded the tractor/backhoe, and was shown how to secure the unit to the trailer.

Backhoe safety and trailer loading training

Conferences and Symposia's

- *Autumn Fest 2008, East Lansing, MI (Providing information on the Ash Seed Collection Initiative)*
- *Miscanthus Vegetative Barriers for Soil Conservations Poster Presentation, Houston, TX*
- *Ash Seed Collection Initiative , Plainwell, MI (Discussion on the Ash Seed Program)*
- *Michigan Farm Conference, Battle Creek, MI*
- *Michigan NRCS Tribal Conference,, East Lansing, MI*
- *Pesticide Application and Sprayer Calibration, Ann Arbor, MI*

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