



BIG FLATS PLANT MATERIALS CENTER PROGRESS REPORT OF ACTIVITIES FOR YEAR 2006

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The Big Flats Plant Materials Center (PMC) is one of 27 plant materials centers operated by the United States Department of Agriculture, Natural Resources Conservation Service. Areas served by the center include the Northeast, from Maine to northern West Virginia. The center is located in the Finger Lakes region of New York State.

PLANT MATERIALS PROGRAM

It is our mission to develop plant materials and state-of-the-art plant science technology for the conservation of natural resources and meet the objectives of environmental programs. We focus on using native plants to solve conservation problems and protect ecosystems. Six major objectives addressed are:

- Cropland Erosion and Water Quality
- Native Plants for Conservation Systems
- Forage and Pasture Improvement
- Protecting and Improving Water Quality
- Wildlife Habitat Improvement
- Critical Area Stabilization

This is a brief summary of 2006 activities at the center. For additional information on the projects, please contact us at the center.

Visit our Plant Materials Program Website at <http://www.Plant-Materials.nrcs.usda.gov> to view Plant Fact Sheets on conservation plants; information on how to obtain conservation plants; publications and technology development from PMC's across the United States; new improved plant uses and technology, and links to websites with additional or supporting information.

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Inside this Issue:

- ..Cover Crops in Corn at Time of Corn Planting
- ..Aerenchyma Root Study with ARS
- ..Intermediate wheatgrass
- ..Developing Eastern Gamagrass as a Forage Crop
- ..Native Prairie Cordgrass and Indiangrass for the Northeast
- ..Beachgrass for Great Lake Dune Ecosystem
- ..Native Cool Season Grasses for Conservation Systems
- ..Native Cool Season Grass Mix Study
- ..RPM Trees
- ..Vegetative Buffers for Air Quality
- ..Evaluation of Sideoats grama
- ..Chinquapin Wildlife Food and Cover
- ..Native Plants for National Parks
- ..Native Plants for Albany Pine Bush Preserve
- ..Arnot Forest Study with Cornell U.
- ..Seed and Plant Production
- ..Tours/Workshops



Establishing Cover Crops in Corn at Time of Corn Planting

The establishment of cover crops following silage corn is a problem in the Northeast due to late harvest and short growing seasons. An alternative method for establishing cover crops in the spring is being continued. Seeding cover crops at corn planting has not been feasible due to commonly used residual pre-emergence herbicides. Now, with the use of imidazolinone herbicides, such as Pursuit, and corn hybrids resistant to them, the option of seeding cover crops at corn planting is possible. This study is finding that this cover crop system works well with red or white clover, alfalfa and perennial ryegrass. A farmer will be able to seed a cover crop under silage corn quite easily in the spring and by fall, have cover crops well established.

Aerenchyma Root Study with USDA, ARS Pasture Lab, Cape May PMC and ARS Beckley Lab

Native warm season grasses are a potentially important component of riparian buffers designed to reduce non-point source pollution (nutrient, pesticides and pathogens) of eastern streams and rivers.



Little is known about the performance of warm season grass cultivars under saturated soil conditions. The objective of this study is to quantify differences in root production among warm season grass cultivars in anaerobic saturated soil conditions such as those that would be commonly found along bottomlands adjacent to field streams. This information will serve to improve field office recommendations to landowners in choosing the best suited material for use in riparian buffers, where flooding can be expected. This study focuses on the development of aerenchyma in the roots of plants placed under flooding compared with non-flooding conditions. Many aquatic plant species develop aerenchyma in their roots. These large intercellular spaces allow movement of oxygen down into submerged root tissues, thus allowing continued growth and nutrient uptake.

In a greenhouse pot experiment, warm season grasses were identified that had the ability to extend their roots into saturated soil. Four field sites in New York, Pennsylvania and Maryland were established to verify the pot study results. Some preliminary results indicate prairie cordgrass, switchgrass and eastern gamagrass provide the best survival and yield at some or all locations. Final results will be summarized after 2007 data is collected.

Intermediate Wheatgrass Evaluation



Thinopyrum intermedium

There is a need to develop production systems which reduce both farmer inputs and soil erosion. This evaluation is to develop an intermediate wheatgrass adapted to the Northeast as an alternative perennial grain crop. This study involves a recurrent phenotypic selection breeding program in cooperation with Rodale Research Institute in Pennsylvania. Intermediate wheatgrass, a perennial relative of wheat, was selected to be evaluated for grain producing attributes. After the second cycle of selection, yields were increased by more than 30%. Once developed, this perennial grain can provide year-round soil protection, increase wildlife benefits and can be utilized for human nutrition.

Eastern Gamagrass as a Forage Crop

Eastern gamagrass (*Tripsacum dactyloides* L.), is a highly productive, digestible, native warm season perennial grass, being developed as a forage crop. Eastern gamagrass may prove useful for hay haylage for intensively managed pastures. Eastern gamagrass could be used in place of corn silage on highly erodible lands and on marginal corn producing soils which are not producing economically yields of corn silage. Eastern gamagrass can out produce cool season grasses during hot, dry summers, doing so with fewer cuttings per year, reducing labor and fuel costs. It can be harvested later than cool season grasses and alfalfa, spreading out labor demands and protecting ground nesting birds.



In 2006, 'Meadowcrest' (a composite of five natural tetraploid collections) was released. 'Meadowcrest' has a dense, upright growth habit, wide leaf, later flowering, increase biomass production and resistance to foliar disease. This cultivar is adapted to plant hardiness zone 6 and higher. In addition to being a forage crop, this plant can be utilized in wildlife and vegetative filterstrip plantings and in restoration projects in areas where eastern gamagrass is a component of that ecological community.

Native Prairie Cordgrass and Indiangrass for the Northeast

Prairie Cordgrass (*Spartina pectinata*), is a tall, perennial, warm season grass that is native to the Northeast States. Its anticipated conservation uses are erosion control along fresh water shorelines, as well as potential uses in created wetlands, critical area treatment on wet soils, waste water renovation, and biomass production. It can grow in both sandy and heavier soils and does not require wet conditions to grow. A collection of prairie cordgrass was made in the Northeast; 50 accessions were assembled from 6 states and Quebec, Canada. Two groupings have been selected for vigor and density and are in the seed increase stage at this time. The first group from Long Island, NY, consists of 3 accessions and the second group consists of 1 accession from Northampton, NH, and 2 accessions from Seabrook, ME. Our plans are to release these two groups as source-identified releases for use in the New England and the Mid-Atlantic States.



Indiangrass (*Sorghastrum nutans*), is an upright, perennial warm season grass.

It has short creeping rhizomes that can product a sod. PI-591811 was selected from a collection of 137 indiangrass accessions collected in the east and evaluated from 1986 to 1991. It was selected for its vigor, early flowering date, and source identified for eastern origin. Its leaf color varies from green to blue and flowers in early to mid August. Accession, PI-591811, is a combination of three accessions from Steuben County, NY, Erie County, PA and Allegany County, MD. We are advancing the seed to the third generation for field testing. PI-591811 Indiangrass can be used for mid-summer grazing systems in the Northeast, wildlife seedings, and for use in areas where eastern source identified Indiangrass plant material is desired.



Beachgrass for Great Lake Dune Ecosystem



The release of 'Cape' American beachgrass has proven useful in the Great Lake dunes as well as the Atlantic Ocean. 'Cape' originated from Cape Cod, Massachusetts. A recent study at the University of Vermont found the Champlain type (Great Lake) is genetically different from the North Atlantic type (includes 'Cape'), and the South Atlantic type. Champlain appears to be a sub-species. Therefore, the use of 'Cape' may pose a situation to the Champlain species by occupying sites that were originally populated by the local native type. Working with The Nature Conservancy and NY Natural Heritage Program, we agreed to assemble plant material of the Champlain sub-species at the Big Flats PMC. Collections were made with the Nature Conservancy at El Dorado Preserve, Southwick State Park and Sandy Island Beach (all on eastern shore of Lake Ontario.) The culms were planted on the PMC. 'Cape' has the ability to develop 15-20 culms in a year while these collections take three years to develop adequate culms. Performance will continue to be monitored.

Native Cool Season Grasses for Conservation Systems

There has been increased emphasis in recent years to use native plants for conservation planting projects. Native species of cool season grasses are almost non-existent in the commercial seed trade. The Big Flats PMC, in conjunction with the Cape May, NJ and Beltsville, MD PMC's, is developing new native grasses for the eastern U.S. The following cool season grasses are being evaluated: Canada wildrye (*Elymus canadensis*), Virginia wildrye (*Elymus virginicus*), hairy wildrye (*Elymus villosus*), Canada bluejoint (*Calamagrostis canadensis*), crinkled hairgrass (*Deschampsia flexuosa*), poverty oatgrass (*Danthonia spicata*), bottlebrush (*Hystrix patula*), and red fescue (*Festuca rubra*). These grasses will be released as source identified seed to meet the need for native eastern eco-types to be utilized in conservation seedings for farm bill practices, wildlife habitat, critical area stabilization, wetland plantings and ecological restoration.



Native Cool Season Grass Mix Study

With the interest in utilizing native cool season grasses for conservation plantings for erosion control, riparian buffers and wildlife habitat, native cool season grasses typically are easier and quicker to establish than native warm season grasses. This study was developed to determine the seed rates of native grasses (fringed brome, fowl bluesgrass, rough bentgrass, and upland bentgrass) and introduced conservation grasses (red fescue, tall fescue and redtop) seeded over a 1:1:1 mix of Canada wildrye, Virginia wildrye and riverbank wildrye. The cool season grasses were seeded with the wildrye mix at three different seeding rates. The fringed brome and fowl bluegrass were least competitive on the wildrye. All the agrostis species (rough bentgrass, upland bentgrass and redtop) were not compatible with the wildrye, therefore the seed rates need to be reduced. Tall fescue and red fescue were competitive with wildrye even at the 3 lb/ac rate.

RPM Trees Study



The “root production method” (RPM) of growing trees has received attention recently with the establishment of a new nursery in Dryden, NY. With this method, the nursery is able to grow a 5 foot tall seedling from seed in less than a year. These trees have an expanded fibrous root system that promotes higher survival rates, rapid growth and quicker regeneration. In the fall of 2006, we established a study to compare the performance and growth of the RPM trees to regular conventional seedlings purchased from a commercial nursery. The five tree species were Pine Oak, Red Oak, Swamp White Oak, Sugar Maple and Shadbush Serviceberry. The trees were planted in replicated plots on November 2, 2006 and their growth will be monitored.

Vegetative Buffers for Improved Air Quality



What can be done to minimize the conflict between residential landowners living near a concentrated animal operation? There are problems with odors, flies, noise, dust and normal agricultural activities. There is information from the Midwest that needs to be adapted to the east where space is limited. A group of cooperators (including NRCS in PA, Penn State University Poultry Science and Horticulture departments, PA Bureau of Forestry, Cooperative Extension, Wenger Fee, Big Flats PMC and farmers), was organized to establish windbreak demonstration sites to evaluate potential benefits for windbreaks and air quality. More than 20 demonstration sites have been planted on poultry, dairy and swine operations. Studies at Penn State University are being conducted to evaluate the effect of trees to absorb ammonia, dust and other pollutants. Fast growing species, as ‘Streamco’ purpleosier willow and ‘Spike’ hybrid poplar are being studied to establish visual screens in 2-4 years, while also acting as an air filter and a living Snowfence. Windbreaks have the ability to reduce odor concentrations and this cooperative group will be monitoring the plantings to determine their effectiveness.

Evaluation of Sideoats Grama

Sideoats grama, a native warm season grass, is a medium size perennial bunchgrass growing 15 to 30 inches tall. This plant is adapted to dry/droughty conditions, grows under a wide variety of climate conditions, and is adapted to a broad spectrum of soils. It often occurs on shallow limestone or dolomite soils, growing in partial to full sun. This grass is a nice addition in a warm season grass mix for wildlife seedings. In cooperation with the NYS Department of Environmental Conservation Natural Heritage Program, collections were made of native stands of Sideoats grama and currently are under evaluation on the Center.

Chinquapin Wildlife Food and Cover Plant

Chinquapin (*Castanea pumila*), is a spreading shrub, 15 feet tall, with leaves and burs similar to chestnut, but smaller. The nuts are around ½ inch in diameter, with 100 seeds weighing an average of .26 lbs. The primary use for chinquapin is for wildlife food and cover. The nuts are eaten by deer, grouse, bobwhite quail and wild turkey.



Chinquapin accession, PI-594371, was selected from a collection of 19 chinquapin accessions from high elevations in Southeastern and Mid-Atlantic States, and evaluated for vigor, disease resistance, winter hardiness and seed production. PI-594371 is comprised of accessions from Floyd County, VA, Bland County, VA, and Mercer County, WV. A release of 'Copper' chinquapin was made in 2005. We are growing out the seed for establishing seed orchards at commercial nurseries.

Native Plants for National Parks



Ensuring the integrity of vegetative ecosystems within the National Parks is an increasing concern for the USDI, National Park Service (NPS). In recent years, the use of native plant materials for revegetation projects in parks has received increased interest. The USDA, NRCS Plant Materials Program and NPS, have set a cooperative agreement to develop native herbaceous and woody plant materials for use in planting of disturbed areas within our National Parks. The Big Flats PMC is cooperating with Acadia National Park in Maine, in developing plants to revegetate disturbed areas. This work involves collecting, propagating and producing 25 native species of grasses, forbs, shrubs and trees. This has allowed the Park Manager to meet the challenge of controlling erosion, while maintaining genetic integrity of the plant ecosystem.

Native Plants for Albany Pine Bush Preserve

The Albany Pine Bush is a common name applied to the last remnants of the once vast pitch pine-scrub oak barrens, which covered most of the Upper Hudson River Valley, in New York. The Albany Pine Bush Preserve Commission manages the globally rare 2,500 acre preserve and they are active in propagating native plants for restoration work on the preserve. They also have a program involving local nurseries to produce the native plants for use by homeowners living adjacent to the preserve for their home landscaping. The Big Flats PMC worked with the Commission to release a source identified wild blue lupine and a butterfly weed, which are referred to as the Glacial Lake Albany germplasms. The federally endangered Karner blue butterfly is found in the Albany Pine Bush and these two plant species are essential in maintaining their butterfly population. Seed increases are underway at the PMC. A germplasm release of Roundhead Bush Clover with the Preserve Commission is being planned for 2007.



Cornell University Arnot Forest Native Grass Studies

Three studies were started at the Cornell University Arnot Research and Training Forest in cooperation with Cornell University, Dept. of Natural Resources in 2006. The first is a Native Cool Season Grass Mix study to determine optimum seeding rates of the mixes and evaluate their establishment. The grasses were: bentgrass, fringed brome grass, fowl bluesgrass, intermediate wheatgrass, red fescue and rough bentgrass. Evaluations of the site will continue through the summer of 2008 and the plots will be used for field training by the PMC and Cornell University. Second is a Native Cool Season and Warm Season Grasses Mix study. The warm season grass mix that was seeded consisted of big bluestem, indian grass, switchgrass, and

deertongue with the cool season grasses consisting of Virginia wildrye, Canada wildrye, Riparian wildrye and intermediate wheatgrass. This study will also be evaluated until the summer of 2008 and be used for field training. The third study at the site is a Switchgrass Variety Trial.



Seed and Plant Production

Plant materials of released conservation plants and new plants under development were grown and processed at the plant materials center. Any seed grower or nursery business interested in producing any of our plant releases should contact us directly at the center. Any landowners that need information on conservation uses of these varieties or local sources of plant materials can contact their local NRCS office.

Tours/Workshops

1st Grassland Contest



Winning team of the First Grassland Contest with Teacher

The first Grassland Contest for 4-H and FFA high school students was held at the Big Flats PMC on May 2, 2006. This contest was developed by the Seneca Trail RC&D Council. We had teams of 4 students per team from schools across the state. The contest was designed to test the student's knowledge of agriculture, grazing and managing resources, soils and plant materials. The teams traveled between 4 stations where they answered questions on the topics. The top winning team went on to compete in the national contest in Missouri in June. Because of the positive response from everyone, the contest will continue next year. The Big Flats PMC staff shared in a Team Excellence Award given by the STC.

Middle School Students Tour

On June 6th, 60 students and their teachers from a local School came to the PMC for a training tour. After an initial discussion and demonstration of soils, they went on to three stations set up for the tour. The first was in the APHIS office where the local inspector gave a talk on different types of beneficial and harmful bugs and insects. The next station was a discussion on conservation plants and how they are used, and the final station was on seeds and the process of cleaning seed.



PA State Foresters Tour of Center



On June 28th the Pennsylvania State Foresters were holding their annual state foresters meeting in Wellsboro, PA and came to the center for a tour. The 65 Foresters were given a tour covering topics from streambank stabilization and soil bioengineering to wildlife habitat establishment methods and 'Copper' Chinquapin.

General Farm Technology Training Class

The NRCS General Farm Technology Training Class was held August 21st to 25, 2006 at the Big Flats PMC. This is a basic farm training course for new NRCS and SWCD employees. The class consisted of speakers from NRCS, Cornell University, Cooperative Extension, SWCD and NE Sun Grant Institute, along with tours of 8 local farms during the course of the week.



Conservation Field Day

The Big Flats PMC conducted a Conservation Field Day Tour on August 2nd for 74 people (both NRCS and others). The participants were taken by wagons to tour stops which included: Invasive Plants – Issues and Identifications; Warm Season Grass Establishment/Dormancy Seeding Study; Cover Crop Establishment at Corn Planting; Aerenchyma Root Study/Wetland Reserve Program; Switchgrass for Biofuels; Eastern Gamagrass/Prairie Cordgrass; Woody Bed Propagation; Soil Quality and Tillage; Soil bioengineering, Windbreaks for Odor Control; Native Cool Season Grass Mix Study; and Wildlife Habitat Improvement/Warm Season Grasses.



NYS Fairground Permanent Exhibit

NRCS New York developed a permanent exhibit site at the New York State Fairgrounds in Syracuse, NY. The Big Flats PMC staff was recruited to construct the site in 2005. Retired Plant Materials Specialist, John Dickerson and Bob Eschemann, our National Plant Materials Leader, helped design the site layout and the Big Flats PMC staff planted trees, built stone walls and developed a pond area at the site. In 2006, the site was cleaned up before the fair and new plants installed. A plot map was made for information and a book of plant identifications was available for thousands of viewers as they walked through the area during the state fair days.



5th Eastern Native Grass Symposium

The 5th eastern Native Grass Symposium was held in Harrisburg, PA, October 11th-13th, 2006. NRCS in Pennsylvania, the plant materials program and ARS Pasture Lab at State College, PA, organized the 5th symposium under the leadership of NRCS Biologist, Barry Issacs. The PMC Manager was involved on the planning committee and the PMC staff helped with set-up, registration, presentations, training sessions and tours. Equipment from the Big Flats and National PMC's were utilized in the seeding/establishment training session and in the seed cleaning training session. Excellent speakers covered a broad array of topics. There were 266 participants and we received very good feedback from the attendees. Proceedings can be found at the following website: <http://.Plant-Materials.nrcs.usda.gov>.



For more detailed information, contact the PMC at (607) 562-8404.

