

PROGRESS REPORT OF ACTIVITIES FOR YEAR 2000 Issued March 2001

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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 on Route 352 in Big Flats, New York, in the finger lakes region of the 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



'Ruby' redbosier dogwood

This is a brief summary of year 2000 activities at the center. For additional information on the projects, please contact us at the Plant Materials Center.

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 investigated. Seeding cover crops at corn planting has not been feasible due to commonly used residual pre-emergence herbicides.

Now, with the use of post-emergence imazethapyr 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 clover, alfalfa and birdsfoot trefoil. 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.



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Intermediate Wheatgrass as a Perennial Grain Crop

There is a need to develop crop production systems which reduce both farmer inputs and soil erosion. In cooperation with the Rodale Institute in Pennsylvania, a long term study is underway to develop a perennial grain cropping system as an alternative to annual crops for use on marginal lands. Intermediate wheatgrass (*Elytrigia intermedia* (Host) Nevski), a perennial relative of wheat, was selected to be evaluated for grain producing attributes. A recurrent phenotypic selection breeding program was established to develop higher yielding varieties. An economic analysis identifies a target for the breeding program of 500-600 lbs./ac. After the first cycle of selection, yields were increased by 30%. Once developed, this perennial grain can provide the advantage of year-round soil protection, lower inputs of labor and materials, improve soil structure, increase wildlife benefits and it can be utilized for human nutrition. The benefits to the environment, as well as to farmers, could be significant.



Developing 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, especially 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. Several new products are in development in an extensive plant breeding project being conducted at the Big Flats PMC. A natural tetraploid collection is being increased for advanced evaluation. This tetraploid collection is higher yielding than the Kansas variety, 'Pete'. Various breeding lines of diploids are also very promising. Cooperative work with the USDA, Agricultural Research Service, in Woodward, OK, has produced improved germplasms that are adapted to the Northeast.



A forage quality and digestibility study of eastern gamagrass is currently being conducted through a SARE grant. A harvest study will determine the best stage to cut eastern gamagrass and subsequent harvest intervals. Feeding trials are underway this winter, comparing eastern gamagrass to corn silage as a significant portion of a dairy ration.

Yield of Eastern Gamagrass with Interseeded Legumes



Companion planting of legumes may be beneficial when growing eastern gamagrass for reducing erosion, adding nitrogen, improving yields and for weed control. A study tested the following companion cover crops on four farms in central New York: alfalfa, black medic, oats, red clover, birdsfoot trefoil and white clover. The gamagrass was planted in May and the covers overseeded in July, following a cultivation.

New 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 indiagrass 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. 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.



A New Variety of Switchgrass for Use as a Forage Crop

A new switchgrass (*Panicum virgatum*), variety named, 'Shawnee', has been released by the Agricultural Research Service in Lincoln, Nebraska. It is a selection out of a population of 'Cave-in-Rock', which is adapted for forage in the Northeast. 'Shawnee' was selected for improved digestibility, and has demonstrated good forage yield, digestibility and disease resistance in Arkansas, Iowa and Indiana. A replicated trial of both seeded and transplanted switchgrass was initiated at the Center in 1996, comparing 'Shawnee', 'Cave-in-Rock', 'Shelter', and 'Blackwell' for yield, forage quality and disease resistance. 'Shawnee' switchgrass has performed well at Big Flats, so we have another forage variety of switchgrass to recommend for use by farmers and landowners in the Northeast.

Native Cool Season Grasses for Conservation Systems



There has been increased emphasis in recent years to use native plants for 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. We are collecting and evaluating the following cool season grasses: Canada wildrye (*Elymus canadensis*), Virginia wildrye (*Elymus virginicus*), hairy wildrye (*Elymus villosus*), Canada bluejoint (*Calamagrostis canadensis*), crinkled hairgrass (*Deschampsia flexuosa*), poverty oatgrass (*Danthonia spicata*), stout woodreed (*Cinna arundinacea*), bottlebrush (*Hystrix patula*), and red fescue (*Festuca rubra*). The plant materials centers are interested in receiving any collections that people may have from the Northeast. 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.

Vegetative Propagation of Sweetgrass

Sweetgrass (*Hierochloa odorata*), is a native, perennial grass that has many cultural uses by Native American Nations. Because of the sweet, vanilla-like fragrance, sweetgrass is often utilized in crafts and basket making. In cooperation with New York Sea Grant, the PMC is developing methods to vegetatively increase sweetgrass for use by Native Americans. Propagation is best done by rhizomes, since seed development is very slow. A sweetgrass plant in a four inch plot can be separated to make 10 to 14 additional plants. A plant materials workshop held in September made sweetgrass plants available to Native Americans so they can establish their own nurseries.



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, 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. We are growing out the seed for field plantings and will have a new release soon.

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 currently 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.



Vegetated Erosion Control Mats for Site Stabilization



Erosion control mats are utilized effectively for stabilizing slopes, allowing the seed mix to be established. At Acadia National Park there is a problem in stabilizing drainage ditches, due to a combination of factors, including flowing water washing seed away, seeding dates and environmental conditions (soil, slope, shade). To overcome these factors, erosion control vegetation was seeded directly into the erosion control mat (1/2" thick coconut fiber with 1 inch potting soil) in a nursery setting at the Big Flats Plant Materials Center.

Mats of various thickness and materials were tested. Once established at the center, they were transported to sites in the Park, rolled out and tacked down. The sites benefit from immediate erosion control with the vegetation sending down roots to stabilize the site. The results indicate this is a viable technique to stabilize highly eroded sites.



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.



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.



For More Information

Visit our Plant Materials Web site at <http://Plant-Materials.nrcs.usda.gov> or the NRCS National Plants Data Center Web site at <http://plants.usda.gov> to find more information on plants and how they can be utilized in solving conservation problems. If you have any questions, contact us at the Plant Materials Center

