



Progress Report of Activities

Cape May Plant Materials Center

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Introduction

The mission of the Cape May Plant Materials Center (PMC) is to provide plant materials and conservation technical assistance to the public, government agencies, non-profit organizations, and commercial growers in a nine-state area that includes Connecticut, Delaware, Maryland, Massachusetts, Long Island-New York, New Jersey, North Carolina, Rhode Island, and Virginia. The Cape May PMC was established in 1965 in response to shoreline restoration needs following Hurricane Donna, and has focused on developing plant technologies for specific concerns pertaining to coastal shoreline protection, sand dune establishment, restoration of mined lands and critical areas, and enhancement of Coastal Plain habitat. Because the Cape May PMC is uniquely situated near coastal dune communities, wetlands, and large tidal marsh estuaries, it is able to be a leader in product and technology development for coastal ecosystems and conserving the health and productivity of Coastal Plain soils.

Plant Development and Evaluation

DEVELOPMENT OF SHORTBEARD PLUMEGRASS AND SUGARCANE PLUMEGRASS

BACKGROUND

The NJPMC collected shortbeard plumegrass (*Saccharum brevibarbe*) and sugarcane plumegrass (*Sacharum giganteum*) to initiate studies to develop a tested or selected release to restore native grasslands along the Atlantic Coastal Plain. These tall prairie grasses occur on the Atlantic Coastal Plain but are not widely distributed by commercial growers. Bob Glennon, retired PMC manager, collected 40 accessions of shortbeard plumegrass and 28 accessions of sugarcane plumegrass.

COLLECTION AND EVALUATION OF GIANT CANE

BACKGROUND

Giant cane, (*Arundinaria gigantea*) is a perennial, cool-season woody grass that was once widespread throughout much of Midwestern and Eastern North America. It is unique in that it is the only bamboo native to the United States. Giant cane grows in dense stands (canebrakes) on the East Coast from Florida to New York and New Jersey, west to Texas, and north to Kansas and Missouri. It bears evergreen foliage and can reach heights of up to 30 feet. It is well adapted as an understory plant of forests as well as to alluvial floodplains and on riverbanks. Giant cane provides many important cultural and ecological services, including water quality benefits and stream bank stabilization.

EVALUATION OF LONG ISLAND ECOTYPE OF PRAIRIE CORDGRASS

BACKGROUND

The NJPMC received Long Island ecotype prairie cordgrass (*Spartina pectinata*) from the Big Flats PMC for further development. Prairie cordgrass is a native, warm-season, perennial grass useful for stabilizing shoreline, and creating riparian buffers, windbreaks, wildlife cover, and nesting habitat. It can be propagated by rhizome divisions or by seed. Although prairie cordgrass has a wide distribution in the United States, 'Red River' and 'Atkins' are the only known releases developed by the NRCS. The 'Red River' release was developed from germplasm collected in Minnesota, North Dakota, and South Dakota, and 'Atkins' was developed from germplasm collected in Nebraska. The NJPMC is interested in developing a Long Island local ecotype for restoration needs specific to the Northeast.

Technology Development

LATE SEASON SEEDING/PLANTING TRIAL: SMOOTH CORDGRASS (SPARTINA ALTERNIFLORA)

BACKGROUND

Smooth cordgrass (*Spartina alterniflora*) is an important perennial species for coastal marsh restoration in intertidal zones in the Northeast. While it is commonly planted in plugs for restoration with a high success rate, working with plugs is expensive, time consuming, and labor intensive. Direct seeding *S. alterniflora* lowers costs and increases the efficiency of restoration work when the appropriate conditions exist (Woodhouse 1979). Previous success in direct seeding trials at a location farther north and beyond the end of the recommended planting window may suggest the need to reevaluate established seeding dates. By performing a late season seeding trial, the PMC hopes to determine if extending the seeding timeframe is a feasible option for future marsh restoration.

DEVELOPMENT OF A DUNE RESTORATION SEEDING MIX USING LEGUMES, GRASSES, AND FORBS

BACKGROUND

The PMC initiated a study to determine the seasonal effect on a native beach seeding mix of legumes, grasses, and forbs. The purpose of the study was two-fold: 1) to create and evaluate the performance of a diverse native dune seed mix that would help introduce more biodiversity into traditional restoration plantings, and 2) to see what time of year would be best for planting. The species selected for this dune planting trial were: trailing wild bean (*Strophostyles behvola*), beach pea (*Lathyrus japonicus*), 'Dune Crest' little bluestem (*Schizachyrium scoparium*), and 'Monarch' seaside goldenrod (*Solidago sempervirens*). This project will have to be reinstalled at a new location due to recent sand dune restoration in the wake of Hurricane Sandy.

BEACH PEA INCREASE FIELD INSTALLED

BACKGROUND

The continued demand for greater diversity in dune plantings has encouraged the NJPMC to install a new production field for the increase of beach pea (*Lathyrus japonicas*). The PMC has tested beach pea in the past as a potential restoration plant, but never in the context of direct seeding mixes. This increase field will serve as a readily accessible seed source for our continued work creating direct-seeded dune mixes.

DEVELOPMENT OF AGROFORESTRY DEMONSTRATION PLOTS (WHITE CEDAR, PERSIMMON, CHESTNUT, AND BLACK LOCUST)

BACKGROUND

Agroforestry demonstration plots were installed in 2009 to develop plant materials that would help meet the demand for conservation practice standard 380 Windbreak/Shelterbelt and standard 311 Alley Cropping. The desire was to find suitable quick growing tree species to reduce potential for wind erosion, reduce crop damage from wind, and conserve moisture, while providing another marketable crop in the alleys and increasing wildlife habitat value.

SLENDER WODOATS

BACKGROUND

In early Spring 2012, PMC staff installed an experimental plot of slender woodoats (*Chasmanthium laxum*) in the alley of an older stand of black locust (Steiner group) on the center. The project goal was to establish a perennial companion grass cover in a black locust understory that would require less maintenance while providing a source of potential forage or food and shelter for wildlife. The objective of the study was to determine vigor, survival, height (cm), and spread (cm) of vegetative transplants planted at two densities, under field conditions.

GERM TEST: SMOOTH CORDGRASS AND SEASIDE GOLDENROD

BACKGROUND

While the PMC continues to experiment with seeding rates, methods, and time of planting with these two species under field conditions, less is known about how storage treatments and thermoperiods can influence germination rates under controlled conditions. These germination studies investigated the effect that temperature and wet storage might have on germination rates to help determine the optimal conditions for seed growth in the field.

Field-Based Technology

RUTGERS NATIVE BEE POLLINATION STUDY

BACKGROUND

The NJPMC is working on a native bee pollination study with Dr. Rachael Winfree and PhD candidate Molly MacLeod. Eighteen native, perennial plant species are being tested for their attractiveness to native bees. This research will support NRCS pollinator-friendly conservation programs by providing data for jobsheets, tech notes, and plant guides.

XERCES POLLINATOR SEEDBED PREP

BACKGROUND

Treatments and evaluations continue on the Xerces seedbed preparation project. The objective is to test different organic methods of weed-suppression prior to planting pollinator plots. These are methods that would be suitable for small growers who want to install pollinator plots but who are unwilling or unable to use conventional sprays or machinery. Treatments consist of using buckwheat as a smother cover crop at two rates, cultivation with light tillage, controlled burn, plastic solar covering, and a vinegar spray as an organic herbicide.

COVER CROP (TIME TRIAL, FALL-PLANTED CLOVER, SOUTHERN COVER CROPS)

BACKGROUND

In support of the NRCS Soil Health Initiative the NJPMC installed a demonstration plot of spring and summer cover crops for potential use in Coastal Plain soils. The objective of the planting was not only to demonstrate basic growth characteristics of a variety of cover crops, but also to test the limits of the window for optimal time of planting. The PMC also installed a fall-planted clover demonstration project with popular clover and clover-type species in anticipation for the NJPMC Cover Crop Field Day.

SOUTHERN COVER CROP FIELD EVALUATION

BACKGROUND

In support of the NRCS Soil Health Initiative the NJPMC installed an initial evaluation of several cover crops more commonly used in southern, subtropical, and tropical regions. The cover crops were pigeon pea (*Cajanus cajan*), cowpea (*Vigna unguiculata*), velvet bean (*Mucuna pruriens*), lablab (*Lablab purpureus*), and jack bean (*Canavalia ensiformis*). Given Cape May's moderate climate and Coastal Plain soils several of these species were known to have potential for hardy, summer vegetative growth in the region, however less was known about their reproductive capabilities. The inability for an introduced cover crop to set seed and reproduce would not necessarily be seen as a negative factor to adoption as the plant would be less likely to be weedy or invasive. Given the importance of improving soil quality, the curiosity for novel ways to build SOM in Coastal Plain soils, the relative moderate climate of South Jersey, access to a 'southern' cover crop seed source, and customer's noted interest in southern cover crop species (Northern Organic Farmers Association), the PMC initiated this evaluation.

CARBON SEQUESTRATION IN THE CONVERSION FROM C-3 TO C-4 PASTURE PLANTS

BACKGROUND

A study was initiated at the USDA-NRCS Cape May Plant Materials Center in 1999 to quantify soil carbon sequestration changes with the conversion from a cool season grass to native warm season grasses in a sandy, coastal plain soil (Downer sandy loam). Five native warm season grasses ('Shelter' switchgrass (*Panicum virgatum*), 'Atlantic' coastal panicgrass (*Panicum amarum* var. *amarulum*), 'Niagara' big bluestem (*Andropogon gerardii*), indiagrass (*Sorghastrum nutans*) and 'Pete' eastern gamagrass (*Tripsacum dactyloides*) were no-till drilled into a spray-killed tall fescue/red fescue sod.

OFF-CENTER EVALUATIONS

SEA OATS (DISCONTINUED)

In 2010, PMC staff, along with Donald Hamer (retired Plant Materials Manager and Conservation Agronomist), installed a planting of sea oats (*Uniola paniculata*) grown from a previous 1991 planting made off 60th street, in Avalon, NJ. Although the original 1991 accessions could no longer be identified, seed was collected in a mixed accession that seemed to exhibit good cold tolerance. This seed was collected and stored, and later seeded in flats in the NJPMC greenhouse in Spring, 2010. In January 2013, the Army Corp of Engineers rebuilt the dunes in Avalon, destroying the study site. Several of the second-year seed-producing plants were salvaged before dune reconstruction, and will be increased at the PMC greenhouse in Spring 2013.

JAMAICA BAY MARSH ISLAND RESTORATION

The Cape May PMC continues to assist the NY District Corps of Engineers, NGOs, and community volunteers restore the Gateway National Recreation Area Jamaica Bay unit. This year, a community-led effort was made to collect smooth cordgrass (*Spartina alterniflora*) coordinated by the American Littoral Society, Ecowatchers, and Jamaica Bay Guardian. These three groups put together a large volunteer staff that the NJPMC staff assisted. While the amount of smooth cordgrass collected was comparable to last year's harvest, the timing of the collection may have been too early to secure an equal amount of viable seed (the harvest window is only a few weeks).

SPECIAL DEMONSTRATION PLANTINGS

DELAWARE BAY EASTERN TIGER SALAMANDER WETLAND RESTORATION

The Cape May Plant Materials Center is cooperating with the US Fish and Wildlife Service (USFWS) and the New Jersey Department of Natural Resources to create and maintain natural vegetation habitat for the state listed endangered eastern tiger salamander (*Ambystoma tigrinum*). Approximately 250 plants of switchgrass (*Panicum virgatum* var. "Timber", "Hightide"), eastern gamagrass (*Tripsicum dactyloides*), and shortbeard plumegrass (*Saccharum brevibarbe*) were planted in a vernal pool in the Delaware Bay Division of the Cape May National Wildlife Refuge.

DIRECT SHRUB SEEDING TO BENEFIT MIGRATORY SONGBIRDS

The Cape May PMC is working together with the US Fish and Wildlife Service (USFWS) to direct seed native shrubs in efforts to restore 3 agricultural fields (45, 15, and 10 acres). This wildlife planting will help provide needed food and shelter for migratory songbirds during autumn migration. While the largest field was planted with warm season grasses, the two smaller fields were planted with shrub seed. The rationale for planting with seed was the desire to identify cost-effective options as an alternative to transplanting seedlings for large restoration areas. Other options, such as deferring to the natural processes of succession, would not provide the diversity of food sources required for berry and insect-eating birds. The fields will be surveyed for breeding and migratory bird activity to assess the value of the shrub habitat.

ASSISTANCE TO RESOURCE-POOR FARMER IN ORGANIC TRANSITION

Many small growers interested in developing niche markets through organic farming face considerable challenges accessing the equipment, seed, and information technology required for the implementation of organic practices. The PMC, working together with the NJ NRCS Soil Quality Specialist, entered into a 3-year agreement (2010-2013) with a NJDA certified organic grower in Cumberland County, NJ to help restore 1 ½ acres by using cover crops for weed control and soil quality improvement. Organic weed management is a continuous challenge requiring, at times, a combined approach of crop rotation, cover crop use, and tillage. This study was designed to help the PMC and local growers better understand the challenges and opportunities organic farmers face when implementing organic weed management. With a better understanding of these challenges the PMC can more effectively promote the use of cover crops as a way to improve soil quality in concurrence with vegetative practices cover crop (NJ 340), conservation crop rotation (NJ 328), residue and tillage management (NJ 329), field border (NJ 386), and access road (NJ 560).

WILLEVER LAKE WHIP RESTORATION

Last winter, the Cape May PMC cooperated with NRCS staff, USFWS, and NJ Audubon on a WHIP lake restoration project after the removal of a dam. The lake bottom required new vegetation to prevent erosion and to enhance its wildlife value. PMC staff used live silky willow (*Salix sericea*) stakes grown and collected at both the PMC and the Pinelands Nursery. Most of the installation consisted of live stakes, but there was also enough material to fashion fascines (wattles) and to conduct a trial at two distances along the streambed.

INFORMATION-BASED TECHNOLOGY

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Sequestering Soil Organic Carbon. Proceedings of the 8th Eastern Native Grass Symposium, Oct 2012., Cape

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- Miller, C. 2012. NJ Antique Auto Club. 11 May 2012. Cape May PMC, NJ.
- Miller, C. and J. Dollar. 2012. Tour of PMC for Mt. Cuba Arboretum. 17, Jul. 2012. Cape May PMC, NJ.
- Miller, C. and PMC Staff. 2012. Cover crop workshop. 18 Oct. 2012. Cape May PMC, NJ.
- Snell, S. 2012. Pesticide safety and exotic/invasive plant ID training. 25 May 2012. Sandy Hook Unit - Gateway NRA, NJ.

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- Miller, C. 2011. Cape May Extension-Master Gardener Program training. 17 Jun. 2011. Cape May PMC, NJ.
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We're on the Web!

<http://plant-materials.nrcs.usda.gov/njpmc/>

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