United States Department of Agriculture
Natural Resources Conservation Service

Plant Materials Program

Big Flats Plant Materials Center
Progress Report of Activities, 2010

3266-A State Route 352, Corning, NY 14830 • P 607.562.8404 • F 607.562.8516 • http://Plant-materials.nrcs.usda.gov

Inside This Issue

- Intermediate wheatgrass
- Biofuel Projects at the Center
- Switchgrass Smut Disease
- Japanese Knotweed Control Study
- Native Prairie Cordgrass and Indiangrass for the Northeast
- Beachgrass for Great Lake Dune Ecosystem
- RPM Tree Comparison Study
- Vegetative Buffers for Air Quality
- NE Native Seed Initiative
- Evaluation of Ken Vogel's Switchgrass Breeding Lines
- Tall Wheatgrass Time of Cutting Study
- Native Shrub Willow Evaluations
- Pollinator Research
- Seed and Plant Production
- Tours/Workshops

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 Central 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
- ✓ Biofuels/Agroforestry
- ✓ Protecting and Improving Water Quality
- ✓ Wildlife Habitat Improvement
- ✓ Critical Area Stabilization
- ✓ Improving Air Quality

This is a brief summary of 2010 activities at the center. For additional information on the projects, please contact us at the center. Visit our Plant Materials Program Website at http://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.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Ave. S.W, Washington, DC, 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382. USDA is an equal opportunity provider and employer.

Cropland Erosion and Water Quality

Cover Crop Demonstration Plots

There are many benefits to the utilization of cover crops, such as reducing soil erosion, improving water quality and soil tilth, alleviating soil compaction, recycling of nutrients, providing nitrogen, weed suppression, early spring forage, and food and habitat for wildlife. All of these benefits rely on the planning of the cover crop system. In July through mid-October 2010, 35 species and cultivars, along with several mixes, were hand-broadcasted into 10 x 20ft plots, for assessing the effects of different planting dates on percent cover, biomass yields, and overall vigor. The cover crop species consisted of: 1. summer annuals used for providing cover for short rotation vegetable crops, smother cropping, or for annual forage production, such as teff, sorghum-sudangrass, Japanese and foxtail millets; 2. Perennial legumes used for interseeding into cereal grains or row crops for erosion control and nitrogen production, hairy vetch, and clovers; 3. Brassicas and 'Tillage' radish used for grazing, compaction mediation, erosion control and water quality benefits; and 4. Grasses and annual grain crops for late season cover following corn silage, 'Aroostook' rye, perennial and annual rye grass, oats, wheat, and triticale. In the Spring of 2011, some plots will be re-visited and evaluated on survival, biomass, and percent cover.

Figure 1. Overview of Cover Crop Plots on November 18, 2010

Native Plants for Conservation Systems

Selecting Native Forbs for Pollinator Conservation

The New Farm Bill of 2008 emphasizes the development and conservation of native habitat for managed and native pollinators. In January 2009, we started over 50 native species in the greenhouse. We looked at which species would germinate readily without cold-moist stratification as well as seeding depths for increased germination and vigor of plants. We also took pictures of the seedlings for a future identification guide for the Northeast. In addition to the greenhouse seeding, we seeded individual species and mixes of species in the field with three replications, three seeding dates, and different weed control methods for potential seeding recommendations. The plots were evaluated in 2010, for percent cover, over all vigor, disease resistance, seedlings per plot (rough estimate), and heights and flowering dates. A ½ acre wet site mix and 3/4 acre dry site mix were hand broadcasted at the end of July. A frost seeded plot will be established in early 2011, with the same species and mixes. Evaluations of all plots will continue in 2011. Also in 2010, we established a Pollinator Enhancement People's Garden, for educating the public on the many different native species of pollinator friendly plants in our region as well as looking at the many species of pollinators that visit the garden at various times of the year. There are 45 species of forbs, and each is labeled with common and scientific names plus pictures of each in bloom. Below are pictures taken on site at the Big Flats PMC.

Figure 3 Spotted beebalm

Figure 2 Bee gathering pollen on sneezeweed

Northeast Native Seed Initiative

There is a growing need in the Northeastern States for seed of local ecotypes of native plants, suitable for habitat restoration. The Northeast Native Seed Initative was formed with cooperators from US Forest Service in the Green Mountains, and the White Mountains National Forests, USDA-NRCS, State Departments of Transportation in NY, VT, NH, and ME, New England Wild Flower Society, state foresters, cooperative extensions, natural heritage programs, and interested NGO/citizens. With little or no native seed available, in the commericial market, the goal of this intitative is to collect seed of selected native species from across the region and grow out in increase blocks. Once harvested, this seed will be provided to commericial seed companies. For the initial collection, 5 grasses (Canada and Virginia Wildrye, fowl bluegrass, upland bentgrass, little bluestem), 1 sedge (nodding sedge), and 5 forbs (common milkweed, NY aster, NE aster, blue vervain, showy tick trefoil) were selected by the group. Collections were made in 2009 and 2010 and will continue in 2011.

Biofuels/Agroforestry

Evaluation of 'Tropic Sun' Sunn Hemp

Figure 4 Sunn Hemp plot in August 2010

Figure 5 Close Up of Sunn Hemp Flower

Sunn Hemp, *Crotalaria juncea,* is a cover crop and can produce high organic matter yields in a single growing season as it fixes nitrogen in the soil. In cooperation with 15 other PMCs across the country, Sunn Hemp will be evaluated here for its potential use as a green manure and cover crop in the Northeast. Being a tropical or sub-tropical plant, this study will help find a range where Sunn Hemp can be utilized. Two plots were seeded in 2009 with a Truax drill legume box. We observed poor stand establishment, and weeds eventually outcompeted the Sunn Hemp. This year, 4 replicated plots were established and seeded at 20lb/A, 40lb /A, and 60 lb/A. Samples were harvested at 45 and 60 days for biomass yields of all plots, as well as heights and flowering date. Results showed that 60lb/A at both dates, 2.0 t/A & 1.58 t/A, and 1.79 t/A for the 40/A at 60 DAP, had the highest yield, although they were not significantly different from each other. They were significantly different from both of the 20lb/A dates, which yielded only 1.15 t/A and 0.7 t/A.

Intermediate Wheatgrass Biomass Comparison Study

Figure 6 Intermediate wheatgrass in bloom

Intermediate wheatgrass, *Thinopyrum intermedium,* is well adapted to the Northeast and can produce large quantities of biomass. In cooler climates, intermediate wheatgrass may require fewer inputs of herbicides to control weeds than switchgrass or other warm season grasses. In addition, intermediate wheatgrass can establish quickly in one year, whereas switchgrass may take two or three years to reach full production. Plots were established in 2009, replicated four times and hand broadcasted. Four cultivars of Intermediate Wheatgrass; 'Oahe' , 'Haymaker', 'Beefmaker', PI # 9051920; 'Alkar' Tall Wheatgrass, Volga' Giant wildrye, and 'Magna' Great Basin Wildrye, compared biomass yields and were, 2.75, 3.06, 2.68, 3.17, 3.07 t/acre. It was found that there were no significant differences in yields or heights, and Magna and Volga were out-competed by weeds and were not used in the 2010 analyses.

Switchgrass Smut Study with Cornell University

Figure 7 Switchgrass smut on seed

Switchgrass Smut is a fungal disease caused by *Tilletia maclaganii* and results in stunting, premature flowering, and seeds that are replaced by fungal sori. Dr. Gary Bergstrom and Christine Layton of Cornell University have set up test plots, in 2009 and 2010, on the center looking at different seed treatments and fungicides that will help in eliminating this stand-depleting fungus. In 2010, a switchgrass variety trial was established, to see if any of these showed resistance to smut infection. Varieties from various sources being tested are Kanlow, Bomaster, Shawnee, Shelter, Blackwell, Cave-in-Rock, Hightide, Carthage, some hybrids and 'Atlantic' Coastal Panicgrass, so far, all varieties are quite susceptible to the smut disease. Further studies will continue in 2011.

Species Evaluation for Biofuels: New York

A New York Farm Viability Institute Grant, "Accelerated Evaluation of Perennial Grass and Legume Feedstocks for Biofuel Production in New York State" was accepted in cooperation with Cornell University. This project evaluated warm and cool season grasses for potential use as a biofuel. There are 24 entries of warm season grasses consisting of switchgrass, big bluestem, indiangrass and eastern gamagrass and nine cool season entries of tall wheatgrass, tall fescue, reed canarygrass and smooth bromegrass, at four locations including one site at the Big Flats PMC. Larger farm plots were planted utilizing the Big Flats PMC Truax native seed drill. Biomass yields were collected in 2009 and 2010 and will continue into 2011. First year data indicates 'Cave-in-Rock' switchgrass yielded 4.5 DT/acre. The biomass of all entries will undergo chemical composition analysis.

Tall Wheatgrass Time of Cutting Study

We evaluated two varieties of tall wheatgrass, 'Alkar' and 'Szarvasi-1', with 5 cutting dates cuttings and 1 recut date with two seeding rates of 20 and 40 N lb/ac. The first cutting dates were 7/09/10, 7/20/10, and 7/29/10, 8/09/10 and 10/25/10; the re-cut date for all was 10/22/10. In the cutting study for 'Alkar' there was a tendency for higher yields with the lower seeding rate and for increased yield for the later in season cutting dates, July 29,2010 yielded 4.06t/ac and Aug 9, 2010 at 3.59 t/A. There was a yield reduction for the cutting date on 10/25/10, with an average yield of 2.9 t/ac. The second cutting yield for 'Alkar' for both seeding rates, averaged 0.27 t/ac. There is a potential for high one cut yields for tall wheatgrass.

Switchgrass and Big Bluestem Breeding project for Biofuels with Cornell University

Figure 8 Evaluating Switchgrass plots initial year

Switchgrass and big bluestem have a lot of genetic diversity within native populations. It is important to collect, evaluate and store this germplasm. An effort was made to collect Northeast native switchgrass and big bluestem to develop breeding lines which originated in the Northeast. Approximately 80 collections each of switchgrass and big bluestem were made from 10 states. They were grown at both the Big Flats PMC and Cornell University. The collections were grown out to establish breeding evaluation blocks of 3,000 individual plants at both locations. Collections that were received late in 2008, were added in 2009 to the existing plot. Evaluations of flowering dates and growth form, heights, vigor, disease, stem and leaf abundance, and leaf widths, were continued in 2010. The best plants will be selected and put into increase blocks in the coming years.

Figure 9 2008 and 2009 Switchgrass plantings. Picture was taken in 2010.

Figure 10 Big Bluestem 2008 planting. Photo taken in 2010

Inter-Center Evaluation of Tall Wheatgrass for Biofuels

Figure 11 Making a biomass clipping

Tall wheatgrass is a non native cool season grass from Southern Europe and Asia Minor; it flowers later with stiffer stems than most forage type grasses grown in the Northeast. It has been used in Hungary for burning for heat. We are evaluating four cultivars of Tall wheatgrass – 'Largo', 'Alkar', 'Jose' and one from Hungary, 'Szarvasi-1', as well as two cultivars of reed canarygrass – 'Chiefton' and 'Bellevue' and one accession of intermediate wheatgrass, #9051920. All are at two seeding rates, 20 and 40 lb/ac except the reed canarygrass which is only seeded at 20 lb/ac. The following centers are cooperating in this study: AZ, CA, ID, MD, MI, MT, NY OR and WA. It appears that it is possible to harvest the majority of yearly growth with a single cutting. First year yields of the intermediate wheatgrass, tall wheatgrass and reed canarygrass with a 2 cut system were 4.1, 3.6 and 2.8 t/ac respectively.

Leymus spp. Potential for a Biofeedstock in the Northeast

Figure 12 Giant wildrye- © 2000 Larry Blakely

Perennial cool season grasses have been given more attention in their potential to be used for biofuels. Given the great amount of research on switchgrass, having other alternatives for the biofuel industry could help in becoming less independent on foreign oil. Researchers in the Midwest and West have had increased interest in the wildryes and hybrids of wildryes due to their adaptability to a wide variety of soils and habitats, as well as their potential for producing large quantities of biomass. This study looks at six different species of Leymus, for their biomass potential, disease resistance, vigor and standability. *Leymus spp*. (or Wildryes) are ecologically important forage grasses used for large scale rangeland vegetation and other agricultural conservation uses, and are mostly native in the Northwest US and Canada. We are looking at these for potential use in the Northeast. The following were obtained from Steve Larsen, in Logan, Utah's ARS Forage Lab; Leymus triticoides (creeping wildrye or beardless wildrye), Leymus condensatus (giant wildrye), Leymus racemosus (mammoth wildrye), some hybrids of these species, Leymus cinereus (great basin wildrye), and Leymus mollis, (American dunegrass), which was collected in Maine. We evaluated these in late summer 2010 and found that L. cinereus, as a whole, performed worse than the other accessions. Accessions of L. condensatus and triticoides showed best overall vigor for the surviving plants, and L. racemosus had the highest survival rate and average vigor. For the success of these species in the NE, weed control seems to be the most important factor.

Water Quality/Streambank Stabilization/Buffers

Japanese Knotweed Control Study with ARS Pasture Lab, USA-COE and Penn State University

Figure 13 Japanese knotweed

Japanese knotweed is a tall growing perennial herbaceous plant that forms dense monocultures on many different sites, from roadcuts to streambanks. This invasive plant grows to 8-10 foot heights, smothering out all vegetation. Herbicide studies have been done to determine the best method to try to control this plant. Japanese knotweed has a rhizomatous root system, so controlling this plant's rhizome system is the key. Once the knotweed is knocked back, what can be planted? The objective of this study is to test different warm and cool season grasses and methods of establishment to rehabilitate sites after controlling Japanese knotweed with herbicides. A site at the Corps of Engineers Tioga-Hammond Dam, near Mansfield, PA, was sprayed in 2006 and plots established in the spring of 2007. Second year results look good for some treatments and plots will continue to be evaluated in 2009. Part of the study involves treating the plots with herbicide for two years (2006 and 2007) and then establishing plots in the spring of 2008. Due to dry weather conditions, the plots established poorly and were reseeded in 2009. Evaluations were preformed in summer and winter of 2010. There was good control of the knotweed in the plots with prairie cordgrass and Canada bluejoint, and the riparian buffer mix, had average control. Continued visits will take place to assess these plots, for long-term survival.

Figure 14. 2010 Picture of Canada Bluejoint and Prairie Cordgrass plot

Figure 15 2010 Photo of Prairie Cordgrass plot (left) and Riparian Buffer Mix (right)

Native Prairie Cordgrass and Indiangrass for the Northeast

Figure 16 Indiangrass seed heads

Figure 17 Prairie cordgrass- Photo by kgNaturePhotography.com

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. 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 three accessions and the second group consists of one accession from Northampton, NH, and two 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 produce 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.

Critical Area Stabilization/Improved Forages/Streambank Stabilization

Beachgrass for Great Lake Dune Ecosystem

The release of 'Cape' American beachgrass (Ammophila breviligulata) has proven useful in the Great Lake dunes as well as the Atlantic Ocean. 'Cape' originated from Cape Cod, Massachusetts. A 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. Collections were made of the Champlain sub-species in 2002, with the Nature Conservancy at El Dorado Preserve, Southwick State Park and Sandy Island Beach (all on the eastern shore of Lake Ontario) and evaluated for their performance. Currently, culms are being increased for field planting trials.

Native Cool Season Grasses for Conservation Systems

There has been increased emphasis in recent years to use native plants for conservation planting projects. The Big Flats PMC, in conjunction with the Cape May, NJ and Beltsville, MD PMCs, 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*), and Canada bluejoint (*Calamagrostis canadensis*). Seed increase fields were established in 2008. 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 Willow Collection

Figure 18 Close up of willow flower

Interest has arisen for collecting native species of shrub willow for restoration plantings in riparian areas, streambanks, and wetlands. Willows are used because they can grow quickly, stabilize soils and withstand flooding, improve water quality, and provide shade and cover for stream life. Four willow collection identification workshops were held to train NRCS and Cooperating agencies on how to identify and collect willows for use in streambank erosion control. Willows were also obtained from SUNY ESF. The species of interest are Bebb's willow, pussy willow, silky willow, shining willow and heart-leaved willow (Salix bebbiana, S. discolor, S. sericea, S. lucida, and S. eriocephala). A total of 122 collections, from VT, NH, PA, and NY, were obtained and were grown in a nursery bed at the PMC. Then in July 2010, these collections were planted in three replications for evaluation of superior native plants for streambank stabilization.

Wildlife Food and Cover/Agroforestry

RPM Trees Study

Figure 19 RPM Trees

The "Root Production Method" (RPM) a proprietary process for producing trees, is very visible in the nursery trade. RPM process includes air pruning of seedlings grown in well aerated soil medium to encourage a dense fibrous root system that promotes rapid growth of the plant. Planting tree seedlings in agroforestry practices can be a problem with weed competition, wildlife browsing and possible flooding and wet soils. The question "should RPM trees be utilized instead of regular nursery seedlings, understanding that the RPM trees are much more expensive?" This study was initiated in the fall of 2006 where five species of hardwoods – Pine Oak, Red Oak, Swamp White Oak, Sugar Maple and Shadbush Serviceberry – were compared to three types of nursery stock: RPM trees, one-year-old seedlings and two-year old seedlings. These trees were evaluated for a number of years to monitor the rate of growth and performance. Also, a field evaluation planting was established in the spring of 2007 on a Wetland Reserve Program site in Madison County, NY, to evaluate RPM hardwood trees of wetland species. Their performance will be compared to regular nursery seedlings. Evaluations performed this year, are showing that although, RPM trees were taller at planting date, 1-yr old and 2-yr old trees were almost as tall after 4 years, but not larger in caliper width. Long-term success of tree plantings and economic benefit, for restoration and conservation practices are the main objectives.

Ash Germplasm Preservation Project

Emerald Ash Borer has been attacking and killing ash trees in the Great Lake States and is spreading. A cooperative project was developed to preserve ash germplasm with NRCS, USFS and ARS Genetic Resource Preservation Unit in Fort Collins, CO. If ash tree populations are decimated by the ash borer, the stored seed can be used as a genetic base to re-establish ash trees for future generations. The website is **www.ashseed.org**.

Vegetative Buffers/Windbreaks for Improved Air Quality on Concentrated Animal Operations

Figure 20 Test windbreak plot

Figure 21 Test windbreak in tiers

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 Feed, Big Flats and the National 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. In 2010 a site at Hillendale Farm, Gettysburg, PA, was established. Many species of trees, shrubs, and grasses, such as Northwind Switchgrass, Streamco Purple Osier Willow, Red Maple, Northern White Cedar, Miscanthus, and Valley Forge Elm, were planted in front of large exhaust fans Studies at Penn State University are being conducted to evaluate the effect of trees to absorb ammonia, dust and other pollutants. Fast growing species, such as 'Streamco' purple osier willow and 'Spike' hybrid poplar are being studied to establish visual screens in two to four years, while also acting as an air filter and a living snow fence. Windbreaks may have the ability to reduce odor concentrations and this cooperative group will be monitoring the plantings to determine their effectiveness.

Evaluation of Sideoats Grama

Figure 22 Photograph of Sideoats grama seedheads

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. Selections were made in 2007 and a seed increase block was established in 2008. In 2010, Sideoats seed grown in the greenhouse and plugs were transplanted, forming another seed increase block.

Native Grass Studies at Cornell University Arnot Research Forest

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 bromegrass, fowl bluegrass, intermediate wheatgrass, red fescue and rough bentgrass. Evaluations of the site will continue through the summer of 2009 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, indiangrass, 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 2010 and be used for field training. The third study at the site is a Switchgrass Variety Trial for biofuels.

Seed and Plant Production

Figure 25 Cleaning 'Aroostook' rye

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 needs information on conservation uses of these varieties or local sources of plant materials can contact their local NRCS office. Seed that was collected in harvested in 2010 was, 'Aroostook' Rye, Canada and Virginia Wildrye, Canada Bluejoint, Sideoats grama, 'Keystone' buttonbush, Albany Pine Bush Little Bluestem, 'Niagara' Big Bluestem, American Dunegrass, New England collections of Little Bluestem, Big bluestem, and Indiangrass, 'Tioga' Deer tongue, 'Copper' Chinquapin, Bur oak, Albany Pine Bush, bush clover, and 'Meadowcrest' Eastern Gamagrass.

Tours/Workshops/Meetings

New York Pollinator Conservation Planning Short Course and Field Tour

On September 23, 2010, a beautiful day, 96 participants, attended a Pollinator short course and field tour. This day-long course helped assist conservationists, land managers, farm educators, farmers and agricultural professionals in the latest science-based approaches to increasing crop security and reversing the trend of pollinator decline, especially in heavily managed agricultural landscapes. Many were on hand to hear Eric Mader, Xerces Society, cover all aspects of pollinator biology, economics, identification, habitat enhancement and plant restoration. Also presenting were, Dr. Bryan Danforth, Dept. of Entomology, Cornell University on the role and importance of native bees in apple pollination, how native bees contribute to apple pollination and how to conserve them in apple orchards; Dr.Derek Artz, , Dept. of Entomology Cornell, on the main bee pollinators of pumpkin, their foraging behavior, frequency of visits to flowers, nesting biology, identification, and effectiveness as pumpkin pollinators.

After lunch, Plant Material Specialist, Paul Salon, gave a short tour of the Big Flats Plant Materials Center pollinator enhancement wildflower projects: Time of seeding study with 4 dates and 60 species, weed control study, pollinator garden, and warm season grass plantings. **For more information of Pollinators, please visit the Xerces Society website: http://www.xerces.org**

Figure 23 Pollinator People's Garden at BFPMC

Figure 24. Field Research Plots

New York Grassland Evaluation Contest

Figure 27 Grassland Contest students

The fifth annual Grassland Contest for 4-H and FFA high school students was held at the Big Flats PMC on October 14, 2010. This contest was developed by the Seneca Trail RC&D Council. We had several teams of four-five students per team from Belleville-Henderson Central School. The contest is designed to test the student's knowledge of agriculture, grazing, soils and plant materials.

Cover Crop Workshop 2010

On November 19, 2010, 100 people attended this workshop which provided the opportunity to examine 35 different cover crops and mixes, some with several seeding dates, and observe the results. After a brief reception in our seed barn, attended view our field plots, then headed to Big Flats Community Center for a number of speakers:

- **Joel Myers**, (PA Farmer and Consultant), No-till and Cover Cropping.
- **Sjoerd Duiker** (PSU Soil & Crops Dept.), Presentation on his cover crop demo project and update of the PA Cover Crop Working Group and websites;
- **Alan Westra** (Cornell Dept. of Plant Breeding), Cover Crop Seed Production and Seed Laws;
- **Ray Archuleta** (USDA NRCS National Tech Support Center-East, Agronomist), The impact of Cover Crops on Soil Health and Function and Case Studies of Diverse Cover Crop Mixes;
- **Thomas Bjorkman** (Cornell Dept. of Plant Breeding, Geneva, NY Experiment Station), Use of Alternative Cover Crops, specifically Brassicas, and Some Organic Farming Considerations;
- **Quirine Ketterings** (Cornell Dept. of Animal Science, Associate Professor, Nutrient Management Spear Program), Update on Latest Research Findings on Nitrogen Management with Cover Crops; followed by a farmer panel discussion. We received many compliments from the attendees, and will continue our 3rd cover crop workshop in 2011.

Biofuel Field Day

The Big Flats PMC conducted a Biofuel Field Day on July 28th, 2010 for approximately 125 people. The tour allowed attendees to observe research and demonstration plots of many warm and cool season grasses including herbicide treatments, seeding techniques, time of seeding and cutting studies, breeding nursery, cultivar and seed treatment studies, plant pathology studies as well as seed production fields. Establishment and management of hybrid willows will be discussed and observed. Presentations were given by Larry Smart, Hilary Mayton and Gary Bergstrom from Cornell University; Tom Richards, Penn State University Director of Institute for Energy and the Environment; Calvin Ernst, Ernst Conservation Seeds; plant varieties, pellet plant development; Virginia Green, USDA -FSA Biomass Crop Assistance Program, NY program manager; Laura Colban, Skanden Energy, Inc., The Next Generation of Heating Technology; Jack Santamor, Tree Source Solutions, Local project in Watkins Glen, US Salt; Dan Conable, NY Biomass Energy Alliance update; Kim McNight, Summerhill Biomass Systems with a demonstration of a powdered biomass burner. Also on display was a portable canola press and a large willow Step planter.

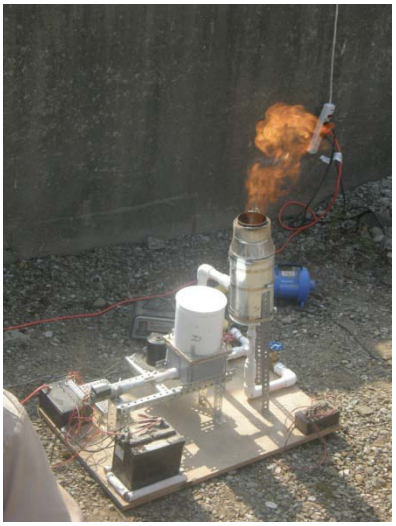

Figure 25 Powdered Biomass Burner

Figure 26. 20 feet willows during 3rd growing season

Figure 27 Willow Step Planter

Soil Quality and Cover Crop Training Course

On November 18, 2010, approximately 45 attendees from NRCS, NYS Ag and Markets, and Soil and Water Conservation Districts, gathered at the Big Flats Plant Materials Center for a day long course. The main speaker was Conservation Agronomist, Ray Archuleta from the East National Tech Support Center, in Greensboro, NC. Also giving presentations were Dave Lamm, East National Tech Support Center, speaking on soil quality economics and a few successful case studies, and Bob Schindelbeck, from Cornell University, presented on the Cornell Soil Health Test and gave a nice demonstration of their rainfall simulator. Ray started us off with some soil quality basics and eye-opening demonstrations of soil health and function. Other topics addressed through the day were soil disturbance , soil management principals, agroecology, and cover crop case studies and 'cocktail' mixes. There was also a field tour given by Paul Salon, on the most common cover crop species and mixes, in the Northeast and showed us the effects seeding dates had on each. The speakers left us with a greater appreciation for soils and how 'keeping our soils healthy' is fundamental in the success of agricultural practices all over the world.

Permanent Exhibit at the NYS Fairground in Syracuse

Figure 29 NYS Fairgrounds site

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. In 2010, the site was mulched before the fair and new plants installed. A plot map and a plant identification book were available for thousands of viewers as they walked through the area, which promotes conservation of our natural resources. In another area of the fair, plants were given to officials for a rain garden exhibit. Rain gardens allow rainwater runoff from impervious surfaces like roofs, driveways, parking lots, and compacted lawn areas, the opportunity to be absorbed. This reduces rain runoff by allowing stormwater to soak into the ground, when normally it would flow into storm drains and surface waters, which can cause erosion, pollution, and flooding.