



Year 2006



Progress Report of Activities

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Appalachian Plant Materials Center

P. O. Box 390, Alderson, WV 24910 Web site: Plant-Materials.nrcs.usda.gov

The transfer of center functions began in 1996 and was completed in 2000.

What We Do

The Plant Materials Center serves Appalachia by evaluating plants for their ability to solve specific conservation problems related to climate, the rugged topography, soil limitations, various land uses, fish and wildlife needs and desires of the landowners. The center provides a place for conducting systematic observations and evaluations of plants needed to protect our natural resources. New techniques are developed for the propagation, establishment, management and use for new or improved species of grasses, legumes, shrubs and trees.

The Center's program emphasizes improving forage production on hillside pastures, address problems associated with concentrated livestock, reclamation of mined lands, streambank stabilization, agro-forestry, wildlife habitat improvement, and utilization of economic and culturally valuable plants. The center assembles plants from the entire service area with similar soils and climate, evaluates the plants, develops management techniques, and provides seed and plants for planting to test performance throughout the area. Most of the plant materials produced at the center are used in West Virginia, Kentucky, Tennessee, Pennsylvania, Ohio, Virginia, and North Carolina.

A brief summary of year 2005 accomplishments follows. For a complete account of all activities, request the 2006 Technical Report at the above address.



Winter at the Appalachian Plant Materials Center

Who We Are

The Appalachian Plant Materials Center serves 11 states in the Appalachian Region from Pennsylvania to Georgia and Alabama. The Center is operated by the USDA-NRCS in cooperation with the USDA-Agriculture Research Service, U.S. Forest Service and the Agriculture Experiment Stations of West Virginia University, Virginia Polytechnic Institute and State University and the University of Kentucky. Alderson is located in the heart of Appalachia, and the Center is situated on County Route 3/29, also known as Old Prison Farm Road, approximately 20 miles Southeast of Lewisburg, West Virginia. This center is new with regard to land resource and physical plant, but is the product of the transfer of programs and equipment from Quicksand, Kentucky to Alderson, West Virginia.

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2006 Summary of Projects

These projects involve one or more species of native plants and have diversified our partnerships with Native Americans, federal agencies and private conservation groups. A brief description of each project follows.

Ramp, *Allium tricoccum*, Propagation & Cultivation Techniques for the Eastern Band of the Cherokee Nation

The Eastern Band of the Cherokee Nation requested plant materials assistance with development of cultivation techniques for *Allium tricoccum*, or ramps, in 2002. Ramps are one of many native plants that are culturally significant to the Cherokee.

Allium tricoccum is a perennial spring ephemeral that is widely distributed in eastern North America. The southern Appalachians represent the southern edge of its range. Colonies of *A. tricoccum* can be found in cove forests and northern hardwood associations throughout Great Smokey Mountains National Park and adjoining Cherokee Reservation lands.

The Cherokee have traditionally harvested ramps from wild colonies on reservation and park land by digging and removing the entire plant in early spring. The harvesting of ramps has been allowed in Great Smokey Mountains National Park since the establishment of the park. National Park Service policy states that the Park Superintendent may

designate certain fruits, berries, nuts, etc. that may be gathered by hand for personal use or consumption provided a written determination indicates that gathering or will not adversely affect the reproductive potential of the plant. However, the National Park Service has become concerned that ramps are being over harvested in the Park. This concern has been heightened with the increasing popularity of ramp festivals, which require large quantities of ramps. Recent Park Service field reports indicate that accessible ramp populations are smaller and less dense than those found in more remote areas of the Park.

In an effort to be proactive, the Cherokee have opted to move from traditional spring ramp gathering from wild populations to establishment and management of "backyard" ramp gardens for their people. The Alderson Plant Materials Center will assist the Cherokee to bring this culturally significant wild plant into cultivation. The goal is to develop a dependable supply of ramps for the Cherokee, while limiting further depletion of the wild population within the Great Smokey Mountains National Park.

In November of 2002, staff from the Plant Materials Center harvested a quantity of dormant ramp bulbs from Cherokee reservation lands in North Carolina. These bulbs were transplanted into a forested area at the Plant Materials Center and monitored throughout 2003 for survival. Survival and growth of the transplants was excellent, but there was no seed production in 2003 and 2004. Approximately 6 grams of seed was harvested in 2005. This seed was conditioned and planted in the greenhouse in 2006.

U. S. Department of the Interior-National Park Service Stones River National Battlefield Native Plant Restoration

Stones River National Battlefield, located in Middle Tennessee on the northwestern edge of Murfreesboro is the site of one of the significant battles of the War Between the States. The Battle of Stones River, fought between December 31, 1862 and January 2, 1863 marked the beginning of the Union Army's "March to the Sea" which resulted in Union control of agricultural land and supply networks and prevented further attempts by the Confederate Army to push northward. Stones River



Allium tricoccum

National Battlefield was established in 1927 to preserve this significant historic site. The original property consisted of 344 of the 4,000 acres over which the battle was fought. The park currently encompasses approximately 700 acres.

Vegetation and terrain played an important role in the outcome of the Battle of Stones River. Because of the incidence of limestone outcroppings, cedar brakes and cedar woods dominated the majority of the original park property at the time of the battle. It is suspected that these areas were used as hog lots circa 1862. The cedar glades in the area, which were and are characterized by shallow soil and exposed limestone bedrock, lacked sufficient vegetation for forage or cover for livestock and likely, were considered wastelands.

During the battle, the rock outcrops and thick cedar woods significantly slowed troop progress and impeded rapid movement of artillery pieces. However, the significance of the battlefield's vegetation lies not only in its historical significance but also in its botanical and ecological value. The site is host to a number of rare and endemic plant species and unique plant communities.

Today, introduced and exotic plant species have encroached onto many areas of the battlefield. Park managers have identified restoration of native plant communities as a high priority for maintenance of the parks circa 1862 authenticity. National Park Service personnel have completed a thorough assessment of the vascular flora inhabiting the battlefield property and have targeted approximately twenty native plant species having high priority for use in restoration of plant communities.

The Alderson Plant Materials Center has agreed to work with the National Park Service at Stones River National Battlefield to collect seed, develop propagation techniques, and produce seedling plants and/or seed of the targeted species for plant community restoration within the park. This project is expected to have at least five years duration.

Calendar year 2003 was the initiation year for this agreement. During 2003, NRCS personnel traveled



Transplanting Plugs at Stones River National Battlefield

to Stones River National Battlefield to become familiar with the park's ecological communities, identify prime seed collection locations for the nineteen species of interest, and to assess appropriate seed collection techniques and optimum harvest times. Several late summer seed collection trips netted small (less than 0.5 pounds) quantities of seeds from thirteen species. All seed was collected by hand stripping methods. The thirteen species represented in the 2003 seed harvest are: *Andropogon virginicus*, *Andropogon ternarius*, *Andropogon gyrans*, *Chasmanthium latifolium*, *Dichanthelium* spp., *Eragrostis spectabilis*, *Leersia virginica*, *Schizachyrium scoparium*, *Asclepias tuberosa*, *Symphyotrichum drummondii*, *Lespedeza violacea*, *Lespedeza hirta*, and *Rudbeckia triloba*. All seed harvested was transported to the Alderson, West Virginia Plant Materials Center, where it was conditioned and placed in appropriate seed storage until planting in fiscal year 2004.

In 2004, the Alderson Plant Materials Center produced approximately 20,000 seedlings from the 2003 seed harvest. The seedlings were mechanically transplanted into tilled fields at Stones River National Battlefield to establish seed production fields. Natural Resources staff at Stones River National Battlefield will harvest and use seed from these fields to restore and maintain this historic site's circa 1862 floristic authenticity.

Seed collection and conditioning and transplant production continued in 2006. The PMC produced a

total of about 26,000 transplants representing 10 plus native species. The majority of the transplants were shipped to Stones River National Battlefield for establishment of seed production fields. Transplants retained by the PMC are to be used to establish small seed production blocks at the PMC in the event of field failures at Murfreesboro.

US Army Corps. of Engineers – Marmet Native Plant Mitigation

The Alderson Plant Materials Center continued to assist the US Army Corps. of Engineers - Huntington District with restoration of native plants at the Marmet Locks and Dam Project. This project is located on the Kanawha River in West Virginia upstream of Charleston. The project includes building a new lock chamber and approach channels at River Mile 67.7. All vegetation and habitats within the approximately 150 acre site will be destroyed during the course of construction.

Six native woody species were harvested from the site prior to the start of construction. These species are: *Acer saccharinum*, silver maple; *Lindera benzoin*, spicebush; *Sambucus canadensis*, elderberry; *Asimina triloba*, pawpaw; *Sassafras albidum*, sassafras; and *Aesculus octandra*, yellow buckeye. These plants are being maintained as container grown stock at the Plant Materials Center until completion of construction, when they will be re-introduced to the Marmet site to assist with re-establishment of genetic diversity at the lock and dam location. In the autumn of 2005, 128 pawpaws, 104 elderberries, 10 sassafras, 100 spice bushes and 38 silver maples were returned to the construction site for transplanting into areas where earth moving activities have been completed. Plants remaining at the PMC continue to be maintained as container stock pending construction completion circa 2008.

Saving West Virginia's Balsam Fir

Abies balsamea, balsam fir is native to high elevation areas in West Virginia. However, balsam fir numbers are declining due to a serious infestation of the balsam wooly adelgid. The adelgid is an exotic, sap-sucking insect that causes mortality within 2-3 years of initial contact. Several conservation groups have recognized the rapid decline of the fir in West Virginia and have formed

a partnership with the US Department of the Interior and the Plant Materials Center to restore balsam fir to four natural areas in the West Virginia Highlands. Volunteers from the West Virginia Highlands Conservancy, The Mountain Institute, The Nature Conservancy, and others harvested balsam fir seed from four locations in the West Virginia Highlands in the fall of 2000. The harvested seed was processed by the volunteers and shipped to Alderson PMC for seed banking. The PMC is also responsible for producing seedlings for reintroduction to the natural areas where the seed was harvested.



Abies balsamea seedling production at Alderson Plant Materials Center

During 2003, staff at the Alderson Plant Materials Center germinated a small lot of seed from each of the four collection locations. While actual germination percentages were low, 20-35 percent, for all lots, several hundred seedlings were produced. These seedlings will be maintained at the Plant Materials Center until they are large enough to be re-introduced into their native habitat. The seedlings from 2003 were maintained at the PMC during 2004 and additional small quantities of seed from each collection were germinated in 2004, with the 2004 germination percentages being similar to 2003 percentages. Approximately 400 seedlings were returned to the Canaan Valley Wildlife Refuge in 2005 and 2006. The PMC will continue to maintain the remaining seedlings until they are reintroduced into their native habitat.

Giant Cane Rapid Propagation Study

Arundinaria gigantea, giant cane or bamboo is our largest native grass. Giant cane covered extensive

areas of the southeastern United States at the time of European settlement. These areas were known as canebreaks and they disappeared rapidly following settlement due to a combination of factors. Today, giant cane persists largely as an understory plant in other vegetative cover types.

The shoots or canes arise from underground stems known as rhizomes. Only rarely does *Arundinaria* flower and set seed. Historical accounts of cane brakes clearly indicate that when *Arundinaria* flowers and produces seed, the plant then dies. Thus the principal method of reproduction is vegetative.

The NRCS has developed an interest in rapidly propagating giant cane for use as a streambank erosion control plant and other conservation uses. Collection of plants from Illinois, Indiana and Ohio were initiated in 2001. The Alderson PMC received plants from 9 different locations. These plants will be evaluated with regard to survival, rate of spread, and ability to produce new plants from division of rhizomes.



Arundinaria gigantea stand near Malden, WV

The Eastern Band of the Cherokee Nation also has an interest in Giant cane. However, their interest is in those cane plants that produce large diameter canes. Cherokee crafters use the large diameter canes to make traditional basketry. Suitable canes have become very difficult to harvest from wild cane populations, and the Cherokee are interested in propagating plants that are suitable for their basketry. The Alderson PMC will assist the Cherokee with development of propagation and management techniques to ensure their crafters have a dependable supply of large diameter cane plants.

In 2004, the Alderson Plant Materials Center continued to maintain and observe the 9 collections from Illinois, Indiana and Ohio. Collections of giant cane from the remainder of the Center service area continue to be sought, especially from stands that are producing larger diameter canes.

Two collections from West Virginia were added to the *Arundinaria* observation block in 2005. An *Arundinaria* plant establishment study was also initiated in 2005 using the eleven accessions currently maintained at the PMC. The PMC continued evaluation giant cane in 2006.

‘Quickstand’ Bermudagrass Forage Production Demonstration Project

‘Quickstand’ bermudagrass is a commercially available bermudagrass that was selected by the Plant Materials Center for use as forage and turf. Coastal type bermudagrasses are routinely used in the Southern states as a warm season summer forages. However, Coastal bermudagrasses are not adapted to the colder, continental climate found in the Appalachian region. ‘Quickstand’ bermudagrass was discovered at the former location of the Plant Materials Center in Quicksand, Kentucky and found to be well adapted to the Appalachian region. In fact, this cultivar has proven to be incredibly cold hardy. It not only survives, but thrives at 3000 feet in elevation in West Virginia! However, like most bermudagrasses, ‘Quickstand’ does not produce viable seed. Thus, new stands must be established by transplanting live plants through a process called “sprigging”.

Interest in use of bermudagrass as forage to alleviate the “mid-summer slump” has increased dramatically within the Center’s service area recently. This increase may be attributed to articles that have been published in popular trade magazines, such as the Stockman Grass Farmer, and also through programs such as the Grazing Land Conservation Initiative. Establishment of bermudagrass through transplanting or sprigging is an intensive process that requires specialized equipment which is not readily available in the Center’s service area. Unavailability of establishment equipment was a detriment to use of bermudagrass by many forage producers.

The Plant Materials Center recognized that equipment unavailability was a problem with use bermudagrass as forage and in late 2002 purchased a no-till sprig planter for use in establishing demonstration plantings. This planter was used to establish bermudagrass for forage in Maryland, West Virginia and Tennessee in 2003, 2004 and 2005. Demonstration plantings included 'Quickstand' and 'World Feeder' cultivars. The PMC no-till sprig planter and 'Quickstand' sprigs continue to be available for demonstration plantings.



Plant Materials Center's No-till Bermudagrass Sprig Planter

Central Appalachian White Clover Germplasm Characterization Study

The Plant Materials Center is cooperating with Dr. Paul Voigt, retired Agricultural Research Service clover breeder, to provide white clover base populations that could be used in future cultivar germplasm development projects. To obtain white clover germplasm with good adaptation to central Appalachian pastures, Dr. Voigt made collections from well managed pastures located in Kentucky, Ohio, West Virginia, and Virginia. Twelve white clover experimental populations and cultivars have been planted in an observation block at the Plant Materials Center. Data collection began in 2003, and is expected to continue through at least 2007.



Central Appalachian White Clover Observation Block

Data being collected includes leaf size, foliage height, stolon spread, stolon density, flower density, and pest damage.

In 2004, Dr. Voigt was able to determine that three of the Central Appalachian White Clover populations deserve consideration for germplasm preservation and possible release. These populations all exhibit good adaptation to Central Appalachian environments and presumably to Appalachian pastures. Two other Central Appalachian White Clover populations were not included in this study. They were planted in a new study established in 2004. Data collection on the study established in 2004 continued throughout 2005 and 2006. One or more white clover germplasm releases are anticipated circa 2008.

Annual Land Judging Competition Held at the Plant Materials Center

The Plant Materials Center was the host location for the Southern and Greenbrier Soil Conservation District sponsored Regional Land Judging competition again in 2006. This marks the seventh year that the PMC has hosted this annual competition.



Regional Land Judging Competition Scene

Competitors are normally Future Farmer of America and Canon Envirothon students from middle and high schools from the seven counties comprising the two soil conservation districts. Students and coaches are given a brief tour of the center after they have completed their judging. The Plant Materials Center looks forward to hosting this competition in future years.

West Virginia National Guard Camp Dawson Native Grasses Project

During 2004, the Natural Resources Staff at Camp Dawson, the Army National Guard Training Camp near Kingwood, West Virginia, entered into an agreement with the Alderson PMC. The purpose of this agreement is for the PMC to produce local ecotype warm season grass seed for the Camp Dawson Natural Resources Staff to use in revegetating areas disturbed by annual training activities. Much of the training conducted at the camp involves earthmoving equipment, which inevitably leaves a lot of bare ground to be revegetated! Previous revegetation efforts have focused almost exclusively on use of introduced grasses and/or legumes which have often proven to be less than satisfactory aesthetic, wildlife and erosion control values. It is the desire of the Camp's Natural Resource Staff to increase use of locally adapted warm season grasses to improve the aesthetic, wildlife, and erosion control values of their revegetation efforts.

Four warm season species are indigenous to the Camp. These species are: *Sorghastrum nutans*, Indiangrass; *Andropogon gerardii*, big bluestem; *Schizachyrium scoparium*, little bluestem; and

Panicum virgatum, switchgrass. Seed from each of these species was collected at Camp Dawson in 2004 and 2005. These seeds were conditioned at the PMC and planted to establish seed production blocks at the PMC in 2006. Seed harvested from the PMC production fields will be returned to Camp Dawson to be used in revegetating areas disturbed by troop training exercises. All four species will also be evaluated at the PMC as potential Central Appalachian ecotype releases for use as forage and wildlife values.

Native Plants for Kentucky Food Security Act Programs

The Kentucky Plant Materials Committee is going native! FSA contracts benefiting wildlife are abundant in Kentucky, while locally adapted native plants to use in these contracts are not. The Kentucky Plant Materials Committee approached the PMC for assistance with this dilemma in 2004. As a result, the PMC will be doing initial seed increase for five native species in 2005. These species are: *Liatris spicata*, Spiked Blazing Star; *Rudbeckia hirta*, Black-eyed Susan; *Desmanthus illinoensis*; Illinois bundleflower; *Lespedeza capitata*, Roundhead lespedeza; and *Lespedeza virginicus*, Virginia lespedeza. Seed produced by the PMC will be provided to Kentucky seed producers who will establish production fields and market seed of these species in Kentucky. All of these species are potential Kentucky ecotype releases.

Seedlings of each Kentucky ecotype were started in 2.25 inch diameter plug cells in 2005. These plugs were transplanted into field production blocks in 2006.

Forest Service Red Spruce Propagation Agreement

As a part of the Early Bird Timber Sale Area Improvement Plan, the Forest Service plans to plant approximately 20 *Picea rubens*, red spruce, seedlings per acre in the upper portions of the sale area in order to accelerate restoration of the Red Spruce Montane Forest Ecosystem. This will increase the habitat suitability for the endangered Northern flying squirrel within the sale area, and possibly provide additional squirrel habitat.

However, locally adapted red spruce seedlings are not available commercially. Thus, the purpose of this agreement is for the Forest Service and the PMC to work cooperatively to produce local ecotype red spruce seedlings at the PMC from seed gathered collected within the Marlinton District of the Monongahela National Forest. The Forest Service and the PMC may also consider jointly releasing this red spruce ecotype for commercial seedling and/or seed production and sale.

Approximately 1000 red spruce seedlings were maintained in a container nursery at the PMC until their reintroduction into the West Virginia Red Spruce Montane Forest Ecosystem in 2006. Remaining seedlings will be transplanted into an evaluation block at the PMC in 2007.

Canaan Valley Wildlife Refuge Ecotype Speckled Alder Project

Canaan Valley National Wildlife Refuge, the nation's 500th, is located near Davis, WV at an altitude of approximately 3500 feet. The combination of altitude, wet soils, forests, shrub lands, and open expanses create a sub alpine landscape and provide a diversity of wildlife habitats. While not as readily visible as other birds, woodcock contribute to the diversity of avian species that inhabit the refuge.

USF&WS personnel at Canaan Valley Wildlife Refuge have secured funding for habitat enhancement projects within the refuge, with a primary focus on woodcock habitat. Personnel have also harvested seed from locally available *Alnus incana ssp. rugosa*, speckled alder, plants for use in producing seedlings for habitat restoration and enhancement within the refuge. However, USF&WS lack the personnel, facilities and expertise to produce seedlings for their woodcock habitat restoration and enhancement project.

Thus, US F &WS personnel opted to solicit PMC assistance with production of the speckled alder seedlings. The PMC agreed to produce approximately 1000 seedlings for the Canaan Valley Wildlife Refuge woodcock habitat enhancement program and proceeded to plant the speckled alder seeds provided by the US F&WS in

the autumn of 2005. This project is expected to continue through 2008.

American Chestnut Blight Resistance Evaluations

American chestnut was once a dominant tree in Appalachian forests until the species was decimated by *Endothia parasitica* (chestnut blight). The American Chestnut Cooperators Foundation (ACCF) is dedicated to conducting chestnut selection and breeding research to improve resistance to chestnut blight. A large part of the ACCF research is conducted through field plantings throughout the natural range of the species to evaluate selected strains. The ACCF approached the NRCS in 2006 for assistance with establishment of a chestnut nursery and evaluation plantings of their improved strains for long term evaluation purposes.

Native plants for high quality wildlife habitat is identified as a high priority need in the PMC Long Range Plan. The PMC recognizes that the American chestnut was once an environmentally and culturally dominant part of the Appalachian landscape, the geographic area which the PMC serves. Also, the PMC has some limited experience with chestnut blight resistance research using seedlings produced from irradiated seed. Cooperating with the ACCF enables the PMC to resume American chestnut blight resistance research and address a high priority need identified in the PMC'S Long Range Plan.

The PMC received chestnuts of approximately 20 accessions from the ACCF in 2006. These seeds were planted in the PMC's woody plant nursery where seed germination was monitored. All seedlings produced will be lifted in the spring of 2007 and distributed to cooperators to establish long term field evaluation plantings.

Jamaica Bay Marsh Island Restoration Project

The Jamaica Bay Islands are a highly degraded, urbanized part of the Jamaica Bay Ecosystem, which is a part of the Gateway National Recreation Area and encompasses parts of Kings and Queens Counties in the State of New York. Even though

Jamaica Bay is plagued by rapidly diminishing total tidal wetland area, the area contains significant wildlife and aquatic resources coexisting with insufficient buffers, previous dredging and filling activities, floating debris, new construction and extensive water quality problems.

In response to these intertidal marsh losses, the U. S. Army Corps of Engineers (USACE) initiated a project to restore approximately 180 acres of intertidal salt marsh between Elders Point Marsh and Yellow Bar Hassock. Execution of the project involved placement of sand to preserve the existing marsh to the greatest degree possible, while contouring the placed sand to match the elevations of the surrounding salt marsh and planting with a local smooth cordgrass (*Spartina alterniflora*) ecotype, a species native to the area. The USACE estimated that 606,000 cordgrass seedlings were required for the 2006 restoration construction season. Local ecotype cordgrass seedlings were unavailable commercially, so the USACE partnered with the Plant Materials Program to obtain the numbers of the plants desired.



Spartina alterniflora production at the Appalachian PMC

Seed of smooth cordgrass was collected in the vicinity of the restoration site in late 2005. Four Plant Materials Centers partnered to produce the quantity of seedlings required for the restoration project in 2006, including the Appalachian PMC. During the 2006 growing season, the Appalachian PMC was responsible for production and delivery of approximately 200,000 seedlings to the restoration project staging area on Manhattan Island. Due to construction scheduling problems, the Appalachian PMC was asked to over winter about 85,000 plants. These plants will be delivered

in late spring 2007. The Appalachian PMC will produce additional seedlings for 2007.

Cover Crop Evaluation Project

The NRCS in West Virginia assists farmers to reduce erosion, improve nutrient management, protect soil quality, and encourages the use of integrated pest management on cropland. NRCS has committed technical and financial assistance for vegetable producers to meet these goals through development of voluntary conservation plans and accelerated application using Farm Bill programs. A critical element of these plans is to insure correct timing and accepted methods of cover crops to achieve the land nutrient balance, minimize the loss of nutrients to ground or surface water, improve irrigation water management, and to improve soil quality. As a research and teaching institute, the West Virginia University Cooperative Extension Service (WVU CES) has a long term commitment with NRCS, Conservation Districts and farmers to bring research and technology to the agriculture community.

During 2006, the Appalachian PMC, in conjunction with the West Virginia NRCS and Cooperative Extension Service, initiated an evaluation project for various winter cover crops on cropland. The final products of this project will be seasonal field trials of NRCS released cultivars and commercially available cover crops, publication of technical reports and recommendations for cover crops used in vegetable production, and seasonal in-field training of NRCS and WVU CES staff based on results of the demonstrations. This project is expected to continue through at least 2008.