

Alderson, West Virginia Plant Materials Center

2004 Technical Report



Allium tricoccum or 'ramp' umbel at Alderson

Study Number: 21033-82D
Study Title: An evaluation of *Arrenatherum elatius*, tall oatgrass as a forage for Appalachian small farms –A Cooperative Study with the University of Kentucky – Dr. Jimmy Henning

Introduction: Tall oatgrass, *Arrenatherum elatius*, is a perennial, cool season bunchgrass that is easily established, adapted to somewhat excessively drained low fertility soils and is compatible with legumes. Joseph Ruffner found that tall oatgrass provided excellent short-term cover at moderately low fertility levels and was especially adapted to droughty soils in the Appalachian Region. He found that good stands developed in all field plantings he made, and that tall oatgrass rated as the best grass for short-term cover on mine soils.

Objective: The objective is to select and release cooperatively a productive tall oatgrass cultivar adapted to the Appalachian Region, for use on droughty Appalachian pastures and mine soils.

Discussion: Accession 9061649 was selected as superior to a collection of 80 accessions evaluated at the former Quicksand PMC. This accession is the product of a poly-cross block established at Quicksand in 1989. 9061649 has a high leaf to stem ratio, late boot date and low seed shattering. A seed increase field of 9061649 was established at Alderson PMC in the fall of 2000. Seed harvest from this field began in 2002, and release of

9061649 for commercial production is anticipated circa 2006.

Study Number:
Study Title:

21035-81G
Evaluation of orchardgrass, *Dactylis glomerata*, for adaptation to droughty Appalachian hillside pastures - A cooperative study with the University of Kentucky- Dr. Jimmy Henning.

Orchardgrass, *Dactylis glomerata* L. is a perennial cool-season forage grass, which grows in clumps, producing an open sod. It is a native of Europe, but has become naturalized over much of North America and occupies an important place as a cultivated forage grass. Orchardgrass is common throughout the Appalachian Mountains and is especially well adapted to Maryland, Pennsylvania, West Virginia, Kentucky, and Tennessee. The predominant cool-season forage grass species used in this region is *Festuca arundinacea* Schreb., tall fescue. However, observations in West Virginia indicate that some droughty hillside pastures were being naturally colonized by orchardgrass while the tall fescue in these pastures was declining.

Objective:

The objective of this study is to select and cooperatively release a productive drought-tolerant orchardgrass cultivar adapted to droughty hillside pastures in the Appalachian Region.

Discussion:

9007238 was selected at the former Quicksand PMC from a collection of 24 naturalized stands in VA, WV, and MD, six commercial varieties, and 37 foreign germplasm introductions from well-drained, shallow, low-fertility,

acid soils. Selection of 9007238 was based on superior vigor and growth throughout the growing season, relative resistance to disease, long-term persistence under clipping, dry matter yield, and drought tolerance. A seed increase field of 9007238 was established at Alderson PMC in the fall of 2000. Seed harvest from this field began in 2002, and release of 9007238 for commercial production is anticipated circa 2005.

Study Number: 21009-91E
Study Title: Evaluation of *Alnus serrulata*, smooth alder, for streambank stabilization in the Appalachian Region.

Introduction: On smaller streams in Appalachia, the major bank erosion problems are caused by high velocity flooding events and occasional gouging of the bank by ice floes in the winter and early spring. Those areas that are stripped of vegetation by water or ice then are highly susceptible to additional erosion and mass wasting of soil. *Alnus serrulata* can be observed naturally stabilizing streams in much of the Eastern United States. Field plantings have been made in the Northeast and South, using seedlings of a local collection of smooth alder. However, no work has been done to select a superior accession of smooth alder for the Appalachian Region. This project is part of a regional project to find better plants, both woody and herbaceous, for streambank stabilization.

Objective: The objective of this study is to identify an accession of *Alnus serrulata* that exhibits superior production of numerous flexible stems and fibrous root systems.

Discussion: Accession number 432411 was selected at the former Quicksand PMC as superior from an assembly of 54 smooth alder accessions and from a total of 540 individual plants (10 per accession). This cultivar is from wild provenance material collected at

Panbowl Lake near Jackson, Kentucky. The Alderson, West Virginia PMC has registered the cultivar as 'Panbowl'. 'Panbowl' produces numerous flexible stems and a large fibrous root system and is longer living than is typical of the species. It is hardy in zones 5b to 8b (USDA) and like the species is best adapted to wet bottomland soils and along the margins of streams, but can be grown satisfactorily on well-drained upland soils as well. A seed orchard of 'Panbowl' was established at the Alderson PMC in 2000 and is expected to begin seed production about 2005. 'Release of 'Panbowl' for commercial production is anticipated in 2005 or 2006.

Study Number(s):	21038-83D, 21039-83D, 21040-83D, 21048-91D, 21072-88D, 21085-88D
Study Title(s):	Native Plant Communities For Minesoil Revegetation, <i>Rhus copallina</i> – winged sumac, <i>Amorpha fructosa</i> – indigobush, <i>Sambucus canadensis</i> – elderberry, <i>Cornus racemosa</i> – gray-stemmed dogwood, <i>Cornus drummondii</i> – roughleaf dogwood, <i>Corylus americana</i> – American hazelnut
Introduction:	Today, most mined sites are being revegetated with introduced, herbaceous species which give immediate cover, but contrast significantly with native plant communities and frequently restrict native plant colonization of the site. This is primarily because neither technology nor commercial sources of native plants exists with which to return the sites to the diverse communities typical of original pre- mining vegetation. Some work has been conducted on ways of establishing or introducing trees into herbaceous cover. However, limited, if any, work has been done where native forbs, grasses, shrubs, and trees together have been successfully planted to re-establish plant communities on mine soils or other disturbed areas.
Objective(s):	The objectives of these studies are: A. To identify, assemble, test and select native plant species, which are ecologically adapted to, disturbed soils in the Appalachian Region.

- B. To develop practical methods for establishing these species in plant communities on these sites.**
- C. To develop commercial sources of the desired plant materials.**

Discussion:

One accession of *Rhus copallina*, *Amorpha fructosa*, and *Sambucus canadensis* were selected for advanced testing at the former Quicksand PMC. Likewise six accessions each of *Cornus racemosa*, *Cornus drummondii* and *Corylus americana* were retained at Quicksand for advanced evaluations. The *Cornus racemosa*, *Cornus drummondii*, *Sambucus canadensis*, and *Amorpha fructosa* plants were moved to the Alderson PMC in the spring of 1999. In the spring of 2000, the *Rhus copallina* and *Corylus americana* plants were moved to Alderson. All species and accessions survived the transplanting, but all plants are also experienced moderate transplanting shock. Additionally, the *Cornus racemosa* accessions have developed moderate to severe dogwood anthracnose infections. However, all species and accessions, with the exception of *Corylus americana*, produced seed in 2003. These studies will be continued in 2005.

Study Number:
Study Title:

WVPMC-T-0104-OT
US Army Corps. of Engineers
Ecosystem Restoration Reimbursable
Project

Introduction:

The Marmet Locks and Dam are located in Kanawha County, WV, on the Kanawha River a short distance upstream of Charleston, WV. The Marmet Locks and Dam Project includes building a new lock and approach channel located on the river right side to accommodate larger tows. The USACE, as a part of their site mitigation plan, wishes to preserve local plant ecotypes for re-establishment on the site upon completion of construction. The local ecotypes of interest are not available commercially.

Objective:

The objective of this project is to assemble or propagate and maintain specific numbers of local ecotypes of six woody species for use by the USACE at their Marmet construction site.

Discussion:

This project was initiated during 2001. Seedling plants of *Acer saccharinum* - silver maple, *Lindera benzoin* – spicebush, *Sambucus canadensis* – elderberry, *Asimina triloba* – pawpaw, and *Sassafras albidum* sassafras were lifted from the construction site during the spring and early summer. These plants were placed into pots and transported to

the Alderson PMC. These plants are being maintained in shade structures at the PMC until completion of construction. Seed of *Acer saccharinum*, *Lindera benzoin*, *Asimina triloba*, and *Aesculus octandra* –yellow buckeye were also harvested from the site during 2001. These seeds will be used to produce seedlings at the PMC to assist with fulfillment of the agreement with the USACE. It is important to note that all plants produced under this agreement are for the exclusive use by the USACE at the Marmet construction site. However, one or more of these species may be made available to the public by the Alderson PMC in the future as source identified releases in conjunction with the USACE.

Study Number:
Study Title:

WVPMC-P-0101-TE
West Virginia Balsam Fir Increase –
A cooperative project with The
Nature Conservancy, US Fish and
Wildlife Service, US Forest Service,
and The West Virginia Highlands
Conservancy.

Introduction:

In West Virginia, balsam fir is found only at high elevations and in conjunction with damp woods and mountain swamps. Although it is not listed as endangered, it is considered to be a somewhat rare plant in West Virginia. Dr. Earl Core, in Flora of West Virginia, describes balsam fir as a tree 10-25 meters tall, 1 meter in diameter, and having a bark warty with resin blisters. Hence, the name “blister pine” commonly used in the Alleghenies.

One of the more alarming contemporary problems in the Appalachians is the rapid depletion of balsam fir forests linked to the Balsam wooly adelgid, an exotic, sap-sucking insect that causes mortality within 2-3 years of initial contact. Although undetected for many years, the adelgid infestation is now widespread and appears to be growing in WV and elsewhere.

Objective:

The objective of this project is to maintain a seed bank for the West Virginia balsam fir, to propagate seedlings for replanting in the areas where the seed originated, and to develop source identified releases for West Virginia balsam fir.

Discussion:

In August 2000 ten volunteers harvested balsam fir seeds from 4 locations within the Allegheny Highlands of West Virginia. These seeds were processed and delivered to Alderson PMC for seed banking and production of seedlings. Limited quantities of seedlings of the four accessions were produced at the PMC in 2003. Seedling production will be continued in 2005.

Study Number:
Study Title:

WVPMC-T-0102-TE
Development of Rapid Propagation
Techniques for *Arundinaria gigantea*

Introduction:

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 canebrakes 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 canebrakes 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. 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.

Objective:

The objective of this study is to develop methods to rapidly propagate large numbers of giant cane plants for conservation uses.

Discussion:

NRCS staff in Indiana, Illinois, and Ohio collected and shipped *Arundinaria gigantea* plants to Alderson PMC in the late winter and early spring of 2001. The PMC received a total of 9 accessions, with 20 plants per accession, in 2001. These plants were planted into a clean tilled observation/nursery block in Field 1. An accession from the Cherokee Indian Reservation in Cherokee, NC and a fifth accession from Indiana was added to the collection in 2002. Two accessions from West Virginia were added to the observation block in 2003. All accessions will be observed for at least two years to evaluate their survival and natural rate of spread. Observations will continue through 2005.

Study Number(s):
Study Title(s):

**WVPMC-P-0105-OT, WVPMC-P-0106-OT, WVPMC-P-0107-OT
Intercenter Plant Evaluation Studies**

Introduction:

Intercenter plant evaluations are used to help determine the area of adaptation of potential releases. Additionally, these studies may be useful in evaluating potential aggressive or invasive properties of candidates for release under controlled conditions outside of the releasing PMC service area. Intercenter evaluation studies are developed with regard to the environmental diversity of the area served by the releasing PMC and the anticipated area of adaptation for the release candidate.

Objective:

The objective of these studies is to evaluate the area of adaptation for 4 species and 5 accessions that are potential releases from the Big Flats PMC.

Discussion:

The Alderson PMC received seed of *Agropyron* genus-intermediate wheatgrass, *Sorgastrum nutans*-Indiangrass, two accessions of *Spartina pectinata*-prairie cordgrass, and *Agrostis gigantea*-redtop in 2001. Seeds of each genus and accession were planted in cone-tainers in the greenhouse in late winter of 2001. Seedling plants were transplanted from the greenhouse to observational

rows in Field 1 mid-spring of 2001. 100 plants of intermediate wheatgrass, Indiangrass, and redtop and 50 plants of each accession of prairie cordgrass were transplanted into the observation area. Plants were evaluated for survival in September 2001. All species and accessions exhibited 100 percent survival. These plants will be evaluated at least twice annually for an additional three years.