

Propagating Native Cool Season Grasses for Conservation Use

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PROJECT BACKGROUND

Part of the USDA's Natural Resources Conservation Service, the National Plant Materials Center (NPMC), is concerned with developing plant species and technology for conservation applications. Erosion control, water quality improvement, upland and wetland wildlife habitat enhancement, and grazing land improvement are focus areas for the NPMC as well as the other 25 plant materials centers which make up the NRCS Plant Materials Program. The goal of the Program is to make improved plants and information available to land owners and managers.

The NPMC and the Plant Materials Centers in Big Flats, New York; Cape May, New Jersey; and Rose Lake, Michigan, have initiated a project to investigate propagation and seed production of selected native cool-season grasses for the Northeast United States. Very few native cool-season grasses are available for widespread use in the region, and the Plant Materials Program is trying to develop both untapped species and technology (i.e., propagation, seed production, processing requirements, and field establishment). The techniques developed by this project will make nursery production of regional grass ecotypes possible.

The NPMC is working with many groups, including the University of Maryland, NRCS field offices, several National Parks, and citizen volunteers to make the initial regional collections of seven native cool-season grass species.

SPECIES UNDER INVESTIGATION

The primary species of interest at the NPMC are Virginia wildrye (*Elymus virginicus*), hairy wildrye (*E. villosus*), and bottlebrush grass (*Hystrix patula*). These species are available on an extremely limited basis from seed vendors, most seed is from outside the region, and each has potential conservation applications. Secondary species of interest include little foxtail (*Alopecurus carolinianus*), Canada brome (*Bromus purgans*), stout woodreed (*Cinna arundinacea*), and little barley (*Hordeum pusillum*). These species are not commercially grown in production fields (or in some cases, not even available), and more research is needed regarding the potential for seed production as well as conservation uses.

PROJECT SCOPE AND CURRENT STATUS

The NPMC is focusing on collections of these native grasses from the coastal plain, piedmont, and mountain regions of the mid-Atlantic states. The collection area extends from the Maryland-Pennsylvania border in the north, south to North Carolina, and west to West Virginia.

Initial seed collections were made for all species in summer and fall 1998, seed from each site was assigned an accession number, and three 100-seed replicates of each collection were tested for percent germination in the greenhouse. Grass plugs will

be lined out in evaluation blocks in late fall 1998 and in spring 1999.

Information generated by previous work at the NPMC with Virginia wildrye, hairy wildrye, and bottlebrush grass will be used to maintain weed-free evaluation blocks, as well as harvest and clean seed. The NPMC has been growing these three species for roadside revegetation projects. Production fields have been established by planting plugs in rows with a modified tobacco planter. Weed maintenance between rows has been accomplished through planting a cover crop or through cultivation. Seeds are harvested using a combine, and seeds are cleaned using a two-screen clipper.

Horticultural Research at The Holden Arboretum

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Formal research at the Holden Arboretum began in 1991 with the hiring of staff with scientific training. Currently, the centerpiece of research is breeding woody ornamental plants to support our mission to develop improved plants for the landscape through breeding or selection and to make significant contributions to the plant sciences. Complementary research includes: studies of plant reproductive biology, measuring genetic diversity, estimating the heritability of important traits, utilization of biochemical markers, and developing alternative propagation methods. The current focus includes work within several genera (*Aesculus*, *Cercis*, *Hamamelis*, *Magnolia*, and *Rhododendron*).

Acquisition of germplasm has been an organizational and early research objective. In 1993, we began assembling a collection of *Hamamelis* cultivars and seed was collected from throughout the range of our native *H. virginiana*. By formal agreement, the Holden Arboretum acquired the property and germplasm accumulated by David G. Leach who was a prodigious breeder of *Rhododendron* for over 50 years. Acquired in 1986, this plant collection is one of the best for cold-hardy *Rhododendron* germplasm. Three full-time employees maintain this satellite research station of nearly 20 acres located within 30 miles of The Holden Arboretum.

At the Arboretum proper, research is conducted from the Horticulture Science Center (HSC) which was completed in early 1994. Currently, over 4000 ft² provides ample office, herbarium, darkroom, and laboratory space for research. The HSC also has a 3000 ft² headhouse and about 4500 ft² of greenhouse space to support the expanding needs of the organization.

The Corning Institute for Education and Research was designed, in part, to promote research by young scientists. This program may support graduate students who conduct research at Holden and complete class work at an appropriate college or university. Alternatively, the Corning Institute may support individuals at the post-graduate level to work with the Research staff on specific projects. A second opportunity is the R. Henry Norweb, Jr. Fellowship that typically supports individual research at the Arboretum typically during the summer. Staff selected for this program may work on a specific project of interest, bring an existing program to The Holden Arboretum, or be supported while on sabbatical leave.