

1998 Progress Report

Study No. 29I142G - Production of Native Missouri Ecotypes of Grasses, Legumes and Forbs for Roadsides, Critical Areas, and All Other Vegetative Plantings Where Native Plants are Now Being Planted.

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Introduction:

Well adapted native grass, legume and forb plantings offer many advantages as a low cost sustainable vegetative cover for management of soil and water resources. Native plant communities resist noxious weed invasion, provide excellent erosion control, and generally require relatively low maintenance.

These characteristics make native plants an excellent selection for use in roadside plantings, wildlife habitat enhancement, long term land retirement programs, public land and all other vegetative plantings where mono-cultures of grasses are presently being planted. This is especially true along public transportation corridors which constitute a major land resource and management problem in the state of Missouri. Based on 1987 NRI data, over one million acres of Missouri land are devoted to rural transportation. Other federal and state agencies also own a significant land base in Missouri.

Proper vegetation management along these corridors is an important element in controlling soil loss and unwanted weedy plant species. Many of these acres are now seeded to introduced cool-season grass and legume species which are often invaded by noxious weeds requiring extensive mowing or herbicide treatment programs. These management techniques are expensive and can also result in additional water quality problems where herbicides are used extensively.

Managing or re-seeding these acres to promote native grasses and forbs offers a low cost environmentally sound approach to roadside vegetation management. Herbicide use, soil erosion, and most mowing can be reduced significantly where a vigorous native grass and forb mixture dominates a roadside right-of-way. In addition, these goals are consistent with on-going NRCS programs designed to improve ground and surface water quality, reduce soil loss and increase wildlife habitat.

Problem:

Many adapted forb, legume and grass species of native origin are either currently not commercially available or available only in very limited quantities, which makes them very expensive. Species that are available are often varietal releases that have undergone an evaluation and selection process or a plant breeding program. Most varieties are designed for high forage production and are highly vigorous plants. They are generally excellent for pasture and hay production but can be too domineering for diversified mixtures. Their origins are often not from within the state in which they are being planted. There is a need for additional native species for use on public lands and other types of conservation plantings with origins close to where they are being planted.

Objectives:

The objective of this project is to accelerate the availability of selected native grass, legume and forb species.

Cooperators:

The Missouri Department of Conservation (MDC), USDA Natural Resources Conservation Service, Plant Materials Center (PMC), and the University of Missouri at Columbia, Missouri (UMC).

Procedures:

The state of Missouri was divided into four zones; Northern Glaciated Plains, Zone #1, Western Prairie, Zone #2, Ozarks, Zone #3, and the Bootheel Region, Zone #4 (See Table #1). Plant Materials were collected as seed by the study coordinator, selected personnel from USDA-NRCS, Missouri Department of Conservation, University of Missouri and other knowledgeable interested persons. Collections were made from prairie remnants throughout each zone striving for a relatively equal and representative sample. Large collections from one site were not allowed to dominate the mixture from throughout the zone. Seed from each collection site was inventoried by location. Seed collected from within each zone was kept separate from the other zones. Increase plots were and will be established as seed becomes available. Each species will be released as 'Source Identified' germplasm from the zone in which it was collected. 'Source Identified' seed has not been improved by evaluation and selection or plant breeding procedures.

Table # 1**Discussion:****1997**

The Missouri ecotype enhancement program was officially started as a plant materials study with the signing of the study plan in December of 1997. This plan is an agreement between cooperators and funded by a grant from the Missouri Department of Conservation. Several

meetings preceded the document signing that included MDC, NRCS, UMC, Department of Transportation, Missouri Department of Natural Resources, and other interested individuals.

The initial grant from MDC to UMC received July, 1997 and a program coordinator was hired by UMC on September, 1997 to work at the Elsberry Plant Materials Center.

A list of species to collect was developed by the cooperators and seed collection, cleaning, and some fall dormant planting started the fall of 1997. See list of species and amount of collections in table # 2. Most species had a substantial amount of seed except for pale purple coneflower, *Echinacea pallida*, finger coreopsis, *Coreopsis palmata*, and butterfly weed, *Asclepias tuberosa*. These three species had lost the bulk of their seed by the time collections were made. Since there was a limited amount of seed, they were grown in the greenhouse for transplanting in the spring of 1998.

1998

As of January 1, 1998, blazing star was the only plot that was planted. In mid-March a second planting of blazing star was made. Five of the eight species were seeded in the greenhouse and transplanted into plots during spring and summer. They were *Echinacea pallida*, *Liatris pycnostachya*, *Asclepias tuberosa*, *Desmodium* spp., and *Coreopsis palmata*. Problems with the soil media containing gnat larvae caused complications as larvae fed on plant roots. *Echinacea pallida* and *Liatris pycnostachya* were damaged the most as more than 90% were lost. Many different approaches were taken to eradicate the larvae, but changing the soil mix was the only solution. Bush clover, *Lespedeza capitata*, was planted in mid April and big bluestem, *Andropogon gerardii*, and little bluestem, *Schizachyrium scoparium*, were planted in early May. A general rating of how the increase plots established can be seen in table # 2. Weed control was a problem with most of the plots and will need to be replanted in 1999.

Goals were established for 1998 collections. Some species from 1997 were recollected and some new species were added (See table #3).

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