



"Plants for the Northland"

# 2002/2003 Northland News USDA-NRCS Plant Materials Center

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## Vegetative Solutions for Conservation Problems



<b><u>In This Issue</u></b>	<b><u>Page</u></b>
<b>Who We Are .....</b>	<b>2</b>
<b>Slough Sedge Spread .....</b>	<b>2</b>
<b>Bur Oaks Look Promising .....</b>	<b>3</b>
<b>New Publications from the PMC.....</b>	<b>3</b>
<b>Cordgrass Alternative.....</b>	<b>3</b>
<b>Free Rent.....</b>	<b>3</b>
<b>The Forb File .....</b>	<b>3</b>
<b>Experimental Chokecherry Planting .....</b>	<b>4</b>
<b>Evaluating New Trees and Shrubs.....</b>	<b>4</b>
<b>Culturally Significant Plants.....</b>	<b>5</b>
<b>Fargo Xeriscape Gardens.....</b>	<b>5</b>
<b>Foundation Seed Sales.....</b>	<b>6</b>
<b>Notes from Field Plantings .....</b>	<b>6</b>
<b>New Crested Wheatgrass Released.....</b>	<b>6</b>
<b>Training Planned.....</b>	<b>6</b>
<b>Morris Cool-Season Grasses Trial .....</b>	<b>7</b>
<b>Prairie Restoration Update .....</b>	<b>7</b>
<b>Certified Seed/Plant Prices.....</b>	<b>8</b>
<b>2002 Staffing/Advisors.....</b>	<b>8</b>

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Front Cover Photos (Clockwise, starting at the center top): Xeriscape Gardens demonstration planting, Fargo, ND; Prairie restoration study; Plant Materials foundation seed production; Chokeberry, Central Lakes College, Staples, MN, Agroforestry study; Burning foundation seed production fields, Bismarck PMC; O.W.L.S. demonstration, Hettinger, ND; Streambank stabilization planting of bareroot rhizomes of slough sedge and Red River prairie cordgrass, Spruce Hill Park, MN; European cranberry, Morris, MN, Field Evaluation Planting; Slough sedge evaluation study; Woody direct seeding, Missouri River watershed; Forage trial, Pierre, SD; Plant Materials training session.

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**Who We Are**

The NRCS Bismarck Plant Materials Center (PMC) is one of 26 plant materials centers

located across the United States. The center serves the states of Minnesota, South Dakota, and North Dakota. Our primary mission is to provide plant science technology to the field offices. Customers consist of NRCS staff; local, state and federal agencies; and private landowners/operators. Our work focuses on selecting and releasing plants, and associated technology needed to help solve the diverse resource problems that occur in the northern Great Plains and upper Midwest.



*Plant Materials staff: (back row, left to right) Mike Bellon, Wayne Duckwitz, Nancy Jensen, Mike Knudson. (front row, left to right), Earl Aune, Dwight Tober, Rachel Bergsagel.*

**Slough Sedge Spread**

Wetland plants are not something one thinks about in the midst of a drought. Optimistic that it will rain again, the PMC continues to grow and test several wetland species.

Slough sedge (*Carex atherodes*) evaluation continues at the Bismarck PMC. Seeds collected in 1997 from South Dakota, Minnesota, North Dakota, and Canada were propagated, and an evaluation block was planted. Seed was collected from superior plants of this assembly, seedlings were grown, and a seed increase field was planted. The anticipated seed harvest of "pounds of seed" from this field was quite different from the actual 130 grams in 2002. Slough sedge seed production appears to be poor. Seed germination is also unpredictable. While seed production is poor, rhizome production is excellent. Rhizomes are many and quite vigorous. These attributes have pointed the PMC in other directions for propagation of the species. In 2002, plants were successfully established in trial beds using bareroot rhizomes. Rhizomes will be planted in field planting trials in 2003 to further evaluate propagation. Methods to enhance seed production will continue.

*Nancy Jensen, Agronomist*

## Bur Oaks Look Promising

In 1992, field office personnel and the Plant Materials staff made a collection of bur oak acorns from across the Great Plains. Selections from 90 different seed sources of oak were planted at the USDA-ARS Northern Plains Research Laboratory at Mandan, ND. The height of the tallest trees was 15 feet after 10 growing seasons. In addition to measuring the trees for height and survival, the amount of acorns produced was recorded. We first noticed a few acorns being produced when the trees were 5 years old. In 2001, many of the trees produced some acorns. Mandan received above average rainfall in 2001. In 2002, our region received less than average rainfall, and the temperatures were above average. The acorn production in 2002 was quite a bit less than in 2001. The better producing trees will eventually be used as a seed orchard. Our region has a real need for a bur oak selection to use in all types of tree plantings.

*Michael Knudson, Forester*

## New Publications from PMC

The PMC staff has been preparing two publications for field office use. The first of these is a large poster showing the plant releases from the Bismarck PMC. The poster will have a photo of each species released; seven warm-season grasses, seven cool-season grasses, five trees, five shrubs, and five forbs. This poster should be available by late summer.

The second publication is a brochure titled "Five Keys to Successful Grass Seeding." In 2002, Plant Materials Tech Note #14 was written by a committee of Ecological Sciences staff members. This Tech Note is titled "Herbaceous Vegetation Establishment Guide," and is found in Section I of the e-FOTG. The purpose of the new brochure is to consolidate key items from the Tech Note into a handout for field office staff and the general public. We hope to have this available by late spring.

*Michael Knudson, Forester*

## Cordgrass Alternative

Too difficult to seed prairie cordgrass where you want it to grow? Do you want to get a field established quickly? No seed available? Perhaps planting rhizomes may be the alternative for you. The PMC has been exploring rhizome propagation for some time.

The seed production fields at the PMC were planted a few years ago, using a tree planter and bareroot rhizome pieces. Rhizomes were dug in the spring, and planted within a few days. Experiments in 2003 showed bareroot prairie cordgrass rhizomes could be dug in the fall, stored in a cooler and planted in the spring. Another trial showed rhizomes dug in the fall and planted to another location soon after digging successfully established. Stand establishment has been excellent for all storage and planting dates tested. Seeding is probably the least labor intensive and cheapest method of prairie cordgrass establishment, but stands can be unpredictable. When seeding is not feasible, rhizomes offer a great alternative. Additional information on rhizome processing, planting techniques, row spacing, storage, etc., is available upon request from the PMC. A traveling poster is also available for workshops or meetings.

*Nancy Jensen, Agronomist*

## Free Rent

Posters are available from the Plant Materials Center even when people are not. These posters were originally used for poster paper sessions at professional meetings. The posters, designed by PMC personnel, have colorful pictures and narrative. They are laminated and are 4 to 6 feet by 3 feet in size. Following are the topics of each poster. If you would like to borrow any of them for meetings, etc., please contact the PMC. Additional posters will be made in the future and will also be available to travel.

### **Native Plant Technology -**

pictures and variety names of all native grass and forb releases from the Bismarck PMC

### **Native Shrubs for Conservation -**

no-till direct seeding trial of five native shrubs  
**Forage Grasses Released by the Bismarck Plant Materials Center and Partners -**

narrative and pictures pertaining to rangeland, pasture and hayland species recommendations

### **Prairie Cordgrass Establishment -**

techniques for vegetative and seed propagation

*Nancy Jensen, Agronomist*

## The Forb File

Among the vast sea of grasses at the PMC, colorful splashes of native wildflowers (forbs) are surfacing. Wildflowers add diversity and color to a planting, provide food and habitat for wildlife and livestock, can fix nitrogen (legumes only),



and can be used in landscaping. Various forbs have been collected by PMC personnel over the past few years. They have been, or will be, planted to evaluate their release potential.

Collections from SD, ND, and MN of shell-leaf penstemon (*Penstemon grandiflorus*) were planted dormant this fall to sanded beds at the PMC. The gray/green smooth leaves should poke through this spring, but the beautiful pink flowers of this dry, sand loving plant won't make much of an appearance until 2004. Plants will be evaluated and seed will be harvested.

Cold, dry conditions are not ideal for the tall grass prairie species cupplant (*Silphium perfoliatum*). How much cold and drought can the species tolerate? The large, yellow-flowered, sunflower like plants, with leaves that form a cup, are originally from MN and WI. They were selected by South Dakota State University. They are being evaluated at SDSU and in ND at the PMC. Their large root system may offer potential for nutrient uptake and erosion control.

Rocky Mountain gayfeather (*Liatris ligulistylis*), also called meadow blazing star, is a showy purple-flowered perennial species of moist meadows and roadsides. The showy flowers are very attractive to butterflies. It is single or few stemmed. The base of the plant is woody and bulb-like. Seeds were collected in central North Dakota last fall and will be propagated in the greenhouse and planted in a plot for evaluation this summer.

Leadplant (*Amorpha canescens*), has been growing at the PMC for a few years. It is shrubby but becomes less woody when excessively grazed or mowed. It is palatable to most livestock. In the spring of 2002, plants at the PMC were undercut and transplanted to a single row. Seed production will continue to be evaluated. Since seedlings are slow to grow, bareroot propagation has been evaluated the past two years through field planting trials. Bareroot material is now available for purchase through the ND Association of Soil Conservation District's Lincoln-Oakes Nursery.

Fourwing saltbush (*Atriplex canescens*) is a perennial of the semi-arid and arid regions of the West. Leaves, seeds, and stems contain high protein and are eaten by livestock and wildlife. It is tolerant of salty soils. A South Dakota seed source is being grown and evaluated at the PMC. Studies have begun at the Agricultural Research Center to evaluate winter grazing potential.

Silky prairieclover (*Dalea villosa*), a small legume with pink/purple flowers and white, hairy leaves and stems is producing a small amount of seed at the PMC. It is a plant of very sandy, dry sites.

The five forb species; maximilian sunflower, stiff sunflower, narrow-leaved purple coneflower, purple prairieclover, and white prairieclover (MT PMC), released in 2000, are producing seed. Seed continues to be distributed for increase to growers. The seed they grow is sold to farmers, ranchers, and public and private agencies and used in various programs.

As releases are made, forbs should become more readily available for brightening your grassy sea with a little color and flavor!

Nancy Jensen, Agronomist

### Experimental Chokecherry Planting

An experimental planting of chokecherry will be established by NDSU at Lincoln-Oakes Nursery this spring. Selected plants originated from field office collections that were established at the Apple Valley site, east of Bismarck. The goal of the planting will be to identify plants that are tolerant of X-disease. This disease occurs naturally throughout our region, and affects most



native stands of chokecherry. Once the X-disease tolerance is identified, the experimental planting will be converted to a seed orchard of superior germplasm. This testing will take a few more years, but we are getting closer to having an improved variety of chokecherry with resistance to western X-disease.

Michael Knudson, Forester

### Evaluating New Trees and Shrubs

Part of our job is to find plants that are compatible with our soils and climate. Though

the Soil Conservation Service started planting trees back in the 1930s, for many years there was a limited selection of trees available. When the Bismarck PMC started in 1954, the Plant Materials Specialist, John McDermand, made annual seed collecting trips to the Ag Canada Arboretum at Morden, Manitoba. As a result of his collections, many new species of trees and shrubs were made available to soil conservation districts for planting.

Evaluations at the various woody FEPs each year document which plants are better than average, or have some superior characteristic. As a result, the PMC continues to receive new species or better seed sources for commonly grown plants. In the past few years, many of the new plants evaluated have come from Lincoln-Oakes Nursery at Bismarck and Lawyer Nursery at Plains, MT. The PMC also receives new plants from USDA-ARS, which operates the Plant Introduction Station at Ames, IA.

*Mike Knudson, Forester*

### Culturally Significant Plants

Plants have played a significant role in the culture of Native Americans. Many of these plants are no longer readily available. As an outreach effort, the Bismarck Plant Materials Center began studying plants with cultural importance. Two species, sweetgrass (*Hierochloa odorata*) and white sage (*Artemisia ludoviciana*), have been collected and propagated by the PMC.

Sweetgrass has been propagated and offered to Tribes and other interested folks since 1999. Distributed plants were to be used to start personal propagation beds. Uses of sweetgrass include ceremonial burning and basketry. The abundant rhizomes of the species are also important for erosion control.

White sage (*Artemisia ludoviciana*) has been collected and is in the initial phase of propagation. In 2002, plants were collected from or near five Reservations. The Reservations were Standing Rock (ND), White Earth (MN), Pine Ridge (SD), Sisseton (SD), and Turtle Mountain (ND). The ten plants (two from each site) were planted at the PMC in 2002. After the bed has become established, rhizomes will be dug and propagated in the greenhouse. These plants will then be made available in 2004 for distribution to Tribes and others interested in starting their own propagation beds. White sage, also called man sage or prairie sage, was a very important



ceremonial plant of many Native American Tribes. It was used medicinally as a liniment, stomach aid, to stop nosebleeds, relieve headaches, suppress coughs, treat rashes and skin irritations, and treat colds. The plant is rhizomatous, has white-woolly leaves and stems, and is sage scented. It is found in dry grasslands and roadsides.

*Nancy Jensen, Agronomist*

### Fargo Xeriscape Gardens

The Fargo Xeriscape Gardens are an extension of the cooperative effort between the City of Fargo, the U. S. Bureau of Reclamation, and numerous other contributors to promote the seven principles of xeriscape. Located at the Fargo Filtration Plant at 13<sup>th</sup> Avenue and 4<sup>th</sup> Street South, the Xeriscape Gardens is designed to provide information to the general public regarding efficient water use in landscaping design. Various demonstration areas include flowering plants in three different water use zones; an alternative lawn display; a riparian area; a drainage swale; and a native prairie restoration demonstration area. The PMC provided seed and installed the alternative lawn demonstration area and the native prairie restoration demonstration area.

The alternative lawn area consists of seven different lawn types/species for public viewing and comparison. Entries include blue grama; buffalograss; blue grama, buffalograss mixture; Kentucky bluegrass, perennial ryegrass mixture; three-variety mixture of perennial ryegrass; crested wheatgrass, perennial ryegrass, Kentucky bluegrass mixture; and tall fescue. Each plot will have different water use management applied. The native prairie restoration demonstration consists of more than

30 species of native grass, forbs, and legumes. The next time you are in the Fargo area, stop by for a self-guided visit and explore the environmentally friendly world of xeriscape!

*Dwight Tober, Plant Materials Specialist*

### **Foundation Seed Sales**

Requests for foundation seed remain strong and most of the native grass species are sold out for this year. It is a good idea to get your name on the waiting list if you are interested. There is no obligation. The releases with the longest waiting list at this time include Pierre sideoats grama, Tomahawk Indiangrass, Bison big bluestem, and Nordan crested wheatgrass. Production was lost last year on many of the warm-season grasses due to a late summer hail storm at the PMC. The cooperative effort with the NDSU North Central Research Extension Center at Minot is working well. They are growing foundation seed of Dacotah switchgrass, Lodorm green needlegrass, Nordan crested wheatgrass, and Itasca little bluestem.

*Dwight Tober, Plant Materials Specialist*

### **Notes from Field Plantings**

There continues to be a high level of interest in the field planting program. The demand for gray dogwood exceeded the supply this year in all three states. This native species is broadly adapted from dry to wet sites. There were also numerous requests from all three states for slough sedge rhizomes. Plantings are planned on a variety of sites including lakeshore, dams, streams, and seeps. Rhizomes are becoming more widely used and gaining in popularity, especially the Red River prairie cordgrass. We have several growers/nurseries getting into rhizome production of Red River. Lincoln-Oakes Nurseries now has rhizomes for sale of Red River prairie cordgrass. A recent article from the Department of Natural Resources in Missouri indicated that in a 3-year trial comparing different methods of establishing prairie cordgrass, rhizomes were the most efficient and economical. Using a tree planter, a crew of three planted 25 acres of rhizomes in 12 hours. Spacing was 4 feet within-row and 20 feet between rows. The survival rate was 75 percent.

Field plantings from previous years continue to be evaluated. The leadplant has had mixed success. High, dry sites with weed control have generally been good. Sites lower on the

landscape or wetter, and/or with less weed control, have been less successful. Survival of the black chokeberry has been very good, even on the drier sites. Growth rates have generally been slow the first year, but better thereafter. Fruit production has been exceptional! Generally, some fruit is produced even the first year. Beginning the second year, fruit production can be very good. The fruit hangs in thick clusters and is easy to pick. The primary problem with the black chokeberry so far has been rabbits chewing on them the first year.

Sweetgrass continues to be popular for demonstration/special planting. Tentative plans are to have white sage available for distribution, similar to the sweetgrass, for 2004.

*Dwight Tober, Plant Materials Specialist*

### **New Crested Wheatgrass Released**

Crested wheatgrass remains one of the best early-season use forage species in the Northern Great Plains. The Bismarck PMC recently cooperated with the Agricultural Research Service (ARS) and the University of Nebraska in releasing NU-ARS AC2 crested wheatgrass. Dr. Ken Vogel, Plant Geneticist with ARS at Lincoln, Nebraska, developed NU-ARS AC2 for increased genetic diversity and high, stable yields when used in cool-season pastures and rangelands in the mid-grass and short-grass eco-regions of the Central and Northern Great Plains. This is a composite population from fairway-type germplasms collected by Douglas Dewey in the former USSR in 1977.

NU-ARS AC2 was tested by the Bismarck PMC in replicated trials near Ft. Pierre, South Dakota and Hettinger, North Dakota. Plant performance data collected for 6 years at each site indicated improved average forage yields compared to most of the other 11 crested wheatgrass entries. Wayne and I looked at the Ft. Pierre plots last summer and observed visual differences indicating a higher stand density and production for the new release compared to the other entries. This was 11 years after the plots were established on a Promise clay soil.

*Dwight Tober, Plant Materials Specialist*

### **Training Planned**

A 3-day training session was held July 16-18, 2002, at the Bismarck PMC. Participants comprised of NRCS Staff, SWCD, SCD and USFS took advantage of the training session. The training included an overview of the plant materials program and the program's focus on

providing vegetative solutions to conservation problems. All three states sent staff to participate, resulting in good discussion regarding plant materials and problems they face in their daily work. The second day was dedicated to hands-on technical training on various plant resources including trees and shrubs, native forbs and legumes, grasses and wildlife.

A 3-day training session is being planned for July 15-17, 2003. Its content will be similar to last year. Those with an interest in this training should visit with their supervisor.

*Wayne Duckwitz, Plant Materials Center Manager*

**Morris Cool-Season Grasses Trial**

Replicated plots (6'x 25') of 32 different cool-season varieties/species were established at the University of Minnesota at Morris, West Central Research and Outreach Center, in April 1998. Plant performance was evaluated for 4 years and biomass was harvested annually for 3 years. It was always great working with the staff at the Morris Research and Outreach Center and the NRCS field offices at Morris, and surrounding locations. Without their assistance, this information could not have been documented. Forage harvest was usually done in July at the end of the cool-season growth. I think we traditionally clipped on the hottest day of the year!

Various varieties/sources of 20 different cool-season species were evaluated. Information from this study was used to recommend changes regarding species and varieties in the latest update of various conservation practices in the Minnesota Field Office Technical Guide. The study is currently being summarized and complete information will be published in the next PMC Technical Report. The following table will give you some insights regarding the plant performance of various entries. Soils are a Doland silt loam. Rainfall amounts annually varied from near

average to several inches below average. The Canada wildrye and Dahurian wildrye performed very well, but both are short-lived and will start to fade out after 3 or 4 years. Tall wheatgrass, intermediate wheatgrass, and pubescent wheatgrass generally had the highest oven-dry forage yields. Four years after establishment with no fertilizer added, both of these species were still clipping in the 4,000 to 5,000 dry matter pounds per acre range.

<b>Species performance ratings (primarily stand/vigor), Morris, MN replicated trial, 1998-2002.</b>	
<b>Highest Rated</b>	<b>Moderately Rated</b>
pubescent wheatgrass	crested wheatgrass
intermediate wheatgrass	timothy
tall wheatgrass	smooth brome
orchardgrass	meadow brome
reed canarygrass	Dahurian wildrye
western wheatgrass	Canada wildrye
<b>Poorly Rated</b>	tall fescue
Russian wildrye	green needlegrass
Altai wildrye	
creeping foxtail	
thickspike wheatgrass	

*Dwight Tober, Plant Materials Specialist*

**Prairie Restoration Update**

The PMC has completed a 5-year study on prairie restoration. This study was in cooperation with the North Dakota Game and Fish Department and focused on diverse mixes of native grasses, forbs and shrubs no-till seeded into killed stands of introduced grass. Results indicate that native stands can be successfully established in one year under a properly managed no-till seeding into killed smooth brome sod. We are currently working on a brochure outlining the findings of this study. The brochure "Getting Started in Prairie Revegetation" will be distributed to field offices in the three-state area in the near future.

*Wayne Duckwitz, Plant Materials Center Manager*

## Certified Seed/Plant Prices – 2003

The following prices have been established for foundation or select class grass seed/plants produced at the Bismarck Plant Materials Center. **This seed is for sale to commercial growers through North Dakota State University for the express purpose of certified seed production.** The cost is per Pure Live Seed (PLS) pound. Shipping costs of 50 cents per pound will be added to the total. A confirmation order will be sent from the Plant Materials Center. The buyer will be billed from the North Dakota State University Foundation Seedstocks Program at Fargo, ND. **Payment in full must be received before seed will be shipped.** Payment must be received within 30 days or the order will be cancelled. For ordering information, please contact Dwight Tober by e-mail at [dwight.tober@nd.usda.gov](mailto:dwight.tober@nd.usda.gov) or phone (701) 530-2075.

RELEASES	CLASS*	COMMON NAME	COST/PLS LB
<b>Native Grasses</b>			
Badlands ecotype	select (G2)	little bluestem	18.00
Bad River ecotype	select (G2)	blue grama	16.00
Bismarck ecotype	select (G1)	buffalograss (propagated vegetatively by 3-inch plugs)	.50 per plug
Bison	foundation	big bluestem	8.00
Bonilla	foundation	big bluestem	8.00
Dacotah	foundation	switchgrass	6.00
Forestburg	foundation	switchgrass	6.00
Lodorm	foundation	green needlegrass	9.00
Mandan	foundation	Canada wildrye	12.00
Pierre	foundation	sideoats grama	14.00
Red River germplasm	select (G1)	prairie cordgrass	75.00
Rodan	foundation	western wheatgrass	6.00
Tomahawk	foundation	Indiangrass	15.00
<b>Introduced Grasses</b>			
Mankota	foundation	Russian wildrye	6.00
Nordan	foundation	crested wheatgrass	4.00
Manska	foundation	pubescent wheatgrass	4.00
Reliant	foundation	intermediate wheatgrass	4.00
<b>Native Forbs/Legumes</b>			
Bismarck germplasm	select (G1)	narrow-leaved purple coneflower	75.00
Bismarck germplasm	select (G1)	purple prairieclover	40.00
Bismarck germplasm	select (G1)	stiff sunflower	75.00
Medicine Creek germplasm	select (G1)	Maximilian sunflower	40.00

\*Generation number for select class material is shown in parentheses (G1 = generation 1).

## 2002 Staffing/Advisors

### PMC Advisory Committee

Thomas Jewett, State Conservationist, North Dakota  
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 William Hunt, State Conservationist, Minnesota

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### Plant Materials Specialist

Dwight Tober, Bismarck, North Dakota

### Bismarck PMC Staff

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 Michael Knudson, Assistant Manager/Forester  
 Nancy Jensen, Agronomist  
 Rachel Bergsagel, Biological Technician  
 Earl Aune, Biological Technician/Field Foreman  
 Michael Bellon, Seed Processing Technician  
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