

Grass Evaluation

The release of adapted plant materials for conservation plantings is a primary responsibility of the Plant Materials Program. Steps leading to an herbaceous release include collection, accessioning (identification number), propagation of collections, establishment of a replicated evaluation plot, evaluations, establishment of a breeder seed increase field, and establishment of a foundation seed field. Following is a list of species that are currently at the Bismarck PMC in various stages of the release process. Seed was collected for all species except Indiangrass which was collected as vegetative material. Field plots consist of three-plant plots of each accession replicated three times with the exception of prairie dropseed. A standard of comparison, if available, was included in field evaluation plots.

SPECIES	COLLECTIONS		SELECTION CRITERIA	USE
	YEAR	NO.		
Prairie sandreed <i>Calamovilfa longifolia</i>	2003	38	disease resistance, rhizome spread, leafiness, seed production, flowering date, forage quality	sandy soils
Sand bluestem <i>Andropogon hallii</i>	2003-2004	21	leafiness, seed production, flowering date	sandy soils, rangeland, landscape
Indiangrass <i>Sorghastrum nutans</i>	2005	41	leafiness, texture, flowering date, color, plant form, forage quality, seed production	forage, landscaping
Prairie dropseed <i>Sporobolus heterolepis</i>	1998-2005	3	seed production, plant form, forage quality, seed germination and seedling vigor	prairie restoration, wildlife, landscaping
Prairie junegrass <i>Koeleria macrantha</i>	2006-2007	97	seed production, forage quantity and quality, flowering date	early forage, prairie restoration
Virginia wildrye <i>Elymus virginicus</i>	2008-2009	81	leafiness, flowering date, uniformity, seed production, disease resistance, longevity, plant form and size, forage production	wildlife, prairie seeding, forage, tree rows, shady sites



Prairie sandreed is a tall, warm-season, perennial grass with strong creeping rhizomes. It is a beneficial species for soil stabilization, particularly on sandy soils.

Progress: Field evaluations were completed in 2008 and a breeder population was selected. The selected plants comprising the breeder population had similar flowering dates and showed minimal stem and leaf rust. The seven selected plants originated from seed harvested in the Minnesota counties of Sherburne, Polk, Norman, Douglas, and Chisago. A breeder seed field was established in 2009 from plants that had been propagated in the greenhouse from root and rhizome pieces of the selected plants. The breeder field was enlarged in 2010 and a small amount of seed (85 gm) was hand harvested. Plant growth and seed harvest in 2011 from the breeder field was more prolific than in previous years. Stem rust and leaf diseases displayed in 2011 were probably due to excessively moist summer conditions not found in previous growing years.



Sand bluestem is a tall, warm-season perennial grass that grows primarily on sandy soils. Production of viable seed for the species in the Northern Great Plains is generally poor.

Progress: Field evaluations were completed in 2010. Flowering date and production of viable seed were criteria for selection. Ten plants were selected for a breeder population. Selected plants originated from seed collected in the following counties: McHenry, Ransom, and Emmons in North Dakota; Corson in South Dakota; Sherburne in Minnesota; and Custer in Montana. A breeder field was established by propagating 10 plants each from the ten selected plants.



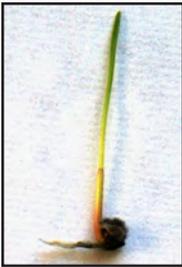
Indiangrass is a tall, tufted, warm-season, perennial grass. It is co-dominant with big bluestem and switchgrass in tall grass prairies.

Progress: Field evaluations were completed in 2009 and a breeder population was selected. Selected plants (25) originated from the Minnesota counties of Redwood, Douglas, Sherburne, and Kittson. Approximately 500 plants were propagated in the greenhouse by dividing the selected plants. A breeder field was established from these plants in 2010. Plants that were very early maturing compared to the other plants were removed from the breeder field in 2011.



Prairie junegrass is a cool-season, perennial, short bunchgrass that is very common in mixed and shortgrass prairies. It produces very early season palatable forage.

Progress: Seed collections were propagated in 2008 and a field evaluation plot was established. Data has been collected since 2009. Plants that were small, had few or no seed heads, and had little foliage were removed from the planting in 2011. Plants expressed both pubescent (hairy) and smooth types in the planting.



Prairie dropseed is a densely tufted warm-season, perennial, often forming large circular clumps. The long leaves are fine textured and arch away from the center of the plant. It prefers light textured soils and moist prairies. It is the most palatable of the dropseed species in the Northern Great Plains. Seed production, seed quality, and seedling vigor is often poor.

Progress: Seedlings propagated in the greenhouse from the three collections were initially planted in separate, single rows. Seed was harvested each year from each row. In 2010, large seed was separated from the harvested seed. The large seed was propagated in the greenhouse and seedlings were planted to a breeder seed production block. Seed was harvested in 2011 (2.2 pounds).



Virginia wildrye is a perennial, cool-season bunchgrass with flat leaves and resembles Canada wildrye. It typically grows 2-3 feet tall and has straight stiff heads with short awns. It prefers moist, low areas along woods and streams, but grows in various upland sites.

Progress: Seed from each collection was propagated in the greenhouse in 2010 and seedlings were planted to an evaluation field. Data was collected in 2010 and 2011. Superior plants were selected in 2011 and seed was harvested. Plants not selected were removed from the planting prior to flowering.

New Faces at the PMC

The PMC welcomed two new staff members in September. Julius Saylor, Office Automation Clerk, comes to the PMC from the NRCS Area Office in Devils Lake, ND, where he worked for almost 20 years. He grew up in Hebron, ND, but attended ND School for the Deaf in Devils Lake and graduated in 1980. Julius continued his education at National Technical Institute of Deaf in Rochester, NY and graduated in 1983. Julius' wife, Sharon, is also an NRCS employee and works as a Soil Conservation Technician in the Mandan Field Office. Julius' step-son, Benjy, is a senior at Valley City State University and his daughter, Kelsey, attends Moorhead State University-Minnesota as a freshman. Julius' son, Matthew, works at Bartlett & West Engineers in Bismarck, but plans to pursue a bachelor's degree at NDSU in Fargo. Julius' hobbies include fishing, hunting, camping, and spending time with his family, as well as his yellow lab, Bucky. Welcome, Julius!



Julius Saylor (left) and Janet Tanski (right) began work at the Bismarck PMC in September.

Janet Tanski, Biological Science Technician, transferred from the USDA-ARS to the PMC. Janet Caolo-Tanski was born in White Plains, NY, and relocated to Fort Collins, CO, in 1980. She has a BS in Biology (1979) from S.U.N.Y. College at Purchase, NY, and in Soil and Crop Sciences (1999) from Colorado State University (CSU). She also received a MA in Music/Concentration Dance (1986) and an MS in Plant Pathology (2003) from CSU. Janet worked for NRCS in Woodland Park, CO, from 2004 through 2007 as a Conservation Technician and assisted the DC in administering conservation plans, conservation practices, and providing technical assistance to farmers, ranchers and landowners. In 2007, she accepted a job with the Agricultural Marketing Service as an Egg Shell Commodity Grader in Grand Junction, CO. In 2008, Janet began working as a Biological Science Technician with the Agricultural Research Service at the National Arid Land Plant Genetic Resources Unit in Parlier, CA. Janet is married to Richard Tanski and has three sons and one grandson. Her family resides in Colorado and her interests include dance, horseback riding, hiking, photography and art. Welcome, Janet!

Lodgepole Pine Study

When conservation districts are asked their agroforestry needs, the reply is “another tall tree species.” Towards that end, seed was collected from an ARS lodgepole pine seed source study at Mandan, ND, in 2006, processed by the PMC staff, and grown in containers by Towner State Nursery. Seedlings from six seed sources were planted in three locations in North Dakota and South Dakota in May 2008. Mongolian Scots pine and ponderosa pine were interspersed as standards of comparison within the complete randomized design planting. So far, annual evaluations show growth rates similar to ponderosa pine and a bit slower than Mongolian Scots pine. The past four years have seen more precipitation and cooler summer temperatures than normal. Lodgepole pine is readily eaten by mule deer and whitetails, hence the extensive tree protectors shown in the picture. Twenty-foot stockade panels make a nice 6-foot diameter by 5-foot high tree shelter. A cheaper, smaller shelter of 5-foot 2x4 welded wire, curled into a 3-foot diameter tube, works equally well.



Lodgepole pines protected from deer by wire enclosures

Growers List

Plant releases (varieties) and Foundation class grass and forb seed are major products of the Bismarck PMC. The PMC has partnered with many seed growers throughout the years to increase seed amounts of PMC releases. Seed growers are a vital link in making the released varieties available for “Farm Bill Programs” and other conservation plantings. Growers sell seed directly to the public or to other vendors such as elevators and seed houses.

In 2011, a survey was sent to seed growers requesting information related to the Bismarck PMC releases and species that they have in seed production. Many previous growers no longer produce seed. A list of growers that are still producing seed was developed from the survey. The releases and species they are producing are identified. This list can be found at <http://www.plant-materials.nrcs.usda.gov/pubs/ndpmcot10434.pdf>

Other sources and vendors of various cultivars and species of seed can be found at <http://www.plant-materials.nrcs.usda.gov/pubs/ndpmcmt8152.pdf> or <http://www.plant-materials.nrcs.usda.gov/pubs/ndpmcmt8151.pdf>

Specialist Update

The 2011 growing season will be remembered for its historic rainfall levels and flooding up and down the Missouri River and elsewhere. It also marked a year of transition in the Bismarck Plant Materials Specialist position, with the September 2nd retirement of Dwight Tober, and the assignment of Wayne Markegard, a former RC&D Coordinator from Bismarck, to this position. With Dwight now working as a part-time volunteer at the Plant Materials Center, his mentorship and further assistance is greatly appreciated in this transition.

Field Plantings: Requests were down somewhat, although I believe everything was planted. New offerings for 2011 were: white poplar (in the Dakota’s only) and common ninebark (all three states). Approximately 98 active field plantings were evaluated in the fall, including black cherry, pin cherry, roundleaf hawthorn, American black currant, and fourwing saltbush. A majority of these field plantings continue to perform well under good management. However, some sites that were most impacted by excess moisture and cool temperatures experienced considerable stand loss. This was most evident in some of the pin and black cherry plantings. They appeared to be most vulnerable to these conditions. A few evaluations also indicated herbicide damage and humidity-related leaf disease.



Shrub row at Grand Rapids OCEP

Off-center Evaluation Plantings (OCEP's): A workshop was held at the Grand Rapids, MN, Field Office in June and included a final tour of the tree plots. The cooperative agreement supporting this evaluation planting has now expired and the study is concluded. In May, new entries were planted at the Becker, MN, and Brookings, SD, sites. The tree plots at Becker and Brookings were evaluated in late August. We also assisted with pruning and maintenance at the Dickinson, ND, site.

Cooperative studies: We continue to support the project at Staples, MN, where they are evaluating a variety of grasses for biomass production. In another cooperative study at Carrington, ND, we assisted with grass and legume sample collection to gather data for evaluating salinity tolerance in selected grasses and legumes.

Special/Demonstration plantings: Special Planting orders were again strong for sweetgrass, but somewhat less for white sage. There were several requests for plants used



Prairie cordgrass, white sage, and other native plants help stabilize soil at a lakeside cemetery for the Mille Lacs Band of Ojibwe (MN)

in pollinator gardens and demonstration plots. Some of these were utilized for “People’s Garden” plantings and were recorded in that database. There were several requests for seed for research purposes. In June, we provided seed, equipment and personnel to the Onida Field Office (SD) to establish a grass demonstration plot on county fairgrounds property. In early August, we assisted the Bison, SD, Field Office with the forage yield harvest of their grass/legume demonstration plot. The yellow-flowered alfalfa, meadow brome, and hybrid wheatgrass plantings continue to look good at the Bison plots.

Tribal Outreach: Plants and seed were provided to the Fond du Lac Reservation (MN), the Upper and Lower Sioux Reservations (MN), the Mille Lacs Band (MN) of Ojibwe, and the Sisseton-Wahpeton Sioux Tribe.

Thanks to everyone who assisted with the Plant Materials Program in 2011.



Sweetgrass planting started with 10 plants at the Grand Rapids Northern Research and Outreach Center

Salinity Trial

The PMC assisted in a salinity trial comparing salinity tolerance, forage production, and forage quality of various forage grasses and a number of alfalfa varieties. This cooperative effort involves the Carrington Research and Extension Center, NRCS, State, Area and Field Offices, and Soil and Water Conservation Districts in Foster and Stutsman County. Three planting sites were planted in the spring of 2010. These sites are located near Buchanan, Carrington and Barlow, ND. The study is testing various grasses and alfalfas on differing salinity gradients. Data will be collected to see what salinity ranges are tolerated by these species and what range of forage production can be achieved within these salinity levels. This was the first year of clipping the plots for production. Forage quality information was determined on all the grasses in 2011. Data collection is planned for the next 4 years and should provide useful information when working with landowners planting perennial vegetation into these salt affected sites. Some of the preliminary data showed ‘Alkar’ tall wheatgrass producing 5.9 tons of forage per acre on a site with an EC of 9.2 dS/m. Forage tests for Alkar tall wheatgrass showed crude protein (CP) averaged 9.22 percent and had a relative feed value (RFV) of 66.03 as compared to ‘NewHy’ hybrid wheatgrass which had 2.0 tons of forage production per acre on soils with EC measuring 10 dS/m. Forage quality of NewHy averaged 9.6 percent crude protein and had a RFV of 77.75. Forage production, EC measurements and forage quality data will continue to be collected and analyzed for the next 4 years, giving us a better perspective of how these different grasses and legumes will perform.



Clipping plots for production data at the Carrington site

Smooth bromegrass - Rebound	Prairie cordgrass - CREC Germplasm
Meadow bromegrass - Fleet	Tall wheatgrass - Alkar
Canada wildrye - Mandan	Slender wheatgrass - Revenue
Beardless wildrye - Shoshone	Western wheatgrass - Rodan
Creeping foxtail - Garrison	Hybrid wheatgrass - NewHy
Switchgrass - Forestburg	Green wheatgrass - AC Saltlander
Prairie cordgrass - Red River Germplasm	Strawberry clover - O’Connors
AC Saltlander Commercial mix (50% AC Saltlander, 20% Revenue slender wheatgrass, 30% Cortney tall fescue)	
Alfalfa - 12 varieties/lines	

New Lath/Hoop House

A new lath house was constructed this fall to replace the temporary slat snow fence structure. The 60-ft by 24-ft structure will protect new seedlings from deer, rabbits and wind. If the situation merits, shade cloth can be pulled over the arched roof struts. Side walls consist of shade cloth with the lower 2 feet protected from rabbits by 1-inch chicken wire fencing. The floor is a gently crowned earth fill covered with weed barrier for drainage and easy cleanup. Managing plants in the lath house should be more efficient with this new structure.



Bison Conservation Field Trial

The grass/legume plots located near Bison, SD, were harvested for forage production on August 6, 2011. Plots were originally seeded in 2007. The heavy biomass of the yellow-flowered alfalfa was easy to pick out across the plots. Cicer milkvetch plots are getting thicker every year. Oven-dry weights were used for all samples. The heaviest yielding plot was the SDSU yellow-flowered alfalfa at 13,030 lbs/acre compared to 'Travois' alfalfa which was 3,048 lbs/acre. Grasshoppers were heavy on the plots and especially liked Travois alfalfa which had most of its leaf material eaten. Alfalfa plots with good mixtures of grass were not as adversely affected by the grasshoppers. Grasses with the yellow-flowered alfalfa that looked good included 'Manska' pubescent wheatgrass (12,631 lbs/ac), 'Fleet' meadow brome grass (7,889 lbs/ac), and 'C2' crested wheatgrass (7,867 lbs/ac). Travois alfalfa was less affected by grasshoppers when grasses were in the mixture and yielded 6,270 lbs/ac with Manska pubescent wheatgrass, 6,618 lbs/ac with 'Rush' intermediate wheatgrass, and 5,493 lbs/ac with AC2 crested wheatgrass. 'NewHy' hybrid wheatgrass did well mixed with Travois alfalfa and produced 4,104 lbs/ac. Cicer milkvetch gets better every year and produced 5,481 lbs/ac mixed with 'Lodorm' green needlegrass. 'Eski' sainfoin performed fair with Manska pubescent wheatgrass and yielded 3,317 lbs/ac. Stand ratings were taken for most entries. Plots replanted in 2009 did not establish well. The border planting of Bad River blue grama continued to do well but was becoming contaminated with other grass species.



Determining forage yield using a small plot forage harvester

Requesting PMC Publications

Are you interested in finding out what brochures and publications the Plant Materials Center can provide? A list is available at http://www.plant-materials.nrcs.usda.gov/ndpmc/pubs/publications_available.pdf. This 2-page list shows the name, a link to the electronic version of each, and the bin number if you want to request a hard copy. Contact the PMC if you would like any of these publications for distribution at workshops, fairs, or meetings.

Green Ash Germplasm Collection

This fall, Dr. Joe Zeleznik, NDSU Forester and Craig Stange, NRCS Forester spent two days collecting green ash *Fraxinus pennsylvanica* seed for storage in germplasm repositories. This was in an effort to maintain genetic diversity of the species following a wider spread of the emerald ash borer. Seeds were collected from west and south of the Missouri River in North Dakota. Collections were made from trees not likely to have been contaminated with pollen from nursery grown and planted green ash trees. To get adequate separation distances, most seeds were collected on public lands within the badlands topography of western North Dakota.



Green ash in fall color in Theodore Roosevelt National Park

Foundation Seed Production

Flooding along the Missouri River caused major problems with the irrigation system that is shared by the PMC and Lincoln Oakes Nursery. No irrigation water was available during the 2011 growing season. Timely rains, however, were adequate to produce good seed harvests from most of the PMC Foundation seed fields. Currently, 21 foundation fields are in production. Five of the fields are located at the North Central Research and Extension Center near Minot, ND. Foundation seed production in 2011 was 5,286 pounds. This was from 13 varieties harvested at the PMC. No seed was harvested in 2011 from the varieties growing at Minot.

Foundation seed of PMC releases is sold through Foundation Seedstocks and distributed by the PMC. In 2011, 1672 PLS pounds (11 orders) of seed were distributed. A good supply of seed of most releases is available for 2012 orders. Currently, 15,200 PLS pounds of seed from 36 released varieties is stored in a temperature and humidity controlled cooler at the PMC. Demand for PMC seed has been increasing in the last few months and additional requests are anticipated as spring approaches. Any commercial seed growers or anyone wanting to get started in seed production of the PMC releases can contact the Bismarck Plant Materials Center.



Bad River blue grama increase field was solid seeded

Big Sage

Big sage (*Artemisia tridentata* ssp. *wyomingensis*) is a major component of sage grouse habitat. Sage grouse are ground dwelling birds found in 11 western US states including North Dakota and South Dakota. They have been declining in numbers due partially to habitat disturbance and loss. The PMC is a partner with several agencies in a project to improve habitat conditions for these birds through propagation and planting of big sage.

Approximately 5100 Wyoming big sagebrush plants were propagated at the PMC from 2010 through 2011 from seed collected in southwestern North Dakota. Most of the seedlings were planted at 12 sites in core sage grouse areas in Bowman County, ND. The sites were identified by NRCS State, Area and Field Office staff. On April 10, 2010, 500 plants (1-year-old) grown by Bureau of Land Management in Montana along with 200 seedlings (4-month-old) grown by the PMC were planted at two identified sites. Small spots of vegetation were killed with glyphosate prior to planting in 2010. Heavy cardboard tubes were placed around the plants for protection. The remaining 4570 plants were planted in 2011 at various locations. They were planted into growing sod except at two newly installed gas pipeline locations, which had little or no vegetation. No tubes were used for protection. Planting dates were May 5, 2011; September 6, 2011; and October 31, 2011. Planting holes were dug with a spade except for the October planting. Planting holes were dug in October using a truck mounted soil probe. Planting time and labor was greatly reduced. Those involved in planting the seedlings included the PMC, other NRCS staff, private landowners, ND Game and Fish, Bureau of Land Management, and Pheasants Forever.

Some of the seedlings were distributed to other entities. The Bureau of Land Management in South Dakota received 500 of the seedlings for habitat plantings in western South Dakota. Big Sioux Nursery at Watertown, SD, received 30 seedlings to determine feasibility of commercial production.



big sage seedlings were planted in Bowman County, ND

Wildflowers for Pollinators

Planting wildflowers is a way to attract and sustain populations of bees and other insects that are important for pollination of various plant species. The PMC is showcasing some of the familiar and “not-so-familiar” species of wildflowers that are recommended for planting in conservation program plantings. Additional species continue to be added each year to separate 4-foot by 7-foot plots (1 species per plot). The different bloom times of the species attract bees and insects throughout the growing season. Bees of all kinds seem particularly attracted to the late-season asters.



a bee on blanketflower

Columbine <i>Aquilegia canadensis</i>
Blue wild indigo <i>Baptisia australis</i>
Prairie blazingstar <i>Liatris pycnostachys</i>
Evening primrose <i>Oenothera biennis</i>
False boneset <i>Kuhnia eupatorioides</i>
Butterfly weed <i>Asclepias tuberosa</i>
Swamp milkweed <i>Asclepias incarnata</i>
Stiff goldenrod <i>Solidago rigida</i>
New England aster <i>Aster novae-angliae</i>
Mountain mint <i>Pycnanthemum virginianum</i>
Shell leaf penstemon <i>Penstemon grandiflorus</i>
Narrow leaved coneflower <i>Echinacea angustifolia</i>
Cinquefoil <i>Potentilla</i> sp.
Canada anemone <i>Anemone canadensis</i>
Wild petunia <i>Ruellia</i> sp.
Harebells <i>Campanula rotundifolia</i>

Wild lupine <i>Lupinus perennis</i>
Smooth blue aster <i>Aster laevis</i>
Rattlesnake master <i>Eryngium yuccafolium</i>
Blue sage <i>Salvia azurea</i>
Heath aster <i>Aster ericoides</i>
Joe-pye weed <i>Eupatorium maculatum</i>
Round-headed bush clover <i>Lespedeza capitata</i>
Early sunflower <i>Heliopsis helianthoides</i>
Fireweed <i>Epilobium angustifolium</i>
Scarlet globemallow <i>Sphaeralcea coccinea</i>
Meadow blazingstar <i>Liatris ligustylis</i>
Western yarrow <i>Achillea millefolium</i>
Purple prairieclover <i>Dalea purpurea</i>
Black-eyed Susan <i>Rudbeckia hirta</i>
Illinois bundleflower <i>Desmanthus illinoensis</i>

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Each species is planted in a 7.5 foot length of row
Initial planting was made 6/2/2010

2011 planting

A Diverse Big Bluestem Release Planned for 2012

A new big bluestem release by the Bismarck PMC is planned for later this year. Seed supply is being increased at the PMC and release procedures are in progress. The proposed name is Bounty Germplasm. It will be a pre-varietal release that has potential to be certified as Select Class seed. It is broadly adapted to Minnesota, the eastern Dakota's, and surrounding regions in the Northern Great Plains and Upper Midwest. Bounty originates from a multi-state plant collection from 326 sites. The parent material was a composite developed from 82 plants selected from a 4000-plant assembly of Minnesota and eastern South Dakota origin big bluestem plants. The selected plants were clonally propagated and breeder seed (generation 0) was harvested. Bounty Germplasm big bluestem is a leafy, fine stemmed, early maturing germplasm that ranks high in protein and feed value when compared to other popular varieties that are adapted to this area. It will provide a more genetically diverse, native release that is broadly adapted to this region. It has been developed for conservation use in native plantings with the primary objective of ecological revegetation, wildlife habitat, and forage production.



Bounty Germplasm big bluestem increase field

Western Sand Cherry Study

This summer, field office and plant materials staff, along with private citizens and nursery personnel, collected fruit from western sand cherry to begin a study of the plant with respect to fruit size and yield, fruit taste, and longevity. Currently, sand cherry only lives 10-15 years in conservation plantings and produces heavy fruit yields for about half that time. In the early 1900's, this species was highly prized throughout the Great Plains as it was one of the few that produced large, tasty fruit. A literature search revealed at least 21 named varieties were released between 1890 and 1920. Only two or three of these varieties are available today. We will seek seed for one more year in an attempt to fill geographic holes in our collections. The PMC would welcome assistance in collecting fruit of western sand cherry from native grasslands or existing plantings. Native stands are usually found on sandy, rocky, or gravelly hillsides or open woodland at low elevations. Plants on native grasslands are often browsed heavily and often don't produce fruit. When picking seed from existing plantings, select fruit from healthy, vigorous plants. Fruit should be fully mature before harvesting. There is one seed (stone) per fruit. Samples of 25-50 seeds would be great; however, we welcome whatever is available from the native grassland collections. Seed collection envelopes can be requested from the PMC. Please provide site information including: legal description or GPS, county, state, location (map or directions), soils, associated plants, how many plants, and the name of the collector(s). Material will be started in the green house in 2013.



Penny Doty, DC, collects native sand cherry seed from section road in west central North Dakota

Dwight Tober Retires

Dwight Tober, Plant Materials Specialist, retired on September 2nd, with over 33 years of dedicated service to the NRCS. Dwight started his career as a range conservationist in Pierre, SD. He then began his 31 years in the plant materials program at Bismarck. He served as a soil conservationist, Plant Materials Center Manager, and Plant Materials Specialist. Dwight had a major role in development and formal release of many grass, forb, shrub, and tree varieties. Dwight has worked closely with commercial seed growers and seed companies to ensure releases are commercially available for conservation plantings. He has been a leader in technology development for prairie restoration and prairie landscaping.

Dwight has been very active in promoting and organizing many demonstration and educational plantings and programs. Each year, Dwight has maintained over 100 active field plantings in North Dakota, South Dakota, and Minnesota.

Dwight has shared his plant expertise with school children, gardeners, farmers and ranchers, university personnel, researchers and extension specialists. He has participated in international technology exchange programs and activities, including a trip to Kazakhstan. Dwight has coordinated annual multi-state training sessions for NRCS employees. He has published many technical articles, regional, national, and popular publications. His strong technical background in plant materials has resulted in many speaking engagements across the country. Dwight has been an active member in various professional organizations. As a way for native plant enthusiasts to share information, he pioneered the Native Plant Summit conference. He has received numerous accolades and awards, including the "Outstanding Achievement Award" from the Society for Range Management.

Thank you, Dwight, for your hard work and dedication to the plant materials program. You will be missed!



Warm-season, Cool-season or Tillage?

NDSU Extension Forester Joe Zeleznik and Plant Materials Forester Craig Stange collected final data on a windbreak between-row management study at the Williston Research Center in northwest North Dakota. This 7-year study evaluated the effects of three between-row weed control methods (mowed crested wheatgrass, blue grama, tilled). These treatments were applied in a randomized complete block design to an 8-year old windbreak that had woven weed control fabric installed at planting time. Since this windbreak was right out the front door from the office, regular mowing and tillage was done as perfectly as possible. After 7 years of annual height growth and between-row neutron tube moisture measurements, the following was observed (without statistical analysis): 1) there was no difference in height growth between treatments; 2) there was no difference in soil water content within the top 4 feet of soil profile between treatments; 3) there was a big difference between soil moisture measurements depending upon which row of the windbreak was measured.; i.e., more water was found where the snow drifts were the deepest. One must be aware of the following precautions concerning these findings: 1) the trees were managed for the first 8 years of life with fabric within the row and tillage between the rows; 2) the weed control practices were applied perfectly, unlike situations often found in the real world; 3) the past 10 years have been some of the wettest ever recorded. Plans are to publish the findings in a peer reviewed journal.



Three between-row weed control treatments: tilled (top), cool-season grass (center), and warm-season grass (bottom)

Skunkbush Study

2011 marked the second year of our skunkbush sumac study. This study evaluates plants from various seed sources for leaf diseases, a common problem in conservation plantings. Twenty-two sources were planted in a randomized complete block design. 'Bighorn' sumac, released by Los Lunas PMC, and 'Konza' sumac, released by Manhattan PMC, were used as standards of comparison. Two spring evaluations showed no significant difference in leaf diseases between seed sources. The 2011 season was extremely cool and wet. The Bighorn sumac (see adjacent photo) exhibited a propensity to break at major forks in the stem. This may be a characteristic of the plant or a result of growing conditions the last two years.



Break at major fork in the stem of Bighorn sumac

X-Disease on Chokecherry

Many common chokecherry *Prunus virginiana* plantings throughout the Great Plains are infected with western X-disease. Infected plants gradually decline and eventually die. In some parts of North Dakota, high percentages of the plants in an area are infected. Fruit from infected plants is not useable.

Chokecherry is one of the most important shrub species for wildlife and human consumption in the Northern Great Plains. Chokecherry products such as syrup, jelly, preserves, and wine are common in markets around the area. Finding a disease resistant plant would provide value for many years to come.

Dr. James Walla, North Dakota State University plant pathologist, in cooperation with Lincoln Oakes Nursery and the Bismarck Plant Materials Center, has established plots at the PMC in an attempt to find disease resistant material. Planting material came from native stands with various degrees of infestation.

To date, material has not shown definitive responses to the disease based on parentage of the plants. However, one source being studied in the greenhouse has shown potential resistance to the disease when inoculated. These studies continue.

OCEP Update

One woody Off-Center Evaluation Planting (OCEP) remains in each State. These are located at Becker (MN), Brookings (SD), and Dickinson (ND). Each of these evaluation sites has room for the addition of new plant materials. Dickinson is undergoing renovation of the old plots, and a major expansion into a nearby area. New entries were added to all three sites in May. Currently, five plants of each new entry are evaluated for each accession. Past studies tested 10 or 25 plants of each accession. This reduces space and maintenance requirements. Annual summaries are prepared for each site and are available from the PMC, or appropriate field offices. Complete data summaries are found in the Technical Reports (TR) which are provided to each area office. Newer TRs are available from the Bismarck PMC homepage.



Brookings (SD) is the newest OCEP started in 2004

Larch and Bur Oak Seed Orchards

This past season has seen various cooperative projects between ND Forest Service, NDSU, Agricultural Research Service, and the PMC. Personnel from these agencies spent several days converting a Siberian larch *Larix sibirica* provenience test plot into a seed orchard. NDSU and ARS had evaluated each plant based on survival, height, and crown density. Trees that scored highest were left as seed trees. Due to the risk of remaining trees becoming uprooted or broken by the wind, only half the trees needing removal were cut this year. The remaining will be cut in about 5 years.

The PMC staff and NDSU have evaluated and marked two randomized complete block bur oak *Quercus macrocarpa* plantings at ARS in preparation for conversion to a seed orchard. Trees to be left scored highest in survival, height and diameter. Twice this season, glyphosate was applied to the "leave" trees (see photo). The suppression of the smooth brome grass under these 20-year-old trees was quickly evident in increased growth and vigor.



Smooth brome grass underneath selected bur oak trees was sprayed with glyphosate twice in 2011

Onida Demonstration Plantings

The fairgrounds will provide a good area to view different grass species and varieties for interested cooperators and the general public. Good accessibility to the site will allow people to readily compare differences in forage production and ground cover. Staff from the PMC traveled to Onida, SD, with the plot drill and assisted with the planting of 10 different grass species. The plots were two drill widths (11 feet) wide and 20 feet long. The grasses were 'Fleet' meadow brome with 30% 'Travois' alfalfa, 'Mankota' Russian wildrye, 'Manifest' intermediate wheatgrass, 'Alkar' tall wheatgrass, 'Bonilla' big bluestem, Badlands little bluestem, 'Forestburg' switchgrass, 'Palaton' reed canarygrass, 'Rodan' western wheatgrass and 'Pierre' sideoats grama. A larger native prairie plot (20-ft x 20-ft) was also seeded containing a mix of 12 different grass species and 13 different native forbs and legumes. The borders were seeded to a 50/50 mix of Bad River blue grama and 'Hycrest' crested wheatgrass. Establishment was off to a good start with the favorable moisture conditions. Rows in the plots could be identified by the end of the growing season. Some of the plots were affected by standing water. Next time you are at the fairgrounds stop by for a visit!



Loading equipment after seeding the plots

Who We Are

The Bismarck Plant Materials Center is one of 27 Plant Materials Centers operated by the United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). The Center serves the States of Minnesota, North Dakota, and South Dakota. It is the mission of the Plant Materials Program to develop plant materials and plant science technology for the conservation of our natural resources.

Bismarck PMC Staff

Dwight Tober, Plant Materials Specialist (retired 9/2011)
Wayne Markegard, Plant Materials Specialist (EOD 11/2011)
Wayne Duckwitz, PMC Manager
Craig Stange, Forester
Nancy Jensen, Agronomist
Julius Sayler, Office Automation Clerk (EOD 9/2011)
Rachel Bergsagel, Biological Science Technician
Earl Aune, Biological Science Technician
Mike Bellon, Biological Science Technician (through 8/2011)
Janet Tanski, Biological Science Technician (EOD 9/2011)
Dennis DeVault, Biological Science Aid (Int.)
Kyle Wolf, Biological Science Aid (Int.)
Ryder Schwagler, Biological Science Aid (temp)

Conservation Priorities

Current work at the PMC focuses on ten major conservation priorities: Streambank & Lakeshore Stabilization; Warm-Season Grass Promotion and Development; Alternative & Specialized Use of Conservation Plants; Tree & Shrub Related Technology; Native Prairie Ecosystem Restoration; Saline & Alkaline Tolerant Plant Materials; Wetland and Riparian Plant Materials; Filter Strips & Nutrient Management; Information, Education & Outreach; and Urban Conservation.

Helping People Help the Land

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