

Potential New Conifers

Over the past few years, several new conifer species have been tested in the three states served by the Bismarck Plant Materials Center.

Meyer's spruce

Meyer's spruce is native to northeastern China. Planting it in the U.S. is relatively new, but it is available from many conservation and retail nurseries. Generally, growth of Meyer's spruce in the Northern Great Plains has been good on soils suitable for Colorado blue spruce. Growth, however, has been slower than Colorado blue spruce. Currently, Meyer's spruce is not an approved species in the NRCS Field Office Technical Guide (FOTG) for North Dakota, South Dakota, or Minnesota. Inclusion of the species in FOTGs could be considered if performance of Meyer's spruce is good in field trials or other plantings over a longer test period.

Lodgepole pine

Initial plantings have shown lodgepole pine to be very similar to ponderosa pine in establishment and growth rates. Subsequent field plantings have indicated that it needs better site preparation, stock handling, and maintenance than some of the more commonly used tall trees.



Mongolian Scots pine

Mongolian Scots pine

Pine wilt nematode, native to North America, has devastated most Scots pine across the Midwest and Great Plains. In North Dakota, the nematode is not currently present. In nematode infested locations, trees younger than 10 years are not affected but by age 30 most trees have died. Therefore, many states no longer recommend planting Scots pine. The Bismarck PMC began evaluating Mongolian Scots pine over 20 years ago in an effort to find additional adapted tree species to plant. As the seed source came from a region in Mongolia where trees have been found resistant to the nematode, the PMC recently decided to test the seed source for nematode resistance. The PMC is seeking test plots in nematode infested areas. Seedlings will be available for these plantings in the spring of 2018. Small quantities of seed have already been provided to interested nurseries for growing stock for their service area.

INSIDE THIS ISSUE

<i>Potential New Conifers</i>	1
<i>National Soil Health Study</i>	2
<i>Cover Crop Cultivar Trial</i>	2
<i>Cover Crop Species and Mixes</i>	3
<i>Field Plantings</i>	3
<i>Prairie Cordgrass Establishment in Saline Soils</i>	3
<i>Herbaceous Plants Evaluated for Release Potential</i>	4
<i>Marshall County, Minnesota Conservation Field Trial</i>	5
<i>Plant Information Available</i>	5
<i>Salinity Study</i>	5
<i>Planting for Pollinators</i>	6
<i>Off-Center Evaluation Plantings (OCEPs)</i>	6
<i>Warm-Season Grass Seeding Date Study</i>	6
<i>On-Center Grass/Forb Establishment Trial</i>	7
<i>Bur Oak Study</i>	7
<i>Training</i>	7
<i>Hybrid Poplar Salinity Tolerance Evaluation</i>	8
<i>Hay Creek Pollinator Planting</i>	8
<i>Trinity Eco Prayer Park, Rapid City, South Dakota</i>	8
<i>Cottonwood Restoration Study</i>	8
<i>Tribal Outreach</i>	8
<i>Fabric Squares with No Strings Attached</i>	9
<i>Stored Forages for Winter Grazing</i>	9

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Douglas Fir

Growing to over 60 feet tall on sandy loam soils in western North Dakota, Douglas fir exhibits potential as a tall tree for conservation plantings. Work with this species by the Bismarck PMC has been quite extensive the past few years. This includes providing stock for two years to conservation districts field trials. Results from these plantings have been variable. Performance has been consistently poor, however, on heavy textured soils and would likely be poor in areas with extensive rainfall. Douglas fir is readily eaten by deer. Seedlings are also quite sensitive to handling. Evaluation will continue for the next few years to determine feasibility of inclusion of the species in FOTGs. Inclusion of Douglas fir would provide a new genus, which would dilute the risk of catastrophic failure of conservation plantings.

National Soil Health Study

When planting a cover crop, is soil health affected by the species mix and/or seeding rate? From 2012-2016, the Bismarck PMC has been part of a National Plant Materials Program study along with six other PMCs to gain insight into this question. There were 3 different mixes and 3 seeding rates along with a check (no cover crops seeded). The mixes included: 2 species (triticale, red clover); 4 species (triticale, red clover, hairy vetch, radish); and 6 species (triticale, red clover, hairy vetch, radish, oats, rape). Seeding rates were 20 seeds/ft², 40 seeds/ft², and 60 seeds/ft². Barley was planted in the spring as a commodity crop, harvested in summer, and then the cover crop mixes were seeded into separate replicated plots. Plots were not tilled once the study began in 2012.

Soil samples were taken at commodity crop planting, cover crop planting, and cover crop termination (frost) each year as a way to measure changes in in the soil. Soil measurements included bulk density, moisture and temperature, organic matter, nitrogen, carbon, along with others. Solvita and soil health was calculated by Dr. Richard Haney, USDA, ARS, Temple, Texas. Samples were also analyzed for other parameters by the Kellog Soil Survey Laboratory, Lincoln, Nebraska.

Biomass of the cover crops was clipped and weighed each year when cover crop was terminated. Each sample was analyzed for %N by Dairy One Laboratory.

In 2016, additional samples were taken for the NRCS Soil Health Initiative Sampling Protocol. Soil was sampled from selected plots and sent to the following soil testing labs: Cornell; USDA, ARS, Temple, Texas; University of Missouri; and the Kellog Soil Survey. The objective of the initiative is to develop and refine scoring for soil health and establish relationships between multiple soil health indicators in a range of soil conditions.

In 2016, the commodity crop was grown, soil samples were taken and the study was terminated by the National Program. The Bismarck PMC is exploring future plans for the plot site.

Cover Crop Cultivar Trial

Cover crops are known to improve soil health. As a way to provide species and cultivar performance information, Plant Materials Centers across the nation began evaluating selected cultivars of species commonly used as cover crops. Species and cultivars were selected by national and regional Plant Materials Program leaders. On May 17, 2016, the Bismarck PMC planted a replicated trial with cultivars of black oats, balansa clover, crimson clover, red clover, hairy vetch, and pea. Data gathered included emergence, date of 50% flowering, disease, and height. In the spring of 2017, overwintering survival will be recorded. Following are a few observations made in 2016. Hairy vetch, crimson clover and red clover all had good growth. While crimson clover flowered and set seed before frost, the red clover continued to bloom and showed little variation among cultivars. Some hairy vetch cultivars flowered while others produced few or no flowers. The peas had a variety of flowering dates and growth habits. All pea cultivars became diseased before seed was fully mature. Growth habit of the two balansa clovers were quite distinct but both remained very small. One black oat cultivar was very diseased while the other one set seed and showed few disease symptoms.

In the spring of 2017, the trial will be repeated in another field with additional species and cultivars. The total number of cultivars for each species will be: 6 hairy vetch, 15 rye, 12 daikon radish, 2 black oat, 2 balansa clover, 8 pea, 8 red clover, and 6 crimson clover. There will be 4 replications, making a total of 236 plots. Data parameters will include germination and emergence, flowering period, height, disease and insects, winter hardiness, and regrowth. An identical trial to that planned for 2017 will be planted in 2018. Hopefully, data gathered from the study will be beneficial when selecting cover crop cultivars and species.



**Cover crop cultivar trial
at the Bismarck PMC**

Cover Crop Species and Mixes

Covercrop demonstrations were established at six locations in 2016 to provide producers with a local site for species identification and comparison of growth, root structure and weed competition. Plantings were located at Bison, South Dakota; Fessenden, North Dakota; Albert Lea, Minnesota; Rochester, Minnesota; Long Prairie, Minnesota; and Fergus Falls, Minnesota. There were up to 42 plots of either individual or mixed species of cover crops at each site. Species were determined collectively by PMC and local NRCS staff along with local producers/landowners. The plots, located on private land adjacent to major highways for easy access and visibility, were utilized by area producers through self-guided tours or field day events. The PMC provided the seed and no-till seeded the plots. All of the plantings established well and cooperating field offices put in considerable effort to maintain and promote the plantings.



Field tour of cover crop demonstration plots at Fergus Falls, Minnesota

Field Plantings

The Bismarck PMC provided both woody and herbaceous plant materials for evaluation across the three-state region. With the exception of foxtail dalea, these were PMC selections evaluated for possible future release and/or inclusion as approved plants for conservation use. Douglas fir was the lone woody species offered to cooperators in 2016. Woody species are evaluated annually for five consecutive years. The chart below provides some of the information provided by cooperating field offices on the woody evaluations.

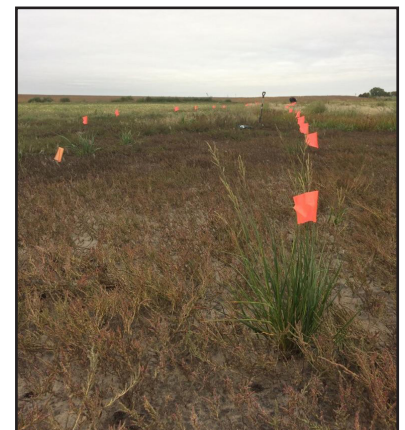
Years Planted	Species (Number of Years Evaluated)	Total Plantings	No. of Active Plantings as of 11/31/15	% Survival in Remaining Active Plantings	Performance Rating of Active Plantings (1-10; 1 = Best)
2013/14	Meyer's spruce (4/3)	37	29	68	6.5
2013/14	Mongolian pine (4/3)	44	32	57	3.8
2014/15	Lodgepole pine (3/2)	25	10	43	5.1
2015/16	Douglas fir (2/1)	24	20	66	6.2

Herbaceous requests are evaluated annually for three years. In 2016, evaluations were completed on eleven plantings of Virginia wildrye, six plantings of foxtail dalea, and one seeding with cupplant in the mix. All three species were seeded in either perennial grass/forb mixes, or cover crop plantings. The Virginia wildrye continues to perform well in a variety of environmental conditions, but typically does best where adequate moisture is available. It is a vigorous cool-season bunchgrass that is somewhat shade tolerant and works well in mixes with other grasses and forbs. It tends to decrease as warm-season species increase over time. It performed well, even in the extreme western edge of the PMC service area. 'Sundance' foxtail dalea appears to perform best in full season cover crop plantings, where it has enough growing degree days to initiate nodules for nitrogen benefit.

Prairie Cordgrass Establishment in Saline Soils

Establishing vegetation in soils with high levels of salinity is difficult. Prairie cordgrass transplants have shown some potential in prior plantings. Seeding prairie cordgrass has not been very successful. Prairie cordgrass transplants were offered for field plantings in 2016 to evaluate establishment in saline conditions. There were six field offices that participated. The Bismarck PMC offered each cooperator 100 container transplants of prairie cordgrass; 50 Red River Germplasm and 50 of a South Dakota State University selection (referred to as Meckling). The transplants were spaced 5 feet apart across varying degrees of salinity. Survival, growth and vigor were compared for each selection.

Establishment results in 2016 were mixed. A couple locations had no survival while others had fairly good survival, even in white-crust soils. The 2016 plantings will be evaluated in 2017 for survival and spread. Transplants are being offered again in 2017 for new field plantings.



Greater than 60% survival in ECs 6-15 at Redfield, South Dakota (1st year evaluation)

Herbaceous Plants Evaluated for Release Potential

Herbaceous plant selection and release remains a significant part of the Bismarck Plant Materials Program. Collections of Indiangrass, prairie dropseed, sand bluestem, and Virginia wildrye are currently being evaluated for potential release. All are perennial grass species.

Sand bluestem

Sand bluestem is a warm-season species adapted to well-drained sandy soils. It is very rhizomatous, making it a good soil stabilizer. Sand bluestem seed was originally collected in 2003-2004 from 21 sites in North Dakota, South Dakota, Minnesota and Montana. Seed was propagated, and space-planted to a field block. Selections were made in 2010 from the field block based on flowering date, plant vigor, and leafiness. The selected plants were divided and planted to an isolated field in 2011. Selected plants originated from seed collected from the counties of McHenry, Ransom, and Emmons in North Dakota; Corson in South Dakota; Sherburne in Minnesota; and Custer in Montana. In 2015 and 2016, plants that exhibited characteristics of big bluestem or crosses were removed from the block. Plants flowering later or earlier than the majority were also removed. Seed was harvested from remaining plants and will be lined out for further evaluation in 2017. The majority of remaining plants are blue/gray in color, produce golden seed, have yellow striped seed culms and are rhizomatous.

Prairie sandreed

Prairie sandreed is a warm-season species with large rhizomes. It can grow in areas with limited precipitation and well-drained soils. In an effort to find a more disease resistant prairie sandreed for the Northern Great Plains, native collection of prairie sandreed began in 2003. After propagation, evaluation, and selection of a population, it was determined in 2016 that available prairie sandreed cultivars would have acceptable performance and would meet the current seed demands. Seed of the selected population has been harvested, and will be put in germplasm storage to make it available to researchers for further development. The selected population originates from Sherburne, Polk, Norman, Douglas, and Chisago counties in Minnesota and shows some resistance to leaf diseases.

Prairie dropseed

Prairie dropseed is a warm-season species of moist prairies. It grows in circular tufts. It is palatable to livestock. No known cultivar or release is available for conservation use in the Northern Great Plains. Seed collections from Burleigh County, North Dakota; Mahnomen County, Minnesota; and Day County, South Dakota were propagated and a field plot was planted at the PMC. In an effort to improve seedling vigor, large seed was selected from several years of harvest at the PMC from each collection. Plants were grown from the large seed to start a small seed increase plot. Seed is currently being harvested. Future plans include evaluation of establishment and seed longevity.

Indiangrass

Indiangrass is a warm-season species of the tall grass prairie. In an effort to find an Indiangrass adapted to the Northern Great Plains and leafier than the cultivar 'Tomahawk', plants originating from Minnesota were evaluated and a breeder population was selected at the PMC. A wide span in flowering dates among the selected population is making harvest difficult. As a result, further evaluation and release plans are uncertain.

Virginia wildrye

Virginia wildrye is a short-lived, cool-season bunchgrass that can grow in both shade and sun. Seed was collected from 81 native sites throughout North Dakota, South Dakota, and Minnesota in 2008 and 2009. Plants propagated from the seed were evaluated and selections were made based on growth form, flowering date and overall vigor. At least one plant from each of the 78 collections became part of accession 9094359, the selected breeder population. A one-acre seed increase field was established at the PMC in 2013. Seed yield was over 500 PLS pounds in 2014 and about 400 pounds in 2015. Seed harvested in 2016 has not been cleaned but is estimated to be about 400 pounds. Leaf to stem ratio data was collected in 2015 and 2016. Leaf/stem ratio was higher for 9094359 than 'Mandan' Canada wildrye and 'Omaha' Virginia wildrye. As a way to look at performance of this selection in "on farm seedings" field plantings in cooperation with local farmers and NRCS offices in their county were made in 2015 and 2016. Establishment, growth and vigor of Virginia wildrye was good for most plantings. Plans for 2017 are to continue evaluation of established field plantings. The PMC anticipates a Virginia wildrye release in 2018.



Virginia wildrye field planting near Mahnomen, Minnesota

Planting for Pollinators

A pollinator habitat was planted at the Minnesota West Central Research and Outreach Center (WCROC) farm campus at Morris, Minnesota, in May 2014. The project was initiated by WCROC. Other partners include: Minnesota NRCS including the Morris field office; USDA-ARS at Morris; and the Bismarck PMC. The planting includes separate plots of four different perennial forb/grass NRCS Program mixes. The mixes are 25, 50, 75 and 100% forbs. The PMC provided some of the seed and seeded the plots with a no-till plot drill. Two years of intensive management to control invasive plants was done prior to seeding. Annual oilseed mix plots were planted adjacent to the perennial plots by ARS researchers. Initial establishment of the perennial plots was good. In 2016, the oilseed plots were destroyed and seeded to oats because they were attracting pollinators away from the perennial plots. The perennial grass/forb plots have been evaluated annually during the summer months (by college students and their instructor) for plant population trends and insect activity. The perennial plots are slowly transitioning to some of the weeds that were present (or in the seed bank) prior to seeding. A herbicide application of Cornerstone will be applied in 2017 to control the encroaching invasive weeds and to evaluate species changes resulting from the herbicide.

The planting offers many learning opportunities. The site hosted a Minnesota Area 2 Plant Materials field tour in September 2014 and an NRCS plant identification training event in 2016. A poster titled *Evaluation of Four Prairie Seed Mixes for Pollinator Conservation* has been compiled from evaluation data and is now available from the University of Minnesota. The PMC will continue to support and monitor the plots.



Plant identification training workshop participants looked over the pollinator habitat at Morris

Off-Center Evaluation Plantings (OCEPs)

Formal evaluation of new and existing tree and shrub species continued at three locations: Becker, Minnesota; Brookings, South Dakota; and Dickinson, North Dakota. A PMC selection of Douglas fir (from a different source than those planted in 2015), was the only addition in 2016. Scheduled evaluations are completed in late summer every year, and the results are documented in the PMC Annual Technical Report. All locations are well-maintained by cooperators with limited assistance from the PMC. Evaluation data is analyzed to determine if any entries have potential for inclusion in the NRCS list of approved conservation plants. Gray birch seed was harvested in 2016 from the Becker location, and propagated for transplanting and evaluation in the other two locations. Over the years, several new PMC plant releases have been made as a result of the supporting documentation from these OCEPs.

Warm-Season Grass Seeding Date Study

Warm-season grasses have generally established most consistently in the Northern Great Plains when seeded in the spring. A five-year study to compare warm-season grass establishment with different seeding dates and seedbed covers began at the PMC in 2013. Seedings are planned to continue each year through 2018. Grasses include big bluestem, sideoats grama, blue grama, Indiangrass, switchgrass, and Canada wildrye (a cool-season used as a standard). Seedbeds include black tilled and barley stubble. A barley/millet stubble was also included in the 2013 and 2014 plantings. Seeding dates are spring, late summer, and dormant (below 40° F soil temperature). Seedling counts using a grid method that determines minimum number of plants/ft² is being used for determining stand establishment. Outcomes have been different each year of the study thus far. Weed pressure from foxtail barley and dry conditions in 2013 resulted in slow seedling growth and poorer stand establishment. Establishment for the 2014 seeding was good for all seeding dates and seedbeds. Surprisingly, seedlings emerged before frost in plots seeded in late summer of 2014. However, not all of these seedlings survived the winter. Stand counts for the 2016 seedings will be made in the summer of 2017. The plots seeded in 2016 had a thick stand of annual weeds which suppressed stand establishment.

Preliminary results show the greatest emergence has generally been in the spring seeded plots. Dormant seedings have had the next best stand establishment. Stubble seems to have some benefit to establishment when rainfall is limited. Additional plantings and data collection will provide more insight to determine best seeding date and seedbed type when establishing warm-season grasses.

On-Center Grass/Forb Establishment Trial

The PMC has initiated an establishment trial comparing several options for establishing prairie or pollinator species. Evaluation of field size NRCS program plantings across North Dakota reveal establishment issues indicating a need for considering changes in FOTG seeding specifications. Based on field evaluations, a considerable number of forb species do not establish well in most areas. Of the 40 or so species of forbs that have been included in seed mixes, it appears that only about 50% of them regularly establish on a consistent basis. In addition, the often slow and poor forb establishment allows invasive plants to encroach and dominate the stands in these plantings. This trial encompasses several variables that include:

- Different proportions of grasses to forbs (60:40 vs 75:25)
- Different seeding rates (full seeding rate vs 1.5 X full rate)
- Three different seeding timeline and combination options:
 1. Seeding the grass/forb mix in the spring
 2. Seeding grass only in the spring and inter-seeding the forbs in the following dormant season
 3. Seeding grass only in the spring and inter-seeding the forbs the following spring

The last two planting options allow for broad spectrum broadleaf herbicide control in the first planting season without concern for damaging the forbs. There are two separate sets of plots, one with those forbs that have a history of consistent establishment, and one with the other 50% of the forbs that do not appear to establish well. This trial will be evaluated for three years to allow time for full establishment.

Bur Oak Study

A bur oak provenance test was established in 1993 at the North Great Plains Research Lab (ARS), Mandan, North Dakota, and other locations across the continent as part of an international study (U.S. and Canada) to identify superior bur oak seed sources for conservation plantings. NRCS was one of the various partners that made native seed collections. Originally, 19 sites planted plots with trees propagated from the acorns collected from eight states and two Canadian provinces. The Mandan ARS plot is one of eight that remains and has 90 sources collected from Oklahoma to Manitoba, the most collections of any remaining planting.

Though no cultivar has been released, maintaining an extensive planting such as this for research is important. Recently, a researcher from NDSU began utilizing live tissue from the Mandan ARS planting to determine cold hardiness of trees from different geographic locations. The research was able to begin without waiting several years to grow the trees. The need for established plantings continues to expand as researchers across the country report an increasing onslaught of oak pests such as oak wilt, oak decline, gypsy moth and deer predation. Oak are also showing mortality and/or no natural regeneration in many areas.



Bur oak plot at Mandan ARS location

Training

The PMC participated in two training/presentation events during July. Minnesota NRCS hosted the NACD summer meeting that included a one-day tour of several conservation-focused projects around the Twin Cities area. The tour stop at the Becker off-center evaluation planting (trees and shrubs) included the Specialist's presentation explaining the PMC program and its connection with the Becker planting. The Specialist and Agronomist also participated in an area NRCS



Live plants grown by the PMC

plant materials grass and forb identification workshop at Morris, Minnesota. The PMC will again offer a one-week on-site plant materials training opportunity in August 2017. Requests for off-site and/or video training will also be considered based on timing and staff availability.



Pressed forbs provided by the PMC

Hybrid Poplar Salinity Tolerance Evaluation

Soil Conservation Districts have often requested trees to plant on saline sites. A study was established near Bismarck to evaluate seven hybrid poplar clones resistant to soil salinity as high as 9 mmhos/cm. After three growing seasons, the saline tolerant poplar study has lost 77 plants of the 189 planted. This is good in that it shows susceptibility of the different clones to the soil conditions of the site. This winter, the survival numbers will be subjected to statistical analysis. Tree shelters and fabric squares were removed from the dead trees. The identification stakes were left to ease orientation when on site.

Hay Creek Pollinator Planting

The new Johnny Gisi Memorial Park along Hay Creek in north Bismarck was “buzzing” with excitement this summer. One of Bismarck’s first public pollinator gardens was planted there in the spring of 2016 in memory of a local environmentalist, Bill Bicknell. The Lewis and Clark Wildlife Club spearheaded the project with the Bismarck Parks and Recreation Department. Assisting were local Boy Scout and Girl Scout Brownie Troops as well as the Bismarck Plant Materials Center. The planting, consisting of various native forbs and a few grasses, is located around a small loop portion of a walking trail and includes several kiosks that address water and wildlife conservation, and pollinator habitat. The PMC seeded the site and provided native grass seed and forb transplants. In early September, the planting was a great place to see monarch butterflies visiting blazingstar flowers.



Blazingstar flowers attracted monarch butterflies

Trinity Eco Prayer Park, Rapid City, South Dakota

This community park showcases regional biomes, focusing on shortgrass prairie, mid-grass prairie, Black Hills, and wetland vegetative species. It includes plant materials that were provided by the Bismarck PMC. The park also incorporates several additional projects promoting conservation and sustainability, including: solar/wind electrical generation; food plot for the hungry; and storm water runoff research. It was designed to encourage reflection on how one relates to the Creator and its stewards, working with nature instead of against it.

Cottonwood Restoration Study

A cottonwood restoration study began in 2013 to determine an economical, effective method to reestablish native cottonwood on dewatered flood plains in the Northern Great Plains. The study is located at the Nature Conservancy Cross Ranch Preserve along the Missouri River in Oliver County, North Dakota. Three stock types were planted: bare root, unrooted cuttings, and plants grown in deep pots. Tree shelters (4-foot length) were placed around each tree and fabric was placed around one-half of the trees of each stock type. The deep pot stock was planted with the root ball 4 feet below the surface and the 6-foot unrooted cuttings were planted with the base end of the cutting 5.5 feet deep.

Listed are findings thus far:

- No one stock type has consistently performed better than another.
- Four-foot tree shelters are not adequate to prevent deer damage. Continuous browsing at the top of the tree shelters appears to stress trees.
- Tree shelters greatly affect form, causing multiple leaders on a tree.
- Many trees died back and resprouted. Tree shelters may have been an influence.
- Plants continue to die over time.

Statistical analysis will be applied to data and results will be published in the future.

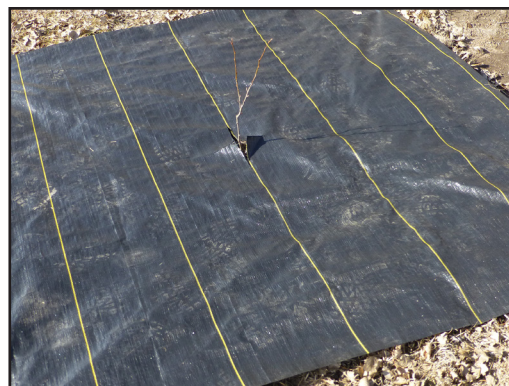
Tribal Outreach

Thirteen cooperators from 10 tribal entities submitted requests for plant materials in 2016. Most requests were for sweetgrass and/or prairie cordgrass plugs for stream bank/riparian buffers. Various forb transplants, fruiting shrubs, and Douglas fir were included in the list of requested plants. Plantings were completed by local youth and adult volunteers who applied hands-on education on proper planting techniques and maintenance aspects of successful plantings. There is ongoing tribal interest in native and cultural plants and plant technologies that contribute to the health and well-being of their respective communities. NRCS and the Plant Materials staff are committed and active participants in doing what we can to help facilitate that.

Fabric Squares with No Strings Attached

The following link shows a 4.5-minute video demonstrating how to cut 6-foot x 6-foot squares from partial fabric rolls. Performed during the off season, such methods can provide a saleable product, increase fabric installation efficiencies, and provide a quality weed control mat with no frayed edges for landowners.

<https://www.youtube.com/watch?v=LcM26vtrua0>



Weed control mat for tree seedlings

Stored Forages for Winter Grazing

A study to evaluate stockpiling grasses and forbs for winter grazing has been ongoing with a local producer near Gann Valley, South Dakota, since 2013. Data collection was completed in 2016. Individual plots of single species and species combinations were sampled for production and quality on a regular basis throughout each year. Samples were collected from plots that had no biomass previously removed and from plots where regrowth was previously harvested. A final report will be available from the PMC when data is compiled and analyzed.

Bismarck PMC Conservation Field Trial: Stored Forages for Winter Grazing							
Average Forage Quality from all samples - 2013-2016							
Clipped Samples	CP	Sugar	ADF	NDF	WSC	RFQ	RFV
Tall Fescue	12.2	5.2	34.0	58.1	12.2	127.2	99.9
Orchardgrass	10.6	4.1	38.2	61.4	11.6	107.7	89.1
Western wheatgrass	12.3	4.1	39.5	65.6	7.2	99.2	82.6
AC Saltlander	10.2	3.7	41.8	68.1	5.7	91.9	76.1
Altai wildrye	11.1	3.8	40.7	66.9	5.6	91.4	79.1
Meadow Brome	9.2	4.0	42.5	59.0	9.2	91.4	80.1
Russian Wildrye	11.9	3.7	40.3	65.9	5.3	89.6	80.0
Blue Grama	8.2	2.9	43.7	70.6	4.3	72.2	71.4
Sideoats grama	6.9	2.9	45.6	71.4	2.8	64.3	67.8
Manystem wildrye	12.8	2.2	46.4	68.8	3.0	52.8	71.9
Prairie sandreed	8.2	1.7	52.9	73.6	2.0	50.0	60.2
Unclipped Samples	CP	Sugar	ADF	NDF	WSC	RFQ	RFV
Tall fescue	12.1	4.9	38.0	59.3	18.5	108.5	89.7
Orchardgrass	9.8	4.4	41.2	64.7	8.4	104.8	81.1
Russian wildrye	10.9	3.0	41.9	68.2	5.0	89.0	75.6
Altai wildrye	10.8	2.8	42.7	69.1	6.1	87.8	76.3
Western wheatgrass	8.6	3.3	43.6	70.5	5.8	85.0	74.5
Meadow brome	8.3	3.4	46.8	70.8	5.3	78.4	69.8
Blue grama	7.9	2.0	45.0	71.1	3.5	70.0	70.3
AC Saltlander	7.4	3.0	46.0	72.2	4.7	65.8	67.2
Manystem wildrye	8.9	2.5	43.2	74.0	5.5	64.0	69.4
Sideoats grama	5.8	1.8	50.3	73.8	1.5	56.2	62.5
Prairie sandreed	7.6	1.2	52.1	75.7	2.2	47.7	59.3

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.

Who We Are

The Bismarck Plant Materials Center is one of 25 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.

February 2017

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