



2004/2005 Northland News
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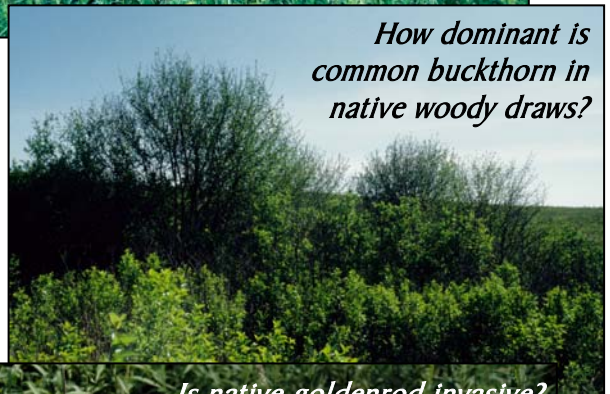
Invasive Species Management and Ecosystem Restoration

Is ecological restoration even possible today within the realm of invasive species? Issues concerning invasive species are current hot topics. Natural resource oriented conferences and workshops are focusing on some of these questions. A three-day workshop in Bismarck starting April 5-7, 2005, is expecting to draw about 200-300 people. Registration is free due to donations received from various groups and organizations recognizing that resource managers need to sit down and discuss the issues. The February 2005 Annual Meeting of the Society for Range Management (SRM) dedicated a day and a half to symposia related to invasive species. John Randall, Plant Sciences Department at University of California – Davis, gave an excellent introductory presentation. His presentation, entitled "Invasive species management in the context of ecosystem restoration: Global challenges and opportunities," described the process as a triangle with apexes labeled: 1) remove invaders, 2) plant natives, and 3) restore or mimic natural processes (fire, floods, etc.). Prevention or containment of invasive species is the highest priority, but within the scope of ecological restoration, a "close approximation" is reality and pristine is not attainable. Restoration of the natural processes may be more vital to the health of the ecosystem than is the immediate removal of the invasive species.

Dwight Tober, Plant Materials Specialist



Are we winning the battle with leafy spurge?



How dominant is common buckthorn in native woody draws?



Is native goldenrod invasive?



Is local phragmites native or exotic?

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70th Anniversary Celebrated

J. R. Flores, North Dakota State Conservationist for NRCS, provided the welcome to approximately 200 people on June 17, 2004. The special field day recognized 50 years of operation for the Bismarck

One of six concurrent demonstrations at the 70th Anniversary Field Day held at the Bismarck PMC on June 17, 2004.



Plant Materials Center (PMC), and 70 years since its beginning as a Soil Conservation Service (SCS) Nursery in 1934. This long-term cooperative effort of plant evaluation and technology development has been the result of the partnerships of many agencies, organizations, district cooperators, seed growers, and nurserymen. A beautiful summer day provided the background for six concurrent tours and demonstrations from seed processing to prairie landscaping. Lunch was served following a brief program with remarks from Gerald Willis, Special Assistant to Chief of the NRCS, Bruce Knight. Recognition was provided for the importance of field offices assisting with seed collection, on-the-farm field plantings, and promotion of new plant releases. A sixteen-page anniversary booklet was distributed with program and speaker information including historical documentation of the SCS Nursery and the Bismarck PMC. Copies are still available upon request.

Dwight Tober, Plant Materials Specialist

Four-Wing Saltbush

A plant enjoying our droughty conditions the past few summers is four-wing saltbush, *Atriplex canescens*. It is native to arid and semi-arid regions from western North Dakota, south to Mexico and west to Washington. It is a shrubby forb that can reach heights to four feet. The “fruits” of four-wing saltbush are papery and have four wings. The plant has separate male and female plants, with only the females producing seed. The leaves remain gray-

green throughout the year. It is high quality forage for livestock. Wildlife browse the species.

Currently, the PMC is evaluating a collection of four-wing saltbush originating at the Cottonwood



Experiment Station in western South Dakota. Plants have been vigorous, fast growers in the greenhouse and in the

field. Two-year old plants have produced abundant seed of good quality. An additional evaluation comparing a Wyoming collection and Wytana (a cross of *Atriplex* species) to the South Dakota collection has shown some interesting differences in size and growth form. Plants of the South Dakota collection have been the tallest and most upright.

Plans are to continue evaluation on plant growth, winter hardiness, and seed production for four-wing saltbush. Four-wing may offer winter livestock grazing, wildlife habitat, and conservation cover for a variety of conditions including dry, poor quality soils.

Nancy Jensen, Agronomist

Harvesting Hawthorns

Hawthorns are frequently found in our region in woodlands, woody draws, and open hillsides. Though they are distinctive looking, with their long thorns, it is hard to identify individual species. Frequent natural hybridization is complicated by great individual variation. In Minnesota, there are 13 native species. In North Dakota, there are two native species of hawthorn. The most common species is the roundleaf or fireberry hawthorn, which tends to be a shrub with multiple stems, growing up to ten feet tall. These plants are usually covered with white or pinkish blooms in late May to early June. Most years, there is a bright red crop of fruit, sometimes known as thornapples, in the late fall. These fruit are often eaten by flocks of robins and cedar waxwings. Deer also like to eat the apples, as well as browse on the current year's growth. Once the plants get established, the deer will often keep the side branches pruned up. The PMC has been evaluating the native hawthorns for quite a few years. A selection of this species from

South Dakota is maintained by the PMC, as a seed source for local conservation nurseries.

The second native species is the downy hawthorn which grows mostly in eastern North Dakota. This hawthorn tends to be more tree-like, with a single stem, reaching up to almost 20 feet. This hawthorn also has white blossoms and colorful red fruit in the fall. In 1993, the Bismarck PMC released 'Homestead' hawthorn, which is a selection of Arnold hawthorn, native to the northeastern part of the United States. The name Arnold comes from the Arnold Arboretum, near Boston, Massachusetts. Homestead hawthorn is grown by some of the conservation nurseries, and has been planted in windbreaks. This hawthorn is similar in form to the downy hawthorn. Though the deer are attracted to it, it is still worth planting. The hawthorn has a nice shape, as well as being drought resistant and long-lived.



Traditionally, the fruit of the hawthorn was eaten by the native people, and used medicinally. It was sometimes mixed with other medicines to make them more palatable. The fruit alone does not always have a good flavor, but with the addition of sugar, it can be used to make jelly. A number of recipes indicate it is good served with meat.

Mike Knudson, Forester

Bad River Blue Grama as Low Maintenance Cover

Ease of establishment, drought tolerance, attractive seed heads, and short stature are all attributes that help make Bad River blue grama an excellent choice as a low maintenance ground cover. The seed size, which is larger than average, accounts for improved seedling vigor and quick establishment. Under optimum conditions, Bad River germinates in 3 to 6 days compared to 12 to 24 days for most buffalograss varieties. The PMC has

been involved with dozens of buffalograss and blue grama plantings in recent years. Observations based on these plantings indicate Bad River blue grama generally dominates the mixture, and the buffalograss component is probably not needed on most sites. Buffalograss spreads by stolons and will help fill in bare spots over time and would be beneficial on tough sites. The PMC recommended mix for smaller areas (per 10,000 ft²) is 80 percent Bad River blue grama (2.5 PLS lbs) and 20 percent buffalograss (5 bulk lbs). Bowie (replaced Tatanka)



Note the darker green color of Bad River blue grama (left) compared to Tatanka buffalograss (right).

and Cody are the recommended buffalograss varieties for this region. Seed of Bad River blue grama is also considerably less expensive than the buffalograss. Bad River blue grama prices have come down to less than \$5/lb compared to \$10/lb for buffalograss. Since blue grama seed is small, only about 10 percent as much seed by weight in comparison to the buffalograss is needed. Comparing a full seeding rate of each on 10,000 ft², the blue grama seed costs \$15 and the buffalograss seed costs \$250. Remember, both blue grama and buffalograss are warm-season grasses and do not have the spring and fall green color of cool-season species like bluegrass and crested wheatgrass. The off-season tawny/gold color of the buffalograss and blue grama seems to be appreciated more now in the context of low water use and less maintenance.

Dwight Tober, Plant Materials Specialist

Prairie Sandreed Assemblies

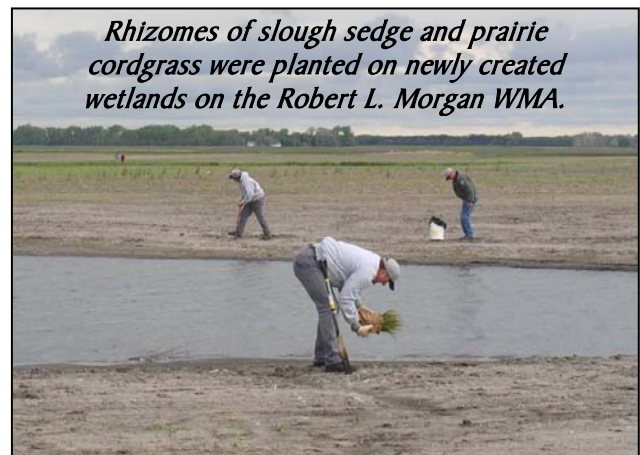
Thanks to field, area, and State office seed collectors, the PMC is on its way to developing a new prairie sandreed release adapted to South

Dakota, North Dakota, and Minnesota. Prairie sandreed is a tall, rhizomatous, native, warm-season grass species that is found most abundantly on sandy, gravelly, and rocky soils. As a conservation plant, it is an excellent soil binder, especially on sands. Though the plant is coarse in nature, it is fair for livestock forage and hay. In field plots, deer and rabbits also enjoy the young plants! Seeds collected from 34 different locations throughout North Dakota, South Dakota, and Minnesota in 2003 were propagated in the greenhouse and planted to an evaluation plot in late spring of 2004. Plants will be compared to each other, to released varieties of Goshen and Pronghorn, ND-95 and a Michigan source (soon to be released). Foliar diseases often plague prairie sandreed when grown under high moisture and humidity. A major screening criterion of plants in the assembly will be lack of disease. "Think rain" for a true test! Other characteristics to be evaluated in the next few years will include leafiness, vigor, size, form, seed production, and winter hardiness. Plants expressing the desired traits will be transplanted to a plot for seed production in anticipation of a new release. Will your collection pass the tests?

Nancy Jensen, Agronomist

"Rhizome" Field Day Held at Robert L. Morgan WMA

Restored wetlands were enhanced on June 7, 2004 when 34 conservationists, including Bob Morgan and family members, planted rhizomes of native wetland plants around the edge of more than 50 restored wetlands in less than 3 hours. Rhizomes are horizontal stems which send out roots and shoots from the nodes. Staff from the PMC at Bismarck provided training to the group on procedures for planting rhizomes of Red River



Rhizomes of slough sedge and prairie cordgrass were planted on newly created wetlands on the Robert L. Morgan WMA.

prairie cordgrass and a new selection of slough sedge. Both native wetland species spread quickly once established and provided immediate wildlife benefits, as well as a seed source for other new wetlands becoming established in the area. Rhizomes are quick and easy to plant and a minimum number are needed to get plant communities started. Bare-root rhizomes are now available from local conservation nurseries for about the same price as bare-root trees and shrubs. The North Dakota Natural Resources Trust is providing the leadership for the implementation of this large Wetland Restoration Program (WRP) project of more than 1,400 acres. A native mixture containing 44 different species was planted on about 450 acres in spring 2004. Seeding is scheduled to be completed in 2006.

Dwight Tober, Plant Materials Specialist

A New Evaluation Site in South Dakota

The first two rows of trees and shrubs were planted spring 2004 at the new Brookings, South Dakota evaluation site. The site is part of the Eastern South Dakota Soil and Water Research Farm, located about one mile north of the campus of South Dakota State University. The Research Farm is 80 acres dedicated to the promotion of research of efficient farm production practices that



Greg Yapp and Darrell Granbois plant the first shrub row at the new off-center evaluation site, Brookings, South Dakota.

conserve soil and water resources. In addition to crop production research, a portion of the acreage is used for grassland research including trials evaluating seed production, stand establishment, food plots, and mixture compatibility. Tree plots had previously been planted evaluating the use of fabric (weed barrier) versus no fabric. Demonstration plantings of sweetgrass and leadplant have also been established through the plant materials program. The PMC plots are

divided into two blocks, trees and shrubs. The site was prepared by treating the brome grass sod with glyphosate and fabric was laid down. Ten entries of shrubs were planted, spaced 5 feet apart, and 5 entries of trees were planted, spaced 10 feet apart. All entries were evaluated last fall at the end of the growing season and overall survival was good. Maintenance of the site was excellent. We greatly appreciate the efforts of Darrell Granbois, District Conservationist at Brookings, and his staff; and John Larson, Big Sioux Nursery, for laying the ground work and coordinating efforts with the Research Farm to provide this opportunity.

Dwight Tober, Plant Materials Specialist

Strawberry Clover Lowdown

If you are out looking at PMC plots, you may be wondering about those clover plants with what looks to be strawberries on them. No, it's not an experiment gone bad! Strawberry clover is a low growing, long-lived perennial legume with flowers and seed pods that resemble strawberry fruit. It is native to Eurasia. It creeps along the ground by stolons and is noted to have tolerance to alkaline and saline conditions. It is seldom used for hay because of its short stature, but is used in lawns, pasture seedings, green manure plantings, and as a cover crop in orchards.

A small plot of strawberry clover was planted at the PMC in 2004. Plants in the PMC assembly originated from seed harvested near South Dakota State University. Harvested plants are thought to be remnants from a previous nursery there. Nursery plants were likely from Europe or Asia. The plants at the PMC were quite vigorous, despite deer and rabbit grazing. Lateral spread, by stolons, averaged over two feet. As is typical of the species, seed production was prolific. The short stature and lateral growth, however, made seed harvest a huge challenge.

Plans for strawberry clover in the next few years include studies on alkaline and saline tolerance, plant growth, species use, winter hardiness, and harvest methods. Though strawberry clover does not produce strawberries, it may have other fruitful uses.

Nancy Jensen, Agronomist

A Chokecherry Orchard

Chokecherry is one of the most common native shrubs in North Dakota. This desirable shrub is

affected by several naturally occurring diseases, including black knot and western X-disease. As early as the 1940s, X-disease was blamed for severe mortality of native and planted chokecherry in North Dakota. In the 1970s, field office personnel from the States of North Dakota, South Dakota, and Minnesota assisted the PMC staff with collecting seed from local sources of chokecherry. These chokecherry seed sources were planted in 1983 in a large block east of Bismarck. In 1987, the PMC began working with Dr. Jim Walla of North Dakota State University (NDSU) in solving the problem of X-disease in this native shrub. The years of evaluation have been spent determining which seed showed the greatest resistance to this fatal disease. The staff at NDSU has grown some select plants from these collections. These plants were planted in both 2003 and 2004 at Lincoln-Oakes Nursery in Bismarck. Once the extent of the X-disease tolerance is identified, the best plants will be used as a seed orchard by the nursery. This testing will take a few more years, but we are closer to having an improved variety of chokecherry for conservation plantings.

In the interim, the PMC is continuing to work with another seed source of chokecherry that was collected in southwestern Sheridan County, North Dakota, not far from Old Johns Lake Wildlife Management Area. This selection has shown better than average form and disease resistance, and will be available for field plantings in 2005.

Mike Knudson, Forester

Student Trainee at PMC

Caesare Toliver, a freshman studying Animal Science at Alcorn State University, Mississippi, spent the summer 2004 at the Bismarck Plant Materials Center. Caesare accepted a Soil Conservationist Student Trainee position in North Dakota and was positioned at the center to learn about the plant materials program and the role our



Caesare

agency has in conservation of our natural resources. He had the opportunity to see the diversity in agricultural practices and products produced in North Dakota and the conservation challenges facing North Dakota producers. Caesare went home with a broadened

view of NRCS. He plans to continue his summer employment with NRCS and is looking forward to increasing his working knowledge of our agency, experiencing different cultures and climates during his work with NRCS. We did challenge him to come back and experience a North Dakota winter.

Wayne Duckwitz, PMC Manager

Behind the Scenes

A very important part of the PMC staff is the crew of summer employees. This past year, we had three college students who spent their summer weeding, mowing, and cultivating in our production fields. They also were a great help on the 70th Anniversary Field Day held in June. Lindy Hagens, a student at Dickinson State



Danielle and Lindy

University, has spent four summers working at the PMC. Danielle Burgard, a student at Northern State in Aberdeen, South Dakota, was in her second year at the PMC. Steve Czczok, a student at Bismarck State College, was a new employee. Thanks!



Steve

Mike Knudson, Forester

Sand Bluestem

Sand bluestem is a tall, warm-season grass with short scaly rhizomes that is a very close relative of big bluestem. It can be distinguished from big bluestem by its dense yellow hairs on the seed heads and the straw colored stems. It is found primarily on deep sandy soils and is a valuable range grass for conservation and grazing on these sites. Varieties recommended in the Northern Great Plains are 'Garden' and 'Goldstrike', with 'Garden' being more persistent. Both originated from Nebraska. Winter hardiness is marginal and seed production is limited, particularly in the northern portion of the area.

The PMC initiated a search in 2003 for sand bluestem seed in South Dakota, North Dakota, and Minnesota with the intent of developing a release comprised of parentage from more northern locations than Garden or Goldstrike. In theory, the material should be more adapted to the Northern Plains.

Thanks to a great effort by field, area, and State office, the PMC has approximately 20 collections.

As sand bluestem is notorious for poor seed fill and the species is primarily found on sands, it was a challenge to find and collect seed. The PMC plans to test viability of the collections in the greenhouse this winter (February 2005) with hopes of starting an evaluation plot.

Nancy Jensen, Agronomist

Seeding Trees and Shrubs with a Grass Drill

Can woody species be direct seeded in a riparian zone in an efficient, economical, and ecologically desirable manner? This is the question being pursued by the PMC and Craig Stange, State forester on the NRCS Ecological Sciences staff at Bismarck. The first trial was planted in the northeast part of North Dakota, near Walhalla, in 2000. A variety of native species and various techniques were evaluated. The planting plan included two main treatments of broadcast seeding and drill seeding. Split plot management schemes included mowing for weed control, herbicides for weed control, and no weed control. Initial weed competition after seeding was very high with various broadleaf species and pigeon grass. Quackgrass and Canada thistle were the main perennial weed species. The most successful woody species established included boxelder, green ash, bur oak, and false indigo. Deer pressure was extremely high. Heavy weed cover, in some instances, protected the tree and shrubs from deer browse, resulting in higher plant densities. Herbicide success varied across treatments and by species. Mowing was the least beneficial treatment and resulted in more weeds.

A second study was initiated at two drier sites near Dickinson, North Dakota, as dormant seedings in the fall of 2004. Grass was seeded with the woody seed and included a half rate of 50 percent

A native grass drill worked well in planting a mix of native tree and shrub seed in a riparian zone in western North Dakota.



Canada wildrye and 50 percent green needlegrass. The intent was that the grass cover would reduce weed competition initially, and that the bunchgrasses would not be overly competitive with the young tree and shrub seedlings. All of the woody species, except for the plum and oak, were planted in the fluffy box of a no-till native grass drill. They were seeded in two rows separate from the grass seed using a 6-foot drill with 8-inch row spacing. A carrier of coarse kitty litter mixed at a ratio of 10:1 was used and calibration using the lowest setting on the drill worked out very close to the desired rate. The large seeded species were planted using a large-seed furrow planter. The tree and shrub seed was purchased and actual cost varied between \$100 and \$200 per acre. The planting sites were 1.7 and 2.8 acres in size.

Dwight Tober, Plant Materials Specialist

Cultural Plants at the PMC

Have you ever contemplated the uses of a particular plant? Native Americans throughout history have used plants for food, spiritual rituals, medicine, and various household and tool items. Many of the plant species once used by the culture are no longer readily available through native harvests or in the market. The PMC is currently working with three of these species in hopes of making them more available. Sweetgrass (*Hierochloa odorata*), white sage (*Artemisia ludoviciana*), and prairie turnip (*Psoralea esculenta*) are currently being studied and grown at the PMC.

Sweetgrass is an early season grass that was used as incense, in ceremonies, and for braiding and weaving. Sweetgrass rooted cuttings continue to be available for demonstration sites. Many have gone out in the past few years in anticipation of folks starting their own transplanting beds. The PMC also has a comparison trial of sweetgrass from other Plant Materials Centers in Kansas, Montana, Colorado, and Michigan, as well as South Dakota State University. Diversity in size, color, and odor of the sweetgrass is great among the different collections.

White sage was offered for field plantings in 2005 and will be available for additional field plantings in 2006. White sage is common in rangelands, roadsides, and open forests. It has a fair to poor forage value for cattle. It increases with overgrazing. White sage, also referred to as "Man sage" is an important ceremonial plant and was used

as a stomach medicine by the Cheyenne. Its rhizomatous growth allows it to spread.

Prairie turnip, known as Indian breadroot, prairie potato, and breadroot scurfpea, was an important food source of the plains tribes. It was eaten like a potato, used as a thickener, eaten raw, and dried for winter use. It was also used as a health aid. A plot of prairie turnip was planted in late fall at the PMC and seed was distributed for a similar planting at Brookings, South Dakota. The PMC is still interested in receiving collections of this species so that we can make a more genetically diverse planting for evaluation and seed increase.



USDA-NRCS PLANTS Database / Britton, N.L., and A. Brown. 1913. *Illustrated flora of the northern states and Canada*. Vol. 2: 363.

Nancy Jensen, Agronomist

The News on NewHy

When searching for a salt tolerant forage grass, the variety 'NewHy' may surface. Don't let the word "quackgrass" in its description deter you from further investigation of the release. Following are some of the characteristics of NewHy that should be considered when making forage species and variety choices for salty sites.

NewHy was developed and released in 1989 by USDA, ARS at Logan, Utah, in cooperation with the Utah Agricultural Experiment Station and the USDA-SCS (now Natural Resources Conservation Service). It is a hybrid between quackgrass, *Elytrigia repens*, and bluebunch wheatgrass, *Pseudoroegneria spicata*. It is a cool-season (flowering occurs mid to late June in Logan, Utah), long-lived perennial adapted to semiarid areas such as the intermountain west and the Northern Great Plains. It is most productive on slightly saline or alkaline range sites receiving at least 13 inches of precipitation annually or supplemental irrigation. Selections were made to combine the vigor, productivity, salinity tolerance, and persistence of quackgrass with the drought resistance, caespitose (tufted) growth habit, seed quality, and forage quality of bluebunch wheatgrass. In development of NewHy, only plants with characteristics of both

species and moderate to no rhizome development were selected as part of the population for the variety.

NewHy has demonstrated excellent resistance to excess salinity in Utah research trials. In greenhouse studies, salinity resistance of NewHy approached that of tall wheatgrass, *Thinopyrum ponticum*. Studies by the Bridger PMC showed NewHy to be very tolerant to salinity. Results indicated production was affected at 13 EC (mmhos/cm) but the variety had an upper tolerance level of 26 EC in Wet/Saturated (water table within 3 feet of soil surface) or Irrigated Sites. Forage studies in Utah indicated its quality, based on fiber and crude protein, compared to intermediate wheatgrass. It remains more succulent and palatable for livestock later in the growing season than most other wheatgrasses. It is resistant to moderate grazing pressure after establishment and recovers rapidly after grazing or defoliation. In North Dakota trials, NewHy persisted well under hay management. Hay yields averaged 65 percent of intermediate wheatgrass and had salt tolerance similar to tall wheatgrass but better forage quality and regrowth potential. It was found to have only mildly spreading rhizomes in contrast to quackgrass.

In replicated trials in southwest North Dakota, NewHy averaged 14.2 percent crude protein on June 1st, compared to 11.4 percent for Cottonwood smooth brome grass and 11.9 percent for Hycrest crested wheatgrass. NewHy performed well in a replicated trial in west central Minnesota. Oven dried forage production harvested over a 3-year period averaged almost 5,000 lbs/ac compared to 3,068 lbs/ac for Latar orchardgrass and 4,420 lbs/ac for Climax timothy. Demonstration plantings in central North Dakota on areas with light to moderate salinity have been successful and landowners have been pleased with the amount and quality of hay harvested.

The recommended seeding rate in North Dakota is 10 PLS lbs/ac in the west and 14 PLS lbs/ac in the east. NewHy should be available in the commercial market. All seed sold is required to be certified because of the relationship to quackgrass and its variety protection.

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Nancy Jensen, Agronomist

Testing the Trees

Since 1954, one of the main tasks of the PMC staff has been tree improvement. This has included seed source studies, selection of superior plants, progeny testing, and establishment of seed orchards. The evaluation of new species and seed sources is an ongoing process. Every spring, PMC staff head out to plant trees and shrubs at selected off-center evaluation sites in the three-state region.



Darrell Granbois helping evaluate trees.

In the fall, the staff returns to these sites to observe how these woody plants have grown. Over the years, a wide range of locations, mainly at experiment stations, have been used. Currently, nine locations in our service area are host to evaluations plantings. They are as follows:

Bottineau, North Dakota

- Maintained by Bottineau Park Board and SCD personnel
- Highly rated new species: American hazel, chokeberry, seaberry

Dickinson, North Dakota

- Maintained by Experiment Station staff
- Highly rated new species: Siberian larch, aspen, Amur chokecherry, bristlecone pine

Apple Valley, North Dakota

- Maintained by PMC staff
- Highly rated new species: Mongolian Scots pine, wayfaring tree, creeping juniper

Grand Rapids, Minnesota

- Maintained by Experiment Station staff
- Highly rated new species: Sandbar willow, Mongolian Scots pine, cranberry, English oak, Centennial cotoneaster, silky dogwood

Morris, Minnesota

- Maintained by Experiment Station staff
- Highly rated new species: McDermand pear, sandbar willow, Meadowlark forsythia, white birch, blueleaf honeysuckle

Becker, Minnesota

- Maintained by SCD personnel and Experiment Station staff
- Highly rated new species: gray dogwood, Amur chokecherry, Siberian larch, false indigo, American currant

Staples, Minnesota

- Maintained by Experiment Station staff
- Highly rated new species: seaberry, false indigo, Nanking cherry, sugar maple

Highmore, South Dakota

- Maintained by Experiment Station staff
- Highly rated new species: White poplar, bur oak, blueleaf honeysuckle, chokeberry, juneberry, Mongolian Scots pine

Brookings, South Dakota

- Maintained by Experiment Station staff and SCD personnel
- Highly rated new species: Common ninebark, gray dogwood, American currant, Missouri gooseberry, leadplant

Mike Knudson, Forester

Medicine Wheel Garden Workshop

Sinte Gleska University (SGU) was the location of a native plant propagation workshop, June 3-5, 2004, on the Rosebud Reservation near Mission, South Dakota. Lisa Colombe organized the session

at the SGU Ranch that included instructors from the South Dakota Extension Service, South Dakota State University, and the NRCS Bismarck PMC. Objectives of the workshops were to gain knowledge of native range and medicinal plants on the Rosebud Reservation; research and discuss



Four medicine wheels were planted at a native plant propagation workshop on the Rosebud Reservation.

medicinal, as well as economic value of native plants; learn how to use the Soil Survey; locate and select plants for four medicine wheels; and to learn how to vegetatively propagate native plant materials. Plants included in the medicine wheels were leadplant, buffalograss, white sage, and sweetgrass. Dwight Tober, Plant Materials Specialist assisted with the workshop and the Bismarck PMC provided some of the plants used in the medicine wheels.

Dwight Tober, Plant Materials Specialist

2004 Field Office Training Held at PMC

Twenty-one NRCS and Conservation District staff from Minnesota, South Dakota, and North Dakota participated in a three-day training session held at the Bismarck PMC, August 17, 18 and 19. The session included a wide range of topics related to conservation plants and the Plant Materials Program. Topics the first day included plant



Trainees touring the PMC.

materials operations, current studies and trials, field office involvement/participation in the program, a field tour, and a seed cleaning demonstration. The second day was our "hands on" day. The day was spent discussing native forbs and legumes, "the top ten species," grasses- "They're not all the same," tree and shrub identification, and planning and managing land for wildlife habitat. Topics for discussion the last day included seed quality issues, what's new with trees and shrubs, grass drill demonstration and seedbed preparation, and a tour of Lincoln Oakes Nursery. Each participant had the opportunity to learn more about the Plant Materials Program and how the program can assist them in their daily work. The multi-state attendance resulted in good interaction and exchange of information among the participants and hopefully increased their working knowledge of the program.

We have scheduled this training again for **August 2-4, 2005**. Anyone who has an interest in attending this type of training should let their supervisor know as soon as possible. Copies of last year's agenda are available upon request.

Wayne Duckwitz, PMC Manager

Specialist's Report

- A high level of interest continues for all three States in field and demonstration plantings. Most of the plants available for testing this spring were allocated at the State annual meetings over the winter. Numerous requests were approved for demonstration plantings. Sweetgrass continues to be offered for outreach plantings; more than 20 requests have been received. White sage is a new species offered this year as a culturally significant plant; 18 requests have been received. More than 100 field plantings were evaluated last year by field office staff.

- Training continues to be a high priority. We are trying something new the end of March when we travel to do a series of one-day workshops on Herbaceous Cover Establishment. We plan to start in South Dakota and do three sessions the week of March 28. The target audience is newer NRCS and SCD employees.

- We officially released two new native shrubs targeted at riparian areas. Thanks to the field office personnel who tested these shrubs in field plantings and helped me with the field review several years ago.

- Invasive species continues to be a hot topic. The Bismarck PMC helped with the workshop in Bismarck on April 5-7, 2005.

- Increasing the percentage of non-grass species in native seedings is a developing trend. The PMC is working with cooperators on establishment of procedures. A higher percentage of forbs and legumes attracts insects which provide a food supply for young game birds.

- Provisions in the Conservation Security Program (CSP) may provide new opportunities for on-farm demonstrations.

- Thanks to all of you who helped with plant evaluations the past year. I look forward to working with many of you in the field this summer.

Dwight Tober, Plant Materials Specialist

New Rockford Demonstration Trial

Kent Otto, a farmer/rancher and Wells County SCD District Supervisor, wanted to establish a grass/legume demonstration trial to test new species in east central North Dakota. Steve Kassian, District Conservationist at New Rockford, and staff laid the groundwork to cooperate with the Bismarck PMC to make this happen. Fifty-two plots, 6' x 30', were seeded on May 28, 2003, using a plot cone-seeder. The plots were off to a good start and notes have been taken the last two years. The area was fenced off and a large project sign listing cooperators was installed. Individual



(left to right) Dwight Tober, Steve Kassian, Bruce Seibold, Kent Otto, and Candi Sauvageau

signs also identify each of the entries. The demonstration site parallels a well-used county road, and numerous visitors have stopped to view the plots. This demonstration planting is also very useful to the PMC as many of the entries in the trial have not been previously evaluated in this area. Several species that have not been tested before and performed well included: redtop, perennial ryegrass, prairie junegrass, awned wheatgrass,

porcupine grass, needle-and-thread, ladino clover, and red clover.

Dwight Tober, Plant Materials Specialist

Foundation Seed Update

2004 was an interesting crop year to say the least. Unseasonably cool temperatures throughout the growing season slowed down growth and brought most herbicide activity to a halt. To add to the injury, early frosts in August virtually eliminated seed harvests for some commercial growers in the north. The 2004 foundation seed harvest at the Bismarck PMC ended with 9,600 pounds of 19 different varieties/fields being harvested. The PMC, in partnership with North Central Research and Extension Center, Minot, North Dakota, is currently growing 26 active foundation seed production fields, totaling 46 acres.

We are fortunate to live and work in an area that generally has a good supply of quality seed readily available for our conservation work, which is directly related to the success of commercial seed growers.

Seed prices have dropped for most species due to low demand and increased inventories. If you or any producers that you are assisting have ever wanted to establish a warm-season pasture or plan a diverse native seeding, now may be the time. Remember to purchase quality seed of known varietal seed sources. Your efforts will be rewarded in the end.

Wayne Duckwitz, PMC Manager

New Vendors List Available

A Conservation Seed/Plant Vendors List with 74 names has been compiled for use in the three-state area. The list identifies vendors, growers, and nurseries by name and location. Websites are hot linked so when used electronically it is easy to check out the product line. Plant materials available are coded as certified seed (CS), seed (S), vegetative trees and shrubs (VTS), vegetative herbaceous plants (VHP), and vegetative wetland plants (VWP). There is no listing of individual plant species or varieties. Contact the PMC or me for a hard copy. This is available electronically on the NRCS Electronic Field Office Technical Guide website www.nrcs.usda.gov/technical/efotg. Click on *Minnesota*, *North Dakota*, or *South Dakota*; click on a *county*; click on *Section One*; click on *Reference*; and then *Plant Materials*. I plan to update the list

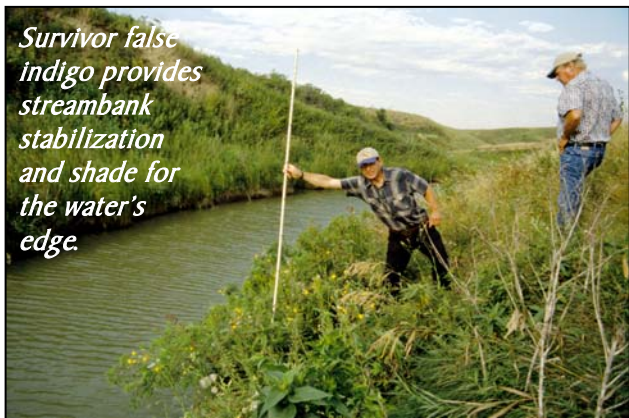
on a fairly regular basis so let me know if there are vendors you would like to see added to the list.

Dwight Tober, Plant Materials Specialist

Sandbar Willow and False Indigo Released

Two new native shrub species were officially released January 2005 by the Bismarck PMC and cooperators. Several local conservation nurseries already produce Survivor false indigo and Silver Sands sandbar willow. These two native species

Survivor false indigo provides streambank stabilization and shade for the water's edge.



are highly rated for use in riparian areas for such purposes as streambank stabilization, lakeshore erosion control, and wildlife habitat. Both releases also perform well in windbreaks on better sites with good weed control. The PMC is currently developing a brochure which will provide additional performance information on these new native shrub releases.

Dwight Tober, Plant Materials Specialist

The Food Plots Have Been Seeded

Chemical seedbed preparation followed by a fall burn provided the seedbed for the perennial food plots. Two perennial mixes, an introduced mix comprised of 18 species, and a native mix of 30 species were no-till seeded on November 4, 2004. The mixes used are not typically seeded for wildlife



Chemically controlled and burned sod provided an excellent no-till seedbed.

habitat. The native mix consists of 10 percent grasses, 80 percent forbs and legumes, and 10 percent shrubs. The introduced mix is 20 percent grass, 70 percent legumes, and 10 percent shrubs. The higher than normal percentages of legumes and forbs were planted to promote increased insect populations for upland birds and provide increased seed and forage sources for wildlife. The project is cooperative with NRCS and the North Dakota State Game and Fish Department. The sites are located in central North Dakota on Wildlife Management Areas managed by the North Dakota State Game and Fish Department. We will begin evaluating plant performance in 2005 and should have additional information to share in the near future.

Wayne Duckwitz, PMC Manager

Jay Mar Receives National PM Award

Jay T. Mar, RC&D Coordinator at Fargo, has been recognized as a national plant materials program Special Service Award winner for calendar year 2004. This award is presented to a person not in the plant materials discipline whose efforts have or are substantially advancing the plant materials program. Jay has been actively involved with plant materials since spending a summer at the Bismarck PMC as a trainee more than 20 years ago. Throughout his career as a Soil Conservationist, District Conservationist, and RC&D Coordinator, he has enthusiastically used the program for the benefit of many district cooperators and various conservation partners. He serves on the North Dakota State Plant Materials Committee and annually develops project proposals using plant materials products and technology. Jay is an innovator and constantly challenges PMC staff to think outside the box when it comes to developing demonstrations and technology for "urban



Jay Mar (left) helps dedicate the Xeriscape Gardens in Fargo, North Dakota.

landscapes.”

Some of the projects and demonstrations include: the Xeriscape Garden at the Fargo Water Treatment Plant, various native plantings at the Lions Conservancy Park and the Living Laboratory, a prairie restoration at the Yunkers Natural Learning Center and Childrens Museum, promoting the use of buffalograss and blue grama as alternative turf species, and working with the Fargo Forestry Department in the coordination of several streambank stabilization projects using native plants from the PMC. Jay especially enjoys working with youth in conservation education and has coordinated many of these activities with the Bismarck PMC. He was co-chair of the 2003 Native Plant Summit held in Fargo. Congratulations, Jay!

Dwight Tober, Plant Materials Specialist

**Adaptation and Survival of
Switchgrass in South Dakota
by Dr. Arvid Boe**

Dr. Arvid Boe is a professor and forage plant breeder at South Dakota State University. Following is an article describing some of his research on switchgrass at various locations in South Dakota. Mg/ha is used in the article when describing production yields. Dividing Mg/ha in half will give a rough estimate of tons/acre.

The northern Great Plains was recently identified by the United States Department of Energy (USDOE) as a region where switchgrass has potential for sustainable and profitable herbaceous biomass production. From 1997 through 2004, the South Dakota Agricultural Experiment Station and the USDOE through contracts with the Oak Ridge National Laboratory and Great Plains Institute for Sustainable Development supported research aimed at determining the potential of switchgrass for production of bioenergy feedstock in South Dakota.

One of the primary objectives of this research was to determine biomass production and stand longevity of commercially available cultivars (i.e., Cave-In-Rock, Dacotah, Forestburg, Shawnee, Sunburst, and Trailblazer) ranging in origin from southern Illinois (Cave-In-Rock and Shawnee, 37.5°N 88.1°W) to southwestern North Dakota (Dacotah, 46.4°N 100.9°W). These cultivars were planted at Brookings in 1997 and at Bristol and South Shore in 1999. At Brookings, plots were harvested once per year during mid August, mid

September, or mid October. At Bristol and South Shore, harvest was shortly after a killing frost, generally late September to early October. In addition, in an effort to determine if switchgrass had potential as a bioenergy feedstock west of the tallgrass prairie region, Cave-In-Rock and Dacotah were no-till dormant seeded into crop residue and herbicide-killed sod at the Dakota Lakes Research Farm at the 100th meridian in the mixed-grass prairie region near Pierre on December 6, 1999. Those plots were harvested in July, August, September, or October during 2001 through 2004

At Brookings (44.3°N 96.8°W) in 1998, highest biomass yields were obtained from the August harvest. However, during the fourth consecutive harvest year (i.e., 2001) highest yields were obtained from the October harvest. For example, Cave-In-Rock produced 6 Mg/ha from the August harvest and 3 Mg/ha from the October harvest in 1998. In contrast, it produced 1 Mg/ha from the August harvest and 4 Mg/ha from the October harvest in 2001. Although the differences between harvest dates was not as great for the other cultivars, the benefit of delaying harvest until late summer or early fall for stand longevity and stable long-term biomass production was consistent for all of the cultivars.

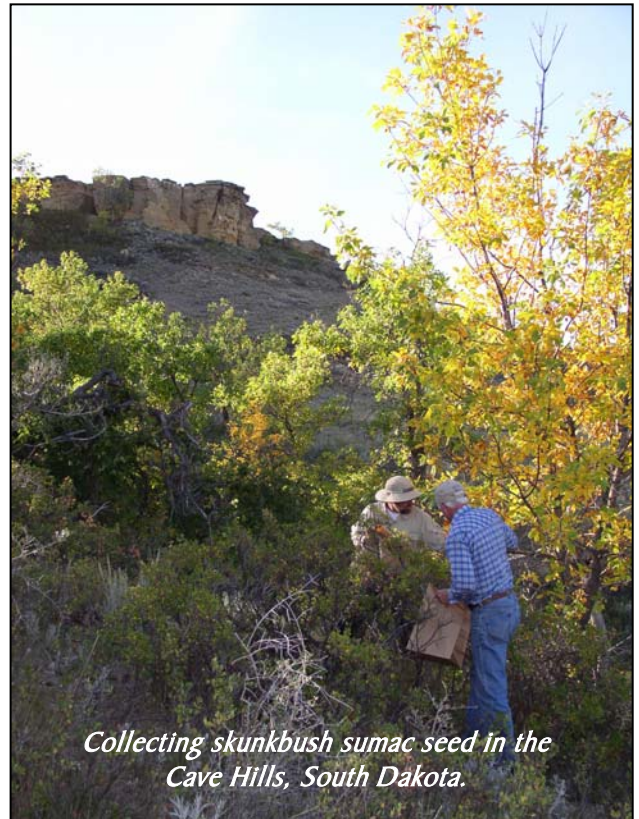
North and east of Brookings at Bristol (45.4°N 97.8°W) and South Shore (45.1°N 96.8°W), adaptation (i.e., area of cultivar origin) was the critical factor for stand longevity in a post-killing-frost harvest system. Cave-In-Rock, Shawnee, Trailblazer, Sunburst and Forestburg produced in excess of 9 Mg/ha at Bristol and in excess of 5 Mg/ha at South Shore in 2000. However, in 2004 at Bristol, Sunburst and Forestburg produced 10 Mg/ha and 9 Mg/ha, respectively, compared with 4 Mg/ha and 6 Mg/ha, respectively, for Cave-In-Rock and Shawnee. Similarly at South Shore, Sunburst and Forestburg produced greater than 3 Mg/ha compared with less than 1 Mg/ha for Shawnee and Cave-In-Rock in 2004.

During the 4-year duration of the research at Pierre, growing season precipitation ranged from 46 percent (2002) to 101 percent (2004) of the 30-yr average, and biomass production was strongly associated with total April and May precipitation. Annual maximum biomass yields ranged from 2 Mg/ha obtained in July 2002 for both cultivars to 11 Mg/ha for Cave-In-Rock in September of 2001 and 10 Mg/ha for Dacotah in August 2003. After four

years, no differences were found between harvest dates for stand densities. However, Dacotah had a higher stand density (71 percent) than Cave-In-Rock (56 percent). Although stands of Cave-In-Rock were starting to show evidence of decline, area of cultivar origin appeared to be less important in stand longevity in central South Dakota than in northeastern South Dakota. This was demonstrated by the fact that Cave-In-Rock was still productive five years after establishment.



Pulling volunteer Siberian elm at the Becker, Minnesota evaluation site.



Collecting skunkbush sumac seed in the Cave Hills, South Dakota.



The field office at Dickinson, North Dakota, was pleased with the results of a demonstration planting of Wytana four-wing saltbush.

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