

**ABERDEEN
PLANT MATERIALS CENTER
2001
PROGRESS SUMMARY REPORT**



**SNAKE RIVER PLAINS GERMPLASM
FOURWING SALTBUCH**



**NORTHERN COLD DESERT GERMPLASM
WINTERFAT**

**U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
IDAHO**

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INTRODUCTION

This report summarizes plant science work conducted within the Aberdeen Plant Materials Center service area during 2001. The primary focus of the Aberdeen PMC is plant selection and establishment techniques for low precipitation rangeland; riparian and wetland plant selection and technology development; and promotion and demonstration of windbreaks and other agroforestry practices.

PROJECT ACTIVITIES

Sandberg Bluegrass Release in Cooperation with USDA - FS

In 1999 the PMC agreed to cooperate with the USDA Forest Service Shrub Lab in the release and seed increase of accession number B5397G1818 *Poa secunda*. This accession was collected by the Shrub Lab in 1997 on the Air Force Saylor Creek Test Range in southwestern Idaho and has been evaluated against 25 other accessions from Idaho. The PMC planted a 1 acre seed increase field in May, 2000. A weak stand established and a small amount of seed was harvested in 2001. A new field will be established in 2002 to further evaluate seed production culture and processing.

'Appar' and Native Blue Flax Comparison

The USDA Forest Service Shrub Lab and the PMC cooperatively released Appar Lewis flax as a native forb in 1980. Appar was later determined to be a naturalized introduced species from Europe. The Shrub Lab has been evaluating native blue flax accessions and requested the PMC assist in a study to compare Appar to one of the more promising native collections. In May, 2000 two rows each (80 feet long) of Appar and Maple Grove G1 collection were seeded at the PMC. Preliminary evaluations in 2000 found the Maple Grove collection to have the best stand and taller plants. Seed samples were harvested in 2001 and the Maple Grove accession yielded 92 percent of Appar. The comparison will be repeated again next year. The PMC also plans to establish a seed production field of the Maple Grove collection in 2002.

Hybrid Poplar Initial Evaluation

The purpose of this project is to evaluate hybrid poplar accessions currently being used in commercial production for fiber and fuel in Washington, Oregon, and western Idaho. Presently there is no commercial poplar production in southeast Idaho or northern Utah and this trial may identify accessions that are adapted to this region. Replicated plots were planted at the PMC in May, 1998. Preliminary evaluations indicate that OP-367 and 52-225 (common clones used in the industry) may be the best suited clones to the soils and climate of the Snake River Plains of southeast Idaho. Evaluations in September, 2001 found OP-367 to average 22 feet tall with a diameter at breast height (D.B.H.) of 5 inches. Clone 52-225 averaged 14 feet tall and D.B.H. of 2 inches.

Grantsville Inter-Center Strain Trial

Grantsville is located approximately 30 miles southwest of Salt Lake City, Utah in an 8-12 inch annual precipitation zone and a region heavily infested with cheatgrass. The trial was seeded in November, 1994 to evaluate grasses and native shrubs for adaptation, performance and ability to compete with cheatgrass. Production, plant height, cover and vigor data were collected. The site was sprayed with Oust™ herbicide on December 2, 1998 to control cheatgrass and to evaluate herbicide effects on the established accessions. A summary of six years of evaluation data was completed in 2001. There were substantial declines in stands of native grass accessions following the herbicide application. 'Nordan' crested wheatgrass had the highest 4 year mean average forage production. Evaluation data from the shrub plots was used to support the release of Snake River Plains Germplasm fourwing saltbush and Northern Cold Desert Germplasm winterfat.

Mountain Home Air Force Base Windbreak Demonstration

This project is a cooperative, reimbursable project with the United States Air Force to install and demonstrate the value of windbreaks. Between 1996 and 1999, approximately 52,940 running feet of windbreak were planted at the Air Force Base. A new agreement was developed in 1999 to continue the installation of approximately 44,285 running feet of new windbreaks through 2003. In March, 2001 the PMC planted Rocky Mountain juniper and installed weed barrier material for the windbreak that was planted in 2000. This row was delayed due to the unavailability of Rocky Mountain juniper in 2000. In addition to completion of this windbreak, 625 trees and shrubs were planted to replace dead materials in previously planted windbreaks. Due to the national emergency on September 11, 2001 and the current international situation, future windbreak installation and demonstration is questionable.

Mountain Home Air Force Base Woody Inter-center Strain Trial

This trial was established in 1991 to test woody plants for use in windbreaks in southwestern Idaho. There are 111 accessions representing 63 species. Semi-annual evaluations were conducted through 1996 to identify both released and potential plant material for adaptation. The PMC will continue to evaluate the site on a 5-10 year interval to observe long term survival and performance. The site is a valuable demonstration of woody plant material. Idaho Plant Materials Technical Note No.29 Test Results - Woody Plant Materials for Windbreaks was completed as a result of this trial.

Idaho Army National Guard

The PMC and the South Bingham Soil Conservation District began working on a reimbursable project with the Idaho Army National Guard in 1996. A portion of the project was to research propagation of tapertip hawksbeard and sharpleaf penstemon, which are native to the Tank Training Area located south of Boise. Another portion of the project was to evaluate native grass and shrub accessions on the Training area. The establishment of 3 plant testing sites was completed in 1999. An experimental seed orchard of winterfat and sharpleaf penstemon was also established on the Training area. During 2001, the final year of the project all test sites and the on-site seed orchard of winterfat and sharpleaf penstemon were evaluated. A final report detailing the progress of the project has been completed.

University of Idaho Herbicide Trials

The PMC is cooperating with the University of Idaho, Aberdeen Research and Extension Center and the Black Snake Cooperative Weed Management Area in the evaluation of Plateau® herbicide on perennial grasses commonly used in rangeland plantings in the Intermountain West. Plateau shows promise in the control of cheatgrass and medusahead prior to seeding. In September, 2000 the University of Idaho applied 13 different herbicide formulations on poor condition rangeland that burned near Aberdeen a month earlier. It was intended to dormant seed 16 accessions in November, 2000 but below normal temperatures and snow prevented seeding until late March, 2001. Although precipitation during 2001 was nearly half of normal, the herbicide applications were successful in controlling cheatgrass. Observations of the plots in September, 2001 found that most varieties had a few plants established in at least one of the herbicide treatments. 'Vavilov' Siberian wheatgrass and 'Rush' intermediate wheatgrass had the best stands. In addition to these trials, the PMC and University also cooperated in evaluating Plateau on the PMC Display Nursery at the Home Farm. One half of each plot was sprayed in September, 2000. In late June, 2001 the plots were clipped to evaluate forage production and forage samples were collected for quality analysis. The forage samples are in the process of being analyzed and results will be reported.

Fourwing saltbush

In 2001, the Aberdeen, Idaho Plant Materials Center (PMC) in cooperation with the Pullman, Washington PMC and the Idaho Agricultural Experiment Station released Snake River Plains Germplasm fourwing saltbush (Selected Class) for use in the Intermountain West. Fourwing saltbush is an erect shrub that provides erosion control, and browse for livestock and big game and is common on dry, moderately saline or alkaline areas. Snake River Plains Germplasm was selected from an assembly of 83 collections evaluated at the PMC from 1977 to 1986. Four of the collections evaluated had very good tolerance to cold temperatures and were planted into a seed increase block. Seed from the increase block was tested from 1995 to 2000 at off-center test sites in Idaho, Utah and Washington. The release shows potential for use in the northern areas of the Intermountain West because of its cold hardiness and should be better adapted than existing releases of the species. Small quantities of Certified seed will be made available to seed growers in early 2002 through the University of Idaho Foundation Seed Program and Utah Crop Improvement Association.

Winterfat

The Aberdeen, Idaho Plant Materials Center (PMC) in cooperation with the Idaho Agricultural Experiment Station released Northern Cold Desert Germplasm winterfat (Selected Class) in 2001. Winterfat is an erect shrub that provides erosion control, and browse for livestock and big game in arid to semi-arid and moderately saline or alkaline areas. Northern Cold Desert Germplasm was selected from an assembly of 45 collections evaluated at the PMC from 1978 to 1986. Five of the collections evaluated had very good tolerance to cold temperatures and were planted into a seed increase block. Seed from the increase block was tested from 1995 to 2000 at off-center test sites in Idaho, and Utah. The release shows potential for use in the northern areas of the Intermountain West because of its cold hardiness and should be better adapted than existing releases of the species. Small quantities of Certified seed will be made available to seed growers in early 2002 through the University of Idaho Foundation Seed Program and Utah Crop Improvement Association.

Breeder and Foundation Seed Production

The Aberdeen PMC is responsible for Breeder and Foundation seed production of 17 plant releases. During 2001, the PMC had Foundation seed fields of 'Magnar' basin wildrye, 'Goldar' bluebunch wheatgrass, 'Rush' intermediate wheatgrass, 'Bannock' thickspike wheatgrass, 'Ephraim' crested wheatgrass, 'Appar' Lewis flax, Richfield Selection firecracker penstemon, Clearwater Selection alpine penstemon, Northern Cold Desert winterfat and Snake River Plains fourwing saltbush.

Constructed Wetland Systems

Constructed Wetland Systems (CWS) are designed and built to mimic a natural wetland's water purification function. CWS use the wetland plants and the microbial populations associated with the roots to breakdown and remove pollutants such as nutrients, sediments, pesticides, heavy metals, and bacteria. The PMC Riparian/Wetland Project has worked on two different types; 1) CWS to treat agricultural wastewater (irrigation and animal) and 2) stormwater CWS to treat urban wastewater. The following CWSs have been installed or are in the process of being installed:

* **Nature Conservancy (TNC) CWS** - Located near Hagerman, Idaho. This site was constructed in 1994 to treat irrigation tailwater from the Northside Canal Company main canal before it enters springs owned by TNC and eventually the Snake River. This project was in response to a court order to clean up irrigation return flows before entering the middle Snake River area. The site was planted in 1995 and 1996. This system is being used for research and demonstration.

* **Cedar Draw CWS** - This site is located on property owned by the Twin Falls Canal Company and Idaho Fish & Game Department. The site was constructed and planted in 1996. This is a cooperative project between the Twin Falls Canal Company, University of Idaho, Idaho Fish & Game Department, USDA - NRCS Aberdeen Plant Materials Center, Idaho Power Company, and Coors Brewing Company. The site is designed and installed around an old fish hatchery. The raceways are used to test individual wetland plant species, CWS design, and management practices. This CWS is being used as a research and demonstration site.

* **Fairview CWS** - Located near American Falls, Idaho on the Neil Poulson farm. This CWS treats furrow irrigation wastewater from a 160-acre farm that raises grain, grass seed, and cattle. The wastewater is treated before it enters American Falls Reservoir on the Snake River. The design was based on replicated components, different plant species, and varying plant communities. Two years of baseline data and extensive water quality data from the surrounding area has been collected. Idaho State University researchers are working with the Riparian/Wetland Project to set up a variety of experiments including microbial populations, rate of establishment, nutrient breakdown in relationship to age of the plants, PAM studies, invertebrate and vertebrate populations, and others. The PMC is helping with design, data collection, plant selection, plant procurement, and planting.

* **H-Drain CWS** - Located near Paul, Idaho on property owned by USDI-Bureau of Reclamation. The site was constructed and planted in 1995. This project treats irrigation wastewater from farms in the A & B Irrigation District. The area originally fed wells that injected irrigation wastewater into the Snake River Aquifer. This project is currently functioning and evaluations are being completed on a 5 year schedule.

* **CSI CWS** - This CWS is situated on the College of Southern Idaho Campus in Twin Falls, Idaho. This system was constructed to treat geothermal water that heats the campus buildings, stormwater runoff from the city of Twin Falls, and agricultural wastewater that enters Perrine Coulee above the city. The site was constructed in 1995 and planted in 1996. Water entering the CWS is about 85°F. The site is used for research and demonstration.

* **City of Pocatello Stormwater CWS** - The PMC assisted the City of Pocatello with the design, construction, and planting of a Constructed Wetland System to treat stormwater that flows through the city from the surrounding watershed. The CWS encompasses about 4 acres. We advised the City in the purchase of plants, planting schedules, and planting. The CWS was planted in 1998. We are evaluating the vegetation and cooperating with the USGS in the water-monitoring plan.

Riparian Projects

The following riparian projects are designed to test and demonstrate bioengineering structures either individually or in conjunction with rock structures. We are studying riparian area management, riparian enhancement, and riparian restoration. The main emphasis of our research is performance-tested native species, planting techniques in the arid and semi-arid west, and community maintenance. The following projects were installed or are being installed:

* **Arimo Ranch Riparian Grazing Demonstration Project** – This study involves 4.1 miles of Marsh Creek, located on private property south of Pocatello, Idaho. One half of the stream is excluded from cattle grazing, and one half is under a managed planned grazing system. One half of the enclosure and one half of the grazed portions have been or are being planted and/or having bioengineering structures installed. This site is being used as a research and demonstration site. This is a cooperative project between USDA-NRCS, Plant Materials Center and Idaho Fish and Game Department. EPA 319 funds have been used to construct the enclosures.

* **Camas Creek/Larson Farms Site** - This site is a 10 mile section of Camas Creek located on Larson Farms north of Hamer, Idaho. Camas Creek is dewatered through irrigation diversions during most of the summer months. The riparian vegetation has been removed through farming operations over the last 20 plus years. The soils are sands and sandy loams. Tons of sediment are eroded from the banks and washed down to the Camas National Wildlife Refuge and Mud Lake each year. The Riparian/Wetland Project was asked to assist with a restoration plan that would significantly reduce the amount of sediment coming from Larson Farms using a combination of rock and bioengineering structures. This site is a demonstration of the feasibility of using rock and bioengineering structures to create a streambank erosion reduction design on a working farm in a semi-arid climate. Two field planting demonstrations studying adaptation of PMC willow materials have been installed along this project area.

* **Trout Creek Off-Center Advanced Test Site** - The Trout Creek site is the oldest riparian testing site for Aberdeen PMC. Grazing was originally excluded in 1988. We have been testing willow, cottonwood, and dogwood accessions in addition to planting methods since 1990. In addition, several streambank bioengineering structures were installed during a Riparian Workshop in 1995. This site has some of the best long-term data available to our program.

* **Upper Portneuf River Demonstration Project** – This project is located on the upper Portneuf River near Chesterfield Reservoir in southeastern Idaho. This section of the Portneuf River, located on an active cattle ranch, was moved, straightened, and incorporated into a canal delivery system to provide water to irrigators on the Arimo Ditch and the Downy Canal. The bank vegetation was totally removed by cattle over the last 30 years. Our goal is to restore the riparian vegetation, reduce streambank erosion, and improve fish habitat. This will help reestablish critical fish habitat downstream in areas that have not been straightened and defoliated. In partnership with the ranch owner, the canal company, and the Idaho Fish and Game Department, the Interagency Riparian/Wetland Project has installed a series of stream barbs and bioengineering structures to restore the streamside vegetation and reduce the streambank erosion.

* **Sheridan Creek, Henry's Fork Watershed, Riparian Recovery** – Sheridan Creek is a perennial stream that flows into Island Park Reservoir located in the Henry's Fork Watershed in Northeastern Idaho. The Sheridan Creek area is partially owned by a large cattle ranch and partially by the State of Idaho (Idaho Department of Lands). It has been heavily grazed in the past and almost all of the willows were removed resulting in unstable streambanks. Sheridan Creek was recently listed in the state's TMDL 303(d) list. With the help of the Henry's Fork Foundation and the rancher, we are putting together a restoration plan. A bioengineering project was installed in the fall of 1999 on one area of the Creek as part of a riparian workshop.

FIELD AND DEMONSTRATION PLANTINGS

Within Idaho and Utah, there are currently 167 field or demonstration plantings. These plantings are installed primarily on private lands in cooperation with the landowner, local soil conservation district and NRCS field office staff. These plantings enable NRCS and the PMC program to field test materials under development, promote materials that have been recently released, and to demonstrate to local planners, land users and landowners the value of the plant(s) to solve resource problems and needs. Each of these plantings is evaluated to determine the performance of the plant(s) under the specific soil, climate and management conditions present at the test location. Evaluation summary reports are available on request from Dan Ogle at dan.ogle@id.usda.gov or telephone (208) 378-5730.

PLANT RELEASES FROM THE ABERDEEN PMC

Alkali bulrush (Bear Lake, Bear River, Fort Boise, and Stillwater Selections), a long-lived, native, perennial, aggressively sod-forming grass-like plant that often forms large colonies in wet marshy or shoreline areas. Released in 1997 for MLRAs B and D.

'Appar' blue flax, a short-lived, naturalized, perennial, naturally reseeding forb used on rangeland, minespoils, highway right-of-way, and ornamental plantings. Released in 1980.

Baltic rush (Railroad Valley, Roswell, Sterling and Stillwater Selections), a long-lived, native, perennial, wiry, aggressively sod-forming grass-like plant that often forms large colonies in semi-wet meadow and saturated areas. Released in 1997 and 1998 for MLRAs B and D.

'Bannock' thickspike wheatgrass, a long-lived, native, very drought tolerant, weakly sod-forming grass used in rangeland and other natural area plantings. Released in 1995.

- Creeping spikerush** (CJ Strike, Malheur, Mud Lake, and Ruby Lake Selections), a long-lived, native, sod-forming grass-like plant that can be singular or in large colonies in very wet meadows to shallow water areas. Released in 1997 for MLRAs B and D.
- 'Delar' small burnet**; a long-lived, evergreen, perennial forb used primarily in rangeland, disturbed areas, and wildlife plantings. Released in 1981.
- 'Ephraim' crested wheatgrass**, a long-lived, introduced, somewhat drought tolerant, bunchgrass used in critical area plantings for stabilization and erosion control. Released in 1983.
- Fourwing saltbush** (Snake River Plains Germplasm), a native shrub, drought and saline tolerant, used in rangeland, disturbed areas and wildlife plantings. Released in 2001.
- 'Goldar' bluebunch wheatgrass**, a long-lived, native, somewhat drought tolerant, bunchgrass used in rangeland and other natural area plantings. Released in 1989.
- Hardstem bulrush** (Camas, Hagerman, Ogden Bay, and Stillwater Selections), a long-lived, native, very tall, aggressively sod-forming grass-like plant that often forms large colonies in very wet shallow water areas. Released in 1997 for MLRAs B and D.
- Laurel willow** (Aberdeen Selection), a long-lived, naturalized, tall shrub used primarily in windbreak and ornamental plantings. Released in 1997.
- 'Magnar' basin wildrye**, a long-lived, native, drought tolerant, very large bunchgrass used in herbaceous windbreak, rangeland, and other natural area plantings. Released in 1979.
- Nebraska sedge** (Centennial, Modoc, Ruby Lake, and Sterling Selections), a long-lived, native, perennial, highly palatable, densely sod-forming grass-like plant found in wet to semi-wet areas. Released in 1997 for MLRAs B and D.
- 'Nezpar' Indian ricegrass**, a long-lived, native, very drought tolerant bunchgrass used for sandy soil stabilization and as winter forage for livestock and wildlife. Released in 1978.
- 'Paiute' orchardgrass**, a long-lived, introduced, high producing, highly palatable bunchgrass used primarily in non-irrigated or irrigated pasture plantings above 16 inches rainfall. Released in 1983.
- Penstemon, Firecracker** (Richfield Selection), a long-lived, native, drought tolerant, very showy, perennial forb used in rangeland, minespoils, highway-right-of-way, and ornamental plantings. Released in 1994.
- Penstemon, Alpine** (Clearwater Selection), a long-lived, native, showy, perennial forb used in rangeland, minespoils, highway-right-of-way, and ornamental plantings. Released in 1994.
- 'P27' Siberian wheatgrass**, a long-lived, introduced, very drought tolerant bunchgrass used primarily on rangeland seedings. Released in 1953.

- ‘Regar’ meadow bromegrass**, a long-lived, introduced, high vigor, rapid regrowth, highly palatable, mildly sod-forming grass use primarily in non-irrigated or irrigated pasture plantings above 14 inches rainfall. Released in 1966.
- ‘Rush’ intermediate wheatgrass**, a long-lived, introduced, high seedling vigor, rapidly growing, high producing, highly palatable, mildly sod-forming grass use in rangeland, non-irrigated, and irrigated plantings above 11 inches rainfall. Released in 1994.
- ‘Sodar’ streambank wheatgrass**, a long-lived, native, very drought tolerant, sod-forming grass used in critical area, erosion control, rangeland and other natural area plantings. Released in 1954.
- ‘Tegmar’ dwarf intermediate wheatgrass**, a long-lived, introduced, late maturing, sod-forming grass used in critical area and erosion control plantings. Released in 1968.
- Common threesquare** (Fort Boise, Malheur, Market Lake, and Wayne Kirch Selections), a long-lived, native, perennial, aggressively sod-forming grass-like plant that often forms large colonies in semi-wet meadow and saturated areas. Released in 1997 and 1998 for MLRAs B and D.
- ‘Topar’ pubescent wheatgrass**, a long-lived, introduced, saline tolerant, low fertility tolerant, sod-forming grass used in pasture and erosion control plantings above 11 inches rainfall. Released in 1957.
- Winterfat** (Northern Cold Desert Germplasm), a native shrub, drought and saline tolerant, used in rangeland, disturbed areas and wildlife plantings. Released in 2001.

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33. Plant and Seed Vendors for Colorado-Idaho-Kansas-Montana-Nebraska-New Mexico-North Dakota-South Dakota-Utah-Wyoming. April 1999.
34. Guidelines to Reduce Rodent Damage while Establishing Windbreaks. April 1999.
35. A Quick Method to Estimate Germination Percentages for Seed Species. March 2000.
36. Optimize Forage Quality by Afternoon Harvesting. August 1999.

37. Hybrid Poplar - An Alternative Crop for the Intermountain West. February 2001.
38. Users Guide to Description, Propagation and Establishment of Wetland Plant Species and Grasses for Riparian Areas in the Intermountain West. February 2001.
39. Waterjet Stinger: A Tool to Plant Dormant Unrooted Cuttings of Willows, Cottonwoods, Dogwoods, and other Species. February 2001.
40. Biology, History, and Suppression of Reed Canarygrass. February 2001.

Wetland/Riparian Project Information Series

- 1 - Planting techniques for vegetating riparian areas from the Aberdeen Plant Materials Center.
- 2 - Planning a Project: Selection and Acquisition of Woody and Herbaceous Plant Species and Materials for Riparian Corridors, Shorelines, and Wetland Restoration and Creation.
- 3 - Use of Willow and Cottonwood Cuttings for Vegetating Shorelines and Riparian Areas.
- 4 - How to Plant willows and Cottonwood for Riparian Rehabilitation. (Short 4 page synopsis of Tech Note 23. For use as a handout to interested people.)
- 5 - Collection, Establishment, and Evaluation of Unrooted Woody Cuttings to Obtain Performance Tested Ecotypes of Native Willows and Cottonwoods.
- 6 - Seed and Live Transplant Collection Procedures for 7 Wetland Plant Species.
- 7 - Use of Greenhouse Propagated Wetland Plants Versus Live Transplants to Vegetate Constructed or Created Wetlands.
- 8 - Constructed Wetland System For Water Quality Improvement Of Irrigation Wastewater.
- 9 - Design Criteria for Revegetation in Riparian Zones of the Intermountain Area.

- 10 - Perigynium removal and cold-moist stratification improve germination of *Carex nebrascensis* (Nebraska sedge).
- 11 - Getting "Bang for your Buck" on your next Wetland Project.
- 12 - Guidelines for Planting, Establishment, Maintenance of Constructed Wetland Systems.
- 13 - A Reference Guide for the Collection and Use of Ten Common Wetland Plants of the Great Basin and Intermountain West.
- 14 - Harvesting, Propagating and Planting Wetland Plants.
- 15 - Costs and considerations of streambank bioengineering treatments.
- 16 - Riparian Planting Zones
- 17 - Waterjet Stinger - a tool to plant dormant unrooted cuttings of willows, cottonwoods, dogwoods, and other species.

Plant Fact Sheets

- 1. Nebraska Sedge, *Carex nebrascensis*
- 2. Creeping Spikerush, *Eleocharis palustris*
- 3. Baltic Rush, *Juncus balticus*
- 4. Hardstem Bulrush, *Scirpus acutus*
- 5. Alkali Bulrush, *Scirpus maritimus*
- 6. Common Threesquare, *Scirpus pungens*
- 7. Aberdeen Selection of Laurel willow, *Salix pentandra*
- 8. 'Rush' Intermediate Wheatgrass, *Elytrigia intermedia*
- 9. 'Bannock' Thickspike wheatgrass, *Elymus lanceolatus ssp. lanceolatus*
- 10. Richfield Selection, Firecracker Penstemon, *Penstemon eatonii*
- 11. Clearwater Selection, Alpine Penstemon, *Penstemon venustus*

Plant Guides

1. Basin Wildrye, *Leymus cinereus*
2. Blue Flax, *Linum species*
3. Bluebunch Wheatgrass, *Pseudoroegneria spicata*
4. Crested Wheatgrass, *Agropyron cristatum*
5. Crested Wheatgrass, *Agropyron desertorum*
6. Fourwing Saltbush, *Atriplex canescens*
7. Indian Ricegrass, *Achnatherum hymenoides*
8. Intermediate Wheatgrass, *Elytrigia intermedia*
9. Pubescent Wheatgrass, *Elytrigia intermedia*
10. Siberian Wheatgrass, *Agropyron fragile*
11. Small Burnet, *Sanguisorba minor*
12. Streambank Wheatgrass, *Elymus lanceolatus spp. psammophilus*
13. Thickspike Wheatgrass, *Elymus lanceolatus spp. lanceolatus*
14. Western Wheatgrass, *Pascopyrum smithii* (Rydb.) A. Löve
15. Winterfat, *Krascheninnikovia lanata*

Unpublished Regional & National Posters

- St. John, L. and P. Blaker. 1997. *Recent Plant Releases from the Aberdeen Plant Materials Center*. USDA-Natural Resources Conservation Service, Plant Materials Center, Aberdeen, ID. Poster Paper.
- Hoag, J. Chris. 1998. *The Practical Streambank Bioengineering Guide: A User's Guide For Natural Streambank Stabilization Techniques In The Arid And Semi-Arid West*. Interagency Riparian/Wetland Plant Development Project, USDA-Natural Resources Conservation Service, Plant Materials Center, Aberdeen, ID. Poster Paper.

Hoag, J.C. 1999. *Wetland Plant Releases from the Interagency Riparian/Wetland Plant Development Project, USDA-Natural Resources Conservation Service, Plant Materials Center, Aberdeen, ID*. Poster Paper.

Holzworth, L., D. Tober, and D. Ogle. 1999. *Plant Materials Centers Provide Vegetative and Technological Solutions*. USDA-NRCS Poster Paper.

Workshops and Training Sessions

* **Multiple - State Plant Materials Training** - For NRCS employees, other federal, state and local agencies, and private landowners. This is a three-day course with one and a half days in the classroom and one and a half days in the field. The course introduces the student to plant materials as an alternative to solve resource management problems, PMC functions, classes of seed, seed tags, fundamentals of seed production, planning a seeding, seed quality, seeding rates, seed mixtures, drill calibration, planting evaluations, use of rice hulls, seedbed preparation, and the integration of plant materials into field office activities. The PMC farms, ongoing projects and studies, and one off center test site are used to give the students a more practical training opportunity.

* **Bioengineering Workshops** - For NRCS employees, other federal, state and local agencies, and private landowners. A two-day course with one day in the classroom discussing riparian zone ecology, management, and restoration principles and the second day in the field installing a variety of bioengineering structures as alternatives to hard structures.

* **Wetland Creation and Enhancement Workshops** - For NRCS employees, other federal, state and local agencies, and private landowners who are interested in Constructed Wetland Systems or enhancement of existing wetlands. A two-day workshop with one day in the classroom reviewing wetland functions, hydrology, plants, plant establishment principles, and plant community maintenance. A second day is in the field planting wetland plants and looking at existing designs.

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