



Alaska Plant Materials Center

2002 Annual Report

Alaska Department of Natural Resources - Division of Agriculture

ALASKA PLANT MATERIALS CENTER

2002 ANNUAL REPORT

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Introduction

The Alaska Plant Materials Center (PMC) is a section of the Division of Agriculture within the Department of Natural Resources. The Plant Materials Center's work advances applied plant research for northern latitudes through two major programs: Revegetation and Native Seed Production, and Potato Production. Each of these programs will be addressed in this report.

Often in late July or early August, the Plant Materials Center hosts an open house. The PMC staff is available to answer questions about the projects and give tours of the facilities. Over 300 people attended the last open house. Scheduling conflicts did not allow an open house in 2002. Construction activities will likely preclude an open house in 2003. However, in 2004 the PMC's open house program will resume.

The majority of the Plant Materials Center's funding comes from non-state sources. In recent years, USDA has become the major funding source. The majority of the remaining operating monies are allocated from the Agriculture Revolving Loan Fund. The PMC no longer relies on the state general fund. That change occurred in fiscal year 1997. Additionally, the center brings in small amounts of revenue through cooperative projects with other agencies, the private sector and through the sale of plant materials. All funds derived from outside sources can be used for direct operations of the Plant Materials Center.

History

Early attempts to establish a federal Plant Materials Center in Alaska were unsuccessful because the U. S. Department of Agriculture believed that the centers at Pullman, Washington and Corvallis, Oregon could serve the needs of Alaska.

The Alaska Legislature was not discouraged, and at the urging of the University of Alaska, conservation groups, and farmers, prepared legislation that would establish the Alaska Plant Materials Center.

In 1972, Governor Bill Egan signed into law a bill creating the Alaska Plant Materials Center. This legislation directed the Plant Materials Center to fulfill several traditional agricultural responsibilities and to develop plant varieties and techniques for revegetation and erosion control and provide technical reclamation assistance to industry.

Soon after the Plant Materials Center bill was enacted, a 285-acre tract near Palmer was selected for the center's site. An additional 120-acre parcel adjacent to the PMC was acquired through a land exchange with the Matanuska-Susitna Borough in 1982. This gave the PMC a total of 405 acres to accomplish its mandated duties which now included revegetation work, horticultural development, foundation seed production and disease-free potato seed stock production.

In 1987, the PMC's programs were consolidated into the two programs; the North Latitude Revegetation and Seed Production Project and the North Latitude Vegetable and Landscape Crop Improvement Project. To further streamline state operations, Forest Nursery operations were transferred to the Plant Materials Center from the Division of Forestry in 1993.

In 1994, the PMC assumed responsibility for the maintenance and production of breeder class seed of all University of Alaska developed grass. The transfer of responsibility has placed the PMC in the position of being the repository and maintainer for Alaska developed germplasm.

Continuing budget reductions have forced the PMC to drop programs. On December 15, 1995, the chronically under-funded Forest Nursery was closed. Prior to closure, seedlings produced in 1995 were shipped or placed in protective storage.

In November 1997, the PMC was notified that the U.S. Department of Agriculture granted the PMC to operate the Arctic Genetic Resources Unit. This includes an operating and capital grant. In 1998, the Germplasm Repository became a reality. The first USDA employee was hired and the state initiated designing of a greenhouse. The greenhouse was completed in 2001. The Arctic Genetic Resources Unit currently holds accessions of alpine, arctic, polar plants with a special emphasis on wetland species. The site also became instrumental at increasing germplasm held at other USDA repositories. We expect a long and productive cooperative effort with USDA. A new specific cooperative agreement is scheduled for implementation in 2003.

In 1999, a grant from USDA Natural Resource Conservation Service (NRCS) allowed the PMC to expand its program in native seed production and commercialization. This program is expected to last five years.

In the year 2000, an additional grant from NRCS allowed the PMC to expand a cold regions program. The program not only allows for the establishment of a supplemental plot network throughout Alaska, it funds additional circumpolar seed exploration/collection projects.

The PMC has been very aggressive in securing grants and federal funds. This trend is not expected to decline, in fact, the level of non-state funding is expected to increase.

North Latitude Revegetation & Seed Production Program

The Revegetation and Native Seed Production Program's products and methods are used to encourage a healthy seed industry and develop new plant materials and methods for land reclamation and erosion control. These two functions are complementary and are intended to promote an instate seed industry while providing state-of-the-art revegetation and erosion control information to the public.

Revegetation & Reclamation Efforts

The construction of the Trans Alaska Pipeline in the 70's triggered the current reclamation research activity in Alaska, however, since the pipeline, ideas associated with revegetation have changed. Continued oil development, renewed interest in surface and placer mining, as well as new federal, state and local regulations have caused applied research activities to address "reclamation" as defined by regulations, which in some cases has precluded the use of "traditional" plant material and planting technology.

The Alaska Plant Materials Center continues to lead Alaska in reclamation, erosion control, research and technology transfer and revegetation. The use of dormant seedlings to extend planting seasons, cost-effective and successful methods in willow planting, and wetland and coastal restoration are research priorities for the Plant Materials Center.

The project follows seven basic steps to establish a resource of conservation plants for use in land reclamation, wildlife habitat improvement and erosion control. They are: 1) define and anticipate conservation problems and establish priorities; 2) research and assemble candidate plant materials; 3) conduct initial evaluations; 4) establish small scale seed or vegetative increases; 5) advanced and final testing and field evaluation plantings; 6) establish large scale seed or vegetative increases; and, 7) release of a variety or cultivar.

This program has gathered at least 275 plot years of information collected from sites around the state (Figure 1), developed 11 new cultivars for revegetation and reclamation and assisted scores of agencies and private companies in reclamation, erosion control and revegetation. Figure 2 represents a typical plot layout used in off-site evaluations.

This report outlines some of the present revegetation and reclamation research being conducted by the PMC and summarizes current activities at sites around the state. Additional information can be found in the individual reports that are listed in this report. Copies of these reports are available from the Alaska Plant Materials Center.

Figure 2 - Typical Plot Layout

Nugget Kentucky bluegrass	Merion Kentucky bluegrass
Park Kentucky bluegrass	Banff Kentucky bluegrass
Sydsport Kentucky bluegrass	Fylking Kentucky bluegrass
Service big bluegrass	Troy Kentucky bluegrass
Sherman big bluegrass	Canbar canby bluegrass
Tundra glaucous bluegrass	Reubans Canada bluegrass
<i>Poa glauca</i> T08867	Gruening alpine bluegrass
<i>Agropyron subsecundum</i> 371698	Sodar streambank wheatgrass
Nordan crested wheatgrass	<i>Agropyron subsecundum</i>
Fairway crested wheatgrass	<i>Agropyron violaceum</i>
Summit crested wheatgrass	<i>Agropyron boreal</i>
Critana thickspike wheatgrass	<i>Agropyron yukonese</i>
Fults alkaligrass	Vantage reed canarygrass
Climax timothy	Engmo timothy
<i>Elymus arenarius</i>	<i>Elymus sibiricus</i> 34560
Norcoast Bering hairgrass	<i>Elymus sibiricus</i> 2144
Sourdough bluejoint	Nortran tufted hairgrass
Meadow foxtail	<i>Calamagrostis canadensis</i>
Garrison creeping foxtail	<i>Alopecurus geniculatus</i>
Boreal red fescue	Arctared red fescue
Egan American sloughgrass	<i>Festuca scabrella</i>
Durar hard fescue	Pennlawn red fescue
Covar sheep fescue	Highlight red fescue
Kenai polargrass	Manchar smooth brome
Alyeska polargrass	Carlton smooth brome
Caiggluk tilesy sagebrush	Polar brome

Mass Aleutian Plant Collection Project

The PMC proposed to both the U.S. Navy and U.S. Air Force that a major effort be initiated to collect seed of species native to the Aleutians and Alaska Peninsula. Both agencies agreed with the concept, a full proposal was developed and by July 1993 an agreement was signed by each cooperator.

This program is possibly one of the more significant efforts undertaken by the PMC. If even partially successful, the native seed industry in Alaska will enter a new era of production and the local seed producers should benefit significantly. All production of these species will be limited to Alaska, eliminating the competition from producers in other regions. Some of the species collected will also have potential markets outside the state.

During the months of August, September and October, staff from the PMC conducted large scale seed collection at King Salmon, Dutch Harbor, Adak, Shemya and Attu. Sixty-four species were collected.

The species with the greatest potential were distributed to seed producers on the Kenai Peninsula in the spring of 1994, with first sales to the Air Force and Navy planned for the spring of 1996. The attempt to propagate the more difficult or obscure species was undertaken by the PMC.

In June 1994, 33 species were planted at the sites at Kenai and the PMC. All plantings produced stands. Several other species are still undergoing tests to determine requirements for germination. In 1995, the first production crop was harvested. Seed was collected from 30 species. Part of this seed will be used to increase production fields and the remainder will be sold to either the Navy or Air Force for use on Adak or Shemya. In 1996 and 1997, additional seed was collected from the production fields. Part of this will be increased at the PMC. Part has been or will be distributed to private growers. Commercial production of some of the species started in 1999 and continued in 2002. Full release documentation will be published in 2003. New larger scale plantings of the most promising collections were established at the PMC in 2002.

Red Dog Mine Revegetation & Demonstration Plots

This project grew out of a mutual need for information. The PMC required revegetation data from northwestern Alaska, and Cominco Alaska, Inc. needed information on species that would perform well in future mine revegetation programs. In 1987, Cominco agreed to provide the PMC with sites to establish evaluation and demonstration plots for at least four years.

In order to provide the best information for both the PMC and Cominco, three plot sites, representing different conditions were selected. A site selected near the port facility was a sandy, gravel beach area common to the region. The second plot was located at the original camp site's fuel bladder containment area. The third plot was similar to the camp area, but provided a site to compare spring and fall seedings.

This combination of plots was intended to supply data for revegetation species selection and planting windows for seeding. The port site was planted on July 6, 1987 and provided information regarding revegetation in the coastal portion of the mine project.

A dormant plot was seeded at the camp site on September 8, 1987. Because of space limitations, the plot dimensions were slightly reduced and 12 accessions were dropped from the plot. The accessions that were eliminated are species that have failed elsewhere in northern Alaska. Their elimination from the plantings did not compromise the value of the information obtained from the plots. On June 15, 1988, a plot was planted on gravelly soil similar to the surface that will exist when construction of the mine is complete.

A major demonstration planting was also established on June 14, 1988. This plot, located on an abandoned disposal site north of the facility, was recontoured and seeded entirely with native species. It was also evaluated for four growing seasons. The completion of the evaluation program occurred September 1990, at which time a final report was prepared for Cominco.

A complete listing of conclusions and recommendations can be found in 1990 Final Report of Data and Observations Obtained From the Red Dog Mine Evaluation and Demonstration Plots.

During September 1992 and 1993, these sites were again visited and evaluated. All of the plots and trials continued to perform very well. During the 1993 site visit, plans were developed for a new research effort planned for 1994. These plans were put "on hold" until 2002.

In 1996, a collection of native species occurred near the port site. This seed was cleaned at the PMC and returned to the mine operator. The 1997 site visit was not conducted because of scheduling conflicts. The areas were, however, evaluated in 1998. Additional evaluations occurred in 1999 and a new program is expected to be in place for the 2003 field season.

Department of Transportation Interior Seed Collection Project

In 1995, the PMC initiated a program for the Alaska Department of Transportation (DOT) to collect and commercially increase native species. The material collected will be used for future highway revegetation programs throughout the interior region. The collection effort began on August 6, 1995 with a ten-day collection program in the Nome area and the surrounding road system. The collection program continued

from Fairbanks to Tok along the Alaska Highway, as well as 50 miles south on the Parks, Richardson Highways and the Tok Cut-off. Additional collections occurred at Port Clarence. The collection effort ended on September 8, 1995. A total of 31 man-days were expended on the collection effort.

A total of 153 collections covering 72 species were made. The amounts of seed collected ranged from 1 to 2 grams to 12 to 15 kilograms. A total of 108 kilograms of seed was delivered to the PMC.

Seed cleaning was initiated in November 1995 and continued through February 1996. In June 1996, 22 species were planted at the PMC. By September 1997, 18 were harvested for increase and distribution to growers.

In June 1997, one of the seed collections, the native wheatgrass, *Agropyron pauciflorum*, was hydroseeded onto a DOT problem site, the embankments of the on-off ramps of the Johansen Expressway at Peger Road. The wheatgrass, a dry land species, grew very well and DOT was pleased with its performance. The plantings were monitored for winter survival and continued growth. The final report was prepared and distributed in December 1998. Large-scale seed increase occurred in 2000. Release documentation for the collection will be prepared in 2003. New production blocks for the most promising material were established at the PMC in 2002.

Upper Knob Creek and Jones Mine

In 1998, the Plant Materials Center continued to work with the Division of Mining and their abandoned mine land program to revegetate two additional sites, Upper Knob Creek and Jones Mine Phase II. Upper Knob Creek is divided into several pits of varying size totalling over 40 acres. The Jones Mine is a 15- acre area across the valley from Upper Knob Creek. These sites were characterized by gravelly, rocky material mixed with finer particles of clay, silt or sand. When wet the substrate was slippery, sticky and easily eroded. When dry the substrate was crusty with cracks that formed as it dried.

Past revegetation efforts have demonstrated that planting combinations of brushlayers, bundles, live stakes, transplants and seeding with native grasses and forbs are appropriate techniques for revegetating sites with steep slopes and erosive soils.

These techniques were used at Upper Knob Creek and Jones Mine Phase II sites. Also, soil that had been salvaged was spread over a relatively small area on the upper slopes of the Jones Mine.

The Jones Mine contains both cut and fill slopes. After the area was graded to contour, most of the area was scarified. Some areas on the middle and upper portions of the cut slope could not be scarified because large rocks would be pulled to the surface and disturb the site too much. Several terraces were created on the lower section of the mine to reduce slope length.

Transplants salvaged from Phase III of the Jones Mine restoration were placed on the terraces. In addition to transplants, numerous brush layers were scattered over the slope. Bundles were strategically placed in areas where rilling had begun to occur and in other locations that appeared to be prone to erosion.

Plots were also established to evaluate three alternative fertilizers, Biosol, Fertil-fibers and Humazyme. Three large plots were set up on the southeast facing slope and three smaller plots were set up on a northeast facing slope. The products were applied according to manufacturer's directions. The site was seeded with native grasses and forbs and the area outside of the fertilizer study plots was fertilized with 20-20-10 fertilizer.

The timing of activities is important and this project reminded us of this point on several occasions. The site was well scarified and then a backhoe was used to move transplants and install brushlayers. The substrate where the backhoe had traveled became compacted and smooth. The benefits of scarification were lost and the soils became more vulnerable to erosion.

During June 2000, a seven-acre section of Phase III of the Jones Mine was revegetated. The site was scarified and planted with willow bundles and a few brush layers. A large quantity of willows had been purchased for the 2000 planting season with the idea that more of Phase III would be ready for revegetation. Since only a total of seven acres was available, the site was planted heavily. Excess material was used on selected areas in Lower Knob Creek.

Driwater, the gel slow release watering product described in the Lower Knob Creek section, was used at this site also. The product was installed late in the season when the rains were beginning and it is not apparent that it provided a benefit. In dry years it may be very beneficial. This site will be monitored for several years.

The Upper Knob Creek site contained four pits. The primary revegetation effort focused on slowing surface water erosion. Bundles, and to a limited extent, brushlayers were placed in areas that had begun to show signs of rilling in Pits 6 and 7. After a very heavy thundershower, the importance of timing became apparent again. Many of the bundles had just begun to leaf out when they were buried by sediment resulting from the erosion caused by the intense rainfall. The young new shoots required careful excavation by hand. Despite the weather conditions, the woody plantings became well established.

All of the pits were seeded with native grasses and forbs and fertilized with 20-20-10 granular fertilizer. With the exception of Pit 6, seed and fertilizer was broadcast by hand. The fertilizer for Pit 6 was applied with an airplane.

The 1998 plantings will be evaluated early in the spring of 1999. Pit 6 is particularly susceptible to erosion and additional soil stabilization and erosion control work may need to be done next spring. In 1999, additional willows and grass seed were planted at Pits 6 and 7 at Upper Knob Creek. Considerable erosion had occurred at these pits late in the 1998 growing season. Intensive willow plantings using brushlayering, bundles and gully plantings addressed these erosion areas. A light seeding of grass was also broadcast on bare areas.

The 1999 plantings appeared to be growing well at the end of growing season. Some of the woody plantings were not completed until mid-July, nearly two weeks after the recommended cutoff date. A survey of the plantings in 2000 indicated that the late planted willows survived.

Extensive cooperation with the Division of Mining, Land and Water's Abandoned Mine Land Project continued in 2002 with the revegetation of Phase V of Jonesville Mine. The area consisted of a large rock face that needed seed and fertilizer above and below it. The lower 18-acre portion was easily treated using a 4x4 tractor with a broadcast spreader. The upper 8-acre portion was considerably more challenging due to poor accessibility and steep terrain. The entire project was completed August 10, 2002 and good growth was apparent in September. Continued monitoring and photo documentation will occur in 2003.

Planning for the revegetation of Phases III and IV of Jonesville Mine was completed and then revised in 2002. The plan will be implemented during the summer of 2003.

Anchorage Water & Wastewater Utility (AWWU)

In 1996, AWWU contacted the Plant Materials Center for assistance in revegetating the upland portion of the Fort Richardson Right-of-Way (ROW) for Phase I of the Anchorage Loop Water Transmission Main. Ft. Richardson (the land owner) wanted the ROW to be revegetated with willow specifically to recreate moose habitat. A contract was developed between AWWU and the PMC for five years to design and implement a revegetation plan.

The contract also provided for annual evaluations of plant growth and any additional plantings in future years required by the regulatory agencies.

The revegetation plan identified five locations for planting approximately 500 live willow stakes, special plantings at the stream crossing, and a light seeding of native grasses, willow and aspen seed. Initially, most of the plantings were going to occur in the spring before July 1. However, after the initial planting efforts encountered exceptionally dry conditions, the decision was made to postpone planting.

The dry weather conditions forced us to consider fall plantings even though there has been limited experience with them. The live stake plantings were eventually completed in the late summer - early fall after the willows were dormant and before the ground was frozen. The creek plantings were also delayed until fall.

The willow/aspen seeding was dictated by the timing of natural seed dispersal. As fettleaf and bebb willow and aspen began to disperse seed, staff harvested branches containing catkins that were dispersing seed.

The branches were taken to the ROW where the staff walked the ROW while waving the branches in the air and dispersing seed to the site. Unfortunately, seed dispersal coincided with the dry weather conditions that did not favor seedling establishment, particularly for these short lived seeds.

The grass seeding was delayed as long as possible hoping that the rains would arrive. A light seeding of native grass was finally broadcast in early August.

The last activity of the 1997 growing season measured plant cover, noted plant species and determined species frequency along the ROW. These measurements were taken late in the season. Many plants had died back, some species probably were not observed, and plant cover measurements were also underestimated.

Plant growth along the ROW was evaluated in the spring 1998. A high percentage of the fall planted willows were growing very well. The few live stakes that had been planted in the spring of 1997 were growing well except in the southern end of the ROW where total plant cover is high and the grasses are competing with the willows. Relatively few seedlings of birch, willow and alder are becoming established. The seeded grasses are maintaining a relatively sparse cover and clover is the primary species growing where wood chips are the heaviest.

The only additional seeding that occurred in 1998 was made with bebb willow. The same seeding technique that was used in 1997 was used again in 1998. At the end of the growing season, it was not apparent that the seeding effort recruited any new willow seedlings.

Again, evaluations occurred late in the season after many species had completed their summer life cycle and had died back. Despite the late season evaluation, efforts were made to record total plant cover, plant cover for each taxa, and determine frequency for each taxa along 16 transects established along the ROW.

At the end of the 2000 growing season, plant cover along the ROW had increased considerably. Many transects had 100 percent cover while others had a more sparse plant cover. Transects with less than 100 percent plant cover were selected for continuing monitoring. Monitoring and evaluations of the ROW will continue for at least another growing season.

Evaluations of the AWWU ROW did not occur in 2001. Plant cover and density continues to increase along the ROW. The final evaluation of the site was conducted in the fall of 2002.

North Atlantic Germplasm Collection Project

As a part of the newly funded Cold Regions Vegetation Project, the PMC initiated a seed collection project on Iceland and the Faroe Islands in 2001. Part of the program is dedicated to acquisition of seed from other circumpolar regions.

Germplasm Collection Project on Iceland and the Faroe Islands
August 19, 2001 – September 11, 2001

Results of the Collection Effort:

Iceland - August 19-25, 2001, North Iceland

Faroe Islands – August 31 – September 7, 2001

Iceland – September 8-11, 2001, South Iceland

Most of the species targeted and collected were indigenous to both Alaska and the two Atlantic Island groups. Collection of material not present in Alaska was limited and only conducted based on interest expressed by the Icelandic or Faeroese scientists.

Material Collected/Total Accessions:

Angelica archangelica /1
Anthoxanthum odoratum /4
Dactylis glomerata /2
Deschampsia caespitosa /14
Deschampsia flexuosa /4
Festuca richardsonii /11
Festuca rubra /12
Holcus lanata /4
Leymus arenarius /23
Ligusticum scoticum /1
Lolium multiflorum /2
Lupinus nootkaetensis /9
Luzula sylvatica /1
Phleum alpinum /3
Phleum pretense /1
Poa alpina /14
Poa glauca /11
Poa pratensis /3
Trisetum spicatum /2

Total: 123 accessions

All the material collected was immediately re-cleaned and tested after arrival in Palmer. In March 2002, all the collections were planted in greenhouses. The resulting seedlings were field planted in July 2002. All the plantings are on PMC property at Palmer. Between July and October 2002, all the plantings were evaluated three times.

Once again a seed collection project was planned and conducted. The 2002 seed collection project was on the Svalbard Archipelago (Spitzbergen), Norway and the Tromso region of Norway. The collections occurred between August 16 and September 10, 2002.

As with the Iceland and Faeroe Islands collections of 2001, the Norway collections concentrated on species common to both the collection areas and Alaska. The new material from Norway and particularly Svalbard, (78-81 degrees north latitude) has added a significant and important component to the U.S. collection.

Material collected/total accessions:

Leymus arenarius /19
Deschampsia caespitosa /40
Deschampsia boreal /10
Deschampsia alpina /88
Trisetum spicatum /6
Poa arctica /7
Poa alpina /4
Poa glauca /2
Alopecurus borealis /3
Festuca rubra /4
Festuca hyperboreal /1
Festuca richardsonii /19
Festuca vivipara /1
Colpodium vahliianum /1
Puccinellia phyganodes /1
Calamagrostis stricta /1
Dupontia pelligera /1
Luzula arcuta /1
Papaver dahlianum /1
Rumex acetosa /1
Oxyria digyna /1

Total: 212 accessions

All the seed was returned to the U.S. under a Norwegian phytosanitary permit and the general USDA import permit. No problems were encountered on return to the U.S. This seed will be field planted on the PMC property in June 2003.

The Cold Regions Evaluation Project is scheduled to be in full operation during the 2003 field season. A series of evaluation plots will be established as originally planned. A collecting project on Greenland is in the planning stage.

Commercial Native Plant Production Project

In 1999, the PMC was awarded a federal grant to initiate a project of commercializing native plants in Alaska. The \$350,000 grant is intended to fund additional collection efforts and hire employees and purchase equipment. The project is intended to last five years with continued grants of an equal size. This project also allows for the re-use of the Alaska Forest Nursery. The project is funded by the U. S. Natural Resources Conservation Service.

One of the first accomplishments of this project was to produce the second edition of the Directory of Alaska Native Plant Sources in January 2000. This document is very useful as a marketing tool for our native plant growers and suppliers.

By April of 2000, the project was fully staffed with 2 Agronomists, a Maintenance Mechanic and 2 Laborers. By mid-April planting was well underway.

During this first growing season, plants were grown from seed collections made by the PMC staff over the last several years. Seed of nine wetland species and 20 upland plants were sown. Different growing media were used to address the growing requirements of the various species.

This initial growing season was an experiment to begin identifying cultural requirements for the different species. There was no attempt to involve growers at this early stage.

The plants produced from these first seedlings were planted in a variety of locations for demonstration and evaluation. The dryland plants such as the *Oxytropis*, *Potentilla multifida*, *Plantago canescens* and *Dryas* were planted into droughty sites.

The remainder of the upland species was planted at a school, the PMC fields and the outside production beds at the PMC Nursery. The wetland species were planted into newly created wetland and production beds at the PMC Nursery. Any seed produced at these sites will be harvested.

Additional seed collections were made from native plants in the Southcentral Region for production and hopefully distribution to growers during the 2001 growing season.

The first announcement of the 2001 native plant distribution came during the Alaska Greenhouse Conference and Garden Fair on April 19-21, 2001. A letter was distributed to interested native plant growers; attached to the letter was a listing and brief description of the plant offerings. Additional advertisement of the program occurred through NRCS, the newspaper and word of mouth.

We received over 20 inquiries about the program. In early June and later in August, we distributed 7,399 plants and 7.29 pounds of seed to 17 growers. At the same time, we provided written material describing the techniques we used to produce the plants, including soil media and scarification techniques.

Not all of the plants we had placed on the April 19th plant listing were ready for distribution in June. We distributed those plants in August. In the meantime, we had produced additional plants which were also offered to growers.

The plants were distributed free of charge with the understanding that once production was underway that the grower would pay the Nursery in seed for the plants and/or seed they had received.

Considerable effort was made to germinate and produce wetland plants. The program experienced mixed results and those species that grew well were distributed to growers and special wetland revegetation projects.

Another accomplishment in 2001/2002 was the updating of the Directory of Native Plant Sources. The directory is now online at http://www.dnr.state.ak.us/ag/native_directory.htm.

The plans for 2002 include producing more species for distribution follow up with the current growers and expanding our seed collection efforts. An agreement with DOT/PF has been developed to produce wetland vegetation mats for installation in 2004 as a trial/demonstration planting.

In 2002, the Native Plant Nursery distributed over 38 grams of seed and 20,000 plants representing 57 species to 20 growers. Additional plants were placed in another demonstration project, a new wildlife pond at Big Game Alaska.

Information continues to be shared with growers on marketing opportunities and plant growing tips. Interaction with the growers after they receive plants has been limited. In 2003, we hope to conduct site visits.

An extensive fall planting was made; the seeded trays were placed in the cooler for over-wintering and stratification. This method of over-wintering should be better than placing the trays in wood chips. The trays in the cooler are protected from the wind, snow and ice and can be moved to the greenhouse for germination earlier.

Evaluation of current plantings will continue. Maximizing seed production from our field plantings will also be a priority.

Department of Transportation and Public Facilities Vetch Survey

Recent statewide interest in invasive/non-native plants prompted concern in DOT/PF about certain species becoming established along road right-of-ways. *Vicia cracca* is one that is prevalent, thus DOT/PF and the PMC joined together to look into the extent of the infestation and the role DOT/PF should play in its control. The report is available on the internet at: http://www.dot.state.ak.us/stwddes/research/assets/pdf/fhwa_ak_rd_02_11.pdf.

Though infestations are considered a problem, more research is needed to determine the invasiveness of this species before eradication control measures are implemented. Including this species in a general weed management plan is appropriate. Care must be taken not to misidentify other native legumes with similar growth habits as the problem vetch. Many strategies are effective in controlling it but mowing is preferred.

Foundation Seed Program

This section of the North Latitude Revegetation and Seed Production Project increases and preserves cereal grain and grass varieties developed for the special growing conditions prevalent in Alaska and other northern latitude countries.

In the past, "breeder" seed of grasses and grain were obtained from the University of Alaska, Agricultural and Forestry Experiment Station (AFES). The Alaska Plant Materials Center was given the responsibility for producing breeder seed of the numerous varieties of grasses in 1994. Small blocks of breeder seed have been established and are being maintained. Breeder seed of the numerous grain varieties developed and released by the AFES are still provided.

The progeny of breeder seed, designated "foundation" seed, is made available to the industry through the state's seed certifying organization, the Alaska Seed Growers, Inc., in conjunction with the state Division of Agriculture. This process ensures that farmers growing "registered" (progeny of foundation) and "certified" (progeny of registered) classes of seed meet all requirements of genetic purity and cleanliness, and are in compliance with state seed regulations and the Federal Seed Act.

When the PMC began operations in 1973, the Foundation Seed Program began increasing newly released varieties of barley, oats, and wheat. These varieties, bred by the University of Alaska, Agricultural Experiment Station, became the primary crops of the agricultural projects of the late 1970s and early 1980s. At the same time, new varieties of grasses for revegetation and turf gradually became available. As production from the large projects wound down, interest increased in revegetation varieties. Today, the Foundation Seed Program raises over a dozen varieties of grasses and forbs bred for revegetation and reclamation throughout the state. In addition, new seed collections from throughout the state are planted and evaluated. Promising species are increased at the PMC and made available for new revegetation projects.

Seed quality is a prime essential to successful farming. A grower needs to know that the variety will perform, has acceptable germination and is free from contaminants.

Plant breeders explore the genetic potential of a variety. Varieties are selected based on the intended use as food, fiber, an ecological niche or its chemistry.

Successful growers understand the requirement for good germination and vigor from their seeds. The Federal Seed Act requires that seed offered for sale meet minimum germination standards.

Contaminants in seed include broken seed, chaff, dust, weed seed, other crop seed and pathogenic organisms. The higher the purity of clean seed, the less the possibility of introducing unwanted pests. The introduction of weeds or diseases in the seed increases the production costs and reduces yields not only in the present, but in future years as well.

As a member of the Association of Official Seed Certifying Agencies, the PMC's Foundation Seed Program, along with the Alaska Seed Growers, Inc., joins 43 other states in insuring that in-state and interstate purchasers have access to high quality, genetically pure seed.

Figure 3 - Seed Increase Pyramid

This diagram illustrates the increase of three pounds of grass breeder seed to a commercially useable quantity. Clean seed yield is based on 80 lbs./acre. The planting rate is based on 3 lbs./acre for seed production and 40 lbs./acre for reclamation purposes.

2002 Growing Season

The 2002 growing season started out cool and wet making for a later start than in the past few years. June and July were very dry which put extra pressure on the irrigation system. September rains kept the longer season crops from drying in the field, with many being harvested in rather wet conditions. Grasshoppers were heavy from June through early September. It was a good season to leave grains off of the planting schedule.

Inspection and Sampling

A service formerly delegated to the Division of Agriculture's main office has been reassigned to the PMC's Foundation Seed Production Program - inspection of certified seed fields and official sampling of seed lots for germination and purity testing. The area of responsibility is south central Alaska, primarily the Matanuska and Susitna Valleys. Seed lots were sampled for testing as required.

Table 1. Revegetation and Turf Varieties in Production in 2002.

Variety	Class	Planted	Acres
'Nugget' Kentucky Bluegrass	Breeder	94	5
'Nugget' Kentucky Bluegrass	Breeder	96	2
'Nugget' Kentucky Bluegrass	Breeder	01	2
'Sourdough' Bluejoint	Breeder	97	.5
'Sourdough' Bluejoint	Breeder	01	1
'Arctared' Red Fescue	Breeder	97	1
'Arctared' Red Fescue	Breeder	01	2
'Norcoast' Bering Hairgrass	Breeder	00	2
'Nortran' Tufted Hairgrass	Breeder	97 & 00	3
'Kenai' Polargrass	Breeder	01	2
'Alyeska' Polargrass	Breeder	01	.5
'Caiggluk' Tilesy Sagebrush	Breeder	95	.5
'Reeve' Beach Wildrye	Foundation	90 & 00	2
'Gruening' Alpine Bluegrass	Breeder	00 & 02	1.5

Table 2. Cereal Grain Seed & Oil Seed Varieties in Storage at the Plant Materials Center, December 2002.

Barley		Wheat		Oats		Rye	
Variety	lbs	Variety	lbs	Variety	lbs	Variety	lbs
Lidal	630	Ingal	1,000	Toral	10,000	Bebral	1,000
Otal	2,500	Nogal	2,600	Ceal	800		
Thual	15,000	Froid	150	Nip	10,000		
Weal	15,000			Golden Rain	2000		
Finnaska	1,600						
Datal	10,000						
Pokko	400						
Arra	650						
Eero	500						
Total	26,980	Total	3,750	Total	22,800	Total	1,000

Table 3. Cereal Grains Sales & Receipts, 1997 - 2002.

Type	1997	1998	1999	2000	2001	2002
Barley	1,500	150	13,000	500	2,450	2,800
	\$533.00	\$60.00	\$2,600.00	\$170.00	\$689.40	\$878.77
Oats	4,500	3,000	6,600	1,100	5,500	1,100
	\$1,700.00	\$600.00	\$1,980.00	\$390.00	\$1,997.42	\$380.62
Wheat	700	1,300	1,500	400	1,500	0
	\$221.00	\$278.00	\$330.00	\$133.75	\$431.90	0
Total	6,700	4,450	21,000	2,000	9,450	3,900
	\$2,454.00	\$938.00	\$4,910.00	693.75	\$3118.72	\$1,259.39

Table 4. Grass Seed Sales & Receipts, 1997 - 2002.

Variety	1997	1998	1999	2000	2001	2002
'Nugget' Kentucky	0	40 lbs	0	97 lbs	25 lbs	119 lbs
Bluegrass	0	\$480.00	0	\$1,164.00	\$288.75	\$743.65
'Arctared' Red	0	0	200 lbs	0	0	185 lbs
Fescue	0	0	\$2,600.00	0	0	\$1,551.19
'Sourdough'	0	0	0	0	0	0
Bluejoint	0	0	0	0	0	0
'Alyeska'	0	0	0	0	0	19 lbs
Polargrass	0	0	0	0	0	\$336.68
'Gruening' Alpine	0	0	0	0	0	0
Bluegrass	0	0	0	0	0	0
'Kenai' Polargrass	0	0	0	0	0	0
'Egan' American	0	20 lbs	0	80 lbs	30 lbs	0
Sloughgrass	0	\$291.00	0	\$1,840.00	\$637.80	0
'Norcoast' Bering	110 lbs	0	0	0	0	0
Hairgrass	\$2,140.00	0	0	0	0	0
'Nortran' Tufted	0	0	100 lbs	0	151 lbs	39 lbs
Hairgrass	\$205.60	0	\$1,500.00	0	\$1422.53	\$542.10
Polar Brome	0	0	0	0	0	0
'Tundra' Glaucous	0	0	10 lbs	0	0	0
Bluegrass	0	0	\$130.00	0	0	0
'Caiggluk' Tilesy	40 lbs	0	0	0	0	0
Sagebrush	\$1,560.00	0	0	0	0	0
	150 lbs	60 lbs	310 lbs	177 lbs	206 lbs	362 lbs
Total	\$3,700.00	\$772.00	\$4,230.00	\$3,004.00	\$2,349.80	\$3,173.62

Potato Disease Control Program

Potatoes are among the most valuable crops grown on Alaskan farms. Commercial potato production is highly capital intensive. High yields with good quality are required to assure a fair return on investment. Diseases can cause significant losses reducing yield and quality factors.

The potato is a vegetatively propagated plant and as a consequence, has unique production problems. Many economically important diseases and pests can be carried in or on the tubers used as seed. The use of seed potatoes having little or no disease is basic to any management plan. Planting certified seed reduces the risk of losses caused by disease. It is for this reason that the production of disease free seed is a primary goal of the Plant Materials Center.

Seed produced at the PMC is sold to growers who increase the original allotment over the next several years. Seed potatoes are subjected to strict certification inspections to assure minimal disease incidence. The volume of certified seed produced in this fashion enables a grower to replace older diseased seed with clean seed.

Alaska is unique in that many disease and insect pests common to North America that require chemical control do not occur here. The importation of seed from outside the state has the potential to introduce pests not known to occur in Alaska. The inadvertent introduction of these diseases or pests would cause major problems. The importation of seed is therefore discouraged. Growers who wish to try new varieties are encouraged to obtain clean seed stock from the PMC.

Pathogen Testing

The major focus of the potato program is providing quality seed potatoes to commercial seed growers. Low levels of disease are required of quality seed because diseases can negate a crop's usefulness as seed. The seed provided by the PMC is used as the initiating stock for the ensuing multiple year certified seed production scheme. This seed, therefore, must be of the highest quality possible since any disease introduced at this point would be multiplied during each successive year of seed increase. To this end, all production is rigorously tested and retested for disease prior to sale.

Testing for the presence of diseases is performed in the PMC laboratory on all the initial seed stocks (Figure 4). The diseases of primary importance are Bacterial Ring Rot (BRR) and the viruses Potato Leafroll Virus (PLRV), Potato Virus Y (PVY), Potato Virus X (PVX), Potato Virus S(PVS), Potato Virus A (PVA), Potato Virus M (PVM), and the viroid Potato Spindle Tuber Virus (PSTV).

All newly acquired germplasm and each mother plant used for the in vitro propagation of the greenhouse stock are tested prior to production and again prior to harvest. The field grown materials are visually inspected during the growing season with laboratory testing performed prior to harvest (Figure 5).

Monitoring the health of the potato stocks at the PMC is a critical function. Understanding and accurately performing the disease test procedures, as well as interpreting the results, is essential. The PMC participates in the Potato Association of America Certification Section Standardization Project. This exercise provides participating labs the opportunity to test their materials and methods against a standardized series of antigens, and thereby developing a level of credibility. The PMC has been successful in detecting very low antigen levels as well as various strains found in North America.

Seed Potato Certification

State of Alaska Seed Regulation 11 AAC 34.075 (J) requires that all potatoes sold, offered for sale or represented as seed potatoes be certified.

The Seed Potato Certification Program is designed to provide growers with potato seed stock that is varietally pure and relatively free from disease causing organisms. These results are achieved by the voluntary compliance of seed growers to the certification regulations. Growers manage their seed production to limit the possible exposure to diseases, but reinfection can occur from soil or other sources. Certification is designed to identify and remove from use as seed those seed lots that have become diseased or are otherwise of reduced value for use as seed.

Diseases are capable of causing severe losses. Many of the diseases affecting the potato are carried in or on the potatoes themselves. The use of seed in which diseases are absent or at low levels has been proven to greatly reduce the risk of losses caused by disease. Certified seed has been inspected during the growing season and has met low levels of the disease tolerances allowed for seed. Certified seed potatoes produced in Alaska are far superior to seed produced outside of the state. The importation of potatoes carries with it the risk of introducing diseases that are capable of having severe consequences to Alaskan growers. The local availability of disease-tested seed reduces the potential of introducing diseases not presently found in Alaska through imported seed.

The Alaska Certification Program is a "limited generation system" in which the initiating seed lot, called Generation 0 (G-0), can be field planted only a limited number of years; i.e., eight years. The rationale of a limited generation system is that the contamination of seed stocks by tuber-borne pathogens increases with each replanting. If the older seed stock is continually removed from the system and replaced with new stock, the probability that pathogens will build up to problem levels is reduced. This system has been very effective in reducing, and in some cases, eliminating virus diseases.

Seed fields are inspected for diseased plants twice during the growing season and once while in storage. Seed lots in which excessive amounts of disease are found, are not allowed to be sold as certified seed.

Alaska's Certified Seed Program is administered by the Alaska Seed Growers, Inc. The inspections are conducted by the PMC's Potato Disease Control Program.

Certified seed potatoes are grown in the Matanuska Valley, Fairbanks, Bartlett Hills, Nenana, Delta Junction and Kodiak. Each lot was inspected according to certification standards for disease and varietal purity.

Table 5. Certified Seed Potatoes

Year	# Growers	# Varieties	# Lots	Acreage
1998	17	212*	233	105
1999	17	44	188	123
2000	14	238*	180	122
2001	12	49	153	128
2002	11	49	160	116

*Includes PMC variety bank.

Educational Program

The University of Alaska Cooperative Extension Service holds an Annual Potato Conference to update growers on research projects and innovations pertaining to potato production. Presentations were made outlining potato diseases found in Alaska. Various control measures were discussed focusing primarily on using quality seed as a management tool.

Scab Resistance Trial

Potato scab is caused by the bacteria *Streptomyces scabies*. It causes brown, circular lesions on the potato skin. The lesions can be raised or sunken and detract from the appearance of the potato. Peeling removes the affected area. Recent work has demonstrated that a chemical (Thaxtomin) produced by this organism can cause lesions to form on tubers in the absence of the live pathogen. The amount of the phytotoxic chemical produced has been shown to correlate with the severity of the pathogenicity of various isolates of the causal organism.

Planting cultivars known to be resistant to scab coupled with production practices that help reduce disease severity is central to integrated pest management systems.

Variety Development

The search for improved varieties is an on-going process. Finding a potato that bulks earlier, has more and better disease resistance, requires less fertilizer and tastes better are but a few of the traits we seek. The new horizon opened with the advances in biological technology appears limitless. Perhaps, a potato that would sprout legs and climb into the sack is the next level.

Breeding programs perform controlled cross-pollination between promising parental material in the hope of creating improved cultivars. The PMC has obtained true seed from several breeders. The seed was planted in the greenhouse and transplanted to the field. One or two small tubers were harvested from each plant. These will be field planted using wide spacing and single hills, which will be observed for yield, skin color and tuber shape. The few hills that meet the minimum requirements will be harvested and replanted for further observations. True seed will be obtained from several potato breeding programs to extend the types of families for testing.

There are thousands of cultivars in the world today. Each year, millions of dollars are spent on breeding programs in the search for better potatoes. Since the early 1900's, Alaskans have planted and observed hundreds of different potato varieties. Certain varieties have had their day with improvements making the older ones obsolete, and yet sentiment or special circumstances create a desire to keep replanting them.

There are many varieties of potato beyond the mainstream russets, whites and reds. A veritable cornucopia of shape, size, color, texture and flavor await those willing to explore. As new and unusual potato varieties are collected by the PMC, they are tested for diseases, purified and then planted. Observations are made of horticultural characteristics, plant type, flower color, tuber shape and color, yield, and storage characteristics; the end result being a variety description.

Several novel varieties lacking this type of database have been cleansed of virus and offered for production as "experimental" varieties. These novelty potatoes have been promoted in several gardening magazines and are prized by some Alaskan growers. The PMC maintains these cultivars to provide an instate source to help obviate the necessity of importing seed potatoes which could introduce exotic diseases.

Disease-Tested Seed Potato Production

Disease-tested potato plants are mass propagated in a sterile environment. The PMC produces tubers from these plants in greenhouses. Growers place orders for these seed tubers the winter prior to production. This provides the time necessary to propagate the thousands of plants required for planting tubers which are distributed the following spring. The process takes 18 months from start to finish. Stock material, if not on hand, is typically obtained from other similar programs. In some instances, the only source is a diseased tuber, so radical treatments are used by the PMC to create the initial disease-free stock. The PMC maintains a disease-tested collection of more than 200 cultivars as field grown stock, while 40 are maintained in culture and are ready for propagation.

The commercial growers have shifted from white-skinned to russet-skinned varieties during the last ten years. Gardeners who purchase a considerable amount of certified seed, have broadened their desire to include many novelty varieties having unique color flavor or shape.

Table 6. Seed Potato Production

Year	Number of Varieties	G-0	G-1	Plantlets
1997	80	1,456	1,200*	2,400
1998	42	1,800	1,100*	2,200
1999	50	1,877	1,000	550
2000	72	1,200	687	2,880
2001	49	1840	350	400
2002	62	3,645	699	160

* Due to a shortage of certified seed potatoes, the Plant Materials Center sold field grown seed.

Virus Disease Expression Plot

A small plot was established to examine viral disease symptom expression. Four seed pieces each of known virus-infected materials were planted May 30th. The diseases were Potato Leafroll Virus (PLRV), Potato Virus Y (PVY), Potato Virus M (PVM), Potato Virus X (PVX), Potato Virus S (PVS), and very small tubers harvested from a plant having Witches Broom symptoms.

Symptoms of virus infection, except PVS, were apparent throughout the season for all viruses beginning a few days after emergence. The Witches Broom material did not emerge until mid August. It appeared healthy until late September when a light marginal chlorosis could be observed on the newer expanding leaves.

Weather Monitoring

The PMC's computerized weather monitoring station has improved meteorological monitoring. The Davis Groweather system, installed May 12, 2000, has been collecting data mostly uninterrupted since then. The summary reports for 2002 are in Tables 7, 8 and 9.

APPENDIX A

CURRENT & HISTORICAL BUDGET INFORMATION

**CALENDAR YEAR 2002 AUTHORIZATIONS,
EXPENDITURES, AND
PROGRAM RECEIPTS**

ARLF Authorizations

Authorizations FY 2002 PMC Total	522,000
Alaska Plant Materials Center	
Project Total	522,000
Personal Services	461,300
Travel	3,000
Contractual	45,200
Supplies	12,500

PMC Operating Budgets for the Past Fifteen Fiscal Years

		FY 87	FY 88	FY 89	FY 90	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY02
Author- ization in Thous- ands	PMC	733.7	596.7	556.7	556.1	566.1	620.8	608.9	585.6	595.3	433.3 100.0*	522.9*	508.6*	511.1	485.9*	523.4	522.0
	Forest Nursery								180.0		95.2	0	0	0	0	0	0
Personnel		17	16	16	16	16	16	16	17	17	15	14	15	19	22	24	36
Full Time		9	7	7	7	7	7	7	7	7	6	5	6	5	6	8	9
Part Time		8	9	9	9	9	9	9	10	10	9	9	9	14	16	16	17

* Indicates Agriculture Revolving Loan Fund source.

When comparing personnel figures listed for FY 02 to those in FY 87, bear in mind that the Plant Materials Center is now performing basically the same duties at nearly the same level as it did in 1987 with 210,300 fewer dollars. The PMC has started generating operating money from federal and private grants to cover needed operations. These funds are in the form of short-term contracts that must continually be renewed. Money to hire and keep labor support staff has been the most critical issue facing the PMC. In the last three years, reductions in supplies and contractual (utilities) have also become areas of constant concern. These funds are now being supplemented with program receipts.

Program Receipts Calendar Year 2002

Contracts, Reimbursable Service Agreements and Grants

Source	Face Value of Contracts Awarded in 2002
USDA Agricultural Research Service (Germplasm Repository)	265,000
USDA Natural Resources Conservation Service	350,000
USDA Natural Resources Conservation Service	268,800
USDA CREES	301,000
U.S. Army National Guard	8,200
Alaska Dept. of Transportation/PF	10,689
Alaska Dept. of Transportation/PF	7,000
Alaska Division of Mining and Water Management	<u>28,500</u>
	Total \$ 1,238,389

RSA, Program & Federal Receipt Values Since CY 1991

Prior to 1988, Program Receipts and contracts were not sought by the Plant Materials Center.

1988	1989	1990	1991	1992	1993	1994
42, 195	31 407	58, 417	117, 981	126, 071	202, 886	377, 161

1995	1996	1997	1998	1999	2000	2001	2002
334, 200	212, 800	304, 200	1,086, 000	928, 400	1,013, 200	5,630,0 00	5,588, 189

2002 Calendar Year Monthly Expenditures of ARLF Funds to the Nearest Dollar

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
PMC Totals	44,417	30,784	23,999	18,712	20,016	24,607	25,444	53,084	66,316	54,585	52,595	40,053
Personal Services	39,729	29,176	19,409	16,335	17,156	22,173	24,072	51,086	56,760	46,622	46,406	32,168
Travel	0	0	320	0	37	0	0	0	752	305	676	892
Contractual	4,319	1,533	3,933	2,380	2,557	2,434	1,270	985	5,915	4,703	2,255	5,749
Supplies	369	75	336	3	266	0	102	1,013	2,888	2,955	3,258	1,244

APPENDIX B

CROP RELEASES

CROP CULTIVARS DEVELOPED AND ADVANCED BY THE ALASKA PLANT MATERIALS CENTER

'Long' Barclay Willow, *Salix barclayi* - This attractive, fast growing native willow was released for commercial production in 1985. This cultivar will be used for reclamation, landscaping and shelter belts.

'Roland' Pacific Willow, *Salix lasiandra* - Roland was released in 1985 and is probably the most attractive willow selected by the PMC to date. This cultivar will be used for landscaping, stream protection and revegetation throughout most of Alaska.

'Wilson' Bebb Willow, *Salix bebbiana* - This willow has a dense growth form and has many potential uses for screening, windbreaks and living fences. Because of the species' wide range of adaptability, it is also expected to be utilized for reclamation activities. Wilson is a 1985 release.

'Oliver' Barren Ground Willow, *Salix brachycarpa* - Oliver was released for commercial production in 1985. This cultivar's interesting growth form will lend itself well for incorporation into hedges. Additional uses range from reclamation to windbreaks.

'Rhode' Feltleaf Willow, *Salix alaxensis* - Rhode was also released for commercial production in 1985. This species occurs throughout Alaska and is listed as a preferred wildlife species. This cultivar will find uses in habitat restoration, reclamation, streambank protection and shelter belts.

'Egan' American Sloughgrass, *Beckmannia syzigachne* - Egan was released for commercial seed production in 1986. This cultivar has performed well at most test sites. Its expected uses are wetland restoration and waterfowl habitat enhancement. In 1991, Egan was registered as a crop cultivar with the Crop Science Society of America.

'Gruening' Alpine Bluegrass, *Poa alpina* - This selection of alpine bluegrass was released for production in 1987. A native species, alpine bluegrass has shown extreme hardiness throughout Alaska and it is well adapted to harsh sites such as mine spoil. In 1991, Gruening was registered as a crop cultivar with the Crop Science Society of America.

'Caiggluk' Tilesy Sagebrush, *Artemisia tilesii* - Caiggluk tilesy sagebrush is a native collection of sagebrush. It was placed in commercial production in 1989. The expected uses range from mine reclamation to restoration of sites contaminated with toxic metals. The cultivar will add diversity to seed mixes. This is the first native broadleaf species brought into commercial production in Alaska. In 1991, Caiggluk was registered as a crop cultivar with the Crop Science Society of America.

'Service' Big Bluegrass, *Poa ampla* - This accession of big bluegrass was derived from a collection made in the Yukon Territories. During the PMC evaluation process, the collection out-performed 'Sherman' big bluegrass (the only known cultivar of big bluegrass) in all categories. Service is expected to find use in dry land revegetation projects in Alaska south of the Yukon River.

'Reeve' Beach Wildrye, *Elymus arenarius* - Reeve beach wildrye was developed from a seed collection obtained from Norway. During the evaluation process, it was determined that this accession was capable of producing commercially viable amounts of seed. This was of extreme interest, as beach wildrye is notorious for not producing seed. Further evaluation indicated that the accession also had hardiness and adaptive traits making it useful in coastal revegetation and reclamation. In 1991, Reeve was released for commercial production. Reeve was registered as a crop cultivar with the Crop Science Society of America in 1994.

'Benson' Beach Wildrye, *Elymus mollis* - This accession was released for commercial production in 1991. Unlike Reeve, Benson was released for vegetative production only. This extremely aggressive and hardy, local collection does not produce seed in any appreciable amounts, therefore, commercial propagation can only be accomplished by vegetative means. This cultivar will find use in transplanting projects where erosion and accretion are beyond the capabilities of any seed species. Benson will become an important cultivar in coastal dune stabilization and restoration in Alaska. In 1994, the cultivar Benson was registered with the Crop Science Society of America.

'Kenai Carpet' Nagoonberry, *Rubus arcticus* L. - 'Kenai Carpet' nagoonberry was selected from a native collection made on the Kenai peninsula. This vigorously growing ground cover has been tested at various trial sites since 1985. It is best suited for use in large areas where an alternative to turfgrass or a mulch is desired. Kenai Carpet nagoonberry spreads by rhizomes and often out competes the surrounding vegetation. A minimal amount of fruit is produced by this cultivar. It was named and released for commercial production in 1991.

'Peanut' syn. 'Swede' Potato. This fingerling potato traces back to the Matanuska Valley in the 1930s. The tubers are small and resemble a peanut in shape and have yellow flesh. Desirable qualities include good yield under adverse conditions and a long dormancy.

'Rote Erstling' syn. 'Rode Eerstling' Potato. European variety promoted by Dr. Donald Dinkel, University of Alaska Fairbanks (retired). Round, red with yellow flesh. Early maturing.

'Alaska Sweetheart' Potato. Germplasm provided by Jayson Dearborn. Round, red with pale pink flesh.

Pending Releases

Violet Wheatgrass, *Agropyron violaceum* - This native accession has undergone evaluation by the PMC since 1979. It has exhibited superior hardiness throughout Alaska, especially on dry, gravelly sites.

Fifteen new native plant releases will occur in 2002. These are products of the recent collection efforts.

APPENDIX C

LIST OF PUBLICATIONS AND PRESENTATIONS

PUBLICATIONS

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Campbell, W. L. Seed Certification. Potato Day, Wasilla, Alaska, March 5, 2002.

Moore, N. J. Soil Bioengineering Techniques in Alaska. Ravenwood Elementary 4th Grade Classes. May 2002.

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Wright, S. J. Tussac Grass, a Unique Southern Hemisphere Genetic Resource Worthy of Additional Research. American Society of Agronomy Annual Meeting, Indianapolis, Indiana, November 13, 2002.

APPENDIX D

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