Alaska Plant Materials Center

2001 Annual Report

Alaska Department of Natural Resources - Division of Agriculture

ALASKA PLANT MATERIALS CENTER

2001 ANNUAL REPORT

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LETTER FROM THE DIRECTOR

The Alaska Plant Materials Center' s (PMC)'s present and past dedicate employees should be proud of their accomplishments. Their high levels of servic over a twenty-nine year period has been challenging.

The PMC has also maintained service levels and actively sought non-state fund for operation. Additionally, changes in methods of operation and efficienc improvements have allowed the PMC to continue providing services to the publi and individuals it serves.

The design phase has started for the new seed laboratory to be located on th PMC property and the state' s new containment building at the Trunk Roa facility. In addition to the capital projects, the PMC' s programs have expande allowing more interchanges with the agricultural community in Alaska. Othe industries relying on certain agricultural products will benefit.

The PMC will continue to operate efficiently with scarce resources. Exploring an using new funding sources has been a hallmark of the PMC. Alaska can be prou of what has been accomplished by the PMC and its staff.

Sincerely,

R Wells

Robert Wells
Director

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Introduction

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

Often in late July or early August, the Plant Materials Center hosts an ope house. The PMC staff is available to answer questions about the projects an give tours of the facilities. Over 300 people attended the last open house o August 5, 1995. Scheduling conflicts did not allow an open house in 2001.

The majority of the Plant Materials Center's funding comes from non-stat sources. In recent years, USDA has become the major funding source. Th majority of the remaining operating monies are allocated from the Agricultur Revolving Loan Fund. The PMC no longer relies on the state general fund. Th change occurred in fiscal year 1997. Additionally, the center brings in sma amounts of revenue through cooperative projects with other agencies, th private sector and through the sale of plant materials. All funds derived fror 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 wer unsuccessful because the U. S. Department of Agriculture believed that th centers at Pullman, Washington and Corvallis, Oregon could serve the needs o Alaska.

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

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

Soon after the Plant Materials Center bill was enacted, a 285-acre tract nea Palmer was selected for the center's site. An additional 120-acre parc adjacent to the PMC was acquired through a land exchange with th Matanuska-Susitna Borough in 1982. This gave the PMC a total of 405 acres t accomplish its mandated duties which now included revegetation work horticultural development, foundation seed production and disease-free potat seed stock production.

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

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

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

In November 1997, the PMC was notified that the U.S. Department c Agriculture granted the PMC to operate the Arctic Genetic Resources Unit This includes an operating and capital grant. In 1998, the Germplasr Repository became a reality. The first USDA employee was hired and the stat initiated designing of a screenhouse. We expect a long and productiv cooperative effort with USDA.

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

North Latitude Revegetation & Seed Productio Program

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

Revegetation & Reclamation Efforts

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

The Alaska Plant Materials Center continues to lead Alaska in reclamatior erosion control, research and technology transfer and revegetation. The use c dormant seedings to extend planting seasons, cost-effective and successfu methods in willow planting, and wetland and coastal restoration are researc priorities for the Plant Materials Center.

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

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

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

Figure 1

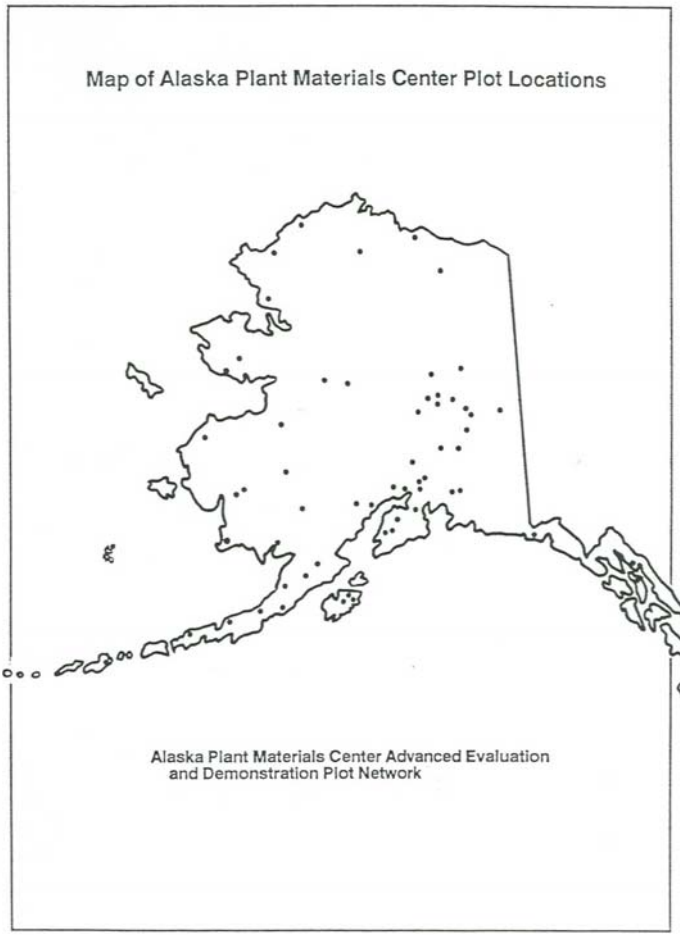

Map of Alaska Plant Materials Center Plot Locations
Alaska Plant Materials Center Advanced Evaluation
and Demonstration Plot Network

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
Poa glauca T08867	Gruening alpine bluegrass
Agropyron subsecundum 371698	Sodar streambank wheatgrass
Nordan crested wheatgrass	*Agropyron subsecundum*
Fairway crested wheatgrass	*Agropyron violaceum*
Summit crested wheatgrass	*Agropyron boreal*
Critana thickspike wheatgrass	*Agropyron yukonese*
Fults alkaligrass	Vantage reed canarygrass
Climax timothy	Engmo timothy
Elymus arenarius	*Elymus sibiricus* 34560
Norcoast Bering hairgrass	*Elymus sibiricus* 2144
Sourdough bluejoint	Nortran tufted hairgrass
Meadow foxtail	*Calamagrostis canadensis*
Garrison creeping foxtail	*Alopecurus geniculatus*
Boreal red fescue	Arctared red fescue
Egan American sloughgrass	*Festuca scabrella*
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 effo be initiated to collect seed of species native to the Aleutians and Alask Peninsula. Both agencies agreed with the concept, a full proposal wa developed and by July 1993 an agreement was signed by each cooperator.

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

During the months of August, September and October, staff from the PM 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 o the Kenai Peninsula in the spring of 1994, with first sales to the Air Force an Navy planned for the spring of 1996. The attempt to propagate the mor difficult or obscure species was undertaken by the PMC.

In June 1994, 33 species were planted at the sites at Kenai and the PMC. A plantings produced stands. Several other species are still undergoing tests t determine requirements for germination. In 1995, the first production crop wa harvested. Seed was collected from 30 species. Part of this seed will be use to increase production fields and the remainder will be sold to either the Nav or Air Force for use on Adak or Shemya. In 1996 and 1997, additional see was collected from the production fields. Part of this will be increased at th PMC. Part has been or will be distributed to private growers. Commerci production of some of the species started in 1999 and continued in 2001. Fu release documentation will be published in 2002.

Alyeska Pipeline Floodplain Investigation

Alyeska Pipeline Service Company was facing the possibility of revegetating a active floodplain as a result of conditions attached to a permit. On August 9 1994, Alyeska requested the opinion of a PMC staff member during a site visi The conditions were rejected by the PMC as not being appropriate for eithe restoration or research. However, regulatory desires prevailed and Alyesk agreed to conduct a study on floodplain restoration. The study plan develope by the PMC relied on comparisons of scarification only, fertilizer wit scarification, and native seed with and without fertilizer, in combination wit scarification. Five species were identified as important floodplain colonizers. During August 1995, a collection effort was initiated to collect seed from thes species. The collection effort centered on the area around Pipeline Mile Post 2 and the Franklin Bluffs Camp Pad. By September, sufficient seed to conduc the study was collected. The seed was cleaned in November/December 199 Planting occurred on the Sagavanirktok River in July 1996. The site wa evaluated in August 1996, 1997, 1998, 1999 and 2000. The final report wa prepared in December 2000 and released in the spring of 2001.

Red Dog Mine Revegetation & Demonstration Plots

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

In order to provide the best information for both the PMC and Cominco, thre plot sites, representing different conditions were selected. A site selected nea the port facility was a sandy, gravel beach area common to the region. Th second plot was located at the original camp site's fuel bladder containmer area. The third plot was similar to the camp area, but provided a site t compare spring and fall seedings.

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

A dormant plot was seeded at the camp site on September 8, 1987. Becaus of space limitations, the plot dimensions were slightly reduced and 1 accessions were dropped from the plot. The accessions that were eliminate are species that have failed elsewhere in northern Alaska. Their eliminatio from the plantings did not compromise the value of the information obtaine from the plots. On June 15, 1988, a plot was planted on gravelly soil similar t the surface that will exist when construction of the mine is complete.

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

A complete listing of conclusions and recommendations can be found in 199 Final Report of Data and Observations Obtained From the Red Dog Min Evaluation and Demonstration Plots.

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

In 1996, a collection of native species occurred near the port site. This see was cleaned at the PMC and returned to the mine operator. The 1997 site vis was not conducted because of scheduling conflicts. The areas were, howeve evaluated in 1998. Additional evaluations occurred in 1999 and a nev program is expected to be in place for the 2002 field season.

Department of Transportation Interior Seed Collection Project

In 1995, the PMC initiated a program for the Alaska Department c Transportation (DOT) to collect and commercially increase native species. Th material collected will be used for future highway revegetation program throughout the interior region.
The collection effort began on August 6, 1995 with a ten-day collectio program in the Nome area and the surrounding road system. The collectio program continued from Fairbanks to Tok along the Alaska Highway, as well a 50 miles south on the Parks, Richardson Highways and the Tok Cut-of Additional collections occurred at Port Clarence. The collection effort ended o September 8, 1995. A total of 31 man-days were expended on the collectio effort.

A total of 153 collections covering 72 species were made. The amounts c seed collected ranged from 1 to 2 grams to 12 to 15 kilograms. A total of 10 kilograms of seed was delivered to the PMC.

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

In June 1997, one of the seed collections, the native wheatgrass, *Agropyro pauciflorum*, was hydroseeded onto a DOT problem site, the embankments c the on-off ramps of the Johansen Expressway at Peger Road. The wheatgras a dry land species, grew very well and DOT was pleased with its performanc

The plantings were monitored for winter survival and continued growth. Th final report was prepared and distributed in December 1998. Large-scale see increase occurred in 2000. Release documentation for the collection will b prepared in 2002.

Upper Knob Creek and Jones Mine

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

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

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

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

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

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

The timing of activities is important and this project reminded us of this poir on several occasions. The site was well scarified and then a backhoe was use 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 t erosion.

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

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

The Upper Knob Creek site contained four pits. The primary revegetation effo focused on slowing surface water erosion. Bundles, and to a limited exten brushlayers were placed in areas that had begun to show signs of rilling in Pit 6 and 7. After a very heavy thundershower, the importance of timing becam apparent again. Many of the bundles had just begun to leaf out when the were buried by sediment resulting from the erosion caused by the intens rainfall. The young new shoots required careful excavation by hand. Despit 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 wa 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 i particularly susceptible to erosion and additional soil stabilization and erosio control work may need to be done next spring. In 1999, additional willow 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 growin season. Intensive willow plantings using brushlayering, bundles and gull plantings addressed these erosion areas. A light seeding of grass was als broadcast on bare areas.

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

Plant recovery in the seven-acre area of Phase III was not as good as it ha been in previous mine site plantings. The reason for poorer survival is unclea especially since the grass cover was good. Plantings at all of the Upper Kno Creek sites continue to perform well. A final round of photo documentation wi occur in 2002.

Anchorage Water & Wastewater Utility (AWWU)

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

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

The revegetation plan identified five locations for planting approximately 50 live willow stakes, special plantings at the stream crossing, and a light seedin of native grasses, willow and aspen seed. Initially, most of the plantings wer going to occur in the spring before July 1. However, after the initial plantin efforts encountered exceptionally dry conditions, the decision was made t postpone planting.

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

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

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

The grass seeding was delayed as long as possible hoping that the rains woul 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 plar species and determined species frequency along the ROW. Thes measurements were taken late in the season. Many plants had died back some species probably were not observed, and plant cover measurements wer also underestimated.

Plant growth along the ROW was evaluated in the spring 1998. A hig percentage of the fall planted willows were growing very well. The few liv stakes that had been planted in the spring of 1997 were growing well except i the southern end of the ROW where total plant cover is high and the grasse are competing with the willows. Relatively few seedlings of birch, willow an alder are becoming established. The seeded grasses are maintaining relatively sparse cover and clover is the primary species growing where woo 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 199 At the end of the growing season, it was not apparent that the seeding effo recruited any new willow seedlings.

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

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

Evaluations of the AWWU ROW did not occur in 2001. Evaluations for 200 will be dependent on the report covering 1996-2000. Plant cover and densit continues to increase along the ROW.

South Atlantic Cooperation Project

In 1996, the PMC was contacted by the Falkland Islands Department c Agriculture, requesting seed of PMC developed cultivars and pre-cultivars Seed was exchanged and discussions continued regarding land restoration an seed production. In January 1998, one PMC collector traveled to the Falklan Islands to collect seed. This project was funded by the USDA Plant Exchang Office through a cooperative grant. A total of 366 seed collections were mad on the Falkland Islands. The seed was returned to Alaska after USD inspection. During the summer of 1998, initial field evaluations began on th accessions.

The results of the 1998 Falkland Project led to a second collection effort o South Georgia Island. This occurred between December 2, 1998 and Januar 18, 1999. A total of 441 collections were made on South Georgia Island Upon arrival in Los Angeles International Airport, the APHIS inspectors prompt lost the entire seed collection. The collection effort on South Georgia Islan was rescheduled for January 2000.

Between January 2, 2000 and January 29, 2000 the second effort in Soutl Georgia and the Falkland Islands resulted in 103 collections. The seed arrive in Alaska without problem. An additional collection effort was funded for 2001 This project was to concentrate on the Chilean islands of Cape Horn and Dieg Ramirez. This is presently on hold as Chilean permits to collect have becom problematic.

North Atlantic Germplasm Collection Project

As a part of the newly funded Cold Regions Vegetation Project, the PM initiated a seed collection project on Iceland and the Faroe Islands. Part of th 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 an the two Atlantic Island groups. Collection of material not present in Alaska wa limited and only conducted based on interest expressed by the Icelandic c Faeroese scientists and the curiosity of the collector.

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 pratense/1
Poa alpina/14
Poa glauca/11
Poa pratensis/3
Trisetum spicatum/2
Total: 123 accessions
Other material marked for future importation:
Festuca vivipara
Deschampsia alpina (viviparous)
Poa alpina (viviparous)

The period of time between August 26 and August 30 was dedicated to the 4 Circumpolar Agriculture Conference. There was an unexpected one-day dela in Iceland; an unscheduled side trip to Winnepeg and a two-day delay i Minneapolis. Other than that, everything went according to plan.

Commercial Native Plant Production Project

In 1999, the PMC was awarded a federal grant to initiate a project c commercializing native plants in Alaska. The $350,000 grant is intended t fund additional collection efforts and hire employees and purchase equipmen 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. Th project is funded by the U. S. Natural Resources Conservation Service.

One of the first accomplishments of this project was to produce the secon edition of the Directory of Alaska Native Plant Sources in January 200C This document is very useful as a marketing tool for our native plan growers and suppliers.

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

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

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

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

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

Additional seed collections were made from native plants in the soutl central region for production and hopefully distribution to growers during th 2001 growing season.

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

We received over 20 inquiries about the program. In early June and later i August, we distributed 7,399 plants and 7.29 pounds of seed to 1 growers. At the same time, we provided written material describing th techniques we used to produce the plants, including soil media an scarification techniques.

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

The plants were distributed free of charge with the understanding that onc production was underway that the grower would pay the Nursery in see 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 we were distributed to growers and special wetland revegetation projects.

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

The plans for 2002 include producing more species for distribution follow u with the current growers and expanding our seed collection efforts. A agreement with DOT/PF has been developed to produce wetland vegetatio mats for installation in 2003. This project will be a trial/demonstratio planting.

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

Foundation Seed Program

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

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

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

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

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

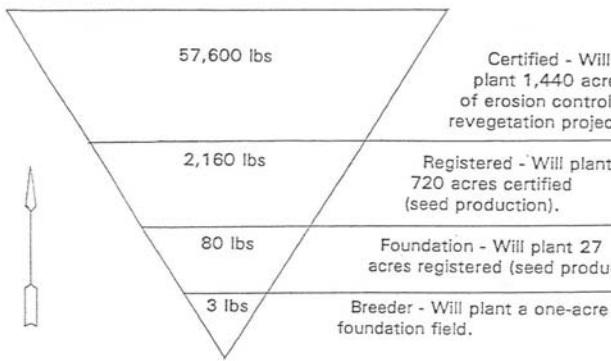
Plant breeders explore the genetic potential of a variety. Varieties are selecte based on the intended use as food, fiber, an ecological niche or its chemistry.

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

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

As a member of the Association of Official Seed Certifying Agencies, th PMC's Foundation Seed Program, along with the Alaska Seed Growers, Inc joins 43 other states in insuring that in-state and interstate purchasers hav 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 commercially useable quantity. Clean seed yield is based on 80 lbs./acre. Th planting rate is based on 3 lbs./acre for seed production and 40 lbs./acre fo reclamation purposes.

2001 Growing Season

The 2001 growing season started out generally warm and dry. A breezy an drier fall allowed good ripening before the early snowfall, though one grain fiel was white at harvest time. Yield was quite good filling nearly all availabl storage facilities. Irrigation was maintained through June.

Inspection and Sampling

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

Table 1. Revegetation and Turf Varieties in Production in 2001.

Variety	Class Planted	Year Planted	Acres Planted
'Ingal' Wheat	Breeder	01	3
'Nip' Oats	Common	01	5
'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
'Alyeska' Polargrass	Breeder	01	.5
'Service' Big Bluegrass	Breeder	97 & 00	2
'Caiggluk' Tilesy Sagebrush	Breeder	95	.5
'Bebral' Rye	Foundation	97	5
'Reeve' Beach Wildrye	Foundation	90 & 00	2
'Datal' Barley	Breeder	01	2
'Toral' Oats	Breeder	01	4
'Gruening' Alpine Bluegrass	Breeder	98 & 00	1

Table 2. Cereal Grain Seed & Oil Seed Varieties in Storage at the Plan Materials Center, December 2001.

Barley		Wheat		Oats		Rye	
Variety	lbs	Variety	lbs	Variety	lbs	Variety	lb
Lidal	16,000	Ingal	5,000	Toral	10,000	Bebral	1
Otal	6,000	Nogal	3,000	Ceal	900		
Thual	15,000	Froid	150	Nip	10,000		
Weal	15,000			Golden Rain	2000		
Datal	10,000						
Pokko	400						
Arra	650						
Eero	500						
Total	63,550	**Total**	8,150	**Total**	22,900	**Total**	1,000

Table 3. Cereal Grains Sales & Receipts, 1996 - 2001.

Type	1996	1997	1998	1999	2000	200
Barley	1,000	1,500	150	13,000	500	2,45
	$420.00	$533.00	$60.00	$2,600.00	$170.00	$689
Oats	1,500	4,500	3,000	6,600	1,100	5,50
	$224.00	$1,700.00	$600.00	$1,980.00	$390.00	$1,99
Wheat	0	700	1,300	1,500	400	1,50
	0	$221.00	$278.00	$330.00	$133.75	$431
Total	2,500	6,700	4,450	21,000	2,000	9,45
	$644.00	$2,454.00	$938.00	$4,910.00	693.75	$3118

Table 4. Grass Seed Sales & Receipts, 1996 - 2001.

Variety	1996	1997	1998	1999	2000	200
'Nugget' Kentucky	25 lbs	0	40 lbs	0	97 lbs	25 lb
Bluegrass	$300.00	0	$480.00	0	$1,164.00	$288.75
'Arctared' Red	0	0	0	200 lbs	0	0
Fescue	0	0	0	$2,600.00	0	0
'Sourdough'	3 lbs	0	0	0	0	0
Bluejoint	$75.00	0	0	0	0	0
'Alyeska'	0	0	0	0	0	0
Polargrass	0	0	0	0	0	0
'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	0	20 lbs	0	80 lbs	30 lb
Sloughgrass	0	0	$291.00	0	$1,840.00	$637.
'Norcoast' Bering	25 lbs	110 lbs	0	0	0	0
Hairgrass	$476.00	$2,140.00	0	0	0	0
'Nortran' Tufted	10 lbs	0	0	100 lbs	0	151 l
Hairgrass	$1,578.20	$205.60	0	$1,500.00	0	$1422
Polar Brome	0	0	0	0	0	0
'Tundra' Glaucous	10 lbs	0	0	10 lbs	0	0
Bluegrass	$130.00	0	0	$130.00	0	0
'Caiggluk' Tilesy	0	40 lbs	0	0	0	0
Sagebrush	0	$1,560.00	0	0	0	0
	73 lbs	150 lbs	60 lbs	310 lbs	177 lbs	206 l
Total	$1,186.00	$3,700.00	$772.00	$4,230.00	$3,004.00	$2,349

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 goo quality are required to assure a fair return on investment. Diseases can caus significant losses reducing yield and quality factors.

The potato is a vegetatively propagated plant and as a consequence, ha unique production problems. Many economically important diseases and pest can be carried in or on the tubers used as seed. The use of seed potatoe having little or no disease is basic to any management plan. Planting certifie seed reduces the risk of losses caused by disease. It is for this reason that th 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 origina allotment over the next several years. Seed potatoes are subjected to stric certification inspections to assure minimal disease incidence. The volume c certified seed produced in this fashion enables a grower to replace olde diseased seed with clean seed.

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

Pathogen Testing

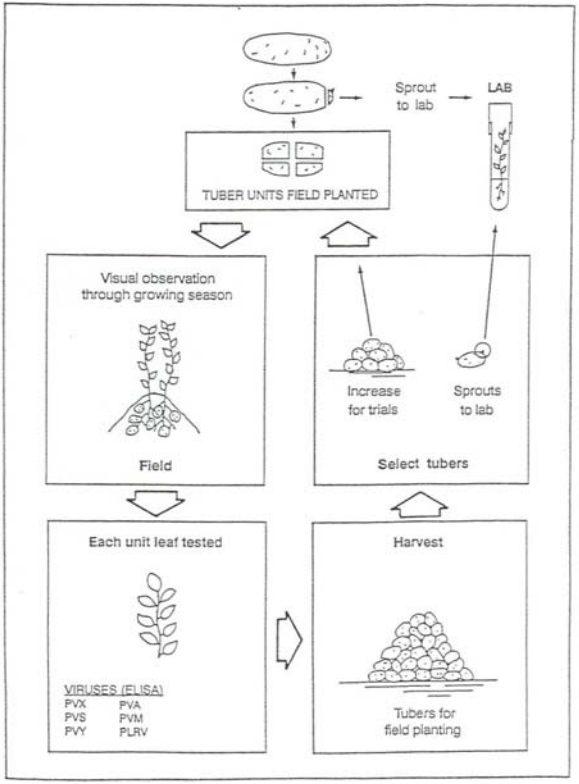
The major focus of the potato program is providing quality seed potatoes t commercial seed growers. Low levels of disease are required of quality see because diseases can negate a crop's usefulness as seed. The seed provide by the PMC is used as the initiating stock for the ensuing multiple year certifie seed production scheme. This seed, therefore, must be of the highest qualit possible since any disease introduced at this point would be multiplied durin each successive year of seed increase. To this end, all production is rigorousl tested and retested for disease prior to sale.

Testing for the presence of diseases is performed in the PMC laboratory on a the initial seed stocks (Figure 4). The diseases of primary importance ar Bacterial Ring Rot (BRR) and the viruses Potato Leafroll Virus (PLRV), Potat 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 vitr propagation of the greenhouse stock are tested prior to production and agai prior to harvest. The field grown materials are visually inspected during th growing season with laboratory testing performed prior to harvest (Figure 5).

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

Figure 4. TUBER INTRODUCTION



Alaska Seed Potato Production & Disease Testing

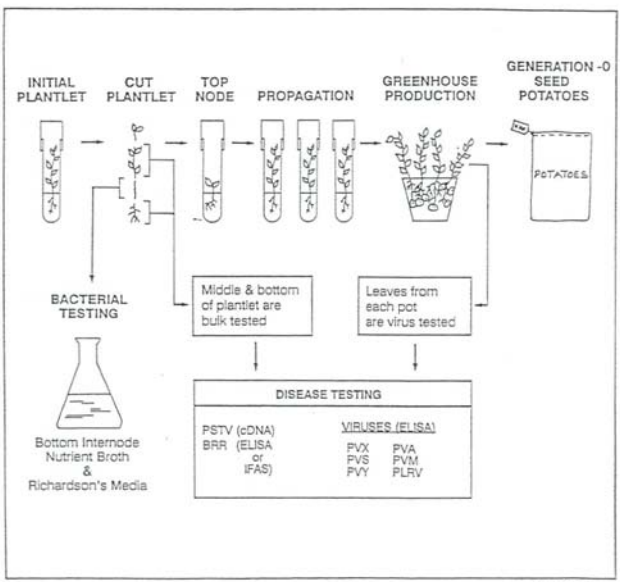


Figure 5

Seed Potato Certification

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

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

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

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

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

Alaska's Certified Seed Program is administered by the Alaska Seed Grower Inc. The inspections are conducted by the PMC's Potato Disease Contr Program.

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

Table 5. Certified Seed Potatoes

Year	# Growers	# Varieties	# Lots	Acreage
1997	17	204*	402	125
1998	17	212*	233	105
1999	17	44	188	123
2000	14	238*	180	122
2001	12	49	153	128

*Includes PMC variety bank.

Educational Program

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

Scab Resistance Trial

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

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

Variety Development

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

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

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

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

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

Disease-Tested Seed Potato Production

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

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

Table 6. Seed Potato Production

Year	Number of Varieties	G-0	G-1	Plantlets
1996	55	1,400	0	420
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

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

Virus Disease Expression Plot

A small plot was established to examine viral disease symptom expressior Four seed pieces each of known virus-infected materials were planted Ma 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 ver small tubers harvested from a plant having Witches Broom symptoms.

Symptoms of virus infection, except PVS, were apparent throughout th season for all viruses beginning a few days after emergence. The Witche Broom material did not emerge until mid August. It appeared healthy until lat September when a light marginal chlorosis could be observed on the newe 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 2001 are in Tables 7, 8 and 9.

Table 7. Temperature (°F)

NAME: PMC1 CITY: Palmer STATE: Alaska
ELEV: LAT: 61° 31' 37" N LONG: 149° 4' 50" W

YR	MO	MEAN MAX	MEAN MIN	MEAN	DEP. FROM NORM	HEAT DEG DAYS	COOL DEG DAYS	HI	DATE	LOW	DATE	MAX >=90	MAX <=32	MIN <=32	MIN <=0
1	1	35.1	23.3	29.7	0.0	1109	0	44.4	18	6.2	29	0	10	25	0
1	2	30.8	12.2	22.7	0.0	1218	0	43.0	27	-4.3	2	0	15	26	5
1	3	36.7	23.9	30.2	0.0	1016	0	44.6	14	-0.7	3	0	9	25	1
1	4	46.9	29.2	38.3	0.0	807	0	56.5	29	10.6	1	0	0	22	0
1	5	53.7	35.2	45.0	0.0	636	0	69.6	28	25.4	5	0	0	11	0
1	6	67.2	46.0	57.3	0.0	244	0	75.8	23	36.4	9	0	0	0	0
1	7	62.2	47.1	55.1	0.0	291	0	68.6	18	30.1	3	0	0	1	0
1	8	65.4	46.8	56.0	0.0	275	0	76.1	13	37.1	25	0	0	0	0
1	9	57.0	36.7	47.0	0.0	546	0	63.0	10	24.5	30	0	0	10	0
1	10	34.8	19.6	27.3	0.0	1171	0	62.7	4	-11.3	27	0	14	23	6
1	11	16.8	2.9	10.0	0.0	1655	0	46.2	18	-18.4	9	0	28	30	14
1	12	14.6	-2.9	5.7	0.0	1833	0	48.4	31	-30.7	15	0	21	30	19
		43.3	26.6	35.2	0.0	10801	0	76.1	AUG	-30.7	DEC	0	97	203	45

Table 8. Precipitation (in.)

YR	MO	TOTAL	DEP. FROM NORM	MAX OBS. DAY	DATE	DAYS OF RAIN .01 OVER .1	1
1	1	3.75	0.00	1.21	7	12	9	1
1	2	1.63	0.00	0.81	27	10	5	0
1	3	0.31	0.00	0.10	7	5	0	0
1	4	0.13	0.00	0.03	4	5	0	0
1	5	0.65	0.00	0.21	2	7	3	0
1	6	0.73	0.00	0.33	11	5	3	0
1	7	2.53	0.00	1.31	20	9	5	1
1	8	0.44	0.00	0.18	28	6	1	0
1	9	0.89	0.00	0.55	2	6	1	0
1	10	0.61	0.00	0.15	21	9	3	0
1	11	1.22	0.00	1.03	17	2	2	1
1	12	0.91	0.00	0.24	21	7	3	0
		13.80	0.00	1.31	JUL	83	35	3

Table 9. Wind Speed (mph)

YR	MO	AVG.	HI	DATE	DOM DIR
1	1	6.5	55.0	15	E
1	2	3.7	58.0	26	E
1	3	3.7	41.0	11	E
1	4	6.0	59.0	3	E
1	5	3.4	31.0	19	E
1	6	0.2	24.0	3	E
1	7	0.5	32.0	18	E
1	8	2.8	34.0	28	E
1	9	3.3	40.0	4	E
1	10	3.2	45.0	4	E
1	11	0.7	39.0	17	ESE
1	12	2.7	44.0	27	ENE
		3.1	59.0	APR	E

APPENDIX A

CURRENT & HISTORICAL BUDGET INFORMATION

CALENDAR YEAR 2001 AUTHORIZATIONS, EXPENDITURES, AND PROGRAM RECEIPTS

ARLF Authorizations

Authorizations FY 2001 PMC Total	523,40
Alaska Plant Materials Center	
Project Total	523,40
Personal Services	463,89
Travel	2,90
Contractual	44,10
Supplies	12,50

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	FY01
Author-ization in Thous-ands	PMC	733.7	596.7	556.7	566.1	566.1	620.8	608.9	585.6	595.3	433.3 100.0*	522.9*	508.6*	511.1	485.9*	523.4
	Forest Nursery								180.0	95.2	95.2	0	0	0	0	0
Personnel		17	16	16	16	16	16	16	17	17	15	14	15	19	22	24
Full Time		9	7	7	7	7	7	7	7	7	6	5	6	5	6	8
Part Time		8	9	9	9	9	9	9	10	10	9	9	9	14	16	16

* Indicates Agriculture Revolving Loan Fund source.

When comparing personnel figures listed for FY 01 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 2001

Contracts, Reimbursable Service Agreements and Grants

Source	Face Value of Cont Awarded in 200
USDA Agricultural Research Service (Germplasm Repository)	265
USDA Natural Resources Conservation Service	350
USDA Natural Resources Conservation Service	300
USDA Seed Laboratory	3,050
USDA Quarantine Facility	1,600
U.S. Army	7
Alaska Dept. of Transportation/PF	10
Alaska Dept. of Transportation/PF	9
Alaska Division of Mining and Water Management	10
Alaska Division of Mining and Water Management	28
	Total $ 5,630

RSA, Program & Federal Receipt Values Since CY 1991

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

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	
117, 981	126, 071	202, 886	377, 161	334, 200	212, 800	304, 200	1,086, 000	928, 400	1,013, 200	5 0

2001 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	39,561	3,193	36,374	31,897	13,024	49,915	28,500	64,224	63,764	43,609	37,482	29,573
Personal Services	34,563	-0-	29,807	29,108	5,699	47,869	27,505	57,331	58,576	39,489	33,618	23,564
Travel	19	-0-	-0-	-0-	1,123	-0-	-0-	179	787	-0-	-0-	-0-
Contractual	3,837	3,488	5,956	2,765	5,964	1,144	352	2,527	3,288	2,463	3,654	3,808
Supplies	1,143	1,288	611	24	239	902	643	4,187	1,113	1,656	210	2,201

APPENDIX B

CROP RELEASES

CROP CULTIVARS DEVELOPED AND ADVANCED BY THE ALASKA PLANT MATERIALS CENTER

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

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

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

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

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

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

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

'Caiggluk' Tilesy Sagebrush, *Artemisia tilesii* - Caiggluk tilesy sagebrush is native collection of sagebrush. It was placed in commercial production in 198 The expected uses range from mine reclamation to restoration of site contaminated with toxic metals. The cultivar will add diversity to seed mixe This is the first native broadleaf species brought into commercial production i Alaska. In 1991, Caiggluk was registered as a crop cultivar with the Cro Science Society of America.

'Service' Big Bluegrass, *Poa ampla* - This accession of big bluegrass wa derived from a collection made in the Yukon Territories. During the PM evaluation process, the collection out-performed 'Sherman' big bluegrass (th only known cultivar of big bluegrass) in all categories. Service is expected t find use in dry land revegetation projects in Alaska south of the Yukon River.

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

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

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

'Peanut' syn. 'Swede' Potato. This fingerling potato traces back to th Matanuska Valley in the 1930s. The tubers are small and resemble a peanut i shape and have yellow flesh. Desirable qualities include good yield und adverse conditions and a long dormancy.
'Rote Erstling' syn. 'Rode Eerstling' Potato. European variety promoted by D Donald Dinkel, University of Alaska Fairbanks (retired). Round, red with yello flesh. Early maturing.

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

Pending Releases

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

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

APPENDIX C

LIST OF PUBLICATIONS AND PRESENTATIONS

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APPENDIX D

ACKNOWLEDGEMENTS

ACKNOWLEDGEMENTS

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U. S. Dept. of Agriculture, Agricultural Research Service
U. S. Dept. of Agriculture, Natural Resources Conservation Service