

Foundation Seed Production

Technical Report

1977 – 1988

**State of Alaska
Dept. of Natural Resources
Division of Agriculture
Plant Materials Center
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FOUNDATION SEED PRODUCTION

Introduction

This section of the North Latitude Revegetation and Seed Production Project at the Alaska Plant Materials Center (PMC) increases and preserves cereal grain and grass varieties developed especially for Alaskan growing conditions. Small amounts of breeder seed are obtained from the University of Alaska, Agricultural and Forestry Experiment Station (AFES), PMC breeder plots, or other northern latitude sources. This seed is planted, grown, and processed at the PMC according to standards and procedures that ensure genetic purity, absence of noxious weed seeds, and freedom from injurious plant diseases.

The progeny of breeder seed, designated foundation-class seed, is made available to the industry through the state's seed certifying agency, 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.

This report covers highlights of technical operations and accomplishments from 1977 through 1983, a detailed look at the 1984 growing season, and highlights and changes during the period from 1985 through 1988. Three phases of the Foundation Seed Project will be examined: seed increase, seed processing, and material distribution.

For simplification, trade names of products and equipment are used in this report. Neither endorsement nor criticism by the Alaska Plant Materials Center is implied.

Seed Increase: Highlights 1977-1983

During these years, some Alaskan cereal grain varieties have become obsolete, superior ones have been introduced and have become popular. On the other hand, new varieties of grasses have augmented, not replaced the other foundation grasses grown; the older varieties remain at least as popular as they were in 1977. But demand overall for grass seed fell off with the completion of the trans-Alaskan oil pipeline, and barley varieties became more important as the large agricultural projects began to farm. Rapeseed created a flurry of interest in 1979 and 1980, and buckwheat briefly had its proponents.

Grains:

'Golden Rain' oats, 'Edda', 'Finnaska', and 'Otra' barleys, and 'Gasser' wheat, all of the last two decades have made way for new varieties such as 'Toral' oats, 'Thual', 'Otal', and 'Datal' barleys, and 'Ingal' and 'Nogal' wheats. Others: 'Lidal' and 'Weal' barley and 'Nip' oats competed with the newer varieties in the 1980s. Datal, outyielding and outweighing Weal and Lidal, was introduced to 21 farmers in free 500-pound promotional allotments in 1982. It has since become one of Alaska's standards. Otal's popularity crossed the border into Canada. Demand shifted from an imported variety of wheat to Alaska's semidwarf, stiff-strawed Ingal. A winter rye, 'Bebral', was added to the grain inventory in 1983.

The demand consistently requires grains with higher yields, early maturity, and resistance to lodging and shattering, but within these requisites, demand for varieties sways rapidly depending upon the perceived market, whether for export or internal use for feed lots or silage for dairies. Over these seven years, the PMCs production of seed has come closer each year to meeting Alaskan farmers' demands, in spite of the difficulty in predicting the market. The acreage planted at the PMC doubled, also allowing a surplus of seed to be stored in the event of crop failure such as occurred in 1982.

Clearing the original 285 acres progressed, and an additional 120 wooded acres were obtained in a land exchange with the Matanuska-Susitna Borough. A new 14-foot grain drill expedited the increased spring work load. Seeding rates and nitrogen fertilizer rates were lowered to help prevent lodging. Premerge and 2,4-D were replaced by more effective herbicides with less critical application timing. Over these years, production increased without sacrificing quality and without a corresponding labor increase.

Grasses:

Demand for foundation grass seed must be predicted at least three years in advance of a consumptive project such as a trans-Alaska gas pipeline. Steps toward production of foundation seed of several varieties developed to fulfill a range of revegetation requirements were taken as early as 1979. By 1983, ample 'Nugget' Kentucky bluegrass and 'Arctared' red fescue were produced and sold but very little of the other grass varieties.

Abandoning rows for solid stands of several of the varieties improved weed and erosion control, and initially increased yields, but interfered with effective roguing of off-types and volunteer grasses. A compromise to six inch rows for bluegrass and fescue allowed seedling year roguing, which, combined with new and effective herbicides, resolved the contamination of solid stands. The meter row spacing for the taller native grasses was improved by replacing mechanical weed control (rolling cultivator) with residual, pre-emergent herbicides.

Some grasses required two years for stand establishment, but by 1983, in addition to Nugget and Arctared, 'Norcoast' Bering hairgrass and 'Alyeska' polargrass were producing foundation seed, and seedling stands of 'Sourdough' bluejoint and 'Polar' brome looked promising for 1984.

Seed Increase: 1984

The spring of 1984 favored early planting, and a good growing season assured high yields of both grains and grasses. Fallow land management was improved by the addition of X-77 spray-adjuvant to applications of Roundup allowing a stubble cover to protect the fields longer while weeds, even quackgrass, were effectively controlled.

Grains:

Planting began with Toral and Nip oats April 25. More acreage of all varieties of grains was planted than in previous years. All fields were fertilized by drop spreader with 300 lb./ac. 20-20-10 before planting. By May 10, five varieties of barley and three of wheat had also been planted. Irrigation was necessary in May and June, before crops booted.

Herbicides were sprayed in late May and early June: Glean to the barleys and wheats, Banvel and Bronate to all the oats and to barleys and wheats in Field 7 where residual Glean could interfere with future grass crops. Weed control by both methods was good, but where Premerge was added to the

Banvel and Bronate mix, (in the 'Chena' wheat), crop burn was severe and recovery was slow, ultimately delaying maturity by more than a week. Contaminating crops and varieties were hand rogued twice in August. Diseases evident were scald in the barleys, and smut, particularly in the Weal.

All crops matured, and on August 28, harvest began with the Toral oats. All combining was completed by the end of September, with Chena wheat being last on September 26. Yields were high, with little loss due to shattering, and in spite of lodging in Datal and Weal.

After cleaning, five varieties of barley had yielded 83,321 lb. Three varieties of wheat yielded 21,763 lb., and two varieties of oats yielded 26,517 lb.

Grasses:

Stands of every named variety of Alaskan grass were in production at the PMC. Fields two, three, and where permitted, four years old were producing seed. New fields of 'Tundra' glaucous bluegrass and Polar brome were planted for future foundation seed.

Depending upon soil analyses, the seedling year was usually the only time a balanced (300 lb./ac. 20-20-10) fertilizer was used. Subsequently, producing fields were usually fertilized with 180 lb./ac. 34-0-0 in the Fall.

Application of herbicides before the boot stage consisted of a mixture of Premerge, Banvel, and MCP. On seedling fields Buctril was used until the three-leaf stage of the crop, after which the above mix was applied later in the summer. Nearly all grasses in their second or third year of seed production were sprayed with Malathion to prevent the condition known as "silvertop", caused primarily by capsus bugs. Irrigation was necessary in May but discontinued before anthesis. Roguing in established grass fields was by backpack-sprayer application of Roundup and X-77, primarily for quackgrass, foxtail barley, and other crop volunteers. Seedling grass fields required hoe-roguing once or twice.

Harvesting several of the grasses such as 'Egan' American sloughgrass, Arctared, and Norcoast was improved through the use of special combine sieve screens with round or slotted perforations. Post-harvest clean-up and renovation of grass fields was improved and speeded by using a forage-chopper with a wagon.

In 1984, for the first time, Arctared, Sourdough, Nugget, Alyeska, Norcoast, and Polar brome all produced foundation seed. Seven varieties (including 'Engmo' timothy, a common seed) yielded after cleaning, 1,853 pounds.

Seed Increase: Highlights 1985-1988

By the spring of 1986, PMC stores of grain seed exceeded growers' demands for foundation-class seed; private growers of registered and certified grains were supplying the bulk of seed needed for the production of animal feed. At the same time, interest in grasses for turf and revegetation strengthened. The PMC took advantage of this market shift to concentrate on the establishment of new foundation grass fields including several new varieties.

Grains:

With over 31 acres of foundation fields planted to wheats, barleys, and oats, 1985 marked the last season of large grain plantings at the PMC in the 1980s. Two new grains from the AFES were introduced: 'Vigal' wheat in 1985 and 'Ceal' oats in 1986. Three Finnish barley varieties being tested by the AFES were also increased in 1986: 'Arra', a medium-tall early maturing variety; 'Eero', a semi-dwarf variety resistant to lodging; and 'Pokko', a shatter resistant, high yielding barley. After 1986, grain plantings were limited to maintaining foundation stocks of the most popular varieties and upgrading older seed lots where germination percentages had dropped below acceptable levels.

The larger acreages of fallow land in this period allowed for a more thorough weed control program. Some fields were fallowed for two years or more. Along with applications of 1.5% Roundup, control of weeds, especially quackgrass, was more effective than previously.

Grasses:

Four new revegetation grasses were released and increased during this time: 'Nortran' tufted hairgrass augmented the previously released Norcoast Bering hairgrass in 1986. A second AFES release was 'Kenai' polargrass, a foundation field of which was planted in 1987. This revegetation grass is more suitable for Southcentral and Interior applications than the previously released Alyeska polargrass. Two PMC releases were planted for foundation seed for the first time in 1987: 'Gruening' alpine bluegrass and 'Egan' American sloughgrass. Gruening has a wide range of revegetation uses and is particularly suited for alpine and interior sites with soil conditions not suitable for other bluegrasses. Egan is particularly suited for reclamation and waterfowl feed in wetland habitats. Along with these new releases, six new foundation grass fields of the established grass varieties were planted in 1987: Polar brome, Alyeska, Nugget, Arctared, Sourdough, and

Norcoast. The new plantings were necessary for two reasons: older fields were moving out of the time limits imposed for certification, and flooding from the Matanuska River in Fields 2 and 5 prevented the harvest of three foundation grass fields. This seasonal flooding began during the summer of 1986 and has repeated each year through 1988, eliminating nearly 80 acres of tillable land at the PMC.

The acquisition of the Mearelli power tiller in 1985 greatly improved weed control in grass fields. Row spacings for all grass varieties were standardized at one meter. The Mearelli tiller could then be used to eliminate weeds and volunteer grasses between the rows without harming the seed crop.

Herbicide applications to seedling grass fields consisted of applications of Buctril and MCPP, except the polargrasses where Buctril alone was used. Stubborn weeds became harder to control with the banning of Premerge in 1987, and hand roguing was necessary to control weeds and off-types within the rows. Rust and powdery mildew in the bluegrasses was effectively controlled with periodic applications of the fungicide Bayleton.

By late summer of 1988, harvest of every released Alaskan grass was complete and field renovation by flail-mowing and fertilization with 34-0-0 was begun.

Seed Processing: Highlights 1977-83

By 1977 the PMC had adequate combining, drying, cleaning, treating, sacking, and storage equipment and facilities to allow execution of all stages of foundation seed production on the PMC site.

In 1979 a small plot combine was purchased to help speed up harvest. A 1500-bushel steel bin drier and a recirculating Moridge handled the bigger grain lots until the first, and later a second, Peerless drier wagon was purchased. Smaller grain and grass lots were dried in 4'x4'x4' plywood boxes with perforated false floors, through which air would be forced by a large squirrel-cage fan. Heat, when necessary, was supplied by an oil-fired space heater.

The seed house was outfitted with both standard and specialized cleaning and processing machinery. The nucleus of the seed house is a four-screen, two-fan 29-D Clipper Cleaner, but for special problems such as barley beards, cracked seed, or weed seed contamination, additional equipment is also used: a debearder, an indent disc separator, an indent cylinder, a scalper, or, rarely, a specific gravity separator. Conveying has been primarily by an air-lift and distributor with downspouts, and small bucket elevators.

Seed treatment, primarily Vitavax applied to barleys and wheats, is accomplished by a Gustavson system mounted above the bagging bin. Nearly all seed is sacked in woven polypropylene bags unless, like bluejoint, the seed is extremely small and is sacked in cloth bags.

Storage until 1982 was in the loft of the barn or palletized in the south end of the seed house or the "F-700 garage." For the large crops of 1981, doors were cut into the old granary's bins for sacked seed storage, but by 1983 the seed storage addition to the seed house was completed and ready for storing sacks arranged on large aluminum pallets.

Seed Processing: 1984

There were innovations in cleaning, conveying, and storage in 1984. The floor of the debearder was replaced with perforated steel for milling seed such as bluejoint or sicklepod alfalfa prior to air-screen cleaning. Specially designed racks with rubber balls were purchased to replace the screen brushes in the 29-D. These especially improved fescue processing, virtually eliminating screen plugging. And for cleaning Egan, a particularly light seed, the specific gravity separator was adjusted so that the light

fraction was retained as the final product.

Bag identification was changed from sewn-on tags to codified lot numbers printed directly on the bag.

An extensive new system of conveyors, elevators, and a new distributor were not yet on-line, but the new 400-bushel bins were used for the first time in 1984 for storing grains both before cleaning and in bulk afterward.

Seed Processing: Highlights 1985-1988

Over the years, the seed cleaning operation has evolved into an efficient winter-time routine; hence, few changes have been necessary. The most notable difference from previous years has been a greatly expanded use of the specific gravity separator or "gravity table." With a greater emphasis placed on seed quality, the gravity table is now used on grains and grasses alike. Its ability to separate heavy seed from light seed has increased bushel weights of grain crops, simultaneously increasing germination percentages. For grasses contaminated with other varieties similar in size, the gravity table could often make separations possible. For both grasses and grains, weed seeds previously uncleanable were removed from the final product. With the introduction of new crop varieties, some experimentation with cleaning techniques became necessary. The velvet-roll separator was used to separate stubborn weed seed from 'Kenai' polargrass, while screen and air adjustments were necessary for the 29-D Clipper Cleaner.

In 1985, use of Vitavax for treating grain was discontinued. This has allowed substandard grain crops to be distributed for feed, freeing much needed storage space. At this time, it is anticipated that Vitavax will be used only if infestations of smut, bunt, or seedling blight warrant its use.

In bagging seed, numbered certification tags have replaced older tags, allowing seed lots to be more easily traced. These tags are now attached with non-reuseable metal seals.

Further progress has been made with the seed house upgrade. The second tier of 400-bushel storage bins was completed in 1986, and seven new elevator downspouts were installed in the fall of 1987. A final electrical upgrade will complete the project.

The number of seed lots cleaned each season ranged from a high of 28 in 1985 to 15 in 1987. With the new fields harvested in 1988, the number of lots cleaned has risen to 23. This number is expected to rise in the next two years with the anticipated release of new revegetation varieties.

Material Distribution: Highlights 1977-1983

Typically twenty-four farmers bought seed from the project each year in the late 1970s; by the '80s that number dropped to sixteen but tonnage increased. The trend was toward the north and west, with demand from the Kenai Peninsula and the Matanuska-Susitna Valley dropping off as demand from the large agricultural projects picked up. Four different organized religious operations or communities, from Copper Center to Fairbanks, competed for wheat seed in 1982. In 1983 the last sale of PMC grass seed intended for pasture was made. Also in 1983 purchases of grass seed were made for contract production outside of Alaska; this practice continues but has not become a trend. At least fifty-six different farmers in Alaska bought seed from the Foundation Seed Project during this span of years.

Material Distribution: 1984

Eleven farmers requested over thirteen tons of barley, Weal receiving the most requests but Lidal as popular in tonnage. Datal, Otal, and Thual were important to Delta farmers in 1984 but the trend away from wheat production continued. Oats, probably due to the Pt. MacKenzie dairy project and poor performance of Canadian varieties, was back in demand with ten farmers requesting nearly five tons. Interest in Norcoast picked up with revegetation and export inquiries, and Alyeska was purchased for the first time. Weed-free Sourdough and Polar brome would not be available until that summer's crops were harvested. In 1984 seventeen farmers bought seed, five for the first time. Receipts totalled \$11,036.17.

Material Distribution: Highlights 1985-1988

The number of farmers buying foundation seed during this period remained mostly steady, with an average of 17 growers purchasing grain or grass seed each year.

Grain sales alternated during this period, with large purchases of foundation seed in 1985 and 1987 and smaller purchases in 1986 and 1988.

Barley continued to be the grain of choice with over 17 tons sold during this time. Interest in Thual hulless barley and Weal hooded barley remained steady while demand for other varieties was sporadic. There was little demand for Lidal and Otal barleys, but growers bought over seven tons of Datal. The three Finnish barleys, Arra, Eero, and Pokko, were distributed to several farmers for the 1987 growing season through the AFES. Initial reports from Pt. MacKenzie indicated that Pokko was a high yielder and

further trials with these varieties are being conducted.

Total oats sold over nine tons while a black oat, Nip, sold over one ton. The new oat variety, Ceal, has not yet found a market. Interest in wheat and rye during this time was limited to a few seed producers plus individuals experimenting with grinding their own flour, producing poultry feed, or growing straw for basket weaving.

Grass seed growers increased from seven in 1985 to ten in 1988. During this time, an increasing number of agencies, both public and private, specified Alaskan varieties of grasses for revegetation projects. Also, a growing recognition of Nugget Kentucky bluegrass and Arctared red fescue as being the most popular and best adapted Alaskan turf grasses has kept these varieties in demand. Two new revegetation grasses released by the PMC were sold for the first time: Egan American sloughgrass in 1987 and Gruening alpine bluegrass in 1988.

For the period 1985-1988, cereal grain sales totaled 31.5 tons while grass seed sales totaled 3,790 pounds. Receipts totaled \$48,389.83 for the period.

Since the inception of the Alaska Plant Materials Center in 1972, the Foundation Seed Project has been committed to the production of the highest quality seed possible. As the entry point of the seed certification system, foundation seed from the PMC must maintain the highest possible standards of genetic purity and cleanliness. Over the years, innovations in applied research and technology have contributed to the production and processing of high quality seed for industry and agriculture. As new varieties become available, new techniques in growing and cleaning will be needed to meet the demands of a changing market.

Figure 1 - Seed Increase Pyramid

This illustrates the increase of three pounds of breeder seed to a commercially useable quantity. Yield is based on 80 lbs./ac. and planting rate is based on 3 lbs./ac. for seed production, and 40 lbs./ac. for revegetation purposes.

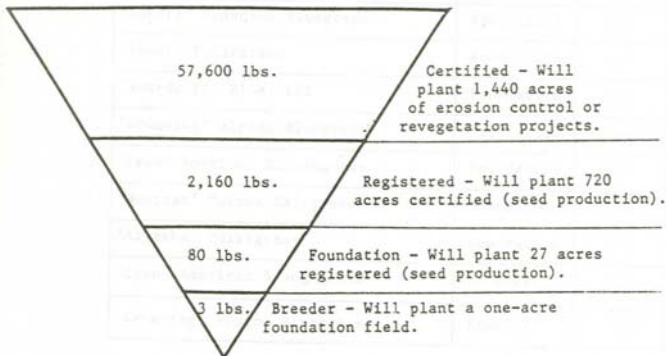


Table 1 - Revegetation and Turf Grasses in Production in 1988

Variety	Class	Acres
'Nugget' Kentucky Bluegrass	Foundation	5.0
'Arctared' Fescue	Foundation	5.0
'Norcoast' Bering Hairgrass	Foundation	3.0
'Polar' Brome	Foundation	2.9
'Tundra' Glaucous Bluegrass	Foundation	2.2
'Kenai' Polargrass	Foundation	2.0
'Sourdough' Bluejoint	Foundation	1.4
'Gruening' Alpine Bluegrass	Foundation	1.0
'Egan' American Sloughgrass	Foundation	1.0
'Nortran' Tufted Hairgrass	Foundation	1.0
'Alyeska' Polargrass	Foundation	1.0
'Egan' American Sloughgrass	Breeder	1.0
'Gruening' Alpine Bluegrass	Breeder	.3

Table 2 - Cereal grain seed & oil seed varieties in storage at the Plant Materials Center, December, 1988

Barley		Wheat		Oats		Rye		Rapeseed		Buckwheat	
Variety	Tons	Variety	Tons	Variety	Tons	Variety	Tons	Variety	Tons	Variety	Tons
Lidal	15.0	Chena	13.1	Total	6.9	Bebrai	1.2	Candle	3.1	Oily	0.3
Otal	8.4	Ingel	4.7	Ceal	4.2						
Thual	7.8	Vigel	1.9	Nip	0.7						
Weel	5.7	Nogal	1.4	Golden Rain	0.1						
Datal	5.0	1397	0.5	Freedom	0.01						
Flnaska	1.0	66116243344	0.3	Total	12.0						
Pokko	0.6	Norstar	0.07								
Arra	0.4	Gessor	0.04								
Eero	0.3	Frold	0.03								
Edda	0.05	Roughlder	0.03								
Peavo	0.03	Total	22.2								
Tibet Hulless	0.03										
Galt	0.01										
Otra	trace										
Stoptoe	trace										
Total	44.6										

**Table 3 - Grass Varieties in Storage at the Plant Materials Center
December, 1988**

Variety	Pounds
'Engmo' Timothy	2,080
'Arctared' Fescue	1,400
'Nugget' Kentucky Bluegrass	928
'Polar' Brome	760
'Norcoast' Bering Hairgrass	500
'Alyeska' Polargrass	380
'Egan' American Sloughgrass	180
'Gruening' Alpine Bluegrass	145
'Sourdough' Bluejoint	122
'Nortran' Tufted Hairgrass	96
'Tundra' Glaucous Bluegrass	40
'Kenai' Polargrass	15
Total	6,646

Table 4. Cereal grains sales and receipts, 1985-1988.

TYPE	1985	1986	1987	1988
Barley	10,080 lbs	4,200 lbs	12,750 lbs	3,750 lbs
	\$5,499.42	\$1,194.92	\$2,478.28	\$1,074.09
Oats	6,050 lbs	5,900 lbs	7,978 lbs	1,200 lbs
	\$1,957.76	\$1,394.98	\$2,097.37	\$ 355.40
Wheat	420 lbs	1,270 lbs	150 lbs	300 lbs
	\$ 118.17	\$ 274.08	\$ 24.13	\$ 70.82
Rye	50 lbs	50 lbs	320 lbs	-0-
	\$ 11.47	\$ 11.47	\$ 51.15	-0-
Rapeseed	-0-	421 lbs	119 lbs	-0-
		free	free	-0-
TOTAL	24,600 lbs	11,841 lbs	21,317 lbs	5,250 lbs
	\$7,586.82	\$2,875.45	\$4,650.93	\$1,500.31

Table 5. Grass seed sales and receipts, 1985-1988.

VARIETY	1985	1986	1987	1988
'Nugget' Kentucky Bluegrass	113 lbs	706 lbs	855 lbs	550 lbs
	\$ 904.00	\$4,942.00	\$6,840.00	\$4,547.60
'Arctared' Red Fescue	20 lbs	624 lbs	200 lbs	100 lbs
	\$ 200.00	\$4,817.00	\$2,000.00	\$ 936.00
'Sourdough' Bluejoint	11 lbs	20 lbs	-0-	6 lbs
	\$ 440.00	\$ 615.00		\$ 209.94
'Engmo' Timothy	-0-	150 lbs	50 lbs	50 lbs
		\$ 450.00	\$ 225.00	\$ 151.00
'Alyeska' Polargrass	-0-	10 lbs	95 lbs	-0-
		\$ 140.00	\$1,000.00	
'Gruening' Alpine Bluegrass	Not Available	Not Available	Not Available	10 lbs
				\$ 130.20
'Egan' American Sloughgrass	Not Available	Not Available	10 lbs	2 lbs
			\$ 80.00	\$ 17.58
'Norcoast' Bering Hairgrass	150 lbs	3 lbs	-0-	-0-
	\$2,100.00	\$ 36.00		
'Polar' Brome	20 lbs	35 lbs	-0-	-0-
	\$ 400.00	\$ 595.00		
TOTAL	314 lbs	1,548 lbs	1,210 lbs	718 lbs
	\$4,044.00	\$11,595.00	\$10,145.00	\$5,992.32

APPENDIX A.

1984 FIELD RECORDS

GRAINS:

CROP	SEED SOURCE* & RATE/ACRE	FIELD NO.	ACRES	DATE PLANTED	PESTICIDES	HARVEST DATE
WEAL	AES, 99 LB.	6	1	4/27	6/14: GLEAN	9/10
WEAL	PMC, 81 LB.	6	8	4/27	6/14: GLEAN	9/10
LIDAL	AES, 88 LB.	2	1.5	4/28	6/14: GLEAN	8/31
LIDAL	PMC, 81 LB.	5	9.5	5/8	6/14: GLEAN	9/1
DATAL	AES, 99 LB.	2	1	5/10	6/5: BRONATE, BANUEL, PREMERGE	9/4
DATAL	PMC, 83 LB.	6	10.9	5/9	6/14: GLEAN	9/5
THUAL	AES, 77 LB.	7	1.3	5/5	6/5: BRONATE, BANUEL, PREMERGE	9/7
THUAL	PMC, 54 LB.	7	2.7	5/7	6/5: BRONATE, BANUEL, PREMERGE	9/7
OTAL	AES, 110 LB.	5	.5	5/9	6/5: BRONATE, BANUEL, PREMERGE	9/14
CHENA	PMC, 98 LB.	7	9.2	5/5	6/5: BRONATE, BANUEL, PREMERGE	9/26
INGAL	AES, 77 LB.	2	.4	5/8	6/14: GLEAN	9/12
INGAL	PMC, 65 LB.	2	1.2	5/8	6/14: GLEAN	9/12
NOGAL	AES, 96 LB.	5	.5	5/9	6/5: BRONATE, BANUEL, PREMERGE	9/13
NORSTAR CA,	94 LB.	3	.6	8/1	NONE IN 1984	1985
FROID WND,	64 LB.	3	.9	8/2	NONE IN 1984	1985
TORAL	PMC, 92 LB.	6	12	4/26	5/31: BANUEL, BRONATE	8/28
NIP	AES, 85 LB.	2	1	4/25	5/31: BANUEL, BRONATE	9/4

*SEED SOURCE: PMC: ALASKA PLANT MATERIALS CENTER
 AES: UNIVERSITY OF ALASKA AGRICULTURAL EXPERIMENT STATION
 CA: CANADIAN CERTIFIED SEED
 WND: WILLISTON EXPERIMENT STATION, NORTH DAKOTA

GRASSES:

CROP	SEEDING RATE/ACRE	FIELD NO.	ACRES	DATE PLANTED	1984 PESTICIDES	HARVEST DATE
ARCTARED	4 LB.	4	3	6/23/81	NONE	7/30
	2 LB.	7	4	8/2/82	NONE	7/31
SOURDOUGH	.14 LB.	7	3.5	6/17/81	5/20: PREMERGE, BANUEL, MCPP	8/2
	1 LB.	1	.8	8/10/82	5/23: PREMERGE, BANUEL, MCPP	8/2
NUGGET	5 LB.	3N	2	6/12/81	NONE	8/6
	5 LB.	3S	1.5	5/12/81	NONE	8/6
ALYESKA	.3 LB.	7N	1.5	6/17/81	5/20: PREMERGE, BANUEL, MCPP	8/27
	.5 LB.	7S	1.2	6/12/80	5/20: PREMERGE, BANUEL, MCPP	8/27
IAS 572	1.5 LB.	1	.6	8/9/82	5/23: PREMERGE, BANUEL, MCPP	8/17
NORCOAST	.5 LB.	3	3	6/17/81	5/23: PREMERGE, BANUEL, MCPP	8/15
	1 LB.	2	3	6/8/84	7/5: BUCTRIL, PREMERGE	8/15
					7/29, 8/7: PREMERGE, BANUEL, MCPP	
POLAR BROME	1 LB.	1	2	5/24/83	5/20: PREMERGE, BANUEL, MCPP	8/13
	1 LB.	3	3	6/5/84	7/5: BUCTRIL	
					8/7: PREMERGE, BANUEL, MCPP	
TUNDRA	.3 LB.	3	1.7	6/5/84	7/5: BUCTRIL	
					8/7: PREMERGE, BANUEL, MCPP	

APPENDIX B.

1984 PRODUCTION RECORDSGRAINS

CROP	ACRES	YIELD IN POUNDS		YIELD/AC., LBS.		BU. WT. LBS.	NET BU./AC.
		GROSS	NET	GROSS	NET		
WEAL	1	2,625	2,025	2,625	2,025	50	41
WEAL	8	21,250	17,750	2,656	2,219	50	44
LIDAL	1.5	2,802	2,497	1,868	1,665	51	33
LIDAL	9.5	18,068	17,500	1,902	1,842	51	36
DATAL	1	3,013	2,765	3,013	2,765	49	56
DATAL	10.9	36,592	33,331	3,357	3,058	50	61
THUAL	1.3	2,059	1,500	1,584	1,154	57	20
THUAL	2.7	5,213	4,300	1,931	1,593	58	27
OTAL	.5	1,239	1,196	2,478	2,392	49	49
CHENA	9.2	20,846	18,488	2,266	2,010	54	37
INGAL	.4	165	685	1,913	1,713	54	32
INGAL	1.2	2,340	1,820	1,950	1,517	54	28
NOGAL	.5	886	770	1,772	1,540	54	29
TORAL	12	29,047	25,200	2,421	2,100	42	50
NIP	1	2,268	1,317	2,268	1,317	40	33

GRASSES

CROP	ACRES	YIELD IN POUNDS		YIELD/AC., LBS.	
		GROSS	NET	GROSS	NET
ARCTARED	3	500	300	267	100
ARCTARED	4		447		112
SOURDOUGH	3.5		90		26
SOURDOUGH	.8		2		3
NUGGET	2	385	176	193	88
NUGGET	1.5	260	107	174	71
ALYESKA	1.5	244	116	163	77
ALYESKA	1.2	116	83	97	69
IAS 572	.6	101	80	168	133
NORCAST	3	330	279	110	93
POLAR	2	414	185	207	93

APPENDIX C.

SEED PROCESSING RECORDS: 1984

CROP	PRETRTMT.	29-D SCREENS				ADD'L.	COMMENT
		1	2	3	4	TRTMT.	
GRAINS:							
WEAL		14	1/13x1/2	13	1/12x1/2	UITAVAX	
LIDAL		14	1/13x1/2	13	1/12x1/2	UITAVAX	
DATAL	SCALPER	13	1/13x1/2	12	8	UITAVAX	8 takes off black buckwheat
THUAL		14	1/13x1/2	13	1/12x1/2	INDENT	rerun on 29-D
		13	1/13x1/2	12	1/12x1/2		
OTAL	DEBEARDER	14	1/13x1/2	13	1/12x1/2	INDENT	
CHENA		12	1/13x1/2	11	1/12x1/2		
INGAL		13	1/14x1/2	12	1/13x1/2		
NOGAL		12	1/13x1/2	11	1/12x1/2		
TORAL		15	1/13x1/2	9/64x3/4	1/12x1/2	29-D	14 for resalp
NIP		16	1/13x1/2	9/64x3/4	1/12x1/2		
GRASSES:							
ARCTARED	DEBEARDER	1/12	6x34	1/22x1/2	6x32	CARTER	FAN LOW
SOURDOUGH	DEBEARDER	1/12	50x50	1/25	60x60	CARTER	FAN LOW
NUGGET	DEBEARDER	1/14	6x42	1/15	6x40	CARTER	FAN LOW
ALYESKA	SCALPER	1/17	6x42	1/18	6x40	CARTER	
IAS 572	SCALPER	1/17	6x42	1/18	6x40	CARTER	
NORCOAST	SCALPER	1/14	6x40	1/15	6x42		
POLAR	DEBEARDER	12	6x24	1/12x1/2	5 tr'le.	CARTER	

APPENDIX D.

1984 WEATHER SUMMARY

MONTH	MAX. °F.	MIN. °F.	NO. DAYS ≤ 32 °F	MEAN °F.	TOTAL IN. PRECIP.	NO. DAYS PRECIP.*	SNOW COVER RANGE, IN.
JANUARY	48	-34	29	13.7	2.07	13	0-5
FEBRUARY	42	-32	29	13.7	1.42	6	1-15
MARCH	54	-4	27	35.3	.05	1	0-11
APRIL	58	20	22	38.3	.97	6	0-2
MAY	68	24	18	46.2	.29	5	0
JUNE	76	32	3	54.7	1.74	8	0
JULY	77	41	0	56.9	1.60	17	0
AUGUST	77	25	4	55.4	2.51	11	0
SEPTEMBER	68	26	12	47.9	2.13	6	0
OCTOBER	57	3	26	33.6	.59	8	0
NOVEMBER	44	-13	29	14.2	.88	3	0-1
DECEMBER	47	-18	29	16.8	2.60	7	0-8
TOTAL	77	-34	228	35.6	16.85	91	0-15

*measureable

GLOSSARY OF VARIETIES

GRAIN VARIETIES, developed by the Alaska Agricultural Experiment Station and the U.S.D.A. unless otherwise noted.

BARLEYS, 6-row spring feed type (Hordeum vulgare)

'Datal': short, early maturing, stiff-strawed, high yield.

'Edda': released 1943 by the Swedish Svalof Branch Station, recommended and distributed to Alaska farmers in 1951, standard by which new varieties are judged.

'Finnaska': a Rovaniemi, Finland selection.

'Lidal': early maturing, fair resistance to lodging and head shattering, high protein.

'Otal': mid-tall, earliest maturing, stiff-strawed, high yield.

'Otra': originated in Finland, early maturing, good yields, susceptible to head shatter.

'Thual': naked kernel, therefore high bushel weight and low fiber content, possible for swine or human consumption.

'Weal': Hooded, beardless variety developed primarily for annual forage mixtures, good resistance to lodging.

WHEATS, hard red spring (Triticum aestivum)

'Chena': selected in Finland in 1970, bearded, medium height, wide range adaptation, suitable for bread.

'Gasser': selection from cross made around 1940 at Fairbanks, released in 1953, with earliness from Russian parent, standard b which new wheats compared.

'Ingal': short, early maturing, stiff-strawed, resistant to lodging, high protein.

'Nogal': early maturing, stiff-strawed, large kernelled, primarily a feed grain.

WHEATS, hard red winter (Triticum aestivum)

'Froid' (Montana Experiment Station): winterhardy, tall, stem rust resistant.

'Norstar' (Lethbridge Alberta Research Station): winterhardy, high yielding, good baking, milling, shatter resistant.

'Roughrider' (North Dakota State University): winterhardy, early maturing, lodging, and stem rust resistant, satisfactory milling, baking.

OATS (*Avena sativa*)

'Ceal': white, early, mid-tall, lodging-resistant, for grain production.

'Golden Rain': Swedish variety widely grown in Alaska, used as standard for comparing newer varieties.

'Nip': black, Swedish, early maturing, lodging, and shatter resistant, recommended for grain and forage.

'Toral': yellow, mid-season, mid-tall, high yielding, for grain or as component of oat-pea forage mix.

RYE (*Secale cereale*)

'Bebral': tall, winter, for baking.

GLOSSARY OF VARIETIES

GRASS VARIETIES, developed by the Alaska Agricultural Experiment Station and the U.S.D.A. unless otherwise noted.

- 'Alyeska' polargrass (Arctagrostis latifolia):
spreading, medium-to-tall with relatively wide leaves, stout rhizomes, recommended for revegetation mixes in acid soils in arctic, alpine, or coastal tundra regions of Alaska.
- 'Arctared' fescue (Festuca rubra):
creeping red fescue, tested, and released primarily for its winter hardy dense turf and for revegetation.
- 'Egan' American sloughgrass (Beckmannia syzigachne):
medium-tall tufted perennial adapted to seasonally flooded areas from southcentral to arctic areas. For wetland reclamation and waterfowl feed. PMC release.
- 'Engmo' timothy (Phleum pratense):
introduced from northern Norway, major forage grass, tolerates acid soils.
- 'Gruening' alpine bluegrass (Poa alpina):
short, non-rhizomatous perennial bunchgrass suitable for erosion control and reclamation in the interior and gravelly alpine sites not suited to other bluegrasses. PMC release.
- 'Kenai' polargrass (Arctagrostis latifolia):
medium-tall revegetation and forage grass for the central interior to the southern coast, For cold, wet soils. Tolerates acid soils and winter ponding and icing.
- 'Norcoast' Bering hairgrass (Deschampsia beringensis):
medium to tall with narrow leaves, recommended for wet, coastal, or tundra reclamation.
- 'Nortran' tufted hairgrass (Deschampsia caespitosa):
a composite from collections in Alaska and Iceland, for revegetation in southcentral and interior Alaska. Tolerates acid soils; rust and snow mold resistant.
- 'Nugget' Kentucky bluegrass (Poa pratensis):
semi-dwarf, winterhardy, rhizomatous, primarily used for a dense, dark green turf.
- 'Polar' brome (Bromus inermis X pumpellianus):
medium to tall, winterhardy, stoloniferous, relatively wide leaves, used for forage on soils with pH above 5.5.
- 'Sourdough' bluejoint reedgrass (Calamagrostis canadensis):
medium to tall, rhizomatous, relatively wide leaves, adapted to a wide range of sites, suitable for Arctic revegetation.
- 'Tundra' glaucous bluegrass (Poa glauca):
short, produces basal clump of narrow leaves, recommended for Arctic revegetation.

APPENDIX G.

1984 ADVERTISEMENT

ALASKA AGRICULTURAL MARKET REPORT

March 6, 1984

FOUNDATION SEED AVAILABLE

The following seed will be available for the production of registered or certified seed. Those growers receiving Foundation seed allocations will be required to participate in the seed certification and inspection program.

The demand for Foundation seed has usually exceeded the supply. Allocation will be made according to the grower's known "track record" and seed production experience in Alaska and elsewhere. In this regard, it will be helpful if applicants indicate the cultural practices to be used in growing this year's seed crop. Every attempt will be made to assure that every grower gets some seed in order to become better acquainted with the management requirements of seed production.

Allocations will be determined by a committee composed of a representative from the Alaska Division of Agriculture, the Alaska Crop Improvement Association, and the Alaska Agricultural Experiment Station.

All requests for Foundation seed must be postmarked by March 24, 1984 to: Alaska Plant Materials Center, Attn: E. Heyward, SR B Box 7440, Palmer 99645.

Payment will be by check only at time of pick up. Prices may vary slightly. In some cases, additional lots of these varieties are available but vary in weed seed content or germination.

Kind	Variety	Pounds	Class	Germination	Cost
BARLEY	Thual	800	Foundation	85%	\$28.36/cwt
	Weal	14,700	Foundation	90%	28.36/cwt
	Lidal	14,600	Foundation	85%	28.36/cwt
	Datal	6,450	Foundation	94%	28.36/cwt
	Otal	1,980	Foundation	84%	28.08/cwt
WHEAT	Ingal	550	Foundation	84%	33.70/cwt
	Froid (wtr)	295	Common	74%	23.35/cwt
	R'rider "	1,083	Common	75%	23.35/cwt
	Chena	1,000	Common	90%	24.91/cwt
	Nogal	500	Foundation	40%	20.76/cwt
OATS	Nip	800	Common	88%	20.73/cwt
	Toral	21,000	Foundation	82%	27.32/cwt
RYE	Bebral	432	Foundation	89%	22.94/cwt
RAPESEED	Candle	6,895	Common	90%	23.98/cwt
GRASS	Nugget	2,625	Foundation	97%	8.00/lb
	Arctared	275	Foundation	89%	10.00/lb
	Engmo	325	Common	77%	4.50/lb
	Norcoast	239	Foundation	80%	10.00/lb
	Alyeska	108	Foundation	88%	35.00/lb