

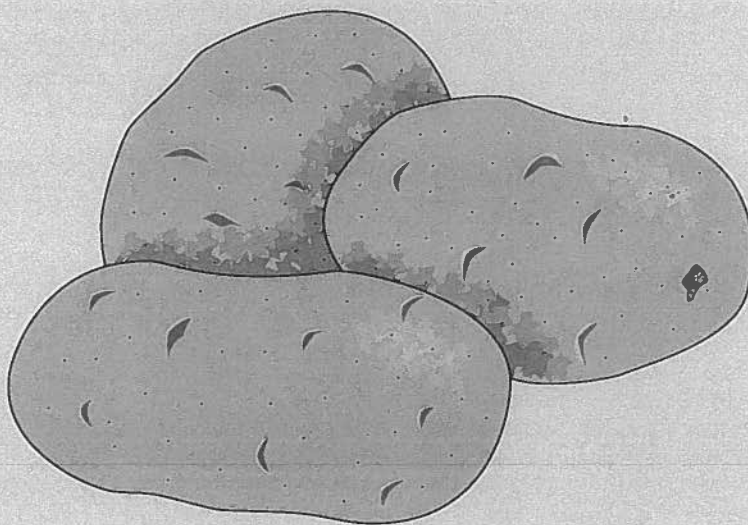
# POTATO VARIETY PERFORMANCE ALASKA 1992

by

**D. E. Carling**  
Professor of Horticulture

and

**P. C. Kroenung**  
Horticulture Field Supervisor



Palmer Research Center  
Agricultural and Forestry Experiment Station  
School of Agriculture and Land Resources Management

**U**NIVERSITY OF **A**LASKA **F**AIRBANKS

---

## TABLE OF CONTENTS

	Page
Introduction .....	1
Matanuska Farm Yield Trials .....	1
Cultural Practices and Environmental Conditions .....	1
Results and Discussion .....	2
Trials at Other Locations in Alaska .....	2
General Procedures .....	2
Site-Specific Information .....	3
Delta Junction.....	3
Fairbanks .....	3
Homer .....	3
Juneau .....	3
Kenai-Soldotna .....	3
Kodiak .....	3

## LIST OF TABLES

Table 1:	Climatic data for Matanuska Farm during the 1992 growing season .....	3
Table 2:	Irrigated yield trial summary, Matanuska Farm—1992 .....	4
Table 3:	Nonirrigated yield trial summary, Matanuska Farm—1992 .....	5
Table 4:	Comparative summary of US #1 tuber yields of selected varieties in irrigated trials conducted from 1988 through 1992 .....	6
Table 5:	Comparative summary of US #1 tuber yields of selected varieties in nonirrigated trials conducted from 1988 through 1992 .....	6
Table 6:	Type and quantity of gradeout observed among selected varieties in irrigated and nonirrigated trials in 1992 .....	7
Table 7:	Yield trial summary from seven Alaskan locations in 1992.....	8
Table 8:	Length of the 1992 potato growing season at seven locations in Alaska .....	9



## INTRODUCTION

A yield trial in which 45 named varieties and numbered selections of potatoes were compared was conducted during the 1992 growing season at the University of Alaska Fairbanks, Agricultural and Forestry Experiment Station's Palmer Research Center, Matanuska Research Farm, located six miles west of Palmer, Alaska.

Varieties with a history of commercial production in the Matanuska Valley (Alaska 114, Bake-King, Green Mountain, and Superior) were included and serve as a comparative base for newly developed varieties, numbered selections or older varieties that have not been tested at this location. Varieties that compare favorably with the above listed standards may warrant consideration by commercial growers.

Nonirrigated trials have been conducted annually since 1982, whereas irrigated trials were initiated in 1985 (AFES Circular 49, 54, 58, 65, 71, 77, 84, and 89). They are available at the AFES offices in Fairbanks and Palmer.

Included in this report are the results of abbreviated versions of the AFES potato yield trial conducted by cooperating individuals and agencies at other locations in Alaska including Delta Junction, Fairbanks, Homer, Juneau, Kenai-Soldotna, and Kodiak.

## MATANUSKA FARM YIELD TRIALS

### Cultural Practices, Environmental Conditions

Irrigated and nonirrigated field trials were planted at the Matanuska Farm on May 7, one week earlier than in 1991. Seedbed preparation included chisel plowing to a depth of 8 to 10 inches followed by discing and packing. Seedbed preparation was scheduled to permit planting as quickly as possible after tilling, thereby minimizing loss of early spring moisture from the soil. Four replicates of each variety, with 20 individual plants per replicate, were planted in rows 36 inches apart in a randomized complete block design. Seed pieces were planted approximately 11 inches apart in the row and covered with 2 to 3 inches of packed soil with a single row Iron Age® assist feed planter. Granular fertilizer was applied at the rate of 120 pounds N, 240 pounds P<sub>2</sub>O<sub>5</sub>, and 240 pounds K<sub>2</sub>O per acre by the planter in bands beside and below the seed. The composition of the fertilizer applied to one acre was 471 pounds of monoammonium phosphate, 400 pounds of muriate of potash, 138 pounds of urea, and 191 pounds of limestone filler. Tensiometers were installed at depths of 12 and 18 inches in the irrigated plots. Water was applied when tensiometer readings reached 40 centibars. Weeds were controlled by a pre-emergent application of Linuron (Lorox®) followed by cultivation and hand weeding when necessary. Plots were hilled in the last week of June.

Seed used in these trials was produced on the Matanuska Farm from stocks inherited from the discontinued USDA potato breeding program, from the Alaska Division of Agriculture, or from stocks acquired from various certification agencies in the contiguous 48 states and Canada. This seed may have contained certain latent viruses. Seed of all varieties was dipped in a 1.85 % aqueous solution of formaldehyde for two minutes at room temperature to kill any pathogenic fungi or bacteria present on the tuber surfaces. Dipping in formaldehyde was completed prior to any break in dormancy to avoid damage to developing sprouts which are quickly killed by formaldehyde. The principal target of the formaldehyde dip was the disease-causing fungus *Rhizoctonia solani*. Seed of most varieties consisted of tuber pieces weighing 1.5 to 2 ounces that were cut from 6 to 10 ounce tubers. Seeds of remaining varieties were whole tubers weighing from 2 to 4 ounces.

Soil moisture was very low leading into the planting season, permitting a relatively early planting date. Planting was completed on May 7, six days earlier than in 1991. Air temperatures in May (Table 1) were slightly below average (45.4 vs 47°F), but the early planting date in combination with the nearly average temperatures caused plants to emerge earlier than we have seen in the past 10 years.

Rainfall in May and June, typically the driest months of the summer, was near the long-term average. This, in combination with low soil moisture going into the season, resulted in very dry soil throughout June. Tensiometer readings indicated plants in the nonirrigated plots were under moisture stress for most of the month of June, and by early July plants in irrigated plots clearly appeared to be larger and more vigorous than their nonirrigated counterparts.

More than two inches of rain fell in July (near the long term average for the month of July, Table 1), and this lowered but did not eliminate moisture stress on plants in the nonirrigated plots. Air temperatures remained slightly above average during the midsummer months, and this contributed to the persistent moisture stress in the nonirrigated plots.

August rainfall was only 40% of the average for this month, continuing further the chronic moisture stress in the nonirrigated plots. At our location it is unusual for so little rain to fall in August. Ordinarily it is not necessary to apply water to the irrigated plots during this part of the summer, however, in 1992, it was necessary. Total rainfall for the summer of 1992 was 7.49 inches, nearly two-inches below the long-term average of 9.46 inches.

September was marked by unusually low temperatures. The average daily mean air temperature was more than 8°F below the long term average. The average daily minimum for the month was 29.4°F, more than 2.5°F below freezing. September 1992 was,



by nearly 2°F, the coldest September at Matanuska Farm in the 57 years that such records have been kept.

Matanuska Valley commercial potato growers, and we at the Agricultural and Forestry Experiment Station, have learned to expect warm days after the first freezing nighttime temperatures of the year. In 1992 however, freezing nights were followed by cold days until finally it was no longer possible to harvest. We managed to harvest all of our experiment plots, completing harvest of the yield trials on September 9. During grading, though, we discovered more frost-damaged tubers than any time during this investigators tenure (which began in 1981). Some commercial growers harvested a portion of their acreage after it had been seriously damaged by frost. Others were not able to complete the harvest because of frozen ground.

## RESULTS AND DISCUSSION

Harvest data summaries from the irrigated and nonirrigated trials are presented in Tables 2 and 3, respectively. The average total yield for all 45 varieties was 19.3 tons/acre in the irrigated trials and 12.3 tons/acre in the nonirrigated trials. Yields of US #1 tubers were 15.3 and 9.3 tons/acre in the irrigated and nonirrigated trials respectively. The top yielding variety in irrigated trials was IditaRed (22.4 tons/acre US #1), followed by Red Warba, Nipigon, Kennebec, and Kutri Jeevan, all of which yielded more than 20 tons/acre of US #1 tubers. The most popular commercially grown varieties, Bake-King and Shepody, yielded 16.2 and 15.6 tons/acre of US #1 tubers respectively. In the nonirrigated trial the top yielding varieties were Gold Coin (13.6 tons/acre US #1), Kennebec, Green Mountain, and Red Warba. Shepody and Bake-King yielded 11.7 and 9.3 tons/acre US #1 tubers respectively under nonirrigated conditions.

Comparisons have been drawn between average yields in the nonirrigated trials from year to year. In a previous report (Circular #89), it was noted that there was no significant moisture stress in May and June 1990, but severe moisture stress during the month of July. The 1990 crop was so severely damaged during this critical period of growth that yields from nonirrigated plots averaged approximately 34% of yields from the irrigated plots. The 1991 season also had a period of extreme drought, but it occurred during May and June, followed by ample rainfall in July. Yields across varieties from the nonirrigated plots in 1991 averaged approximately 81% of yields in irrigated plots, indicating the importance of water to the plants during the critical phases of plant development that occur in July. In 1992, yields from nonirrigated plots averaged approximately 62% of irrigated plot yields. Early season rainfall was adequate to maintain plant growth. July rainfall, though average in quantity, was not adequate to raise yields above 62% of the

irrigated plots. These observations again point to the importance of an abundant water supply during this critical phase of potato plant development in July.

The percent of harvest that met criteria for US #1 was somewhat lower than it has been in previous years. This was due in large part to low temperatures during harvest and the increase in damage to tubers that results when harvesting occurs under these conditions. Specific gravity values also were lower than usual, possibly due to the less than average number of sunny days after June.

Production by selected varieties over the past five years is summarized in Table 4 (irrigated) and Table 5 (nonirrigated). Under irrigated conditions (Table 4) it can be seen that 1992 was comparable to 1991, but approximately one ton/acre below the five year average. Under nonirrigated conditions (Table 5), 1992 is shown to be clearly lower than 1991 production and also below the five year average. Tables 4 and 5 also demonstrate over this five year period that irrigation not only results in consistently higher yields, but also eliminates the wild fluctuations in yield that can be expected under nonirrigated conditions.

Specific types of gradeout for 11 varieties under irrigated and nonirrigated conditions are summarized in Table 6. Alaska 114 produced a high percentage of undersize tubers in both trials, an observation typical for this variety. Bake-King once again had one of the very highest percentages of US #1. Lemhi Russet had one of the lowest percentages of US #1 tubers, with most gradeout falling in the undersize, growth crack, and green categories.

For the second year, five foreign varieties, including Caulin Alto, Chilac Ancyd, Isla Cauchua, Kamarez, and Kutri Jeevan, were included in this variety trial. Kamaraz was developed in Minsk, Belarus, while the origin of the others, although probably Asian, is not known. Kutri Jeevan did very well in the irrigated trial, whereas Caulin Alto ranked near the top of the nonirrigated trial. Isla Cauchua did poorly in both trials, and Kamaraz did very poorly in the nonirrigated trial. The primary weakness of each of these varieties is tuber size, as up to 30% of the total yield is too small to qualify for the US #1 category. This, along with other problems such as eye depth and tuber shape, probably would eliminate these varieties from serious consideration by commercial growers. However, all appear to possess good cooking qualities and may be able to find a niche in the specialty market.

## TRIALS AT OTHER LOCATIONS IN ALASKA

### General Procedures

Ten potato varieties were planted by cooperators at six other locations throughout Alaska. Some of the cooperators are private citizens, others are employed



by the Cooperative Extension Service or USDA. At the various locations, when environmental conditions permitted, seed pieces were planted in rows 36 inches apart and spaced 11 to 12 inches apart in the row. At most locations, commercial fertilizers were applied at a rate that was comparable to that applied at Matanuska Farm. Crop management, including irrigation, fertilization, weed control, and hilling, was carried out by each cooperator at the respective site and may have varied from site to site. Total and US #1 yields for varieties at each site are summarized in Table 7. Length of season at the six sites and at the Matanuska Farm (Palmer) are recorded in Table 8.

### Site Specific Information

**Delta Junction** — This plot was fertilized at the rate of 152-400-200-60 (N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O-S) pounds per acre and planted May 10, which was 10 days earlier than 1991. No irrigation water was applied, as rainfall was above average through late August. June was somewhat cooler than normal, whereas the later months were about 10% above normal temperatures. Grasshoppers, present in late July, damaged and may have reduced yields. A 24°F freeze occurred August 30 killing the vines to the ground. Harvest was completed the next day. *Cooperator: Don Quarberg, CES.*

**Fairbanks** — Plots were fertilized at the rate of 260-260-130 (N-P<sub>2</sub>O<sub>5</sub>-K) pounds per acre and planted June 4. Planting was delayed by old and new snow in May. Rainfall was above average in June but below average in July and August. Plots were irrigated four times between June 30 and August 4 to offset below average rainfall. Weeds were controlled with Linuron. The summer had average temperatures, except September which was the coldest on record. A 14°F frost killed vines September 9, and harvest was done September 23. Harvest was complicated by the 15 inches of snow that fell September 12 through 13. Eight inches of

snow remained on top of plots on harvest day, complicating an otherwise pleasant day of work. *Cooperator: J. S. Conn, ARS.*

**Homer** — Plots were planted May 15, after fertilization was 50 pounds of blood meal, 60 pounds of bone meal plus a seaweed, sawdust, halibut compost. Rainfall was below average through mid-July, then slightly above average through August. The season, as a unit, had below average rainfall, and above average in growing degree days. Vines were killed by a frost (approximately 27°F). Harvesting was September 14, 18 and 28. *Cooperators: Warren Larson, CES and Ted Reynolds, master gardener.*

**Juneau** — Plots were fertilized at the rate of 100-400-200 (N-P<sub>2</sub>O<sub>5</sub>-K) pounds per acre and planted June 15. Record high rainfall made irrigation unnecessary. Summer temperatures were below normal, and a 28°F frost destroyed vines September 11. Harvesting was done September 17. *Cooperator: Jim Douglas, CES.*

**Kenai-Soldotna** — Plots were fertilized at the rate of 180-360-360 (N-P<sub>2</sub>O<sub>5</sub>-K) pounds per acre and planted May 28. Rainfall was below normal early in the season and slightly above normal later. No irrigation water was applied. The number of growing degree days was 12% above normal for the season. Temperatures in the mid-20's killed the vines September 10, and harvesting began September 11 and was completed September 14. *Cooperator: Warren Larson, CES.*

**Kodiak** — Fertilizer was applied at the rate of 104-416-208 (N-P<sub>2</sub>O<sub>5</sub>-K) pounds per acre and plots were planted June 10. Ample rain fell each month during the season and irrigation was unnecessary. Temperatures were above average through August, but nearly 4°F below average in September. The first killing frost occurred September 17 and harvesting was done September 22. *Cooperator: Fred Sorenson, CES.*

**Table 1.** Climatic data for the Matanuska Farm during the 1992 growing season.

	May	June	July	August	September
Temp. (°F)					
Air					
Daily max.	56.1 (57.7) <sup>1</sup>	65.8 (65.3)	66.9 (67.4)	62.9 (64.9)	47.5 (55.3)
Daily min.	34.7 (36.2)	45.3 (44.2)	50.5 (47.8)	48.2 (45.8)	29.4 (37.8)
Daily mean	45.4 (47.0)	55.5 (54.7)	58.7 (57.6)	55.6 (55.4)	38.5 (46.6)
Soil (4" depth)					
Fallow	46.00	57.20	60.50	55.00	38.80
Sod	44.70	55.40	61.30	56.40	40.80
Precip. (in.)	0.73 (0.76)	1.51 (1.49)	2.28 (2.34)	1.00 (2.48)	1.97 (2.39)

<sup>1</sup> Values in parenthesis represent a 57 year average.

Table 2. Irrigated yield trial summary, Matanuska Farm – 1992.<sup>1</sup>

Variety	Skin <sup>2</sup>	US#1 <sup>3</sup>	Small <sup>4</sup>	Other <sup>5</sup>	Total	Percent US#1	Tuber Weight <sup>6</sup>	Specific Gravity
IditaRed	R	22.4	1.4	1.6	25.4	88.3	6.4	1.071
Red Warba	R	20.5	1.3	4.4	26.1	78.4	7.1	1.074
Nipigon	W	20.2	0.9	5.2	26.4	76.7	8.2	1.078
Kennebec	W	20.1	1.4	4.7	26.2	76.6	7.7	1.080
Kutri Jeevan	W	20.0	1.1	2.3	23.4	85.5	6.6	1.077
Chieftain	R	19.8	1.1	0.9	21.8	90.6	5.7	1.077
Gold Coin	W	19.7	1.7	1.3	22.7	86.8	7.3	1.086
Green Mountain	W	19.4	1.8	3.4	24.7	78.6	6.3	1.088
Red Pontiac	R	19.0	1.1	3.4	23.5	80.6	6.7	1.078
Sable	W	18.2	0.6	1.8	20.6	88.7	7.5	1.071
Alaska 114	W	18.1	2.2	1.0	21.2	85.3	5.5	1.084
Acadia Russet	Ru	17.4	1.5	1.5	20.4	85.4	7.2	1.086
Avon	W	17.2	1.1	4.1	22.4	76.7	7.0	1.078
Cherokee	W	16.8	1.2	4.4	22.5	74.8	6.2	1.082
Atlantic	W	16.7	1.1	3.0	20.9	80.0	6.5	1.099
Superior	W	16.6	1.0	2.4	20.0	82.9	6.7	1.078
Russet Burbank	Ru	16.3	2.0	2.7	21.0	77.8	5.9	1.095
Bake-King	W	16.2	0.6	0.7	17.5	93.0	7.4	1.095
Sangre	R	16.0	1.0	1.1	18.1	88.7	7.1	1.076
Katahdin	W	16.0	0.7	2.0	18.7	85.8	8.0	1.077
Caulin Alto	W	15.8	5.3	0.7	21.8	72.6	4.3	1.088
Shepody	W	15.6	1.2	2.7	19.5	79.9	8.6	1.083
6-78-139-80 <sup>7</sup>	W	15.4	2.1	1.1	18.6	82.7	5.3	1.075
Denali	W	15.4	0.9	1.5	17.8	86.4	6.6	1.098
Kamaraz	W	15.3	2.9	1.0	19.2	79.8	4.1	1.092
Chilac Ancyd	P	14.8	2.3	1.7	18.8	78.6	4.9	1.098
Norgold Russet	Ru	14.7	2.0	1.3	18.1	81.2	5.6	1.076
Yukon Gold	W	14.7	1.2	2.5	18.4	79.8	7.2	1.083
Batoche	R	13.9	1.1	3.4	18.4	75.4	6.3	1.080
Lemhi Russet	Ru	13.8	1.9	4.0	19.8	69.9	6.2	1.093
Russet Norkotah	Ru	13.4	2.2	1.6	17.2	77.8	6.5	1.075
Campbell 13	W	13.3	1.3	3.4	18.0	74.0	6.9	1.075
Alpha	W	13.1	1.4	4.1	18.5	70.4	5.1	1.092
Alaska Russet	Ru	12.8	2.3	1.9	16.9	75.4	6.0	1.084
Isla Cauahua	W	12.8	4.0	3.6	20.4	62.7	4.1	1.095
Monona	W	12.6	0.5	2.0	15.0	83.8	7.7	1.073
Hilite Russet	Ru	12.0	1.9	0.4	14.2	84.0	5.5	1.082
Allagash Russet	Ru	11.7	2.0	1.4	15.1	77.3	5.7	1.081
Nugget Russet	Ru	11.1	1.4	0.8	13.3	83.4	5.9	1.091
Agassiz	Ru	11.1	3.3	0.4	14.7	75.1	4.5	1.086
Alasclear	W	10.8	1.1	5.3	17.2	63.2	6.9	1.095
BelRus	Ru	10.5	1.2	0.3	12.0	87.7	5.2	1.092
Nooksack	Ru	10.4	0.3	1.4	12.1	85.9	7.1	1.088
Irish Cobbler	W	10.3	1.9	6.9	19.1	53.8	6.5	1.076
Coastal Russet	Ru	8.3	1.6	2.6	12.6	66.3	5.9	1.083
Average		15.3	1.6	2.4	19.3	79.3	6.3	1.084
LSD 5% <sup>8</sup>		3.3			2.9			

<sup>1</sup> Yields expressed in tons per acre.

<sup>2</sup> (R) = red skin, (Ru) = russet skin, (W) = white skin, (P) = purple skin.

<sup>3</sup> #1 market grade as defined by the USDA.

<sup>4</sup> Tubers less than 1.88 inches in diameter.

<sup>5</sup> Includes oversize, shatter or growth crack, second growth, green, etc.

<sup>6</sup> Average weight of #1 tubers in ounces.

<sup>7</sup> 6-78-139-80 originated in the breeding program of C.H. Dearborn.

<sup>8</sup> LSD: Least significant difference based upon type 1 comparisonwise error rate.



**Table 3. Nonirrigated yield trial summary, Matanuska Farm – 1992.<sup>1</sup>**

Variety	Skin <sup>2</sup>	US#1 <sup>3</sup>	Small <sup>4</sup>	Other <sup>5</sup>	Total	Percent US#1	Tuber Weight <sup>6</sup>	Specific Gravity
Gold Coin	W	13.6	1.0	0.8	15.4	88.5	6.1	1.099
Kennebec	W	13.5	0.6	0.4	14.5	92.9	6.7	1.098
Green Mountain	W	13.2	0.7	0.8	14.8	89.7	5.6	1.095
Red Warba	R	13.1	0.7	4.7	18.6	70.7	6.8	1.083
6-78-139-80 <sup>7</sup>	W	12.1	1.5	0.5	14.1	85.9	5.4	1.093
Sable	W	11.9	0.5	0.8	13.1	90.5	6.3	1.090
Caulin Alto	W	11.8	3.1	0.3	15.2	77.8	4.1	1.096
Shepody	W	11.7	0.5	1.0	13.3	88.5	8.1	1.097
IditaRed	R	11.6	1.3	1.8	14.7	79.1	5.3	1.085
Red Pontiac	R	11.5	0.6	3.4	15.5	74.2	6.1	1.090
Chieftain	R	11.4	1.1	1.4	13.9	82.0	5.4	1.088
Russet Burbank	Ru	11.4	1.7	2.5	15.5	73.3	5.7	1.101
Nipigon	W	11.2	0.5	3.2	14.9	75.2	7.1	1.094
Hilite Russet	Ru	10.7	1.1	0.2	12.0	89.1	5.6	1.091
Chilac Ancyd	P	10.6	1.4	0.7	12.7	83.3	4.3	1.107
Cherokee	W	10.3	0.8	1.4	12.6	82.3	4.8	1.095
Sangre	R	10.3	0.6	0.9	11.8	87.3	7.2	1.089
Allagash Russet	Ru	10.2	1.0	0.3	11.5	88.4	5.3	1.098
Alaska 114	W	10.1	1.5	0.2	11.7	86.1	4.6	1.102
Acadia Russet	Ru	9.9	1.0	0.9	11.8	83.9	5.6	1.095
Yukon Gold	W	9.8	0.5	0.6	10.8	90.7	6.3	1.102
Nugget Russet	Ru	9.6	1.0	1.4	12.1	79.7	5.4	1.104
Superior	W	9.6	1.0	0.5	11.1	86.1	4.9	1.098
Bake-King	W	9.3	0.6	0.6	10.6	87.9	6.9	1.097
Alasclear	W	9.2	0.7	2.4	12.4	74.5	6.5	1.100
Campbell 13	W	8.8	0.6	2.5	11.9	73.7	6.2	1.090
Atlantic	W	8.7	0.9	2.4	11.9	72.9	5.4	1.101
Batoche	R	8.6	1.0	1.2	10.8	79.9	5.9	1.088
Alpha	W	8.6	1.3	1.7	11.6	74.5	4.1	1.100
BelRus	Ru	8.5	1.0	0.1	9.5	89.2	5.1	1.106
Kutri Jeevan	W	8.5	0.8	2.3	11.5	73.8	5.8	1.087
Katahdin	W	8.4	0.3	1.6	10.3	81.0	7.0	1.090
Monona	W	8.3	0.4	0.4	9.1	91.1	6.5	1.086
Lemhi Russet	Ru	8.1	2.2	1.9	12.2	66.4	5.3	1.103
Isla Caucahua	W	7.9	3.9	2.7	14.5	54.4	3.9	1.102
Coastal Russet	Ru	7.7	1.6	0.2	9.5	81.1	5.2	1.096
Norgold Russet	Ru	7.6	1.3	2.9	11.8	64.5	5.1	1.095
Russet Norkotah	Ru	7.5	1.6	0.7	9.9	76.0	5.8	1.093
Denali	W	7.5	0.8	2.7	11.0	68.4	5.7	1.100
Avon	W	7.4	0.8	3.8	12.0	61.9	5.5	1.090
Nooksack	Ru	7.1	0.3	2.0	9.4	75.4	6.4	1.094
Alaska Russet	Ru	6.9	1.5	2.5	10.9	63.2	4.7	1.096
Agassiz	Ru	6.6	2.7	0.0	9.3	70.8	4.1	1.093
Kamaraz	W	6.3	1.8	3.8	11.9	52.7	4.1	1.103
Irish Cobbler	W	6.0	1.2	4.8	12.0	50.3	4.8	1.085
Average		9.6	1.1	1.6	12.3	78.0	5.6	1.095
LSD 5% <sup>8</sup>		2.3			2.0			

<sup>1</sup>Yields expressed in tons per acre.

<sup>2</sup>(R) = red skin; (Ru) = russet skin; (W) = white skin; (P) = purple skin.

<sup>3</sup>#1 market grade as defined by the USDA.

<sup>4</sup>Tubers less than 1.88 inches in diameter.

<sup>5</sup>Includes oversize, shatter or growth crack, second growth, green, etc.

<sup>6</sup>Avg. weight of #1 tubers in ounces.

<sup>7</sup>6-78-139-80 originated in the breeding program of C.H. Dearborn.

<sup>8</sup>LSD: Least significant difference based upon type 1 comparisonwise error rate.

**Table 4. Comparative summary of US#1 tuber yields of selected varieties in irrigated trials conducted from 1988 through 1992.<sup>1</sup>**

Variety	1988	1989	1990	1991	1992	Average <sup>2</sup>
Alaska 114	—	20.6	22.1	19.3	18.1	20.0
Bake-King	—	20.3	18.5	15.8	16.2	17.7
Denali	—	18.2	17.5	20.4	15.4	17.9
Green Mountain	19.4	23.3	22.8	20.6	19.4	21.1
IditaRed	17.8	22.4	22.4	19.3	22.4	20.9
Kennebec	—	20.9	16.8	18.9	20.1	19.2
Lemhi Russet	16.3	20.9	19.6	14.3	13.8	17.0
Russet Burbank	13.6	14.3	15.5	—	16.3	14.9
Shepody	16.9	17.9	16.2	14.9	15.6	16.3
Superior	18.2	20.5	18.4	18.2	16.6	18.4
6-78-139-80	21.3	22.2	20.4	12.5	15.4	18.4
LSD 5% <sup>3</sup>	2.7	2.1	3.5	2.7	3.3	
Average	17.4	20.2	19.1	17.4	17.2	18.3

<sup>1</sup>Yields expressed in tons per acre; "—" indicates variety not tested. #1 market grade as defined by the USDA.  
<sup>2</sup>Average calculated on yields from 1988-1992.  
<sup>3</sup>Least significant difference.

**Table 5. Comparative summary of US#1 tuber yields of selected varieties in nonirrigated trials conducted from 1988 through 1992.<sup>1</sup>**

Variety	1988	1989	1990	1991	1992	Average <sup>2</sup>
Alaska 114	—	16.9	6.0	13.9	10.2	11.8
Bake-King	—	16.3	6.9	13.6	9.3	11.5
Denali	—	13.2	6.5	12.8	7.5	10.0
Green Mountain	—	18.5	8.6	16.7	13.2	14.3
IditaRed	9.9	18.0	5.4	17.5	11.6	12.5
Kennebec	11.9	17.5	9.9	15.8	13.5	13.7
Lemhi Russet	—	16.2	5.4	12.2	8.1	10.5
Russet Burbank	11.9	12.6	7.1	—	11.4	10.8
Shepody	14.4	15.7	7.5	11.4	11.7	12.1
Superior	10.9	14.8	3.7	15.4	9.6	10.9
6-78-139-80	17.2	18.2	8.0	11.7	12.1	13.4
LSD 5% <sup>3</sup>	2.1	1.9	2.0	2.2	2.3	
Average	12.6	16.2	6.6	14.1	10.7	12.0

<sup>1</sup>Yields expressed in tons per acre; "—" indicates variety not tested. #1 market grade as defined by the USDA.  
<sup>2</sup>Average calculated on yields from 1988-1992.  
<sup>3</sup>Least significant difference.



Table 6. Type and quantity of gradeout observed among selected varieties in irrigated and nonirrigated trials in 1992.<sup>1</sup>

	Total	#1	Under size	Over size	Shatter crack	Growth crack	Green	Other <sup>2</sup>
Acadia Russet	11.8 20.4	9.9 (83.9) 17.4 (85.4)	1.0 (8.7) 1.5 (7.4)	0.4 (3.1) 0.0 (0.0)	0.4 (3.4) 0.1 (0.4)	0.0 (0.0) 0.0 (0.0)	0.1 (0.6) 1.2 (5.9)	0.1 (0.3) 0.2 (0.9)
Alaska 114	11.7 21.2	10.1 (86.1) 18.1 (85.3)	1.5 (12.4) 2.2 (10.4)	0.0 (0.0) 0.0 (0.0)	0.1 (0.7) 0.0 (0.0)	0.1 (0.4) 0.1 (0.5)	0.1 (0.4) 0.7 (3.3)	0.0 (0.0) 0.1 (0.5)
Allagash Russet	11.5 15.1	10.2 (88.4) 11.7 (77.3)	1.0 (8.6) 2.0 (13.2)	0.0 (0.0) 0.0 (0.0)	0.0 (0.0) 0.0 (0.0)	0.2 (1.8) 1.0 (6.6)	0.1 (1.2) 0.3 (1.8)	0.0 (0.0) 0.2 (1.1)
Bake-King	10.6 17.5	9.3 (87.9) 16.2 (93.0)	0.6 (6.0) 0.6 (3.3)	0.0 (0.0) 0.0 (0.0)	0.1 (0.7) 0.1 (0.5)	0.2 (1.6) 0.0 (0.0)	0.2 (2.0) 0.3 (1.6)	0.1 (1.8) 0.3 (1.6)
Gold Coin	15.4 22.7	13.6 (88.5) 19.7 (86.8)	1.0 (6.4) 1.7 (7.5)	0.0 (0.0) 0.1 (0.4)	0.4 (2.4) 0.0 (0.0)	0.3 (1.7) 0.5 (2.2)	0.1 (0.8) 0.5 (2.2)	0.1 (0.3) 0.2 (0.9)
Green Mountain	14.8 24.7	13.2 (89.7) 19.4 (78.6)	0.7 (4.8) 1.8 (7.3)	0.0 (0.0) 0.3 (1.2)	0.3 (2.1) 0.2 (0.8)	0.1 (0.9) 1.1 (4.5)	0.1 (1.0) 0.9 (3.6)	0.2 (1.3) 1.0 (4.0)
IditaRed	14.7 25.4	11.6 (79.1) 22.4 (88.3)	1.3 (8.9) 1.4 (5.5)	0.2 (1.6) 0.2 (0.6)	0.9 (6.0) 0.6 (2.3)	0.6 (4.0) 0.3 (1.1)	0.0 (0.0) 0.2 (1.0)	0.1 (0.4) 0.3 (1.2)
Lemhi Russet	12.2 19.8	8.1 (66.4) 13.8 (69.9)	2.2 (17.8) 1.9 (9.6)	0.0 (0.0) 0.0 (0.0)	0.1 (0.2) 0.4 (2.3)	1.2 (10.0) 0.9 (4.7)	0.4 (3.0) 2.0 (9.9)	0.3 (2.6) 0.7 (3.6)
Sangre	11.8 18.1	10.3 (87.3) 16.0 (88.7)	0.6 (4.9) 1.0 (5.4)	0.0 (0.0) 0.0 (0.0)	0.7 (5.9) 0.4 (2.2)	0.2 (1.6) 0.2 (1.3)	0.0 (0.0) 0.2 (0.9)	0.1 (0.3) 0.2 (1.5)
Shepody	13.3 19.5	11.7 (88.5) 15.6 (79.9)	0.5 (4.0) 1.2 (6.1)	0.1 (1.1) 0.4 (2.0)	0.1 (1.0) 0.1 (0.3)	0.1 (0.4) 0.1 (0.1)	0.4 (3.7) 0.7 (3.6)	0.2 (1.3) 1.6 (8.1)
Superior	11.1 20.0	9.6 (86.1) 16.6 (82.9)	1.0 (9.3) 1.0 (5.0)	0.0 (0.0) 0.0 (0.0)	0.1 (1.3) 0.8 (3.8)	0.2 (1.8) 0.4 (2.1)	0.2 (1.5) 0.9 (4.4)	0.0 (0.0) 0.4 (1.8)

<sup>1</sup> Weights expressed in tons per acre; values in parenthesis indicate percent of total yield.

<sup>2</sup> Includes primarily second growth, plus rotten, misshapen, etc.

\*shaded lines represent irrigated trials; lines not shaded weren't irrigated.

Table 7. Yield trial summary from selected Alaskan locations in 1992.<sup>1</sup>

Variety	Delta		Fairbanks		Homer		Kenai Soldotna		Kodiak		Palmer		Juneau	
	#1 <sup>2</sup>	Total <sup>3</sup>	#1	Total	#1	Total	#1	Total	#1	Total	#1	Total	#1	Total
Alaska 114	3.9	9.6	12.5	15.1	13.7	18.2	13.7	16.5	0.0	3.8	18.1	21.2	3.9	8.2
Allagash	8.2	16.0	10.9	13.6	13.5	18.7	6.6	8.7	0.0	5.4	11.7	15.1	2.7	7.7
Atlantic	7.8	19.0	7.9	15.7	21.6	26.9	13.9	16.3	0.0	5.0	16.7	20.9	3.7	8.1
Bake-King	5.3	10.9	10.4	12.2	19.8	23.1	10.1	12.1	1.1	5.2	16.2	17.5	6.9	10.6
Green Mountain	8.3	18.2	13.3	16.1	22.8	32.7	16.3	19.9	0.2	9.6	19.4	24.7	7.6	13.1
IditaRed	9.7	19.7	14.4	19.0	14.0	20.5	13.4	17.4	1.1	10.5	22.4	25.4	7.3	9.4
Kennebec	12.2	29.8	12.9	19.7	24.1	25.1	12.6	14.7	0.5	5.1	20.1	26.2	8.2	18.6
Shepody	9.9	17.1	10.0	13.0	18.1	23.9	9.2	12.9	0.4	6.2	15.6	19.5	6.4	9.1
Superior	7.5	12.8	9.1	11.6	16.6	20.4	9.3	11.2	0.8	6.4	16.6	20.0	3.8	5.3
6-78-139-80	3.6	16.1	8.7	11.9	18.2	22.0	13.0	15.4	0.4	5.8	15.4	18.6	2.0	4.1

<sup>1</sup> All #1 and total yields are expressed in tons per acre. Yield figures represent the average of three replications at all locations except Palmer.

<sup>2</sup> #1 market grade as defined by the USDA.

<sup>3</sup> Total yield = #1 plus gradeout. Gradeout includes undersize, oversize, growth and shatter crack, green, etc.



*Table 8. Length of the 1992 potato growing season at seven locations in Alaska.*

Location	No. of days from plant to harvest	Killing frost <sup>1</sup>	No. of days from plant to killing frost
Delta Junction	102	1	101
Fairbanks	110	13	97
Homer	122	4	118
Kenai-Soldotna	107	2	105
Kodiak	104	5	99
Palmer	124	0	124 <sup>2</sup>
Juneau	94	6	88

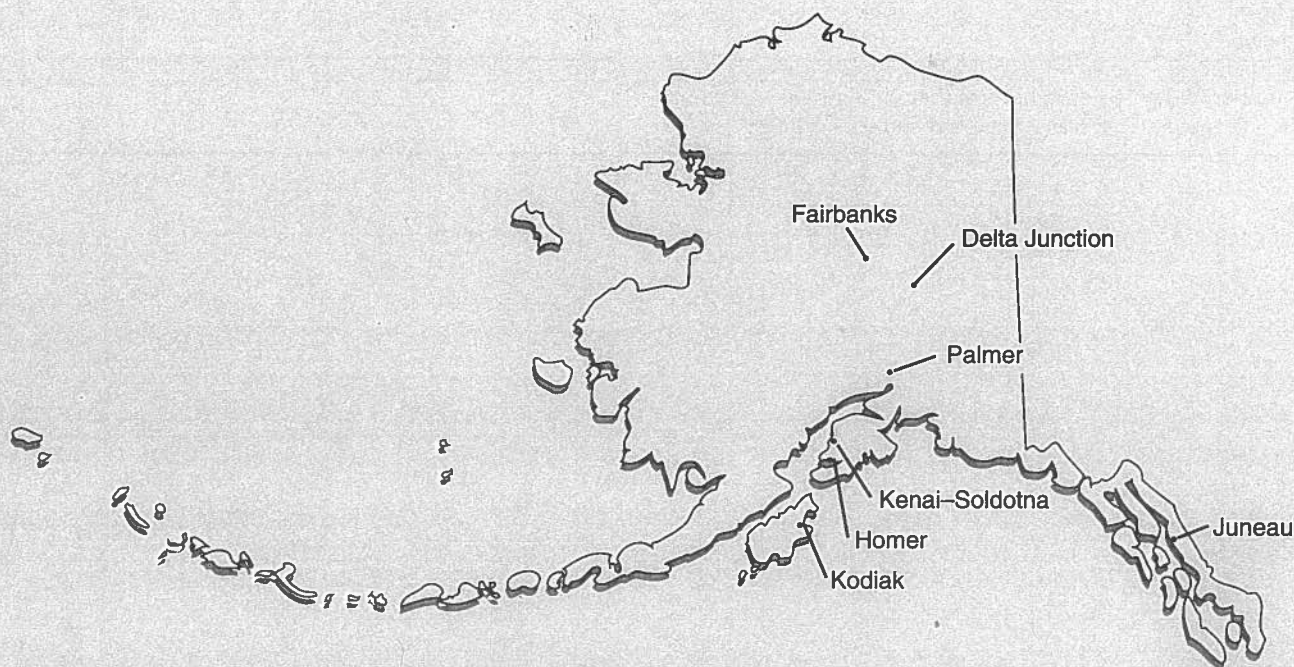
<sup>1</sup>Number of days prior to harvest that killing frost occurred.  
<sup>2</sup> In one case harvest was completed before a killing frost.

### *Acknowledgements*

*We wish to acknowledge the contribution of the following people, without whose voluntary help the off-station trials would not have been possible.*

1. Delta Junction: Don Quarberg, Cooperative Extension Service (CES)
2. Fairbanks: J.S. Conn, USDA, Agricultural Research Service
3. Homer: Warren Larson, CES
4. Juneau: Jim Douglas, CES
5. Kenai-Soldotna: Warren Larson, CES
6. Kodiak: Fred Sorenson, CES

# Potato trial locations



*The University of Alaska Fairbanks provides equal education and employment opportunities for all, regardless of race, color, religion, national origin, sex, age, disability, status as a Vietnam era or disabled veteran, marital status, changes in marital status, pregnancy, or parenthood pursuant to applicable state and federal laws.*

*In order to simplify terminology, trade names of products or equipment may have been used in this publication. No endorsement of products or firms mentioned is intended, nor is criticism implied of those not mentioned.*

*Material appearing herein may be reprinted provided no endorsement of a commercial product is stated or implied. Please credit the researchers involved and the Agricultural and Forestry Experiment Station, University of Alaska Fairbanks.*