



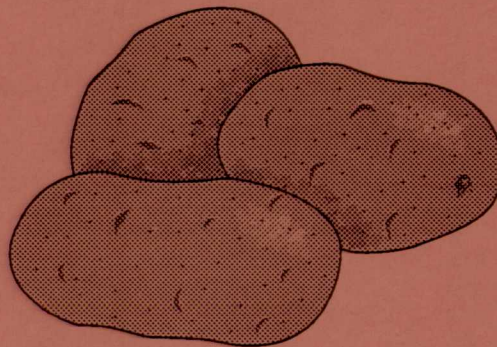
POTATO VARIETY PERFORMANCE ALASKA 1990

by

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TABLE OF CONTENTS

	PAGE
Introduction.....	1
Matanuska Farm Yield Trials	1
Cultural Practices - Environmental Conditions	1
Results and Discussion.....	3
Trials at Other Locations in Alaska.....	10
General Procedures	10
Specific Site Information	11
Delta Junction	11
Fairbanks	11
Homer	11
Juneau	11
Kenai - Soldotna	11
Kodiak	11
Seward	11

LIST OF TABLES

Table 1: Climatic data for Matanuska Farm during the 1990 growing season	2
Table 2: Irrigated yield trial summary, Matanuska Farm – 1990	4
Table 3: Non-irrigated yield trial summary, Matanuska Farm – 1990	5
Table 4: Comparative summary of US #1 tuber yields of selected varieties in irrigated trials conducted from 1986 through 1990	6
Table 5: Comparative summary of US #1 tuber yields of selected varieties in non-irrigated trials conducted from 1986 through 1990	7
Table 6: Type and quality of gradeout observed among selected varieties in irrigated and non-irrigated trials in 1990	8
Table 7: Yield trial summary from selected Alaskan locations in 1990	9
Table 8: Length of the 1990 potato growing season at eight locations in Alaska	10

Introduction

A yield trial which compared 45 named varieties and numbered selections of potatoes was conducted during the 1990 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) are 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.

Non-irrigated trials have been conducted annually since 1982; irrigated trials were initiated in 1985 (AFES Circulars 49, 54, 58, 65, 71, and 77). These circulars 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 eight locations in Alaska.

Matanuska Farm Yield Trials

Cultural Practices and Environmental Conditions

Duplicated trials, irrigated and non-irrigated, were planted at the Matanuska Farm on May 9 and 10, respectively. Seedbed preparation included moldboard plowing to a depth of 8-10 inches followed by discing and packing. Seedbed preparation was scheduled to permit planting as quickly as possible after tilling thereby minimizing the loss of early spring moisture from the soil. Four randomly placed (randomized complete block design) replicates of each variety, with 22 individual plants per replicate, were planted in rows 36 inches apart. Seed pieces were planted approximately 11 inches apart in the row and covered with 2-3 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 P₂O₅ and 240 pounds K₂O 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 the tensiometers readings reached 40 centibars. Weeds were controlled by a pre-emergent application of metribuzin (Sencor[®]) followed by cultivation and hand weeding. Plots were hilled on June 22.

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 in order to kill any pathogenic fungi or bacteria present on the tuber surfaces. The principal target of the formaldehyde dip was the disease-causing fungus *Rhizoctonia solani*. Seed pieces weighing 1.5 to 2.0 ounce were cut from 6 to 10 ounce tubers.

Soil moisture was high at planting time and in the early part of the growing season. Above average snowfall the previous winter plus twice the average amount of rainfall in May (Table 1) accounted for the abnormally high level of soil moisture. Emergence was nearly 100 percent for all varieties, indicating the comparatively high soil moisture conditions did not promote seed piece decay and interfere with germination.

Air temperatures were more than 3°F above the average for May. The warm temperatures promoted rapid emergence but also accelerated the loss of moisture from the soil. High temperatures, along with below average rainfall in June (Table 1), made it necessary to begin applying water to the irrigated plots as soon as the plants emerged. Above average temperatures continued through June and July.

Table 1. Climatic data for Matanuska Farm during the 1990 growing season.

	May	June	July	August	September
Temp. (°F)					
Air					
Daily max.	60.4 (57.7) ¹	68.0 (65.2)	71.0 (67.5)	67.6 (65.0)	56.9 (56.4)
Daily min.	40.2 (36.2)	47.0 (44.1)	48.8 (47.7)	47.3 (45.7)	42.2 (38.6)
Daily mean	50.3 (47.0)	57.5 (54.7)	59.9 (57.6)	57.5 (55.4)	49.6 (47.5)
Soil (4" depth) ²					
Fallow	46.0	55.0	58.0	56.0	47.0
Sod	42.0	55.0	59.0	55.0	50.0
Precip. (in.)	1.53 (0.76)	1.13 (1.52)	0.21 (2.36)	1.79 (2.54)	4.92 (2.45)

¹ Values in parenthesis represent a 55-year average.
² Soil temperatures were recorded at the Palmer Research Center, 533 E. Fireweed, Palmer, AK.

Normal precipitation in July averages nearly 2.4 inches, but in July, 1990 only 0.21 inches fell. This deficiency greatly stressed plants in the non-irrigated plots at a time when plant development was rapid and the demand for water great. Water was applied, when necessary, to the irrigated plots through July and into August, essentially eliminating stress due to lack of water. During this period, plants in the non-irrigated plots displayed symptoms of severe water stress including wilting, leaf rolling, and stunting.

Mean air temperatures remained above average throughout the growing season and rainfall was well below average through August. Nearly five inches of rain fell in September, but it was too late for the non-irrigated plants to overcome the effects of earlier drought stress. In spite of the severe drought in the middle of the growing season, 4.92 inches of precipitation in September raised the growing season total to within 0.05 inches of the 55-year average.

The irrigated and non-irrigated plots were harvested on September 11. In previous years lifting was done mechanically followed by hand harvesting. In 1990, the yield trials were harvested with a one-row Juko[®] mechanical harvester. Harvested tubers were placed in plastic tubs or burlap bags and stored in a refrigerated cellar until grading. The harvested crop went into storage in very good condition, in spite of relatively wet conditions at the time of harvest. No frost damage was encountered, as freezing temperatures did not occur until well after harvest.

Results and Discussion

Results of the irrigated and non-irrigated trials are summarized in Tables 2 and 3 respectively. The average total yield for all varieties was 23.6 tons/acre in the irrigated and 8.3 tons/acre in the non-irrigated trial. Yields of US #1 tubers averaged 25-30% less than total yields. The top yielding variety in the 1990 irrigated trial was Acadia Russet with a US #1 yield of 23.6 tons/acre (Table 2). Acadia Russet was followed closely by Green Mountain, IditaRed, and Alaska 114, each of which yielded more than 22 tons/acre of US #1 tubers. Ten varieties yielded more than 20 tons/acre of US #1 tubers, and 13 varieties had total yields greater than 25 tons/acre in the irrigated trial.

Average yield of US #1 tubers in the non-irrigated trial was 5.9 tons/acre (Table 3), approximately 33% of average US #1 tuber yield in the irrigated trial. Similarly, total yield in the non-irrigated trial was approximately 35% of the average total yield in the irrigated trial. Top yielding varieties in the non-irrigated trial included Kennebec, Alpha, Katahdin, and Green Mountain.

Russet skinned varieties yielded comparatively better in 1990 than in previous years. This year, for the first time, a russet skinned variety had the highest yield of US #1 tubers (Table 2) in the irrigated trial. Five russet skinned varieties (Acadia Russet, Hilite Russet, Nugget Russet, Coastal Russet, and Lemhi Russet) yielded 19.6 tons/acre or more of US #1 tubers. This improvement in performance, relative to white skinned varieties, may be due in large part to the warmer temperatures which, in effect, lengthened the season. We have observed the performance of many russet skinned varieties improve when the growing seasons are longer.

Average specific gravity among varieties in the irrigated trial was 1.083, whereas the average specific gravity among the same varieties in the non-irrigated trials was 1.105. This difference in specific gravity between irrigated and non-irrigated trials is greater than it has been in previous years and probably is due to the extreme drought stress experienced by the non-irrigated trial. In previous years a moderate amount of drought stress has not been sufficient to alter specific gravity.

A comparison of yields of selected varieties under irrigated conditions for the past five years (Table 4) illustrates that the 1990 production year is second only to 1989. Both the 1989 and the 1990 growing seasons were much warmer than average; 1990 was also much drier. The extreme stress imposed by drought on all varieties is clearly illustrated in Table 5.

Specific types of gradeout are identified in selected varieties in Table 6. Most characteristic weaknesses of varieties are indicated again in 1990, such as the tendency of Shepody to get too big and the tendency of Russet Burbank to shatter crack. However, two atypical observations also were made. There were high percentages of undersized and green tubers. The large percentage of undersized tubers can be explained by the severe drought stress. The relatively high percentages of green, however, has no obvious explanation. One possible reason is that large yields caused cracks to form in the hills. This in turn exposed developing tubers to sunlight which caused them to turn green. This is possible, and is supported by the fact that percentages of green were far higher in the irrigated plots prior to the first frost.

Table 2. Irrigated yield trial summary, Matanuska Farm - 1990.¹

Variety ²	US #1 ³	Small ⁴	Other ⁵	Total	Percent US #1	Tuber Weight ⁶	Specific Gravity
Acadia Russet	23.6	1.8	1.8	27.3	86.5	6.7	1.087
Green Mountain	22.8	1.9	4.7	29.5	77.4	6.4	1.092
IditaRed	22.4	1.4	2.3	26.1	85.8	6.8	1.078
Alaska 114	22.1	2.1	2.8	26.9	82.0	5.3	1.090
Hilite Russet	21.1	1.2	0.7	23.0	91.7	7.4	1.087
Caribe	20.6	0.6	6.4	27.5	74.8	8.5	1.078
Nugget Russet	20.5	1.7	1.2	23.3	87.8	5.9	1.103
3-79-280-81	20.5	1.5	1.8	23.8	85.9	6.4	1.088
Coastal Russet	20.4	1.1	1.3	22.8	89.6	6.8	1.091
6-78-139-80	20.4	3.3	2.2	25.9	78.9	5.4	1.088
Sable	19.9	0.6	3.4	24.0	83.1	7.6	1.082
Reddale	19.9	1.1	5.1	26.0	76.2	8.6	1.079
Sangre	19.8	0.9	4.9	25.5	77.6	7.2	1.081
Bintje	19.8	3.4	2.0	25.1	78.6	5.0	1.086
Lemhi Russet	19.6	2.7	4.7	27.0	72.8	6.1	1.102
Alpha	19.6	1.4	5.1	26.1	75.2	6.1	1.098
Snowchip	19.6	2.3	5.3	27.1	72.2	6.0	1.090
Rosa	19.1	1.6	3.5	24.1	79.1	5.3	1.083
3-79-270-81	19.1	1.7	3.8	24.5	77.8	6.9	1.086
NorKing Russet	18.7	1.3	2.9	23.0	81.5	6.2	1.095
Bake-King	18.5	1.1	1.6	21.3	87.1	6.4	1.097
Superior	18.4	0.9	4.6	23.8	77.1	6.7	1.084
Atlantic	18.0	1.2	4.8	23.9	75.1	6.3	1.099
Alasclear	17.9	1.0	3.4	22.4	80.1	6.6	1.092
Columbia Russet	17.7	2.0	5.1	24.9	71.3	5.7	1.098
Allagash	17.6	1.4	2.2	21.2	83.2	6.4	1.083
Denali	17.5	0.9	4.9	23.3	74.9	6.8	1.105
Nooksack	17.0	0.3	4.4	21.8	78.2	7.6	1.097
Kennebec	16.8	1.1	8.5	26.4	63.5	7.7	1.091
Shepody	16.2	1.0	6.9	24.1	67.2	8.4	1.092
Russette	16.0	0.8	2.7	19.5	81.9	6.7	1.100
Maverick	15.8	1.3	5.5	22.6	70.1	6.2	1.079
Russet Burbank	15.5	0.9	2.8	19.2	80.7	7.0	1.097
Katahdin	15.3	0.9	8.7	24.9	61.4	8.3	1.087
Krantz	14.9	0.7	3.3	18.8	79.2	7.6	1.089
Nemarus	14.9	1.5	7.1	23.5	63.3	7.1	1.085
Alaska Russet	14.7	2.1	4.8	21.6	68.2	5.8	1.088
Monona	14.5	0.7	5.4	20.5	70.5	7.2	1.082
Yukon Gold	14.4	0.9	9.1	24.5	58.9	7.7	1.089
Agassiz	14.2	3.9	1.8	19.9	71.5	4.5	1.088
6-5	13.8	1.2	5.8	20.7	66.5	7.0	1.088
Jemseg	13.5	1.1	8.6	23.2	58.3	7.5	1.082
Russet Norkotah	12.2	2.4	3.7	18.3	66.8	5.7	1.083
ND 860-2	11.9	3.6	2.8	18.3	64.6	4.4	1.090
Irish Cobbler	11.5	1.3	11.5	24.2	47.3	6.2	1.082
Average	17.7	1.5	4.4	23.6	75.1	6.6	1.083
LSD 5% ⁷	3.5			3.4			

¹ Yields expressed in tons per acre.

² Numbered selections originated in the breeding program of C.H. Dearborn.

³ #1 market grade as defined by the US Department of Agriculture.

⁴ Tubers less than 1.75 inches in diameter.

⁵ Includes oversize, shatter or growth crack, second growth, green, etc.

⁶ Average weight of #1 tubers in ounces.

⁷ LSD: Least significant difference based upon type 1 comparisonwise error rate.

Table 3. Non-irrigated yield trial summary, Matanuska Farm - 1990.¹

Variety ²	US #1 ³	Small ⁴	Other ⁵	Total	Percent US #1	Tuber Weight ⁶	Specific Gravity
Kennebec	9.9	1.0	0.6	11.5	86.1	5.1	1.104
Alpha	9.4	2.0	0.0	11.5	82.0	4.0	1.103
Katahdin	9.3	1.0	0.8	11.1	83.8	5.4	1.101
Green Mountain	8.6	2.0	0.4	11.0	77.7	4.3	1.105
Nooksack	8.5	0.6	0.9	10.0	85.0	5.6	1.101
6-78-139-80	8.0	3.0	0.1	11.1	72.4	3.7	1.097
Nugget Russet	7.7	1.9	0.3	10.0	77.8	4.0	1.109
Caribe	7.7	1.0	0.0	8.7	88.3	4.3	1.108
Russette	7.7	1.6	0.3	9.6	80.2	4.4	1.108
Shepody	7.5	1.2	0.6	9.2	80.7	5.2	1.103
Sangre	7.4	1.8	0.1	9.3	79.7	4.1	1.095
Reddale	7.1	0.8	1.4	9.3	76.6	5.1	1.096
Russet Burbank	7.1	1.8	0.5	9.4	75.5	4.3	1.109
Sable	7.1	0.9	0.1	8.1	88.0	4.2	1.101
Acadia Russet	7.1	2.2	0.3	9.5	74.1	4.4	1.104
Bake-King	6.9	1.5	0.1	8.6	81.0	4.6	1.108
Denali	6.5	1.4	1.0	9.0	72.9	4.1	1.109
Atlantic	6.5	1.6	0.4	8.6	76.0	4.1	1.109
Maverick	6.3	2.2	0.1	8.6	73.4	3.8	1.103
Alaska 114	6.0	3.4	0.0	9.4	64.1	3.5	1.107
Columbia Russet	6.0	1.9	1.1	9.0	66.8	4.1	1.104
3-79-280-81	6.0	2.1	0.2	8.4	71.6	4.0	1.105
Nemarus	5.8	2.7	0.4	8.9	65.7	4.3	1.104
Alasclear	5.8	2.3	0.3	8.4	68.5	4.1	1.109
Bintje	5.6	4.2	0.1	9.9	56.2	3.4	1.102
IditaRed	5.4	2.2	0.3	7.9	68.6	3.9	1.093
Lemhi Russet	5.4	3.3	0.1	8.8	61.4	3.9	1.109
Irish Cobbler	5.4	2.0	0.3	7.7	70.4	3.4	1.106
Coastal Russet	5.4	2.5	0.0	8.0	68.0	4.8	1.102
Yukon Gold	5.4	1.4	0.1	6.9	78.1	4.4	1.108
Monona	5.3	1.4	0.1	6.8	78.3	3.9	1.103
NorKing Russet	5.2	2.4	0.1	7.7	67.8	4.0	1.106
Snowchip	5.2	3.1	0.1	8.4	62.1	3.7	1.104
Hilite Russet	4.9	2.0	0.1	7.0	69.6	4.4	1.100
Rosa	4.8	2.2	0.1	7.1	67.6	3.4	1.107
Krantz	4.6	1.2	0.0	5.9	78.5	3.9	1.109
6-5	4.3	2.1	0.0	6.5	66.4	3.8	1.103
Allagash	3.8	3.2	0.1	7.2	53.2	3.8	1.108
Jemseg	3.8	2.0	0.1	5.8	64.6	3.8	1.107
Superior	3.7	2.9	0.2	6.8	54.4	3.4	1.109
3-79-270-81	2.8	3.2	0.3	6.3	44.5	3.9	1.102
ND 860-2	2.4	4.1	0.0	6.5	37.5	3.1	1.108
Alaska Russet	2.0	3.1	0.1	5.3	38.4	3.6	1.106
Agassiz	1.9	4.2	0.0	6.2	30.5	3.5	1.108
Russet Norkotah	0.8	3.9	0.0	4.7	16.1	3.6	1.106
Average	5.9	2.2	0.3	8.3	68.4	4.1	1.105
LSD 5% ⁷	2.0			2.1			

¹ Yields expressed in tons per acre.

² Numbered selections originated in the breeding program of C.H. Dearborn.

³ #1 market grade as defined by the US Department of Agriculture.

⁴ Tubers less than 1.75 inches in diameter.

⁵ Includes oversize, shatter or growth crack, second growth, green, etc.

⁶ Average weight of #1 tubers in ounces.

⁷ 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 1986 through 1990.¹

Variety	1986	1987	1988	1989	1990	Average ²
Alaska 114	12.2	13.6	-	20.6	22.1	17.1
Bake-King	12.3	13.8	-	20.3	18.5	16.2
Denali	12.3	12.1	-	18.2	17.5	15.0
Green Mountain	13.0	15.5	19.4	23.3	22.8	18.8
IditaRed	13.7	13.5	17.8	22.4	22.4	18.0
Kennebec	16.9	12.7	-	20.9	16.8	16.8
Lemhi Russet	10.8	13.6	16.3	20.9	19.6	16.2
Rosa	12.7	13.8	15.9	21.2	19.1	16.5
Russet Burbank	8.5	9.9	13.6	14.3	15.5	12.4
Shepody	12.8	12.4	16.9	17.9	16.2	15.2
Superior	14.2	14.5	18.2	20.5	18.4	17.2
6-78-139-80	15.7	14.1	21.3	22.2	20.4	18.7
3-79-270-81	15.4	11.1	-	19.5	19.1	16.3
LSD 5% ³	3.2	2.1	2.7	2.1	3.5	
Average	13.1	13.1	17.4	20.2	19.1	16.6

¹ Yields expressed in tons per acre (- indicates variety not tested).
#1 market grade as defined by the US Department of Agriculture.
² Average calculated on yields from 1986-1990.
³ Least significant difference.

Table 5. Comparative summary of US #1 tuber yields of selected varieties in non-irrigated trials conducted from 1986 through 1990.¹

Variety	1986	1987	1988	1989	1990	Average ²
Alaska 114	14.3	10.0	-	16.9	6.0	11.8
Bake-King	12.1	10.5	-	16.3	6.9	11.5
Denali	11.4	6.6	-	13.2	6.5	9.4
Green Mountain	15.5	12.4	-	18.5	8.6	13.8
IditaRed	14.0	9.7	9.9	18.0	5.4	11.4
Kennebec	13.6	12.0	11.9	17.5	9.9	13.0
Lemhi Russet	14.8	14.8	10.8	-	5.4	11.5
Rosa	14.1	11.6	13.9	16.8	4.8	12.2
Russet Burbank	11.0	10.2	11.9	12.6	7.1	10.6
Shepody	14.2	11.7	14.4	15.7	7.5	12.7
Superior	11.1	8.2	10.9	14.8	3.7	9.7
6-78-139-80	14.0	12.3	17.2	18.2	8.0	13.9
3-79-270-81	14.8	10.2	10.9	15.9	6.0	11.6
LSD 5% ³	2.5	2.0	2.1	1.9	2.0	
Average	13.5	10.5	12.6	16.2	6.6	11.9

¹ Yields expressed in tons per acre (- indicates variety not tested).
#1 market grade as defined by the US Department of Agriculture.

² Average calculated on yields from 1986-1990.

³ Least significant difference.

Table 6. Type and quantity of gradeout observed among selected varieties in irrigated and non-irrigated trials in 1990.¹

		Total	#1	Under size	Over size	Shatter crack	Growth crack	Green	Other ²
Acadia Russet	(NI) ³	9.5	7.1 (74.1)	2.2 (23.1)	0.0 (0.0)	0.2 (1.8)	0.0 (0.2)	0.0 (0.3)	0.0 (0.5)
	(I)	27.3	23.6 (86.5)	1.8 (6.7)	0.2 (0.8)	0.2 (0.8)	0.1 (0.2)	0.8 (2.9)	0.6 (2.1)
Alaska 114	(NI)	9.4	6.0 (64.1)	3.4 (35.9)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
	(I)	26.9	22.1 (82.0)	2.1 (7.7)	0.1 (0.5)	0.0 (0.0)	0.0 (0.1)	2.6 (9.5)	0.0 (0.1)
Allagash Russet	(NI)	7.2	3.8 (53.2)	3.2 (45.3)	0.0 (0.0)	0.0 (0.4)	0.0 (0.0)	0.1 (0.8)	0.0 (0.4)
	(I)	21.2	17.6 (83.2)	1.4 (6.4)	0.2 (1.0)	0.1 (0.6)	0.0 (0.1)	1.4 (6.6)	0.4 (2.2)
Bake-King	(NI)	8.6	6.9 (81.0)	1.5 (17.6)	0.0 (0.0)	0.1 (1.3)	0.0 (0.0)	0.0 (0.2)	0.0 (0.0)
	(I)	21.3	18.5 (87.1)	1.1 (5.3)	0.4 (2.0)	0.0 (0.2)	0.1 (0.4)	1.1 (4.9)	0.0 (0.0)
Green Mountain	(NI)	11.0	8.6 (77.7)	2.0 (18.5)	0.0 (0.0)	0.4 (3.4)	0.0 (0.0)	0.0 (0.0)	0.0 (0.4)
	(I)	29.5	22.8 (77.4)	1.9 (6.5)	0.9 (3.2)	0.3 (0.9)	0.1 (0.4)	2.9 (9.8)	0.5 (1.7)
IditaRed	(NI)	7.9	5.4 (68.6)	2.2 (27.5)	0.0 (0.0)	0.3 (3.4)	0.0 (0.0)	0.0 (0.2)	0.0 (0.2)
	(I)	26.1	22.4 (85.8)	1.4 (5.5)	1.4 (5.4)	0.4 (1.5)	0.1 (0.5)	0.1 (0.2)	0.3 (1.0)
Lemhi Russet	(NI)	8.8	5.4 (61.4)	3.3 (37.7)	0.0 (0.0)	0.0 (0.1)	0.0 (0.5)	0.0 (0.0)	0.0 (0.3)
	(I)	27.0	19.6 (72.8)	2.7 (9.9)	0.7 (2.6)	0.3 (0.9)	0.2 (0.7)	3.2 (11.7)	0.4 (1.4)
Russet Burbank	(NI)	9.4	7.1 (75.5)	1.8 (18.9)	0.0 (0.0)	0.5 (4.8)	0.0 (0.0)	0.1 (0.8)	0.0 (0.0)
	(I)	19.2	15.5 (80.7)	0.9 (4.5)	0.4 (2.3)	1.3 (6.8)	0.2 (0.9)	0.9 (4.5)	0.0 (0.2)
Sangre	(NI)	9.3	7.4 (79.7)	1.8 (19.3)	0.0 (0.0)	0.1 (0.6)	0.0 (0.0)	0.0 (0.2)	0.0 (0.3)
	(I)	25.5	19.8 (77.6)	0.9 (3.3)	2.1 (8.2)	0.1 (0.5)	0.2 (0.8)	2.1 (8.2)	0.3 (1.4)
Shepody	(NI)	9.2	7.5 (80.7)	1.2 (12.6)	0.2 (1.9)	0.0 (0.3)	0.0 (0.0)	0.4 (3.9)	0.1 (0.6)
	(I)	24.1	16.2 (67.2)	1.0 (4.0)	2.1 (8.7)	0.1 (0.4)	1.1 (4.5)	3.3 (13.7)	0.3 (1.4)
Superior	(NI)	6.8	3.7 (54.4)	2.9 (43.2)	0.0 (0.0)	0.1 (0.9)	0.0 (0.0)	0.0 (0.4)	0.1 (1.1)
	(I)	23.8	18.4 (77.1)	0.9 (3.6)	0.3 (1.4)	0.6 (2.3)	0.2 (0.7)	3.4 (14.1)	0.2 (0.8)

¹ Weights expressed in tons per acre. Values in parenthesis indicate percent of total yield.
² Includes primarily second growth, plus rotten and misshapen tubers.
³ (NI) = non-irrigated, (I) = irrigated.

Table 7. Yield trial summary from selected Alaskan locations in 1990.¹

Variety	Delta		Fairbanks		Homer		Juneau		Kenai-Soldotna		Kodiak		Seward		Palmer	
	#1 ²	Total ³	#1	Total	#1	Total	#1	Total	#1	Total	#1	Total	#1	Total	#1	Total
Alaska 114	8.0	12.9	14.6	16.9	8.0	14.8	3.6	9.0	14.0	18.9	1.8	6.5	6.5	12.4	22.1	26.9
Bake-King	11.0	14.5	12.5	13.8	5.3	8.8	4.2	6.5	10.3	12.2	3.8	7.8	8.2	10.2	18.5	21.3
Denali	9.4	12.3	11.4	13.0	6.6	10.0	6.4	9.3	9.1	13.7	2.4	6.9	6.9	11.7	17.5	23.3
Green Mountain	7.7	13.9	14.5	18.3	10.3	14.7	7.2	11.9	16.4	20.4	6.7	13.4	9.6	15.0	22.8	29.5
IditaRed	10.0	16.5	12.7	16.5	10.0	14.9	6.4	12.3	14.2	19.2	1.9	6.9	9.1	16.1	22.4	26.1
Kennebec	7.6	13.6	9.7	18.2	10.9	14.3	5.6	8.5	20.7	22.5	4.9	9.2	7.7	10.2	16.8	26.4
Lemhi	5.0	10.2	12.1	16.2	9.0	11.3	6.6	10.3	18.6	22.1	2.1	6.2	8.4	13.1	19.6	27.0
Shepody	8.0	11.8	10.1	14.7	7.8	11.0	4.3	8.2	14.7	16.3	3.3	6.8	8.9	10.6	16.2	24.1
Superior	7.2	10.0	15.0	16.4	17.1	19.5	6.6	9.9	13.2	17.3	6.7	12.7	6.2	10.8	18.4	23.8
3-79-270-81	5.9	11.7	11.9	14.8	4.8	7.4	4.1	7.3	12.5	15.0	1.4	5.0	6.6	10.4	19.1	24.5

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

² #1 market grade as defined by the US Department of Agriculture.

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

Trials at other locations in Alaska

General Procedures

Ten potato varieties were planted by cooperators at seven other locations throughout Alaska. Some of the cooperators are private citizens; others are employed by the Agricultural and Forestry Experiment Station, Cooperative Extension Service or U.S. Department of Agriculture agencies. At the various locations, when environmental conditions permitted, seed pieces were planted in rows 36 inches apart and spaced 11-12 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 seven sites and at the Matanuska Farm (Palmer) are recorded in Table 8.

Table 8. Length of the 1990 potato growing season at eight locations in Alaska.

Location	No. of days from plant to harvest	Killing frost ¹		No. of days from Plant to killing frost
Delta Junction	122	0	-	122
Fairbanks	112	0	-	112
Homer	98	0	-	98
Juneau	128	0	-	128
Kenai-Soldotna	110	0	-	110
Kodiak	113	3	(30°F)	110
Palmer	124	0	-	124
Seward	127	8	(26°F)	119

¹ Number of days prior to harvest that killing frost occurred, followed in parenthesis by the actual temperature.

Specific Site Information

Delta Junction (Cooperator, Don Quarberg-CES): Potatoes were planted on May 16. The growing season was extremely dry from the time of planting, until early August. No irrigation water was applied. A high population of shrews was present in the plot and did a moderate amount of damage to the tubers. Harvest was completed on September 14, prior to the first frost.

Fairbanks (Cooperator, J.S. Conn-USDA/ARS): The Fairbanks trial was planted on May 23. The growing season was relatively warm but also dry. Water was applied several times during the season through overhead sprinklers. Some water stress may have occurred early in the season when the irrigation system failed. This trial was harvested on September 12.

Homer (Cooperator, Warren Larson-CES): The Homer trial was planted on June 22. Fertilizer applied to the plot consisted of 50 lbs of blood meal and 60 lbs of burned bones; no traditional commercial chemical fertilizer was used. Plots were harvested on September 28, prior to any frost damage to the vines.

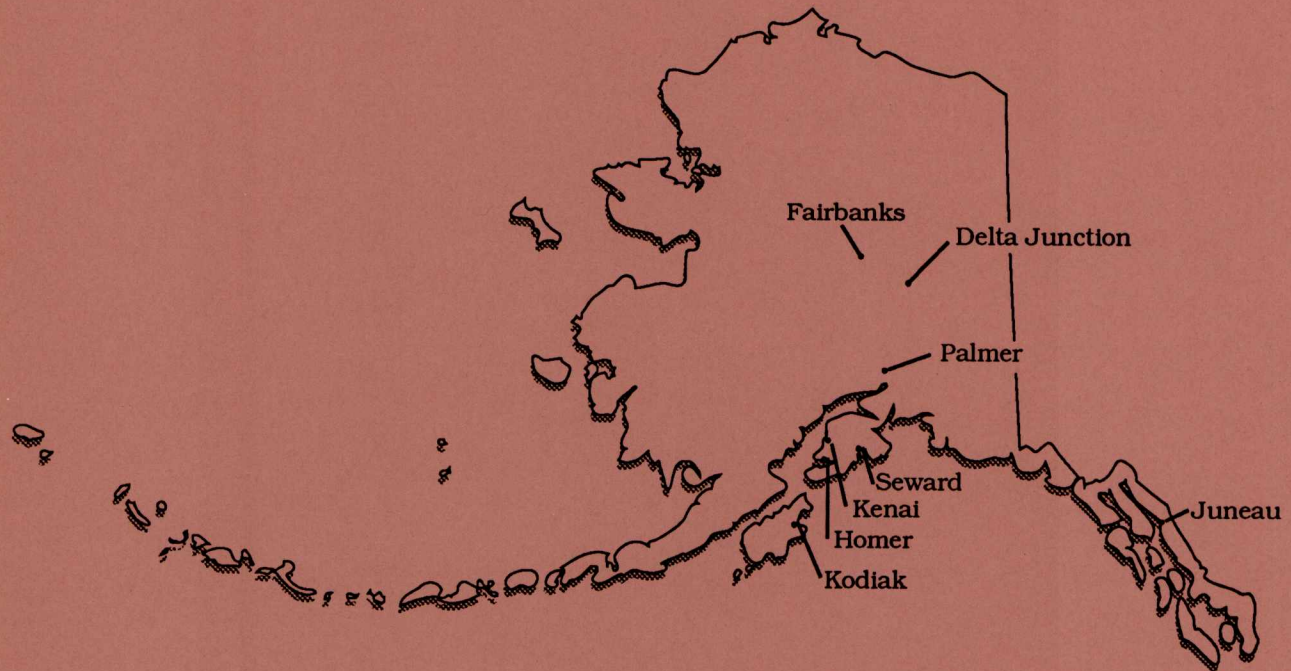
Juneau (Cooperator, Jim Douglas-CES): The Juneau potato trial was planted at the Lemon Creek Correctional Facility on May 15. Harvest was completed on September 20, prior to the first frost.

Kenai-Soldotna (Cooperator, Warren Larson-CES): Potatoes were planted at the Kenai Plant Test Site on May 24 and harvested on September 11, prior to any frost damage.

Kodiak (Cooperators, Fred Sorenson and Hank Pennington-CES): The Kodiak potato trial was planted at the Borough Fairgrounds, 10 miles south of Kodiak City, on June 7. Seed tubers were placed in raised beds built on 36 inch centers. Commercial fertilizer (8-32-16) was applied at the rate of 1400 lbs/acre. No pesticides or herbicides were used, and no irrigation water was applied. Potatoes were harvested on September 28, three days after a light frost damaged the vines.

Seward (Cooperator, Warren Larson-CES): The Seward potato trial was planted on June 4 and fertilized with commercial fertilizer (8-32-16) at the rate of 1380 lbs/acre. Plots were harvested on October 9, approximately eight days after the vines were killed to the ground by freezing temperatures.

Potato trial locations



Agricultural and Forestry Experiment Station
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