

**POTATO VARIETY PERFORMANCE  
ALASKA  
1985**

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**Agricultural and Forestry Experiment Station  
School of Agriculture and Land Resources Management  
University of Alaska-Fairbanks**

**James V. Drew, Dean and Director**

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by

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## TABLE OF CONTENTS

Introduction .....	1
Matanuska Valley Yield Trials.....	2
Trial Results .....	2
Other Yield Trials .....	7

## LIST OF TABLES

Table 1: Climatic data for Mananuska Farm during the 1985 growing season. ....	2
Table 2: Nonirrigated yield trial summary, Matanuska Farm.....	4
Table 3. Irrigated yield trial summary, Matanuska Farm. ....	5
Table 4: Comparative summary of US #1 tuber yields by selected varieties from 1982 through 1985.....	6
Table 5: Yield trial summary from summary from selected Alaska locations. ....	8

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## INTRODUCTION

Comparative yield of suitable, or potentially suitable, commercial production potato varieties were conducted during the 1985 growing season by the University of Alaska-Fairbanks, Agricultural and Forestry Experiment Station, Palmer Research Center. Forty named and numbered varieties were included in the 1985 trial. Numbered varieties originated in the potato-breeding program of Dr. C.H. Dearborn.

## MATANUSKA VALLEY YIELD TRIALS

Irrigated and nonirrigated plots were planted in fields located at the Matanuska Research Farm on Trunk Road in Palmer. Water requirements in irrigated plots were determined from tensiometers installed at 6-, 12-, or 18-inch depths at various locations throughout the plot.

Four replicates of each variety, with twenty-two seed pieces per replicate, were planted on May 17, 1985. Plants were spaced 11 inches apart in the row, and rows were spaced 36 inches apart. Granular fertilizer (8-32-16) was applied in bands at the time of planting at the rate of 1000 lbs/acre.

Plots were harvested on September 10 and graded in early October. Yield data are summarized in Tables 2 and 3.

### Trial Results

The 1985 Matanuska Valley growing season was cold and dry through May and June. Rainfall for both months was far below average (table 1), and the daily mean air temperature was well below average through June. Weather records from and including 1918 through 1984 reveal that eight Mays and only one June have had

**Table 1. Climatic data for Matanuska Farm during the 1985 growing season.**

	May	June	July	August	September
Temp. (°F)					
Air					
Daily max.	55.2 (57.7) <sup>1</sup>	66.8 (64.9)	67.8 (67.5)	62.2 (65.1)	55.4 (54.9)
Daily min.	33.7 (35.8)	41.5 (43.8)	49.2 (47.6)	43.9 (45.4)	37.0 (37.2)
Daily mean	44.5 (46.8)	51.2 (54.4)	58.5 (57.6)	53.1 (55.2)	46.2 (46.0)
Soil (4" depth) <sup>2</sup>					
Fallow	42.3	52.0	60.7	56.0	47.8
Sod	36.5	45.3	55.7	55.5	48.7
Precip. (in.)	0.46 (0.75)	0.88 (1.57)	1.48 (2.42)	2.99 (2.50)	3.59 (2.24)

<sup>1</sup> Values in parenthesis represent a 40-year average.

<sup>2</sup> Soil temperatures were recorded at the Palmer Research Center.

daily mean air temperatures lower than those of 1985. The cool temperatures delayed emergence, and the dry soils in nonirrigated plots further retarded plant development.

Temperatures increased to above-average levels in July, but rainfall for the month remained well below average. During this period, soil moisture in the nonirrigated plots was not sufficient for minimal plant needs, and foliar wilting occurred on warm days.

Rainfall was above average in August and September, but water stress in earlier months limited the value of the late-season rainfall for the nonirrigated plots. September rains interfered to some extent with harvest, and the incidence of soft rot among freshly harvested tubers was higher than in 1983 or 1984.

Yields from the nonirrigated plots averaged 35 per cent less than yields from the irrigated plots (tables 2 and 3). The most popular commercial varieties, including Bakeking, Green Mountain, and Superior, were among the top yielders in both irrigated and nonirrigated plots. Rosa, a white-skinned, red-eyed potato developed in New York yielded well in the nonirrigated trial. However, its specific gravity is somewhat low, and it remains to be seen if Rosa can withstand harvest and storage under Alaskan conditions.

Belrus, Butte, Nooksack, and Norgold Russet continue to perform poorly. Irrigation did not improve the relative position of these varieties among the forty varieties tested this year. Russette, a newly developed russet variety of some interest to local growers, also was near the low end of the yield list in both irrigated and nonirrigated trials.

Two varieties that continue to perform well are Shepody and 3-79-270-81. Both are long, white-skinned varieties that yield competitively. Both are of good eating quality, and Shepody possesses good processing characteristics. Processing characteristics, which indicate potential usefulness in the manufacture of chips, french fries, etc., have not been determined for cultivar 3-79-270-81.

US#1 yields by the most popular commercial varieties over the past four years are summarized in Table 4. Also included are several varieties that may be of commercial value in the future. Data summarized in this table permit comparisons among varieties on given years and the consistency of performance by varieties over the years.

**Table 2. Nonirrigated yield trial summary, Matanuska Farm.<sup>1</sup>**

Variety <sup>2</sup>	Per-acre yields in tons				Per cent US #1	Tuber Weight <sup>6</sup>	Specific Gravity
	US #1 <sup>3</sup>	Small <sup>4</sup>	Other <sup>5</sup>	Total			
Rosa	10.5	2.0	0.6	13.1	80.2	5.0	1.077
3-79-168-81	10.1	1.5	0.1	11.7	86.3	5.5	1.091
6-78-139-80	10.0	2.3	0.1	12.4	80.7	5.2	1.081
Kennebec	9.8	0.6	1.5	11.9	82.4	7.4	1.083
10-71-1-74	9.7	1.2	0.6	11.5	84.3	5.9	1.076
3-79-270-81	9.4	0.9	1.2	11.5	81.4	6.1	1.081
Shepody	9.4	0.6	0.5	10.5	89.3	6.3	1.083
Bakeking	9.3	0.7	0.1	10.1	91.7	5.6	1.095
18-6	9.2	1.9	1.1	12.2	75.1	5.1	1.074
Green Mt.	9.1	1.7	0.5	11.4	80.3	5.3	1.088
13-68-5-72	9.1	1.1	1.5	11.8	77.4	6.3	1.085
B8883-13	9.0	1.6	0.0	10.7	84.6	4.5	1.085
3-79-280-81	9.0	1.4	0.6	10.9	82.2	5.8	1.085
Superior	8.6	1.0	1.0	10.6	81.0	5.8	1.079
Alaska Red	8.5	2.2	0.5	11.3	76.0	5.3	1.085
Denali	8.5	1.0	0.3	9.8	86.6	5.5	1.097
Lemhi	8.4	1.6	1.3	11.3	74.1	5.4	1.093
Snowchip	8.3	1.7	0.2	10.3	80.8	4.8	1.083
6-5	8.2	1.6	0.5	10.3	79.9	5.0	1.082
Russet Burbank	8.2	2.1	1.0	11.3	72.9	4.4	1.093
Red Pontiac	8.2	1.7	2.0	12.0	68.6	5.5	1.074
Alasclear	8.2	0.8	1.7	10.7	76.6	5.7	1.088
Highlat Russet	8.2	1.4	0.4	10.0	81.9	5.1	1.087
Ak. Frostless	7.9	1.5	0.8	10.2	77.4	4.6	1.091
B7631-3	7.7	0.7	1.1	9.5	81.0	6.0	1.081
Allagash	7.7	1.2	0.8	9.7	79.4	6.0	1.081
3-79-366-81	7.7	2.1	0.5	10.3	74.8	5.1	1.082
Nooksack	7.5	0.8	1.3	9.5	78.5	6.0	1.091
Alaska 114	7.2	2.2	0.1	9.5	75.3	4.4	1.080
26-68-2-71	7.2	2.8	1.3	11.3	63.6	4.5	1.087
Alaska Russet	7.0	1.5	1.0	9.4	74.5	4.9	1.083
Epicure	6.9	1.8	1.0	9.7	71.3	4.9	1.087
Minn. Russet	6.7	0.9	0.9	8.5	78.8	5.5	1.080
Belrus	6.5	2.0	0.1	8.5	76.3	4.1	1.099
Onoway	6.3	1.3	2.3	9.8	64.4	5.8	1.074
Red Norland	6.2	0.8	2.5	9.5	65.2	5.4	1.074
Norchip	6.1	2.0	0.4	8.5	71.8	4.4	1.081
Russette	6.1	1.0	1.3	8.4	72.5	5.4	1.087
Butte	5.2	0.2	0.9	6.3	82.9	7.9	1.077
Norgold Russet	5.0	2.3	0.9	8.3	60.8	4.6	1.081
LSD 5% <sup>7</sup>	2.1	—	—	1.7	—	—	.004

<sup>1</sup> All figures represent least-square means of 4 replications. <sup>2</sup> Numbered varieties originated in the breeding program of C.H. Dearborn. <sup>3</sup> #1 market grade as defined by the US Department of Agriculture. <sup>4</sup> Tubers less than 1.75 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> LSD: Least significant difference based upon plot-wide variation.



**Table 3. Irrigated yield trial summary, Matanuska Farm.<sup>1</sup>**

Variety <sup>2</sup>	Per-acre yields in tons				Per cent US #1	Tuber Weight <sup>6</sup>	Specific Gravity
	US #1 <sup>3</sup>	Small <sup>4</sup>	Other <sup>5</sup>	Total			
Green Mountain	15.2	0.9	0.8	16.9	89.9	5.5	1.088
10-71-1-74	15.1	1.0	1.4	17.5	86.3	6.4	1.080
3-79-270-81	14.8	1.0	0.7	16.6	89.5	6.1	1.088
13-68-5-72	14.7	1.0	1.3	17.1	86.3	5.9	1.087
3-79-168-81	14.7	1.2	0.2	16.1	91.5	5.2	1.095
Superior	14.7	0.4	1.2	16.4	89.9	6.3	1.077
Bakeking	14.6	0.5	0.3	15.4	94.9	6.5	1.096
18-6	14.6	2.0	1.0	17.7	82.6	5.2	1.078
3-79-280-81	14.5	1.0	0.8	16.4	88.8	6.2	1.087
Rosa	14.4	2.3	0.4	17.0	84.6	4.9	1.077
Red Pontiac	14.4	1.1	1.7	17.1	83.8	5.4	1.078
Shepody	14.3	0.6	0.4	15.3	93.1	7.1	1.085
Epicure	14.0	1.9	0.8	16.7	83.9	5.4	1.087
Kennebec	13.8	0.6	2.4	16.8	81.9	6.8	1.084
6-78-139-80	13.8	2.5	0.6	16.9	81.9	4.7	1.086
26-68-2-71	13.5	3.4	2.3	19.2	70.4	5.1	1.088
Alaska 114	13.3	1.2	0.7	15.3	87.2	4.8	1.083
Alaska Red	13.3	1.6	0.6	15.6	85.6	4.8	1.086
B8883-13	13.2	1.3	0.2	14.7	89.5	5.0	1.085
B7631-3	13.1	0.4	1.5	14.9	87.9	6.9	1.082
Denali	13.1	0.8	0.5	14.5	90.8	5.9	1.100
Red Norland	13.1	0.8	2.2	16.0	81.5	5.9	1.075
Allagash	12.9	0.7	1.1	14.7	87.7	6.1	1.087
Ak. Frostless	12.9	0.7	1.5	15.0	85.6	4.4	1.090
6-5	12.6	2.0	0.2	14.9	84.9	5.4	1.088
Onoway	12.4	1.1	1.8	15.4	80.7	5.5	1.075
Lemhi	12.3	1.7	1.7	15.8	78.2	6.1	1.092
Snowchip	12.1	2.4	0.6	15.1	80.2	5.7	1.091
Alaska Russet	12.0	1.3	0.8	14.2	84.9	5.2	1.086
Alasclear	11.4	0.6	1.6	13.6	83.8	5.9	1.090
Minn. Russet	11.2	0.6	0.6	12.3	90.7	5.7	1.076
Norgold Russet	11.2	2.1	0.5	13.8	80.8	4.8	1.078
3-79-366-81	11.1	2.2	1.6	14.9	74.5	4.5	1.093
Russet Burbank	10.3	2.5	1.9	14.7	69.9	4.2	1.097
Belrus	10.1	1.8	0.3	12.2	83.4	4.6	1.098
Norchip	10.0	1.7	2.2	13.9	72.1	4.8	1.083
Russette	9.7	1.1	1.7	12.5	77.6	5.7	1.094
Highlat Russet	9.5	1.3	2.4	13.2	72.0	5.3	1.086
Butte	9.4	0.7	0.6	10.7	87.9	6.8	1.082
Nooksack	8.9	0.6	3.3	12.8	69.7	5.5	1.090
LSD 5% <sup>7</sup>	2.0	—	—	1.7	—	—	.003

<sup>1</sup> All figures represent least-square means of 4 replications. <sup>2</sup> Numbered varieties originated in the breeding program of C.H. Dearborn. <sup>3</sup> #1 market grade as defined by the US Department of Agriculture. <sup>4</sup> Tubers less than 1.75 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> LSD: Least significant difference based upon plot-wide variation.

**Table 4. Comparative summary of US #1 tuber yields by selected varieties from 1982 through 1985.<sup>1</sup>**

Variety	1982 <sup>2</sup>	1983 <sup>2</sup>	1984 <sup>2</sup>	1985 <sup>3</sup>	1985 <sup>2</sup>	Average
Alaska 114	12.0	16.7	14.2	13.3	7.2	12.7
Bakeking	16.5	12.4	12.4	14.6	9.3	13.0
Denali	12.6	13.1	12.6	13.1	8.5	12.0
Green Mountain	20.0	16.7	15.0	15.2	9.1	15.2
Kennebec	19.2	18.4	16.5	13.8	9.8	15.5
Lemhi	13.9	14.1	11.6	12.3	8.4	12.1
Rosa	17.1	—	—	14.4	10.5	14.0
Russet Burbank	9.9	15.2	9.2	10.3	8.2	10.6
Shepody	—	—	14.4	14.3	9.4	12.7
Superior	13.9	9.8	12.4	14.7	8.6	11.9
3-79-270-81	—	16.9	13.1	14.8	9.4	13.6
18-6	19.9	18.0	16.4	14.6	9.2	15.6
LSD 5% <sup>4</sup>	2.5	1.5	1.9	2.0	2.1	—
Average	15.5	15.1	13.4	13.8	9.0	13.4

<sup>1</sup> Yields expressed in tons per acre. (— indicates variety not tested)

<sup>2</sup> Not irrigated.

<sup>3</sup> Irrigated.

<sup>4</sup> Least significant difference.

## OTHER YIELD TRIALS

Replicated trials also were conducted at four other locations: Ambler, Fairbanks, Noorvik, and Soldotna. Three replicates of seven to ten varieties were planted at each location. Fertilizer application rates and plant and row spacings were similar to those described for the Matanuska Farm trial. Yield data from trials conducted at these locations are summarized in Table 5. Although not as detailed as the Matanuska Farm trials, these abbreviated studies are intended to be a brief comparative look at varietal performances in other parts of the state.

The growing season at Noorvik and Ambler were much shorter than at Palmer or Soldotna. Planting in Soldotna occurred on June 7 and harvest was completed 119 days later on October 4. Fairbanks plots were planted May 24 and harvested 108 days later on September 9. This compares with the 126 day growing season at Matanuska Farm this year. Frost was not a factor at Fairbanks or at either southcentral location. At Noorvik the crop was planted June 17 and harvested 92 days later on September 19. The first killing frost at Noorvik plots occurred on September 5. The Ambler plots were planted June 5 and harvested after 88 days on September 3. The first frost occurred in Ambler on August 17. Gradeout was high at all interior locations and was comprised primarily of undersized tubers. Scab was present on most tubers harvested at Noorvik. Rainfall was well below average in Ambler and Noorvik. Some irrigating was done in Ambler, but not in Noorvik.

**Table 5. Yield trial summary from selected Alaska locations.<sup>1</sup>**

Variety	Fairbanks		Soldotna		Noorvik		Ambler	
	#1 <sup>2</sup>	Total <sup>3</sup>	#1	Total	#1	Total	#1	Total
Green Mountain	5.7 <sup>1</sup>	12.3	14.5	16.7	4.7	8.7	7.5	14.5
Kennebec	11.9	14.5	14.5	17.9	1.1	2.9	8.9	14.0
Alaska 114	5.8	13.1	9.4	13.8	2.4	6.8	5.8	14.7
Bakeking	6.9	13.1	10.2	15.5	—	—	7.3	11.4
18-6	8.4	13.6	9.7	16.5	4.4	7.0	11.4	15.6
Lemhi	4.5	11.0	12.1	15.8	—	—	—	—
Denali	4.0	9.1	9.4	10.2	2.0	5.4	6.8	11.1
Highlat Russet	8.3	11.8	11.4	13.6	—	—	—	—
Shepody	10.6	12.6	16.7	19.6	—	—	—	—
10-1	10.9	14.8	10.2	13.6	4.2	7.5	6.5	11.8
Ak. Frostless	—	—	—	—	4.2	7.6	10.6	15.5

<sup>1</sup> All #1 yields and total yields are expressed in tons per acre. (— indicates variety not tested)

<sup>2</sup> #1 market grade as defined by the US Department of Agriculture.

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



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