

SUMMARY RESEARCH PROGRESS REPORT FOR 1989

AND RESEARCH PROPOSAL FOR 1990

Submitted to:

SLV Research Center Committee

and the

Area II Potato Administrative Committee

TITLE: Physiological and Cultural Studies

PROJECT LEADER: David G. Holm

PROJECT JUSTIFICATION:

Identification of the various strengths and weaknesses in potato clones for various postharvest storage, quality, and physiological characteristics is essential in the selection and release of new cultivars. Each year new selections are included in the postharvest testing scheme. Selections are generally evaluated for at least three years.

The development of improved cost effective potato production practices is a key component in maximizing the yield of quality potatoes.

PROJECT STATUS: This is an ongoing project.

SIGNIFICANT ACCOMPLISHMENTS FOR 1989:

A set of 107 clones (including duplicates and checks) was evaluated for two or more of the following characteristics: blackspot susceptibility, storage weight loss, dormancy, enzymatic browning, specific gravity, chip color, french fry color, and french fry texture.

Blackspot indices ranged from 2.1-5.0, with an average of 4.3. High levels of blackspot resistance (indices ≥ 4.1) were exhibited by 76% of the samples tested.

The average storage weight loss was 5.4% for a four month period at 45°F. Weight loss ranged from 3.3-9.1%. Most samples (81%) had shorter dormancy periods than Russet Burbank.

Enzymatic browning potential at 60 minutes ranged from 1-5, with an average of 3.1. Little browning was observed for 34% of the samples even 60 minutes after tuber cutting.

Specific gravities were exceptionally high in 1989. Specific gravities ranged from 1.069-1.131; 87% were ≥ 1.080 . The average specific gravity was 1.091. Specific gravities ≥ 1.080 are generally required for processing selections.

Twenty-nine samples (45%) produced french fries with acceptable color and texture.

Undercutting roots of AC79100-1 one week prior to harvest did not have any effect on shatter bruise.

Removal of flowers as they formed resulted in a nonsignificant increase in total yield (14 cwt) for Russet Nugget.

OBJECTIVES FOR 1990:

1. Test intermediate and advanced selections from the breeding project and Western Regional Trials for: blackspot susceptibility, storage weight loss, dormancy, enzymatic browning, specific gravity, chip color, french fry color, and french fry texture. This information is needed to determine potential weaknesses, relative storability, and processing potential of these selections.
2. Cooperate with Joe Maga, Department of Food Science and Human Nutrition, in evaluating selections for protein, alkaloids, taste, vitamin C, and sugars.
3. Compare the influence of whole and cut seed on yield, grade, stand, and stem number for Centennial Russet, Russet Burbank, Russet Nugget, and Sangre.
4. Evaluate the influence of undercutting on shatter bruise susceptibility of AC79100-1.
5. Soil samples will be taken as part of the alligator hide survey to characterize the soils where this disorder was prevalent.
6. Evaluate the influence of flower bud removal on the yield and grade of Russet Nugget.

FUNDING REQUEST: 1989 Allocation: \$5,600.00

1990 Budget Request

Labor	\$4,050.00
Travel	300.00
Supplies	<u>1,550.00</u>
Total	5,900.00

RESEARCH PROGRESS REPORT FOR 1989
"PHYSIOLOGICAL AND CULTURAL STUDIES"

SUBMITTED TO THE
SLV RESEARCH CENTER COMMITTEE
AND THE
COLORADO POTATO ADMINISTRATIVE
COMMITTEE (AREA II)

BY
DAVID G. HOLM
SAN LUIS VALLEY RESEARCH CENTER

RESEARCH PROGRESS REPORT FOR 1989
"Physiological and Cultural Studies"

Submitted by

David G. Holm

San Luis Valley Research Center

Research was conducted in the following areas in 1989:

- A) Postharvest evaluations
 - 1 - Blackspot Susceptibility
 - 2 - Storage Weight Loss and Dormancy
 - 3 - Enzymatic Browning
 - 4 - Specific Gravity, Chip Color, French Fry Color and Texture
 - 5 - Baked Potato Flavor and Color, Enzymatic Browning, Vitamin C, Glycoalkaloids, Protein, and Sugars (tests conducted by Dr. Joe Maga, Department of Food Science and Human Nutrition.
- B) Undercutting Studies to Reduce Shatter Bruise
- C) Influence of Flower Removal on Yield and Grade of Russet Nugget.

POSTHARVEST EVALUATIONS

One hundred seven samples (including duplicates and checks) were evaluated for two or more of the following characteristics: blackspot susceptibility, storage weight loss, dormancy, enzymatic browning, specific gravity, chip color, french fry color, and french fry texture. Twenty-eight clones were selected for additional quality evaluations as itemized in item A-5 above.

Blackspot

Ten randomly selected tubers for each clone tested were bruised on the stem and bud ends with a 150 g weight dropped from a height of 60 cm. Tubers were stored at 40°F prior to bruising. After bruising, tubers were stored at room temperature for three days prior to evaluation. Blackspot susceptibility was evaluated by cutting the tubers in half longitudinally and rating the extent of damage.

High levels of blackspot resistance (indices ≥ 4.1) were exhibited by 76% of the samples tested (Figure 1). Blackspot indices ranged from 2.1-5.0, with an average of 4.3 (Table 1). Selections with severe discoloration were: A80559-2, AC80369-1, and A082283-1.

Storage Weight Loss and Dormancy

Ten randomly selected tubers were weighed into storage on October 11, 1989 and held at 45°F for a four month period under low relative humidity conditions. Dormancy evaluations were made at the same time tubers were weighed at the end of four months. Results are summarized in Figures 2 and 3 and Table 1.

The average storage weight loss was 5.4% for a four month period at 45°F. Weight loss ranged from 3.3-9.1%.

Most samples (81%) had shorter dormancy periods than Russet Burbank. Selections with comparable dormancy to Russet Burbank were: AC75430-1, AC77101-1, AC80545-1, AC81198-11, AC83044-1, AC83330-4, AC84209-8, CO83029-2, CO84074-2, CO84N6-12, and NDTX9-1068-4RU.

Continuing emphasis will be placed on breeding for a longer dormancy period, which will be needed if the sprout inhibiting chemicals were to be banned.

Enzymatic Browning

Five tubers of each clone tested were cut in half lengthwise and rated for degree of darkening at 15 minute intervals up to 60 minutes. Results are shown in Figure 4 and Table 1.

Little browning was observed for 34% of the samples even 60 minutes after tuber cutting. Enzymatic browning potential at 60 minutes ranged from 1-5, with an average of 3.1.

Continuing emphasis will also be placed on breeding for reduced enzymatic browning potential because of the concern over the use of sulfites in processed food products.

Specific Gravity

Specific gravities were exceptionally high in 1989. Data on specific gravity are summarized in Figure 5 and Table 2.

Specific gravities ranged from 1.069-1.131; 87% were ≥ 1.080 . The average specific gravity was 1.091. Specific gravities ≥ 1.080 are generally required for processing selections.

Fry Color and Texture

Data are presented in Figures 6 and 7, and Table 2 on french fry color and texture. Twenty-nine samples (45%) produced french fries with acceptable color and texture. Selections producing excellent fries were: AC80369-1, AC83064-6, AC83172-1, AC84069-3, A081216-1, CO81095-4, CO81038-6, CO83120-3, and CO08014-1.

Baked Flavor, Enzymatic Browning, Vitamin C, Glycoalkaloids, Protein, and Sugars

Results of these evaluations are presented in Table 3. None of the selections were disliked strongly for baked potato flavor. Several selections were liked a lot for flavor. AC77101-1 and Centennial Russet received a 1 rating (like a lot) for a second year in a row. Other clones with a 1 rating for baked potato flavor were: AC75430-1, AC83172-1, C079018-11, C08011-5, C081095-4, C082142-4, Russet Burbank, and Russet Nugget.

Six clones exhibited very little enzymatic browning after 60 minutes. They were: AC75430-1, AC78069-17, AC83172-1, BC0038-1, C083027-2, and Atlantic.

Several clones had more vitamin C than Russet Burbank. These clones were: AC77101-1, AC83044-1, AC83044-2, AC83064-1, AC83064-6, AC83172-1, AC83306-1, C082142-4, C083027-2, Centennial Russet, and Russet Nugget.

None of the selections tested had excessively high levels of glycoalkaloids. Selections with ≥ 20 mg/100 g on a fresh weight basis are discarded.

Little variation was observed among the selections for protein (7.16-7.57%) and total sugars (1.29-1.67%).

UNDERCUTTING STUDIES

The influence of undercutting roots just prior to harvest on tuber susceptibility to shatter bruise was studied. A susceptible clone, AC79100-1, was used in this study.

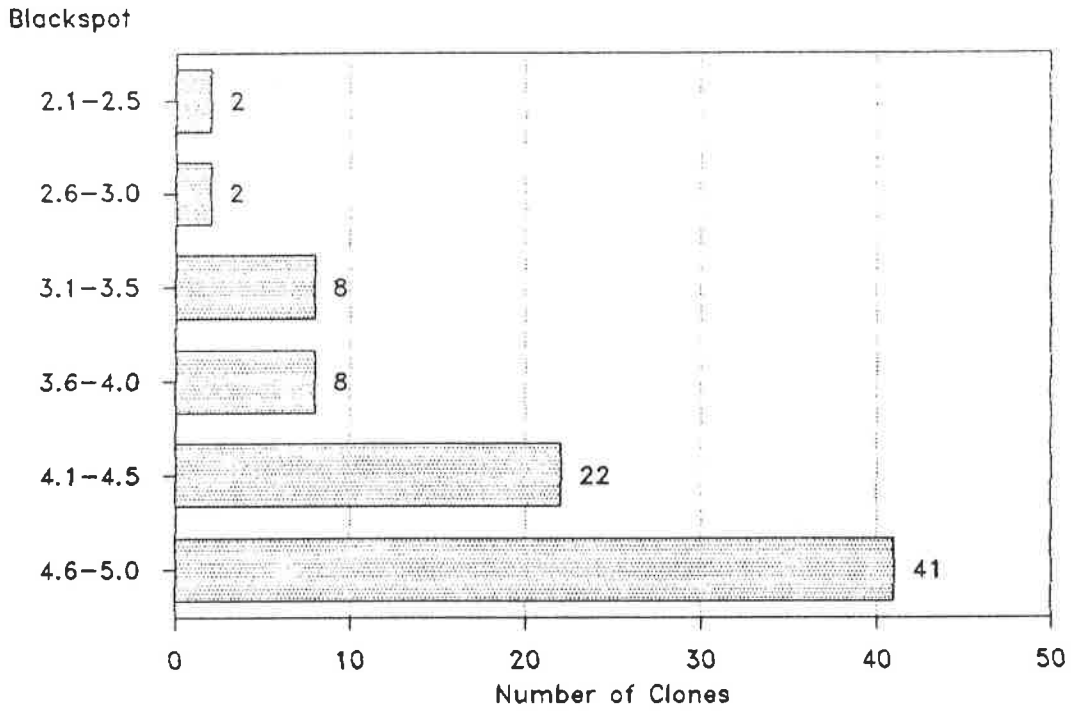
Undercutting roots one week prior to harvest did not have any effect on yield, grade, or shatter bruise susceptibility of AC79100-1 (Table 4).

FLOWER REMOVAL STUDIES

Research by other individuals has indicated that there is a competitive relationship between flowering and yield. This experiment was designed to determine if flower removal would have an influence on the yield and grade of Russet Nugget.

Removal of flowers as they formed did not have any effect on yield or grade of Russet Nugget (Table 5). Plots that had flowers removed however had a nonsignificant increase in total yield (14 cwt).

Figure 1. Blackspot
Distribution (83 Clones) - 1989



5=No Discoloration

Figure 2. % Weight Loss
Distribution (83 Clones) - 1989

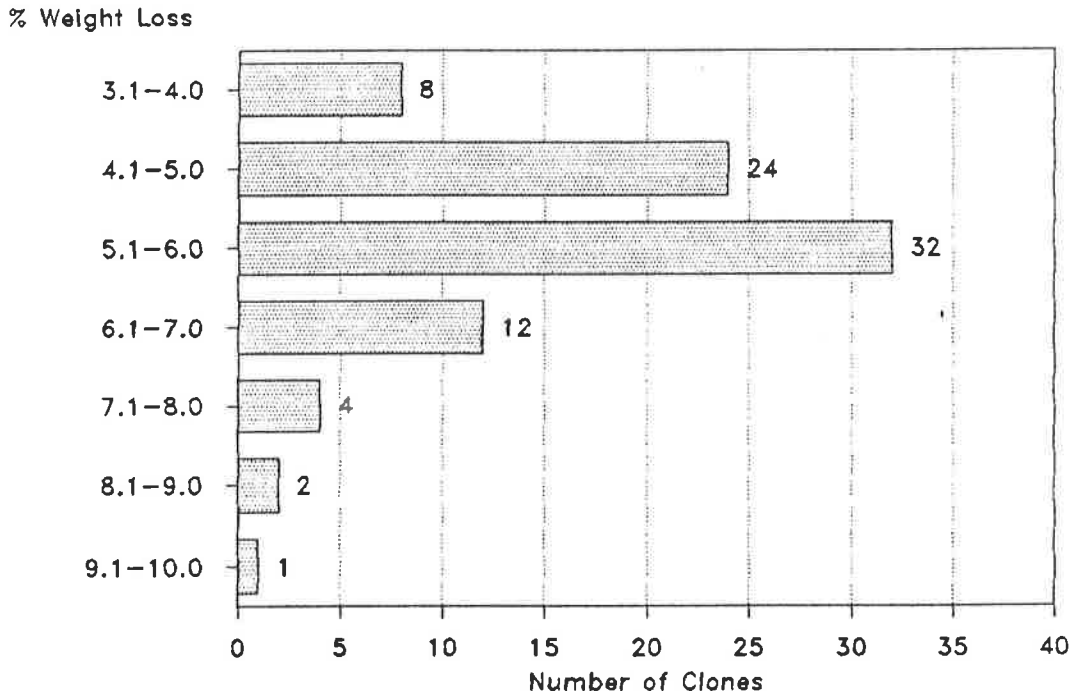
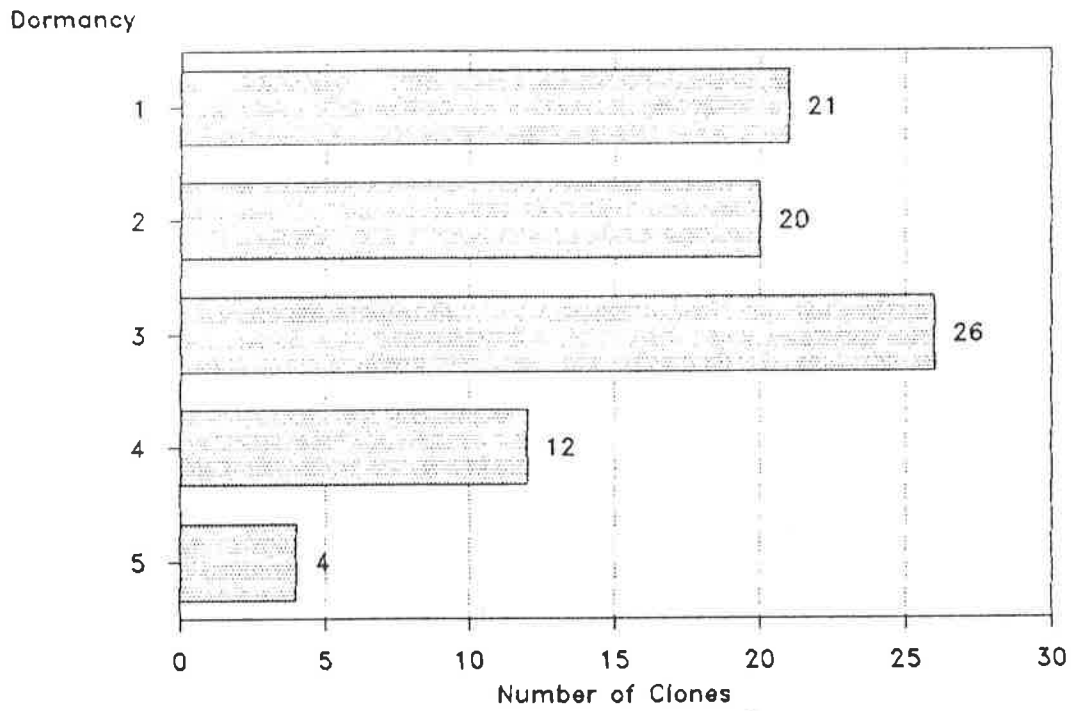
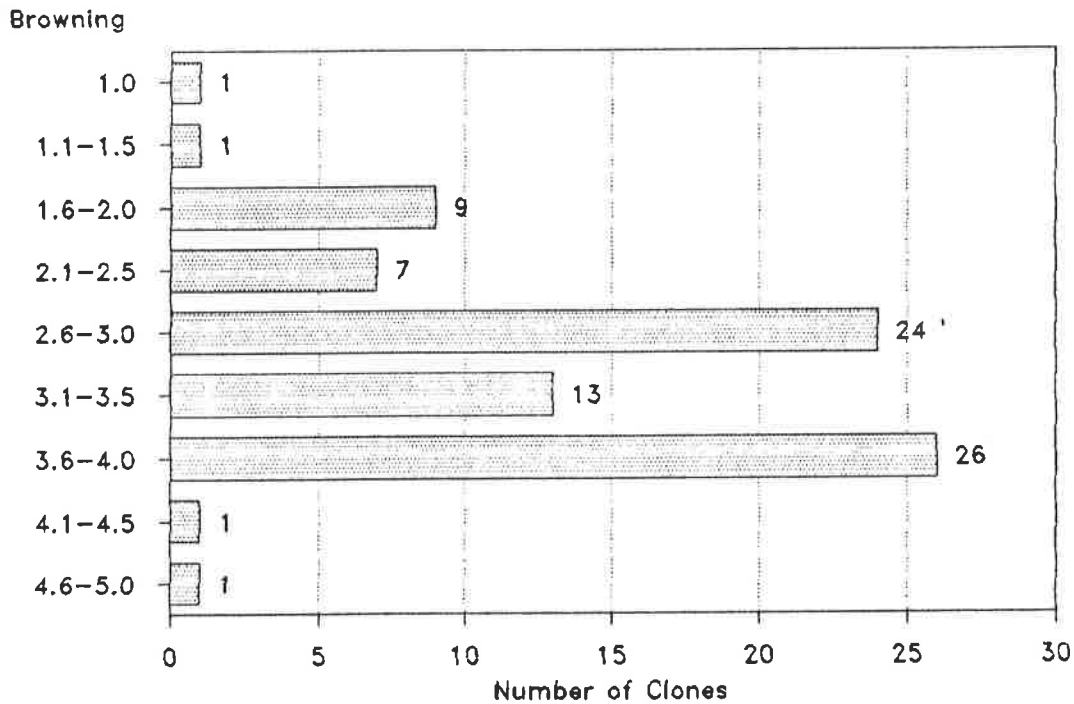


Figure 3. Dormancy
Distribution (83 Clones) - 1989



5=No Growth

Figure 4. Enzymatic Browning (60 Min)
Distribution (83 Clones) - 1989



5=No Discoloration

Table 1. Blackspot, storage weight loss, dormancy, and enzymatic browning evaluations for chipping, intermediate, advanced, and Regional Trial clones - 1989.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy Index ³	Enzymatic Browning ⁴			
	Bud End	Stem End	Average			15 Min	30 Min	45 Min	60 Min
*** SLV Chipping Study ***									
A80559-2	4.0	2.0	3.0	4.7	3	5.0	4.0	4.0	4.0
AC80545-1	4.1	4.3	4.2	4.5	4	5.0	4.0	4.0	4.0
AC83306-1	5.0	4.6	4.8	4.6	3	4.0	3.2	3.2	3.2
Atlantic	3.3	3.0	3.2	5.9	1	5.0	5.0	5.0	5.0
Gemchip	4.7	3.2	4.0	5.2	3	4.2	3.4	3.2	3.2
Norchip	5.0	4.3	4.7	5.4	2	4.6	3.8	3.6	3.4
*** Intermediate Trial ***									
AC83330-4	4.2	5.0	4.6	4.2	4	3.8	3.4	3.4	3.0
AC84017-3	3.2	3.7	3.5	5.9	3	4.8	4.4	4.0	4.0
AC84028-4	5.0	4.6	4.8	7.0	1	4.0	3.6	3.4	2.8
AC84069-3	4.9	4.8	4.9	6.3	1	5.0	5.0	4.0	4.0
AC84209-8	4.3	3.9	4.1	6.8	4	4.6	4.0	4.0	3.8
AC84413-4	5.0	4.8	4.9	7.8	1	3.8	3.4	3.2	2.6
AC84472-1	4.6	4.7	4.7	6.5	3	5.0	5.0	4.6	4.4
AC84487-1	5.0	4.9	5.0	7.4	3	4.6	4.2	4.0	4.0
AC84509-2	4.9	4.0	4.5	6.2	2	4.0	3.0	3.0	2.0
AC84638-1	4.8	4.4	4.6	5.0	2	2.0	1.0	1.0	1.0
CO84074-2	5.0	4.9	5.0	4.7	4	5.0	4.8	4.0	3.8
CO84205-3	5.0	5.0	5.0	5.7	3	5.0	4.6	4.0	3.8
CO84205-5	5.0	4.9	5.0	5.7	3	5.0	5.0	4.0	4.0
CO84N6-12	4.0	3.7	3.9	5.2	5	3.6	2.8	2.4	2.0
CO08014-1	4.0	3.3	3.7	5.8	2	4.0	4.0	3.4	3.0
NDTX9-1069-4RU	4.8	4.7	4.8	5.4	4	4.0	3.6	3.4	3.0
Centennial Russet	5.0	4.9	5.0	5.9	3	4.6	4.6	4.4	3.4
Lemhi Russet	4.3	3.0	3.7	6.2	2	3.6	3.0	2.0	1.8
Nooksack	4.9	4.5	4.7	5.2	5	4.6	3.6	3.2	3.0
Russet Burbank	4.7	4.3	4.5	5.4	5	4.6	4.0	4.0	3.4
Russet Nugget	4.9	4.8	4.9	4.5	1	4.6	4.0	4.0	3.6
Sangre	4.7	4.8	4.8	5.2	3	4.8	4.0	4.0	4.0
*** Advanced Yield Trial ***									
AC75430-1	5.0	4.6	4.8	3.8	4	5.0	4.4	4.0	4.0
AC80369-1	3.7	1.6	2.7	6.6	1	4.8	3.8	3.6	3.6
AC81240-2	4.5	3.5	4.0	6.8	2	3.6	3.4	3.2	3.0

Continued

Table 1. Continued.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy Index ³	Enzymatic Browning ⁴			
	Bud	End Stem	End Average			15 Min	30 Min	45 Min	60 Min
*** Advanced Yield Trial (continued) ***									
AC82263-1	5.0	4.7	4.9	5.6	3	4.8	4.0	4.0	3.8
AC83044-1	4.8	3.1	4.0	8.2	4	4.0	3.6	3.6	2.6
AC83044-2	3.8	2.5	3.2	4.6	1	4.8	4.0	3.8	3.4
AC83064-1	5.0	5.0	5.0	5.2	2	5.0	4.4	4.4	4.0
AC83064-6	4.9	4.8	4.9	6.6	1	4.0	3.4	2.8	2.2
AC83068-1	4.6	4.9	4.8	5.9	3	4.0	3.0	3.0	3.0
AC83172-1	5.0	4.4	4.7	7.0	1	3.6	3.4	2.8	2.6
BC0224-3	5.0	3.9	4.5	6.6	1	2.8	2.6	1.8	1.6
CO81018-2	5.0	4.9	5.0	8.8	1	5.0	4.8	4.8	4.0
CO81038-6	4.9	4.9	4.9	4.7	2	4.6	4.0	4.0	3.6
CO81082-1	5.0	5.0	5.0	5.0	2	4.8	4.0	4.0	3.6
CO81095-4	4.9	3.7	4.3	5.2	2	4.0	3.4	3.2	3.0
CO82142-4	5.0	4.7	4.9	4.8	2	4.6	4.0	3.2	3.0
CO83027-2	5.0	4.6	4.8	9.1	1	5.0	5.0	4.4	4.0
CO83027-3	5.0	4.8	4.9	6.7	1	5.0	4.4	4.0	4.0
CO83029-2	4.8	3.9	4.4	5.4	4	5.0	4.4	4.0	3.8
CO83054-4	5.0	4.5	4.8	4.3	3	4.0	4.0	3.6	3.0
CO83120-3	4.8	4.0	4.4	4.9	3	3.4	3.2	2.4	2.4
MN10874	4.2	3.9	4.1	3.9	1	3.6	3.4	2.4	2.4
Norgold Russet	4.5	4.4	4.5	3.3	1	3.6	3.2	2.4	2.2
Centennial Russet	4.9	4.8	4.9	5.3	2	4.0	3.8	3.6	3.6
Russet Burbank	4.7	4.4	4.6	4.6	4	4.0	3.6	3.0	3.0
Russet Nugget	5.0	4.8	4.9	3.9	3	4.0	4.0	3.4	3.4
*** Western Regional Chipping Trial **									
A80559-2	3.1	1.7	2.4	5.1	3	4.8	4.0	4.0	3.4
AC80545-1	4.5	3.7	4.1	3.8	4	4.4	4.0	3.6	3.2
AC81592-2	4.1	2.8	3.5	6.0	1	3.4	3.2	3.0	3.0
AC83306-1	4.9	3.6	4.3	5.5	3	3.8	3.8	3.6	3.2
NDA2031-2	4.9	4.0	4.5	4.6	2	4.8	4.6	4.2	4.0
NDA2126-6	3.9	2.9	3.4	5.2	2	4.4	3.4	3.2	2.6
NDO1496-1	4.6	3.3	4.0	5.3	1	3.8	3.0	2.4	1.8
Atlantic	3.5	2.7	3.1	5.7	2	5.0	4.4	4.0	4.0
Gemchip	3.8	2.4	3.1	4.9	3	3.6	2.8	2.6	2.0
Norchip	4.8	4.6	4.7	5.1	1	3.4	3.2	2.4	2.0

Continued

Table 1. Continued.

Clone	Blackspot Index ¹			% Weight Loss ²	Dormancy Index ³	Enzymatic Browning ⁴			
	Bud	End Stem	End Average			15 Min	30 Min	45 Min	60 Min
*** Western Regional Trial ***									
A7816-14	4.9	4.5	4.7	4.9	2	4.6	3.6	3.6	3.0
A7961-1	4.6	3.7	4.2	5.5	1	4.0	3.8	3.0	3.0
AC77101-1	4.7	3.6	4.2	5.1	4	3.2	2.0	2.0	1.2
AC78069-17	4.4	4.5	4.5	4.0	3	4.0	4.0	3.6	3.0
AC81198-11	4.2	4.0	4.1	4.1	4	4.6	3.6	3.4	3.2
A081216-1	4.5	3.8	4.2	5.2	2	3.6	2.8	2.0	2.0
A082283-1	2.3	1.9	2.1	5.0	2	3.6	3.2	2.4	2.4
A082611-7	4.7	4.4	4.6	4.7	3	4.0	3.8	2.8	2.6
BC0038-1	4.4	3.1	3.8	5.2	2	4.0	4.0	3.0	3.0
CO79018-11	4.4	3.8	4.1	4.2	3	5.0	4.0	3.8	3.6
CO8011-5	4.7	4.5	4.6	5.2	3	5.0	4.0	4.0	3.6
NDTX9-1068-11R	4.3	4.3	4.3	7.7	3	4.0	3.6	3.6	2.6
TXND329-1	5.0	4.8	4.9	5.0	1	4.4	4.0	4.0	3.4
Centennial Russet	4.8	4.7	4.8	7.3	3	4.4	4.0	4.0	3.4
Lemhi Russet	4.0	2.8	3.4	4.6	3	4.0	3.6	3.2	2.2
Norgold Russet	4.5	4.6	4.6	5.6	1	4.2	4.0	3.6	2.6
Red LaSoda	4.2	4.5	4.4	5.0	2	4.0	3.0	2.4	2.0
Russet Burbank	4.7	3.6	4.2	3.8	5	4.4	3.6	2.6	2.4
Sangre	4.5	5.0	4.8	3.6	3	4.4	3.8	3.6	2.8

¹Blackspot was rated on a 1 to 5 scale, with 5 indicating no discoloration.

²Tubers were stored at 45°F for a four month period.

³Dormancy rating was based on sprout length after the tubers were stored at 45°F for four months. The following scale was used: 1=>2"; 2=1-2"; 3=1/4-1"; 4=<1/4"; and 5=no visible growth.

⁴Degree of darkening rated at various time intervals after slicing fresh tubers in half lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

Figure 5. Specific Gravity
Distribution (107 Clones) - 1989

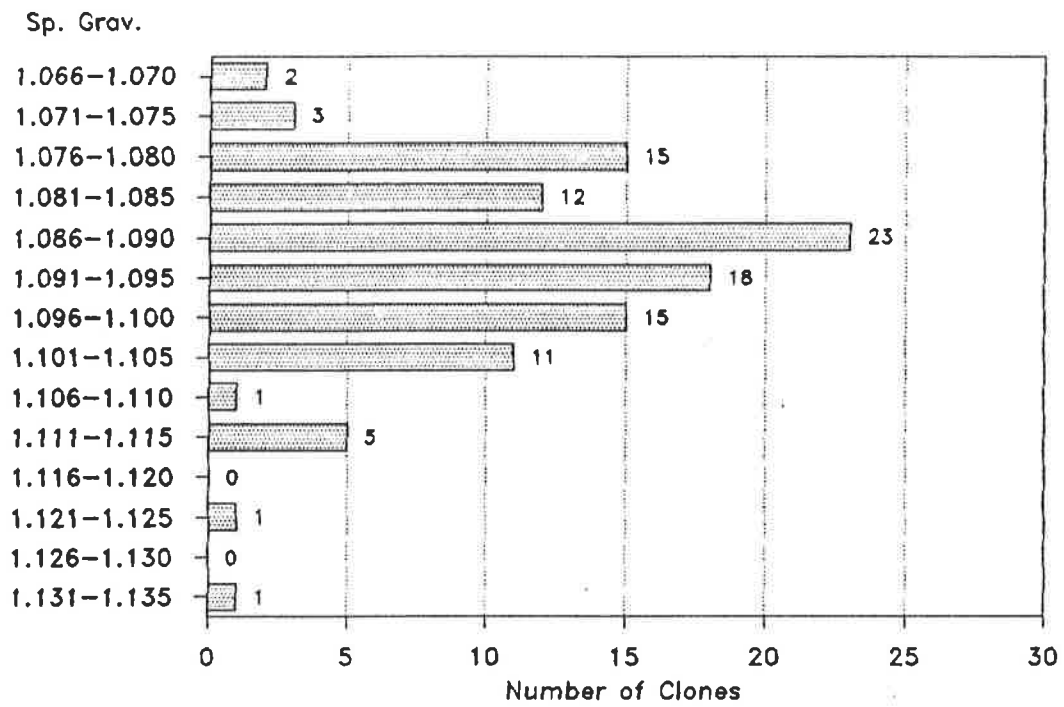


Figure 6. Fry Color
Distribution (64 Clones) - 1989

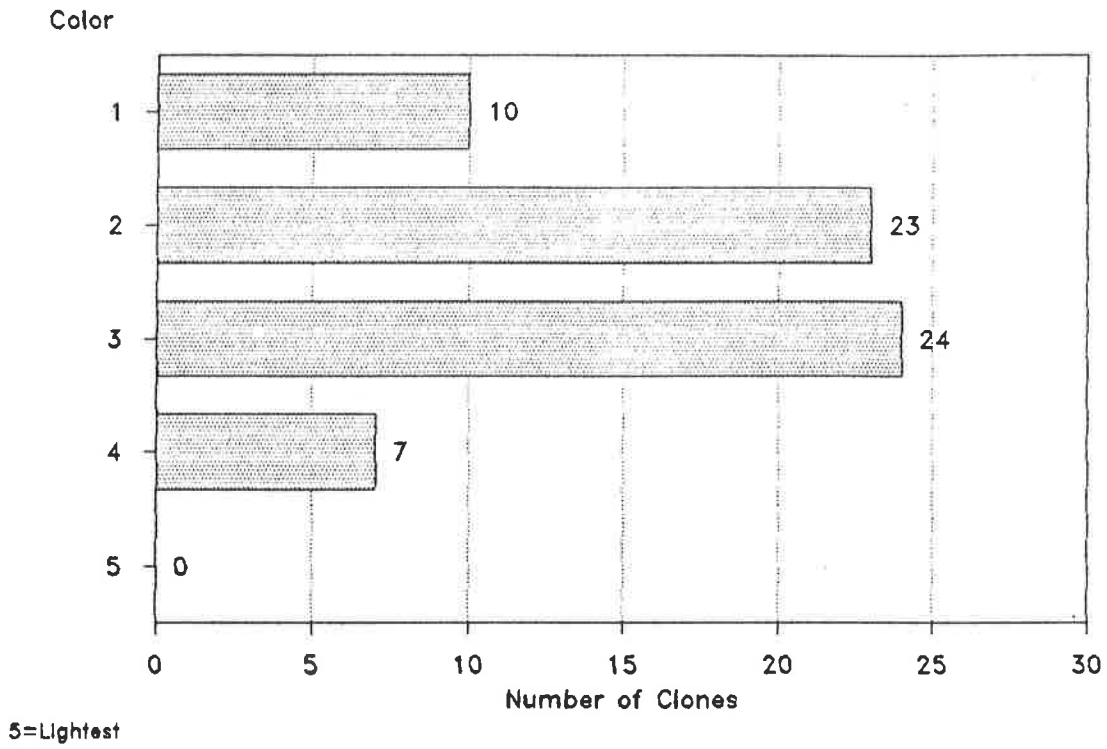


Figure 7. Fry Texture
Distribution (64 Clones) - 1989

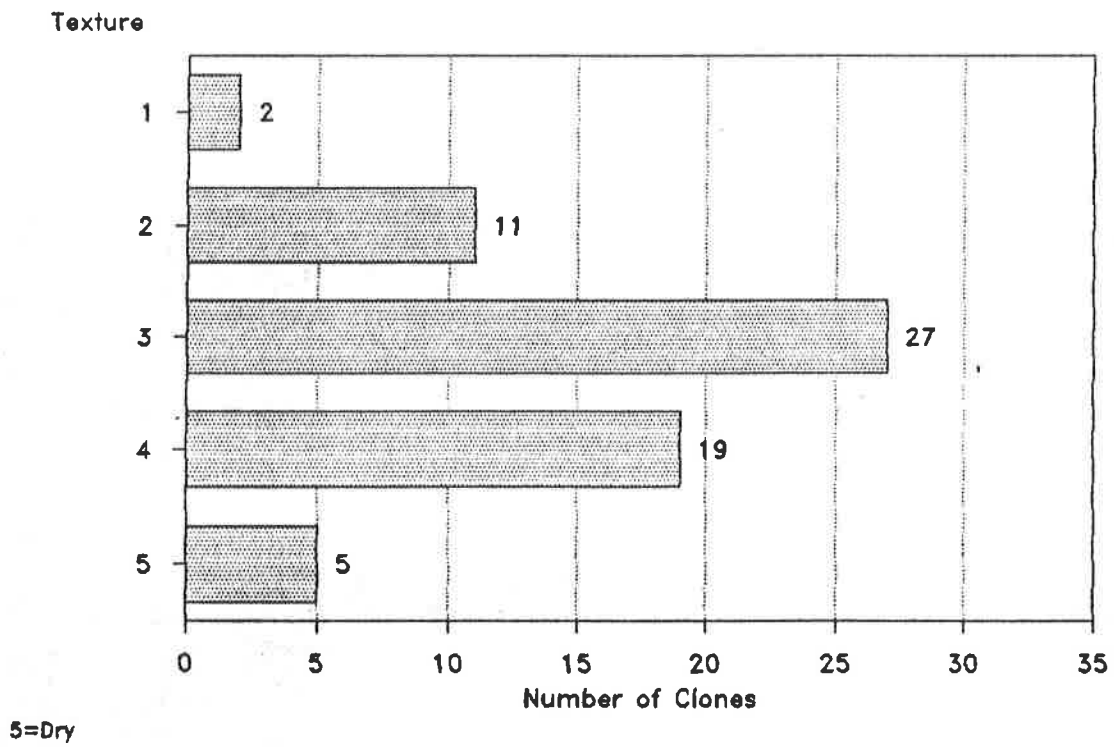


Table 2. Specific gravity, french fry color, and fry texture for intermediate, advanced, and Western Regional Trial clones.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 50°F+ 8 wks 45°F	At Harvest	4 wks 50°F+ 8 wks 45°F
*** Intermediate Trial ***					
AC83330-4	1.074	3	2	3	2
AC84017-3	1.077	3	3	4	3
AC84028-4	1.080	4	2	2	3
AC84069-3	1.090	3	2	5	4
AC84209-8	1.078	3	2	4	3
AC84413-4	1.078	3	3	2	2
AC84472-1	1.075	4	2	3	3
AC84487-1	1.074	3	3	3	3
AC84509-2	1.089	3	3	3	4
AC84638-1	1.080	2	2	3	3
CO84074-2	1.083	1	1	2	2
CO84205-3	1.086	3	2	4	3
CO84205-5	1.069	1	1	2	1
CO84N6-12	1.081	2	2	3	3
CO08014-1	1.090	4	4	5	5
NDTX9-1069-4RU	1.082	2	2	4	3
Lemhi Russet	1.091	4	4	3	4
Russet Burbank	1.088	3	3	3	4
Russet Nugget	1.096	4	3	5	4
*** Advanced Yield Trial ***					
AC75430-1	1.101	3	3	3	3
AC80369-1	1.099	5	4	3	5
AC81240-2	1.084	2	2	1	2
AC82263-1	1.093	3	2	3	3
AC83044-1	1.092	3	3	3	3
AC83044-2	1.086	2	2	3	3
AC83064-1	1.087	3	2	3	3
AC83064-6	1.086	4	4	4	4
AC83068-1	1.088	2	2	3	3
AC83172-1	1.106	3	3	4	5
BC0224-3	1.097	4	3	3	4
CO81018-2	1.092	1	1	3	4
CO81038-6	1.087	3	2	4	4
CO81082-1	1.078	1	1	4	3
CO81095-4	1.102	4	4	5	5

Continued

Table 2. Continued.

Clone	Specific Gravity	Fry Color ¹		Fry Texture ²	
		At Harvest	4 wks 50°F+ 8 wks 45°F	At Harvest	4 wks 50°F+ 8 wks 45°F
*** Advanced Yield Trial (continued) ***					
CO82142-4	1.093	1	1	3	3
CO83027-2	1.094	3	3	3	3
CO83027-3	1.082	2	1	2	2
CO83029-2	1.091	4	3	2	3
CO83054-4	1.095	2	2	3	4
CO83120-3	1.089	3	3	4	4
MN10874	1.086	2	2	4	3
Norgold Russet	1.078	1	2	3	2
Centennial Russet	1.087	2	1	2	1
Russet Burbank	1.085	3	3	3	4
Russet Nugget	1.097	3	3	4	4
*** Western Regional Trial ***					
A7816-14	1.099	3	3	3	4
A7961-1	1.099	3	2	3	4
AC77101-1	1.089	2	2	2	3
AC78069-17	1.097	4	3	3	4
AC81198-11	1.094	1	1	2	2
A081216-1	1.098	3	3	4	5
A082283-1	1.104	4	4	4	3
A082611-7	1.096	3	3	3	4
BC0038-1	1.094	3	4	3	3
CO79018-11	1.091	3	3	3	3
CO8011-5	1.078	3	2	3	2
NDTX9-1068-11R	1.079	1	1	3	2
TXND329-1	1.080	3	3	3	3
Centennial Russet	1.089	2	1	3	2
Lemhi Russet	1.102	3	3	4	4
Norgold Russet	1.081	2	2	2	2
Red LaSoda	1.083	3	3	3	3
Russet Burbank	1.098	3	3	4	4
Sangre	1.080	1	2	3	3

¹Fry color was rated on a 1 to 5 scale, with 5 being the lightest or best color. Color ratings of ≥ 3 are acceptable.

²Fry texture was rated on a 1 to 5 scale, with 5 indicating the cooked flesh was dry, with 1 representing a soggy, wet texture.

Table 3. Potato quality evaluations - Joe Maga, 1989.

Clone	Baked Flavor ¹	Enzymatic Browning ²			Vitamin C ³	Total Glyco- alkaloids ³	% Protein ⁴	% Total Sugars ⁵
		15 Min	30 Min	60 Min				
A80559-2	3	5	3	3	30	14.0	7.24	1.51
AC75430-1	1	5	4	4	31	12.4	7.47	1.40
AC77101-1	1	4	3	1	34	11.2	7.33	1.45
AC78069-17	2	5	4	4	25	10.7	7.29	1.41
AC80369-1	3	4	2	1	29	12.4	7.16	1.32
AC80545-1	2	4	3	2	24	10.5	7.26	1.39
AC81198-11	2	5	4	3	23	8.7	7.29	1.45
AC81240-2	2	4	3	2	28	9.4	7.38	1.33
AC83044-1	3	4	4	2	42	8.3	7.31	1.39
AC83044-2	3	3	3	2	38	8.5	7.33	1.35
AC83064-1	2	5	5	3	40	9.2	7.27	1.37
AC83064-6	2	4	4	3	35	9.7	7.30	1.47
AC83068-1	3	5	3	1	31	8.4	7.28	1.51
AC83172-1	1	5	5	4	37	8.7	7.37	1.42
AC83306-1	2	3	2	2	33	9.2	7.40	1.56
BC0038-1	4	5	5	4	26	14.7	7.57	1.42
CO79018-11	1	5	4	3	27	11.1	7.41	1.32
CO8011-5	1	5	4	3	29	10.3	7.37	1.30
CO81082-1	2	5	4	2	31	10.2	7.29	1.37
CO81095-4	1	4	2	1	27	9.1	7.39	1.29
CO82142-4	1	3	2	1	35	9.0	7.30	1.37
CO83027-2	2	5	4	4	34	8.7	7.32	1.43
Atlantic	4	5	5	5	27	11.4	7.19	1.55
Centennial Russet	1	5	4	2	33	7.8	7.40	1.62
Norchip	4	4	3	2	30	12.0	7.29	1.52
Russet Burbank	1	5	4	2	31	12.8	7.32	1.67
Russet Nugget	1	3	2	2	38	9.4	7.43	1.49
Sangre	4	5	4	3	31	12.3	7.37	1.42

¹Based on a taste panel assessment using the following scale: 1=like a lot; 2=like a little; 3=neither like nor dislike; 4=dislike a little; 5=dislike a lot.

²Degree of darkening rated at various time intervals after slicing fresh tubers in half lengthwise. Rated on a 1 to 5 scale, with 5 indicating no discoloration.

³Fresh weight basis, mg/100 g.

⁴Dry weight basis.

⁵Fresh weight basis.

Table 4. Yield, grade, and shatter bruise index for AC79100-1 as influenced by undercutting - 1989.

Treatment	Yield (Cwt/A)					Shatter Bruise Index ¹
	Total	US #1			Total	
		Total	%	>10 oz	<4 oz	
Control	316	265	83.5	83	33	66.2
Undercut	332	266	80.1	88	40	65.5
Significance ²	NS	NS	NS	NS	NS	NS

¹The shatter bruise index is average length of the cracks on a tuber measured in mm.

²NS=Not significant.

Table 5. Yield, grade, stand, and vine maturity of Russet Nugget as influenced by flower removal - 1989.

Treatment	Yield (Cwt/A)					% Stand	Vine Maturity ¹
	Total	US #1			Total		
		Total	%	>10 oz	<4 oz		
Control	349	273	78.1	65	70	99	3.8
Flowers Removed	365	283	77.4	73	75	98	3.8
Significance ²	NS	NS	NS	NS	NS	NS	NS

¹Vine maturity is rated on the following basis: 1=very early; 2=early; 3=medium; 4=late; and 5=very late.

²NS=not significant.