SUMMARY RESEARCH PROGRESS REPORT FOR 1992
AND RESEARCH PROPOSAL FOR 1993

Submitted to:

SLV Research Center Committee
and the
Colorado Potato Administrative Committee (Area II)

TITLE: Physiological and Cultural Studies on Potatoes

PROJECT LEADER: David G. Holm

PROJECT JUSTIFICATION: Identification of 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. Also, cultural practice studies are important in developing production management information for new and established potato cultivars.

PROJECT STATUS: This is an ongoing project.

SIGNIFICANT ACCOMPLISHMENTS FOR 1992: A total of 156 samples 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.

High levels of blackspot resistance (indices >4.0) were exhibited by 70% of the samples tested (Figure 1). Blackspot ratings ranged from 1.4-5.0, with an average of 4.2

The average storage weight loss was 5.1% for the three month period at 45F. Weight loss ranged from 2.7-9.6%. Length of dormancy ranged from 63-152 days. Most selections evaluated had shorter dormancy periods than Russet Burbank. A few selections approached the dormancy of Russet Burbank. Only one selection, AC87024-2, had a dormancy longer than Russet Burbank.

Little or no browning was observed for 33% of the samples even 60 minutes after tuber cutting. Enzymatic browning potential at 60 minutes ranged from 1.8-5.0, with an average of 3.9.

Specific gravities ranged from 1.064-1.113; 49% were >1.080, the value generally required for processing selections.

Thirty-four samples (49%) produced french fries with acceptable color and texture after storage for two months.

A higher proportion of the selections evaluated in 1992 were classified as cold chippers. Ten selections produced acceptable chips after 7 weeks of 40F storage. Also thirty-three of the selections produced acceptable chips with reconditioning after storage at 40F.

Planting single drop seed did not significantly affect total or US #1 yields, stand, vine maturity, stems/plant, and tuber number/stem. Use of single drop seed resulted in a lower % US #1 tubers primarily due to lower yields of >10 oz tubers and greater yields of <4 oz tubers. This is also reflected in the lower average tuber weight for single drop seed.

Russet Norkotah sustained 29 and 43% loss respectively for total and US #1 yield with 60% simulated damage. Comparable values for Russet Nugget were 39 and 47%.

OBJECTIVES FOR 1993:

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.

2. Clonal evaluations for storage disease reaction were added in 1992. Initial focus is concentrated on bacterial soft rot and dry rot (Fusarium and early blight). These tests will be continued in 1993 on the more advanced selections.

3. A study will be initiated to determine sugar profiles for standard processing cultivars under San Luis Valley growing conditions.

4. A study will be conducted to evaluate factors that may influence emergence uniformity of C080011-5.

5. Simulated hail studies will be continued in cooperation with National Crop Insurance Services. No funding is requested from the SLV Research Committee for this project.

6. Cooperate with Joe Maga, Department of Food Science and Human Nutrition in postharvest evaluations for advanced selections for protein, alkaloids, taste (flavor), and vitamin C.

FUNDING REQUEST: 1992 Allocation - $6,200.00

1993 Budget Request

Labor	$4,400.00
Travel	500.00
Supplies	2,200.00
Total	$7,100.00