SUMMARY RESEARCH PROGRESS REPORT FOR 1994
AND RESEARCH PROPOSAL FOR 1995

Submitted to:

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

TITLE: Potato Breeding and Selection

PROJECT LEADER: David G. Holm

PROJECT JUSTIFICATION: Many challenges and opportunities are confronting the Colorado potato industry. These challenges/opportunities include food safety, water quality, current market constraints, new market development (processing, exporting, etc.), changing consumer expectations, and increasing costs with highly variable potato prices.

To help meet each of these challenges, continued emphasis needs to be placed on developing potato cultivars with increased yield, improved quality, resistance to disease and pests, and tolerance to environmental stresses. Increased emphasis needs to be placed on breeding for improved postharvest and processing qualities such as lengthened dormancy, ability to process after cold storage, and resistance to diseases such as tuber early blight and late blight. Cultivars with these characteristics will help assure that the potato industry in Colorado remains productive and in a competitive position.

PROJECT STATUS: This is an ongoing project.

SIGNIFICANT ACCOMPLISHMENTS FOR 1994:

Fifty-four parental clones were intercrossed in 1994. Seeds from 156 combinations were obtained. Eighty seedling families were grown in the greenhouse producing 26,007 tubers for initial field selection in 1995. Surplus tubers will be distributed to Idaho, Minnesota, Oregon, Texas, and Canada.

A total of 71,212 first-year seedlings were planted with 592 being selected at harvest for further observation. Another 647 clones were in 12-hill preliminary, and intermediate stages of selection. One hundred eighty nine of these clones were saved at harvest for further evaluation. Thirty-two advanced selections were saved and contingent on additional evaluations will be increased in 1995. Another 210 selections were maintained for germplasm development, breeding, or other experimental purposes.

Grower evaluations were conducted on nine russets (CO80011-5, AC78069-17, CO81082-1, CO82142-4, AC83064-1, AC83064-6, AC83068-1, AC84487-1, and CO84074-2) and one chipper (AC83306-1). Selection AC83306-1 has been discarded from further testing. CO80011-5 will be named Crestone Russet in 1995 as a high yielding, medium-early maturing, fresh market potato. Naming was delayed due to stand problems in 1994. Century Russet (A74212-1E), a high yielding, medium-late maturing, fresh market cultivar, will be named and jointly released in 1995 by the Oregon, Idaho, Washington, Colorado, California, and Texas Agricultural Experiment Stations and the USDA-ARS.

Eleven clonal selections of Russet Norkotah with improved vine vigor were evaluated in comparative trials for a second year. Two selections (3 and 8) had total and US #1 yields that were significantly greater than standard Russet Norkotah. Nuclear seed stocks were released to seed growers.

In 1994, three CSU developed cultivars (Centennial Russet, Russet Nugget, and Sangre) represented 57.2% of the fall potato acreage grown in Colorado.

A total of 171 samples were evaluated for two or more of the following postharvest characteristics: blackspot susceptibility, storage weight loss, dormancy, enzymatic browning, specific gravity, chip color, french fry color, and french fry texture.

Other results relating to developing sugar profiles of processing cultivars during growth and storage are summarized in the comprehensive report.

OBJECTIVES FOR 1995:

1. The potato breeding and selection program will be continued. Advanced clones will be tested in yield trials, out-of-state trials, and by growers.
2. The Colorado Western Regional Trials will be conducted.
3. Clonal selections of Russet Norkotah will be compared in yield trials.
4. Twelve-hill plots and clones acquired from other programs will be screened for potato spindle tuber viroid (PSTV).
5. 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.
6. Clonal evaluations for storage disease reaction will be continued. Primary focus is concentrated on bacterial soft rot and dry rot (Fusarium and early blight). No funding for this study is being requested.
7. A study to determine sugar profiles for standard processing cultivars under San Luis Valley growing conditions will be continued.
8. Cooperate with Joe Maga, Department of Food Science and Human Nutrition in postharvest quality evaluations for advanced selections for protein, alkaloids, taste (flavor), and vitamin C.
9. Studies will be initiated in the greenhouse as needed to study the utility of various chemicals in enhancing production of nuclear seedstocks.

FUNDING REQUEST: 1994 Allocation - $22,500.00

1995 Budget Request

Labor	$11,600.00
Travel	1,600.00
Supplies	11,500.00
Total	$24,700.00