

SUMMARY RESEARCH PROGRESS REPORT FOR 2000 AND RESEARCH PROPOSAL FOR 2001

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

Title: Potato Disease Management

Project Leaders: Richard Zink and Robert Davidson, CSU

Project Justification: The potato industry in the San Luis Valley continues to be faced with serious disease management challenges. The presence of late blight has significantly increased the need for expensive fungicide application, thus increasing production costs. Early blight continues to be damaging and difficult to control. Potato leafroll and potato virus Y are becoming epidemic in some cultivars. Seed-borne and soil-borne diseases such as powdery scab, pink rot, silver scurf, and *Rhizoctonia* require increasingly sophisticated management schemes. Although cultural practices and varietal resistance are of great value, these diseases will be controlled to a large extent by utilizing clean seed, good management techniques, and judicious use of chemicals.

Efficacy trials are now a permanent component of the overall research effort at the San Luis Valley Research Center. These trials generate the basic information required by product manufacturers, the EPA and State Department of Agriculture for labeling and registration. Ongoing evaluation of products is essential to maintaining current labels as well as justifying Section 18, LSN24C and Section 3 registrations for new products. Availability of new crop care products to potato growers in Colorado is contingent upon scientifically valid data developed within the University on a regional basis.

Evaluation of advanced clones from the Cultivar Development Program for reaction to several critical diseases is also a permanent component of the overall research effort. The increasing threat of several major disease problems and the advent of Plant Variety Protection for new cultivars makes this a major thrust for protecting the growers' and the University's interests. Additionally, these evaluations can provide valuable information to the producer of new cultivars so that the threat from many diseases can be managed.

The funds being requested in this research progress report and proposal will be used to secure the ongoing labor needed to insure continuity in efficacy trials from year to year and in the advanced clone disease assessment program. The funding request for Objective 1 covers half of the cost of a full-time Research Associate shared with the Potato Physiology Project under the direction of Dr. Thompson. Additional funds are requested for plot rent, seasonal labor, supplies, analyses and expendable equipment. Funds for some expenses will also be obtained from outside sources.

Project Status: Ongoing

Significant Accomplishments for 2000:

- Evaluated twenty-eight season-long fungicide programs for control of early blight.
- Evaluated thirteen potato seed piece treatments for control of *Rhizoctonia*, *Fusarium* dry rot, and bacterial soft rot.
- Evaluated five treatments as in-furrow applications for control of *Rhizoctonia* on potato stems, stolons and tubers.

- Evaluated eleven chemical treatments as in-furrow applications for control of powdery scab.
- Evaluated Ridomil Gold 4EC and Ultra flourish as in-furrow applications for control of pink rot.
- A biological additive, Ascend PA, for enhancing potato growth and yield following soil fumigation was evaluated at four off-station locations.
- The growth regulator, Auxi Gro, was evaluated as a tool for increasing tuber number in the cultivar Chipeta.
- Two micro weather stations for data collection to predict late blight onset were purchased; however, were not installed due to their late arrival in the season.
- A working collaborative relationship was established with Dr. Barbara Christ at Pennsylvania State University for studies on powdery scab.
- Held an industry-wide workshop on powdery scab with three invited speakers; Dr. Stuart Wale from Scotland, Dr. Barbara Christ from Pennsylvania and Dr. Melvin Grove from ISK Biosciences. (Sponsors included the CCPGA-\$5000, Syngenta-\$250 and the Potato/Grain Conference-\$2000).
- Evaluated nine European potato cultivars for performance under SLV conditions.
- Evaluated Kocide and Quadris as post-harvest fungicides on potato tubers for control of early blight tuber rot and *Fusarium* dry rot.
- Evaluated seven advanced clones for reaction to potato leafroll virus and PVY.
- Evaluated twenty seven advanced clones and cultivars for reaction to bacterial ring rot.

Objectives for 2001:

- 1) Continue a full range of efficacy trials on-station and whenever possible in conjunction with cooperating potato growers.
- 2) Continue evaluation of advanced selections from the Cultivar Development Program for reaction and symptom expression to several major pathogens.
- 3) Develop a comprehensive research effort on powdery scab. The following objectives will be priorities for 2001:
 - Establish a permanent powdery scab research site.
 - Expand chemical control trials.
 - Evaluate soil assays for detection of pathogen.
 - Elucidate the roles of soil temperature and water level and planting date on symptom development.
 - Collaborate with Dr. Barbara Christ at Pennsylvania State University in national USDA funded powdery scab project.

Funding Request:	2000 Allocation:	\$21,000
	2001 Request: Objective 1	\$15,000
	Objective 2	\$ 5,000
	Objective 3	\$ 8,000
	Total	\$28,000