

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 Disease Studies

Project Leaders: R. D. Davidson and J. L. Whitworth, SLV Research Center

Project Justification:

Managing potato disease problems in the San Luis Valley is critical for growers with rising production costs and the potential for significant crop losses because of disease. A substantial effort has been put forth to reduce the impact of four major seedborne disease problems; potato leafroll (PLRV), mosaic viruses (PVX, PVS & PVY), blackleg - *Erwinia* spp. and bacterial ring rot (BRR) - *Clavibacter michiganensis* pv. *sepedonicus*. The certified seed potato program has initiated intensive programs designed to reduce or eliminate the threat from these disease problems. Success has been varied, but overall, there have been reductions in the percentage of seed lots with PLRV and BRR. However, there have been recorded increases in mosaic and blackleg problems. These diseases have not been eradicated in the San Luis Valley, primarily because of the presence of additional sources of recontamination and dealing with latent (non-visual) infections. Therefore, continued research of these diseases and others with potential impact in the future is warranted. Emphasis for this project is on practical, grower oriented methods of control.

Project Status:

This is an ongoing project which has been funded at various levels for the past several years. Since the early 1980's, leafroll and BRR screening of the newest numbered clones being released by Colorado's Cultivar Development program has been in place. Reaction to BRR and PLRV, including a rating of each clone for symptom development and potential susceptibility to these diseases, is completed each year. Reducing the impact and spread of bacterial diseases, specifically blackleg, and the mosaic virus PVY are also areas of focus.

1994 Significant Accomplishments:

- Twenty five (BRR) & twenty two (PLRV) advanced clones and four established cultivars were screened for symptom expression to PLRV and BRR. Six clones that had no leafroll symptom expression in 1993 were retested in 1994 and expressed excellent leafroll reactions. One clone, CO86051-3, had no reaction in either 1993

or 1994. It would be beneficial to further test this clone. All other clones tested in the plot had adequate expression of leafroll symptoms. Risk of in-field spread from infected to non-infected plants was high for many clones in 1994. This may be related to heavy aphid pressure during the season. BRR expression was marginal to adequate for the majority of the clones tested. Two clones, CO86030-1 and CO86153-2, were of concern. CO86030-1 still did not demonstrate any BRR symptoms during the season, while BRR symptoms were marginal in CO86153-2. All clones will be retested in 1995.

● Microplant symptom expression to BRR was examined for the third and final year. Stands of microplants inoculated with *Clavibacter michiganensis* pv. *sepedonicus* (Cms) were not affected in 1994. More BRR symptoms were apparent in the years 1993/94 than in 1992. Overall, the higher the inoculum level, the greater the percentage of plants with BRR symptoms. This relationship also held true for tuber symptoms. All cultivars demonstrated BRR symptoms unlike previous years.

1995 Objectives: In 1995 we propose to continue:

- 1) screening new releases for BRR and PLRV expression
- 2) examining the use of sulfuric acid in reducing recontamination with Erwinia spp. and PVX/PVS
- 3) studies on cultural factors contributing to expression of PLRV and PVY in the varieties Chipeta and CO80011-5 (Crestone) and improved detection methods for these diseases.

Funding:

1993 Allocation: \$1,500

1994 Request:	Labor	\$2,000
	Equipment/supplies/rent	<u>\$1,500</u>
	Total	\$3,500