

**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: EVALUATION OF ADVANCED CLONES FOR POTATO LEAFROLL AND BACTERIAL RING ROT EXPRESSION UNDER SLV CONDITIONS

PROJECT LEADER: Robert Davidson

PROJECT JUSTIFICATION: Managing potato disease problems in the San Luis Valley becomes increasingly important as production costs increase and financial commitments rise. For the last several years a significant amount of effort has been put forth to reduce the impact of two major diseases; potato leafroll and bacterial ring rot. Because of the unique environmental conditions in the San Luis Valley, it has become extremely important to obtain information on symptom expression and overall plant reaction to leafroll (PLRV) and ring rot (BRR) on the new clones being released from the Colorado Cultivar Development program. This information is generated early enough in the clone's history to be taken into serious consideration as the time for release to SLV growers draws near. Additionally, the Certification Section of the Potato Association of America has targeted clone reaction to these two diseases as essential information to be included with each official notice of cultivar naming and release.

PROJECT STATUS: Ongoing project funded the last several years.

1992 SIGNIFICANT ACCOMPLISHMENTS: Five (PLRV) and twelve (BRR) advanced clones were screened for their symptom expression to PLRV and BRR. Because of a failure in the cooler containing the PLRV positive controls for inoculation, screening for PLRV was not completed on the five clones entered into the trials. This work will be conducted in 1993 with the next set of clones. All of the clones tested in 1992 had typical, adequate symptom expression for BRR. Two clones of concern in 1991, AC83064-6 and AC84487-1 had typical timing and expression for BRR in 1992.

1993 OBJECTIVES: Fifteen to twenty advanced clones from the Colorado Cultivar Development program plus the five clones not tested for PLRV will be inoculated and evaluated for PLRV and BRR symptom timing and expression and for in-field PLRV spread.

<u>FUNDING REQUEST:</u>	1992 Allocation:	\$3000.00
	1993 Request:	\$1500.00

ANNUAL PROGRESS REPORT 1992

Evaluation of Advanced Clones for Reaction to Bacterial Ring Rot Infection

Robert Davidson

SUMMARY:

Twelve numbered clones and four control cultivars/clones were evaluated in the field in the San Luis Valley for their reaction to inoculation with bacterial ring rot (BRR). The timing of symptom development, the height of the plants, the type of expression, both in the foliage and in the tubers and the number of plants out of each clone or cultivar exhibiting symptoms was measured.

All of the clones and cultivars were susceptible to infection by bacterial ring rot. Two clones, AC83064-6 and AC84487-1 were of concern in 1991 because of late initial symptom expression and overall numbers of plants with foliar expression. In the 1992 trials, however, they showed excellent timing for first symptom expression and adequate symptom development. There were no clones which demonstrated any marked problem with overall foliar BRR reaction including stem squeeze and actual symptom expression. CO84205-5, did show only 5% of the tubers with visible symptoms. This should be considered if it is released to growers. Plant height measurements were taken in mid-July, with few differences evident. Further work must be done with this process to make a case for using this measurement in BRR diagnosis.

Materials & Methods:

The methods used in 1992 were identical to those used in 1991. Please see the 1991 Annual Progress Report for this information. Readings were taken beginning June 26 (50 DAP) until August 16 (102 DAP) at weekly intervals.

Results & Discussion:

Data is presented in two tables outlining field symptom information and tuber symptom information. Please see the summary information above for a general discussion of the 1992 trials. Clones which do not require further testing in 1993 include AC83064-1, AC83064-6, AC83172-1, AC84028-4, AC84487-1, CO84074-2 and CO84205-5. All of these clones have demonstrated adequate overall expression of BRR in at least one of two years. One note, CO84205-5 has only shown a maximum of 5% of the tubers with visible BRR symptoms in both years of testing. While foliage expression is adequate, lack of tuber symptoms may provide a false sense of security when determining quality of seed based on this factor alone!

BACTERIAL RING ROT CLONAL EVALUATION STUDY 1992
FIELD SYMPTOM INFORMATION

CLONE # AND NAME	DATE FIRST: : SYMPTOMS : APPEARED	# OF REPS: : POSITIVE	# OF PLANTS : POSITIVE	% PLANTS : POSITIVE	DATE 50% OR: : MORE PLANTS : POSITIVE	PLANTS: : POSITIVE	SUMMARY OF : SYMPTOMS : OVER SEASON
1 AC84610-5	7/13	2	3	14.2	7/24	100.0	: ED, R, IVC, IVN, MN, W
2 AC85438-4	7/3	1	2	9.5	7/24	95.2	: ED, R, IVC, IVN, MN, W
3 ATX6-84378-1RU	7/3	1	4	19.0	7/31	85.7	: ED, R, IVC, IVN, MN, W
4 CO85026-4	7/3	3	9	42.9	7/13	95.2	: ED, R, IVC, IVN, MN, W
5 CO85168-4	7/3	1	1	4.7	7/16	95.2	: ED, R, IVC, IVN, MN, W
6 AC84028-4	7/24	3	6	28.5	7/31	71.4	: ED, R, IVC, IVN, MN
7 AC84487-1	7/3	2	8	38.1	7/16	95.2	: ED, R, IVC, IVN, MN, W
8 CO84074-2	7/24	1	1	4.7	7/31	100.0	: ED, IVC, IVN, MN, W
9 CO84205-5	7/3	1	4	19.0	7/16	100.0	: ED, R, IVC, IVN, MN, W
** 10 AC83064-1	7/13	1	2	9.5	7/31	100.0	: ED, R, IVC, IVN, MN, W
** 11 AC83064-6	7/3	2	4	19.0	7/24	100.0	: ED, R, IVC, IVN, MN, W
** 12 AC83172-1	7/3	2	5	23.8	7/24	100.0	: ED, R, IVC, IVN, MN, W
13 Centennial	7/31	2	3	14.2	8/14	61.9	: IVC, IVN, MN, W
14 Russet Burbank	6/26	2	3	14.2	7/3	100.0	: ED, R, IVC, IVN, MN, W
15 Sangre	7/13	3	4	19.0	7/24	95.2	: ED, R, IVC, IVN, MN, W
16 WNC230-14	7/3	2	2	9.5	7/31	90.5	: ED, R, IVC, IVN, MN, W

KEY TO SYMPTOMS: ED-early dwarf, R-rosette, IVC-interveinal chlorosis,
IVN-interveinal necrosis, MN-marginal necrosis & W-wilt.
Planting date on 5/7-8/92. Last reading taken on 8/18/92 approximately 100 DAP.

* INDICATES CLONES PREVIOUSLY TESTED, * - ONE YEAR, ** - TWO YEARS

BACTERIAL RING ROT CLONAL EVALUATION STUDY 1992
 TUBER SYMPTOM DATA EVALUATED ON 9/16/92 (8/16/92 FOR STEM SQUEEZE)

CLONE # AND NAME	(# + REPS OUT OF 3)	STEM SQUEEZE	PERCENT TUBERS W/ INTERNAL	PERCENT TUBERS W/ SYMPTOMS	PERCENT TUBERS SHOWING	PERCENT TUBERS SYMPTOMS
1 AC84610-5	3		30	20	50	50
2 AC85438-4	3		20	20	40	60
3 ATX6-84378-1RU	3		20	15	35	65
4 CO85026-4	3		5	10	15	85
5 CO85168-4	3		15	5	20	80
6 AC84028-4	3		15	5	20	80
7 AC84487-1	3		15	5	20	80
8 CO84074-2	3		35	0	35	65
9 CO84205-5	3		0	5	5	95
** 10 AC83064-1	3		15	10	25	75
** 11 AC83064-6	3		25	15	40	60
** 12 AC83172-1	3		25	30	55	45
13 Centennial	3		5	0	5	95
14 Russet Burbank	3		45	25	70	30
15 Sangre	3		35	15	50	50
16 WNC230-14	3		45	20	65	35

20 TUBERS WERE RANDOMLY PICKED AND ASSAYED PER CLONE

* INDICATES CLONES PREVIOUSLY TESTED, * - ONE YEAR, ** - TWO YEARS