

BUDGET REQUEST FOR 1987

Gary D. Franc
Extension Potato Specialist

This budget request is for work needed to provide answers to SLV growers' questions, i.e., it is for an applied research program. The funds requested for labor are needed to minimize my time spent on routine procedures during the growing season. The budget request is for work needed to:

1. Summarize, collate and index past research projects done in the San Luis Valley. This is needed to make the vast amounts of research data already collected more accessible to extension agents, researchers, crop consultants and growers seeking information on specific topics.
2. Determine if Alternaria alternata is playing a role in early blight epidemiology in the San Luis Valley as it is in Pennsylvania. If present, it may be possible to "fine-tune" the IPM day degree model as well as alter some current fungicide recommendations to achieve more efficient disease control.
3. Determine if contaminated irrigation water used in 1986 established latent tuber infestations on Erwinia-free tubers that will not be expressed as blackleg until 1987, and to determine if Erwinia can replicate in natural San Luis Valley irrigation water.

Materials and Supplies	\$ 600.00
Plot Maintenance	162.00
Labor	738.00
Travel	<u>100.00</u>
TOTAL	\$1,600.00

RESEARCH PROPOSAL FOR 1987

Gary D. Franc
Extension Potato Specialist

This research program is needed to answer questions frequently asked by growers. The first section addresses the issue of making research information on SLV potato production more accessible to extension agents, researchers, crop consultants, and growers, now and in the future, and the second and third sections address specific diseases (early blight and blackleg) and the need to understand their epidemiology under the unique growing conditions found in the San Luis Valley. The request for labor assistance is a necessary part of the budget to minimize my time spent on routine procedures during the growing season.

Section I. Indexing of San Luis Valley Research Results

It is a constant problem for extension agents to become familiarized with the vast amounts of research information available through present and past research projects done by CSU personnel. It is much more efficient to summarize, collate and index past research projects so workers can easily find information on specific topics. By establishing such an indexing system, this information could be easily accessed by anyone (crop consultants, researchers and growers) visiting the San Luis Valley Research Center. Such a system would also minimize the impact due to the loss of CSU personnel through retirement or turnover, i.e., it would become easier for new personnel to become familiarized with production practices in the Valley. I propose to develop a system for indexing research records on file at the SLV Research Center and to initiate use of this system with the help of SLV Research Center personnel. Rather than proposing new research, this would allow more efficient use of previous research results.

Section II. Early Blight Epidemiology in the San Luis Valley

It is well accepted that Alternaria solani causes early blight and is world-wide in distribution. However, some reports suggest that A. alternata (a closely related fungus) can also cause "early blight" type symptoms in some potato production areas. One of the most recent reports (1986) is from Pennsylvania where it was found that fungicides effective for control of A. solani were not effective against A. alternata. The researchers concluded that late season epidemics of early blight may be due to the use of fungicides ineffective against A. alternata.

The first step needed to determine if a similar situation is occurring in the San Luis Valley is to attempt isolation of A. alternata from leaves with symptoms similar to those described for A. alternata as well as A. solani. It would be a simple matter to collect symptomatic leaves during Cooperative Extension visits to growers' fields during the growing season. Isolations will be done at the SLV Research Center to determine if A. alternata is part of early blight epidemiology in the Valley. Research results may make it possible to "fine-tune" the IPM day degree model as well as determine if current fungicide recommendations need to be changed to achieve more efficient disease control.

Section III. Blackleg Epidemiology in the San Luis Valley

The planting of Erwinia infested seed is known to increase the incidence of blackleg and seedpiece decay. Planting "Erwinia-free" seed virtually eliminates this problem.

Research done by me at CSU for my doctoral thesis has shown that irrigation of an Erwinia-free potato crop with Erwinia contaminated irrigation water is an efficient means of re-infesting healthy stems (Figure 1) and tubers (Figure 2). However, virtually all stems and tubers showed no visible symptoms i.e., the infections, when present, were latent.

I propose to plant back in the field, during 1987, tubers harvested from the treatment plots inoculated in 1986 (data shown in Figure 2). This would help us determine if Erwinia strains applied in irrigation water can persist in an apparently healthy seedlot and cause disease symptoms during the following growing season.

An additional study needed is to determine if Erwinia can replicate in SLV irrigation water. Although numbers of Erwinia in SLV water appear to be very low relative to potato production areas in northeastern Colorado, it is not known if a specific niche exists for rapid multiplication of cells in water. A simple study will be done to determine if replication in water can occur under natural conditions in the field. If replication can occur, growers may be able to reduce the risk of recontamination by Erwinia by modifying irrigation practices.

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Figure 1.

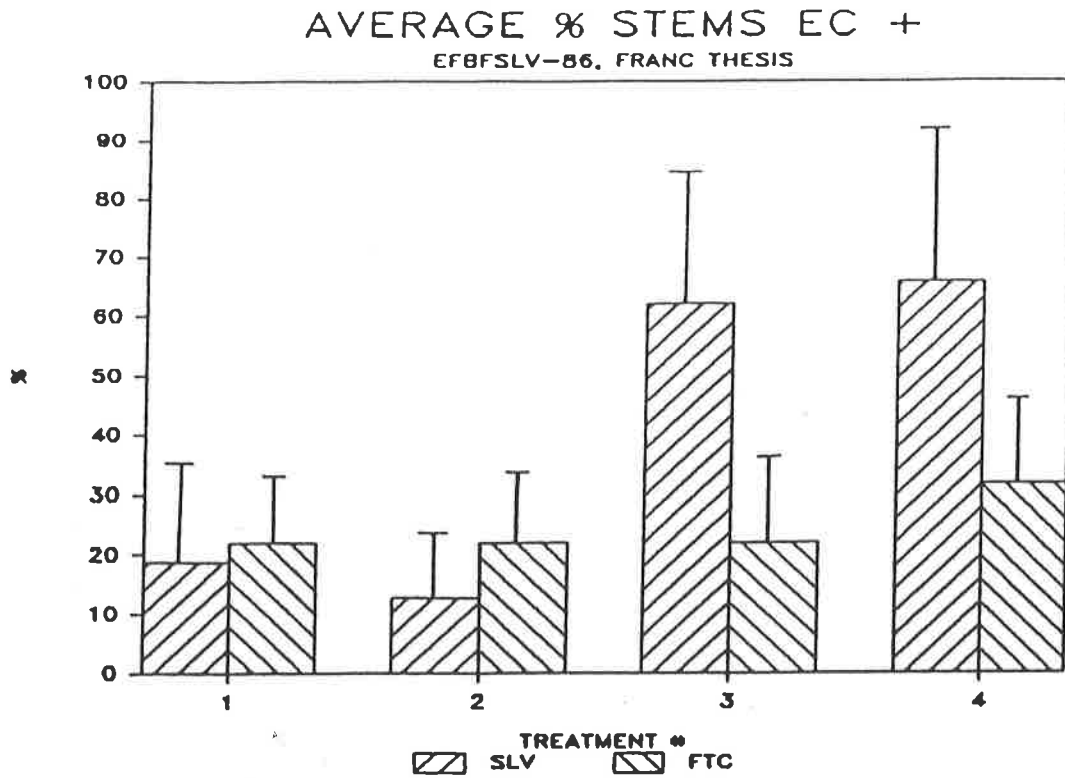
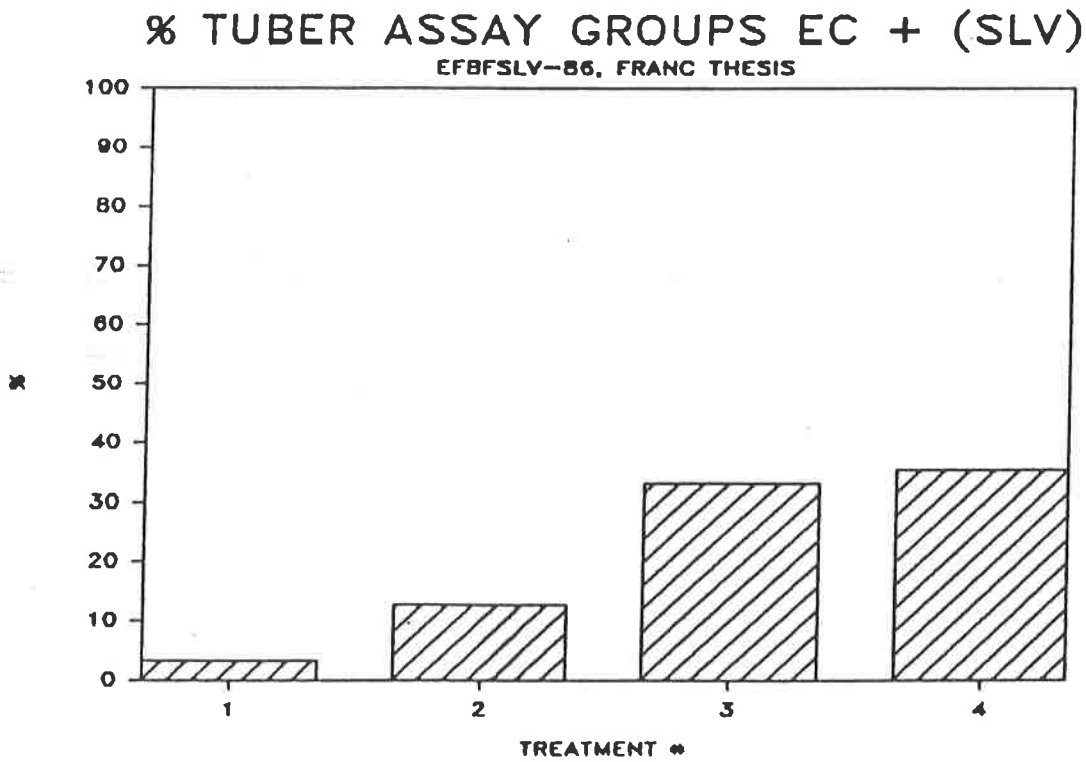


Figure 2.



Erwinia carotovora treatments applied in 1986 were:

1. Surface water
2. Surface water + 200 colony forming units (CFU)/ml
3. Surface water + 2,000 CFU/ml
4. Surface water + 20,000 CFU/ml

SLV = San Luis Valley

FTC = Fort Collins

