

1986 RESEARCH PROPOSALS
Whitney Cranshaw
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Continuation of Bait Plant Studies

A greatly expanded program using bait plants is needed in 1985 to further confirm the extent of early season leafroll spread. This will involve the use of a larger number of plants and trapping locations to get better sensitivity of when spread is occurring. Again, a concurrent study will evaluate aspects of the bait plant techniques such as use of different species of bait plants.

The occurrence of positive spread of leafroll to bait plants will be correlated with flights of green peach and potato aphid. If a system of aphid monitoring is not funded by the Potato Administrative Board, a separate smaller scale aphid trapping program will be undertaken as part of this project - at extra research cost.

Overwintering Host Plant Survey

During May a survey of Prunus spp. will be conducted to establish which trees are successfully producing the spring generation of green peach aphid. This survey will include sand cherry and choke cherry as well as known hosts such as plum, cherry, peach, and apricot. Locations of Prunus spp. will be determined using maps of trees found in previous overwintering aphid control work done in the Valley.

Informal surveys of Rosaceae plants (Rose family) will also be initiated to begin identifying overwintering hosts of the potato aphid.

Insecticide Trials

Insecticide trials comparing materials for aphid control will again be conducted. Particular attention is anticipated for evaluating post-planting soil systemic insecticide treatments since these can be expected to limit potential problems with groundwater contamination by insecticides. The percentage of leafroll in plants treated with various insecticide applications will also be monitored.

Potato psyllid control will be evaluated when psyllid populations are present.

Evaluation of soil insecticides for possible interaction effects with Sencor herbicide treatment will be repeated in 1986. This study is done in coordination with Mike Thornton.

Cultural Control/Aphid Studies

The impact of various cultural practices on aphid colonization and virus spread will be continued. Specific treatments include various plant spacings, the presence/absence of stubble, and treatment with Dithane or Bravo fungicides. Numbers of aphids landing on the crop, aphid populations on plants, and leafroll spread will be evaluated.

Potato Psyllid/Variety Interaction

Eight potato varieties will be grown with and without psyllid control treatment. The numbers of psyllids on the untreated plants will be monitored at regular intervals. Differences in yield between treated and untreated potatoes will be used to indicate varietal tolerance to psyllid injury.

NOTE: During 1986 an entomology graduate student, Robert Hammon, will be located full-time in the San Luis Valley.

1985 RESEARCH FUNDING REQUEST

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Fort Collins, CO 80523

Summer salary of research assistant	\$2,200
Housing, utilities, research assistant	950
Post-season hourly labor	350
Plot maintenance, supplies	350
Travel	1,000
Greenhouse, office supplies, reporting costs	450
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TOTAL BUDGET REQUEST	\$5,300

SUMMARY OF 1985 RESEARCH RESULTS

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Bait Plant Studies

A continuation of the studies by Livingston and Klein using bait plants to indicate time of leafroll spread was conducted. Bait plants in trap pans were placed at five Valley locations at weekly intervals beginning June 22 and continuing through August 28. Plants were tested for leafroll infection by ELISA.

At present testing of plants is not yet completed but preliminary results are available. Most important was the occurrence of infection in plants exposed in the field June 28-July 3. This early season infection rate was low but did occur in approximate relation to the first winged aphid captures reported by Agro-Engineering.

A secondary aspect of the bait plant study was to evaluate the technique as an indicator for when potato leafroll is spread by winged aphids. During 1984, Physalis alone was used in these studies. In 1985, Physalis was compared with "Centennial", "Russet Burbank", or Datura seedlings. All different bait plants were infected at equivalent rates in 1985.

Trap Pan Studies

Since the yellow pan trap has in the past been used to make within season and between year comparisons of aphid abundance, studies were made to examine factors affecting trap capture. Briefly stated, the addition of wetting agents (Basic H, Aqua-Gro) and the color of the background at

the trap location were the only factors affecting insect capture. Water level, addition of detergents, and fluon banding did not affect insect capture in traps.

Insecticide Trials

A foliar insecticide efficacy treat was established at the roguing plot. Soil applied systemic insecticides were tested in Larimer County when potato psyllid pressure was higher.

All foliar insecticides controlled green peach aphid (the dominant 1985 species at the plot). Superior control performance was demonstrated by Monitor and Pydrin. The aphid control by Pydrin was considered to be somewhat unusual since it is not normally considered an aphicide. Potatoes from these plots are being grown to determine 1985 potato leafroll infection rates.

Soil applied systemic treatments, applied post-emergence, again indicated that the carbamate insecticides Temik and Furadan give inferior control of potato psyllid than did the organophosphate insecticides DiSystem and Thimet.

Potato Psyllid Varietal Trial

Potato psyllid populations were monitored on 13 potato varieties. A 3-4X difference in infestation among varieties were demonstrated. Interestingly, the variety previously reported to be relatively immune to psyllid yellows, WNC 230-14, was heavily infested by psyllid. This indicates that varieties may range widely in tolerance to psyllid feeding.