

Section VIII.
Mites & Sap-sucking Insects

WASHINGTON POTATO IPM PROGRAM – 2000
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Potatoes currently rank as one of most economically important commodities in Washington, with a total of 175,000 acres planted in the 2000 growing season. The harvested crop has a farmgate value of over \$450 million. The economic impact of the potato industry on the Washington economy is estimated to be nearly \$3 billion. The vast majority of which is processed.

The losses due to net necrosis in 1999 for Washington alone were in the millions, with entire fields of potatoes rejected by processors. The primary means of control once potatoes have emerged from the ground has been foliar control using mostly aerial applications of methamidophos (Monitor). This single product has been the primary post emergent means of controlling GPA in Washington potatoes for over 15 years. Nationally, 520,000 pounds of methamidophos active ingredient were used in 1999 for aphid control on potatoes according to the 2000 National Agricultural Statistics Service Agrichemical Field Crop Summary. Forty five percent of this amount, or 236,000 pounds, was used in Washington. Additional products used in much smaller amounts for control of green peach aphid were disulfoton (Di-Syston) and dimethoate. All three of these products are organophosphate insecticides.

The incidence of net necrosis is increasing. Possible causes for increasing losses due to net necrosis include the following: 1) Increased use of pyrethroid insecticides for control of Colorado potato beetle (CPB) is thought to flare aphids and other secondary pests such as two-spotted spider mites; 2) Early season potatoes have a much higher action threshold for control of GPA, this means that growers often do not control the pest. The increased plantings of early season potatoes has been mentioned as a source of increased GPA. 3) The loss of some uses of Temik in the potato industry has also resulted in increased PLRV occurrence in potato seed. This results in more sources of PLRV inoculum in grower fields.

Starting in 2000, growers had access to alternative products for control of GPA and CPB. These products included Fulfill and Success, respectively. Additionally, Provado received a label change allowing it to be applied by air, making it a more effective product. Grower use of these products was minimal due to concern over their cost effectiveness in commercial conditions.

Potato entomologists across the PNW worked together to develop a model IPM program for potatoes. The separate programs were developed for non-storage potatoes and those to be stored. The full program is available at www.wsu.edu/~potatoes. It represents the accumulation of results of research and extension potato IPM program from across the Pacific Northwest.

In an attempt to respond to the widespread losses associated with net necrosis, the Washington State Potato Commission initiated an areawide potato IPM program on early season potatoes in May of 2000 using the idealized program developed by PNW entomologists. The project covered 1,500 acres, half of which included use of alternative products for control of GPA and CPB. Grower fields were intensively scouted for pests and beneficial organisms. Growers were given additional information on when and how to apply alternative products. Major components of the project included.

- No use of disruptive insecticides that might flair aphids or mites (e.g. pyrethroids)
- Once aphids flights start, potatoes that will be stored should be continually protected by applications of insecticides.
- Only non-disruptive products should be used for Colorado potato beetle control
- Fields should be scouted twice a week

Results.

One field was never treated because it was harvested before aphids built up in number to the action threshold. One field was oversprayed with a non program chemical. Several fields had no PLRV (which is good for the growers, but not so good for evaluating our program.)

The final report which was just finalized in mid December is just over 60 pages long and has a mind numbing 200+ tables. Want to know about what Monitor does to big eyed bugs, or what Success does to Colorado potato beetle larvae, well just thumb through this report. Overall, fields treated with Fulfill had lower aphid counts on average than fields treated with Monitor, although aphid counts were highly variable across fields and time. Five of 13 fields had detectable levels of PLRV. The average level of PLRV in conventionally treated fields was 15.9%. The average level of PLRV in fields treated with Fulfill was 9.0%. CPB levels were generally low throughout the season and there were no differences between the conventional and program fields. One field developed a mite program, but interestingly only on the conventionally treated side of the program, mite numbers on the program side of the field were ten-fold lower.

Conclusion and the Future. The program was generally considered a success for two reasons. First, we actually accomplished what we set out to do. We successfully implement the ideal IPM program, albeit in a less than an ideal fashion. Second, we controlled CPB and aphid pests and we reduced the occurrence of PLRV by nearly 50% using products that are much less acutely toxic than conventionally use materials.

The Washington State Potato Commission plans to expand the program in 2001 to 4,500 acres. The program will also be expanded to include mid and late season potatoes. Plans are being made to include the Columbia Basin of Oregon as well. For more information on this program contact Andy Jensen (509 765 8845), Keith Pike (509 786 9269) or Alan Schreiber (509 543 9757)