

A PROGRAM FOR CONTROLLING APHIDS IN SEED POTATOES
IN NORTHWESTERN WASHINGTON

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This publication reports research involving pesticides. It does not contain recommendations for their use, nor does it imply that the uses discussed here have been registered. All uses of pesticides must be registered by appropriate State and/or Federal agencies before they can be recommended. Also, mention of a pesticide in this paper does not constitute a recommendation of this product by the USDA.

Years ago, it was customary for farmers in eastern Washington to buy a few sacks of seed potatoes from some remote area; then they increased them for one year before they planted them for the main crop. This cheap way of obtaining seed was fairly satisfactory until leaf-roll disease, carried by the green peach aphid, Myzus persicae (Sulzer), got out of hand during the early 1940's. Since then, the use of one-year-old seed has usually been disastrous.

A number of areas supply good seed potatoes. However, one area may have a little more virus or bacterial or fungal disease present than another so strong prejudices have developed during the years as to the best sources of seed potatoes. Washington State Certification records go back to the 1920's, and an examination of these records shows that some growers have consistently produced disease-free seed.

Washington-grown certified seed may usually be obtained in eastern Washington somewhat more cheaply than from other sources, but the state's total production is only 1/7 of the state's requirements. Therefore, for the past several years, the Washington State Seed Potato Commission has conducted an aphid survey and warning system in Whatcom County which has enabled seed growers to time their applications of insecticides more correctly and thus produce better seed. Also, starting in 1968, the Washington State Potato Commission and entomologist of the Agricultural Research Service, U. S. Department of Agriculture have assisted with research designed to assist in the production of good quality seed potatoes within the state.

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Aphid Abundance in Whatcom County

Although the green peach aphid, the foxglove aphid, Acyrtosiphon solani (Kaltenbach), and the potato aphid, Macrosiphum euphorbiae (Thomas),^{4/} infest potatoes in northwest Washington, only the green peach aphid is an effective vector of leaf roll virus (MacCarthy 1954). Numerically, the aphids that infest potatoes in Whatcom County are normally so few that they would probably go unnoticed in eastern Washington. The low populations may be attributed to the following conditions:

The green peach aphid does not go to peach trees in Whatcom County and, therefore, no overwintering eggs are laid that would be a source of early spring migrant aphids.

The cool summers in Whatcom County depress the aphids' reproductive rate during the growing season, and the fairly cold winters kill most of the overwintering summer forms of the aphids.

In addition, large wooded areas in Whatcom County isolate potato fields so aphid-borne diseases are not readily spread from one field to another. Also, to insure that aphids do not become established unnoticed on the crops, the Washington Seed Potato Commission has employed a trained fieldman for the past 5 years who periodically sweeps potato fields grown for seed and reports his findings to the growers so fields may be treated immediately if necessary.

Results of 1968 Research

A survey of the practices of Whatcom County Seed potato growers revealed that there was little agreement about which of several registered insecticides gave best control of aphids on potatoes. Therefore, in 1968, the relative merit of each of the materials was studied in the field.

No single large field of potatoes grown for seed was available for a comparison of insecticides for aphid control, so a majority of the growers agreed to use their fields as separate plots and to divide the testing with 4 insecticides among them in such a way that at least 4 fields would be treated throughout the growing season with the same material. Sprays of oxydemetonmethyl (Meta-Systox-R[®]), endrin, demeton (Systox[®]) and phosphamidon were applied at the maximum registered rate to the entire

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fields with 10-row, tractor-drawn sprayers. The timing of the applications of spray was left to the grower, but in each field, aphid control was evaluated by investigators about once a week. Also, records were made after each spraying, so it was possible to judge the day-to-day performance of the insecticides. The results indicated that demeton gave somewhat better control of aphids for 10- to 14-day periods than did any of the other insecticides.

Results of 1969 Research

Since the 1968 research had shown which insecticide was most effective in northwestern Washington, the 1969 trials were designed to determine the timing of the applications that would give the best, season-long control of aphids.

Hugh Hawley, Ferndale, Wash., made a 10-acre field of Russet Burbank potatoes available. The crop was planted the latter part of May, and the plants came up early in June. At that time, the field was divided into 16 20-row wide plots about 300 ft. long. Four randomized plots were to be left unsprayed, 4 were to be sprayed every 7 days, 4 every 14 days, and 4 every 21 days. The spraying started June 10 and was continued into September. An investigator examined each plot every Tuesday for aphids during the season.

No green peach aphids were found at any time in plots treated every 7 or every 14 days. The assumption may therefore, be made that in Whatcom County, good control of the green peach aphid can be obtained if potatoes are sprayed with demeton (1/2 lb. actual ingredient/acre) every 14 days during the time the green peach aphid is in flight.

Literature Cited

MacCarthy, H. R. 1954. Aphid transmission of potato leafroll virus. *Phytopathology* 44(4): 167-74