

APHIDS THAT OCCUR IN YELLOW PAN TRAPS  
AS COMPARED TO THOSE ACTUALLY FOUND IN THE POTATO CROP

by

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Potato leaf roll virus (PLRV) and potato virus Y (PVY) are serious problems in potato production in Oregon. Suppression of these viruses by controlling the aphids that vector them is one of the most important considerations that Oregon's potato growers face. Adequate control of the vector aphids requires monitoring techniques that allow early recognition of aphid infestations. Control may then be achieved without major outbreaks, and costs of control may be reduced.

Monitoring methods used today in Oregon are not adequate for two reasons. The first reason is that only wingless aphid numbers are monitored. Winged aphids are known to be important in the spread of plant viruses and are also the forms responsible for colonizing the field. Knowledge of their numbers can thus be important in attempts to control early virus transmission and to predict the rise of wingless aphid populations. Secondly, scouts rely heavily on counts of aphids on leaves. This is a poor technique because it is time consuming, and misses many of the winged and the larger wingless aphids; the disturbance to the plant caused by the leaves being picked is likely to cause the aphids to drop from the plant in an attempt to escape, resulting in inaccurate population estimates. For these reasons, utilization of an easier and more effective monitoring technique is crucial.

As a part of our research on integrated pest management of potato pests, we are working to develop a monitoring method using yellow pan traps and beating cloths. In 1992, we had a large series of yellow pan traps in our potato plots (plot size: 50'x50'), and took biweekly data from these and from beating cloth samples in each plot. The yellow pan traps used were about eight inches in diameter. All winged aphids were collected from them and identified to species. Beating cloths were 28"x28", each sample consisted of about two whole plants beaten over the cloth as it lay on the ground. All aphids were counted and identified to species.

Comparison of the two collecting techniques shows that 49 species of aphids were collected using yellow pan traps, while only 10 were found in beating cloth samples. Table 1 lists the ten species of aphids found in beating cloth samples and two common pan trap species which were not. Green peach aphid was dominant in the beating cloth samples, but shared the stage with spirea aphid in the yellow pan traps.

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Potato aphid was about equally represented by both techniques. The data show that most aphid species collected in yellow pan traps are not remaining in the crop for long. This means that nearly all the aphids found in beating cloth samples are species that colonize potato, and should be treated as potential virus vectors.

Table 1. Comparison of Results from Two Aphid Sampling Techniques.

<b>Aphid Species</b>	<b>Beating Cloth Total/ Proportion</b>	<b>Pan Trap Total/ Proportion</b>
Green Peach Aphid	3694/ 0.9888	9009/ 0.4524
Potato Aphid	25/ 0.0067	64/ 0.0032
Spirea Aphid	5/ 0.0013	8934/ 0.4487
Pea Aphid	3/ 0.0008	105/ 0.0053
Bird Cherry-Oat Aphid	3/ 0.0008	43/ 0.0022
Cabbage Aphid	2/ 0.0005	887/ 0.0445
Rose-Grass Aphid	1/ 0.0003	62/ 0.0031
Grain Aphid	1/ 0.0003	18/ 0.0009
Russian Wheat Aphid	1/ 0.0003	15/ 0.0008
Rose Aphid	1/ 0.0003	0/ 0.0000
Turnip Aphid	0/ 0.0000	251/ 0.0126
Oleander Aphid	0/ 0.0000	110/ 0.0055

It was generally true throughout the season that more aphids were collected per pan trap than per beating cloth. This fact coupled with the more general nature of the pan traps' catches leads us to suggest that pan traps be used as a sensitive first line of defense in aphid monitoring, followed with beating cloth samples to establish whether aphids in pan traps are also present in the crop.

Furthermore, we have found that yellow pan traps placed within potato plots represent not only the number of aphids coming into the plot, but also the number of aphids leaving the plots. The early peak in aphid flight in June is the primary colonizing flight. The second peak reflects the exodus of the aphids from the dying crop at the end of the season. The effects of treatment on the catch of alate green peach aphid are strongly significant. That yellow pan traps can be used to get very localized data on aphid flight and accurately represent green peach aphid on plants is an important find.

We are currently working to develop a set of recommendations for growers regarding aphid monitoring. Initially, we will suggest that several yellow pan traps should be kept in each field, and that when winged aphids are found in them, beating cloth samples be taken adjacent to the pan traps. Research during subsequent seasons will work toward developing a more specific program including action thresholds.