MALHEUR COUNTY POTATO PEST MONITORING PROGRAM – 2021

Stuart Reitz Malheur Experiment Station, Oregon State University, Ontario, OR

Summary

Forty potato fields throughout Malheur County were monitored for pest and beneficial insects. Traps were placed in fields on May 7 and monitored weekly through July 21 as the crop senesced and most fields were prepared for harvest. Results were reported via email to growers and their crop advisors. Significant findings were also reported on the Pacific Northwest Pest Alert network (http://www.pnwpestalert.net/) and shared with Erik Wenninger, University of Idaho, who oversees the Idaho psyllid monitoring program.

Potato psyllids were found early in the season. Although psyllids occurred in all fields during the season, populations were not as high as in 2020.

Other pests showed typical seasonal patterns although pest abundance tended to be lower than in 2020. An exception to this were populations of thrips, which were much higher than in 2020. The predominant thrips species in potatoes are western flower thrips, although onion thrips also occur.

The relatively large numbers of beneficial insects probably help suppress pest populations. Large numbers of pirate bugs, ladybird beetles and lacewings probably helped to suppress high aphid populations late in the season.

Objectives

- Monitor populations of key potato pests across Malheur County and deliver that information on a weekly basis to potato growers, crop advisors and other interested people in the county. All fields that growers wish to have monitored will be included in the program.
- Pests to be monitored will include 1) potato psyllids, 2) aphids, 3) beet leafhoppers, and 4) potato tuberworms, 5) defoliating caterpillars and Colorado potato beetles, 6) thrips, 7) spider mites, 8) lygus bugs, and other potentially significant pests. Associated beneficial insects will also be monitored, in support of developing biologically-based IPM programs.
- Assist growers in scouting for other pests and diseases during the growing season and with identifying and addressing other crop management issues.
- Relay information to growers and crop advisors directly through email and phone contact and publish pest monitoring data in the Treasure Valley Pest Alert Network.
- Relay information to other pest monitoring program leaders in the PNW.

Procedures

Trapping stations were set at 40 potato fields in Malheur County and were monitored from May to the end of July. The monitoring program did not last as long as usual because of the early crop senescence.

Trapping techniques specific for the different pests were used for monitoring. Because of COVID19 concerns, we were unable to collect traps for two weeks in late May and early June.

Potato Psyllid Monitoring – To aid growers in managing potato psyllids and zebra chip, yellow sticky cards were placed within potatoes fields, with 2 traps per field. Traps were collected and replaced weekly. Leafhopper traps (see below) were also examined for the presence of psyllids. Foliage samples were inspected for psyllid nymphs and eggs.

Beet Leafhopper Monitoring – Additional yellow sticky traps were placed near ground level along borders of fields to monitor beet leafhopper, which can transmit the pathogen that causes purple top. Traps were collected and replaced weekly, and the numbers of leafhoppers recorded. Fields were also inspected for plants infected with purple top caused by beet leafhopper transmitted virescence agent (BLTV).

Aphids – Aphids were also monitored with yellow sticky traps. Aphids were identified as green peach aphid (GPA), potato aphid (PA) or other aphids.

Potato Tuberworm Monitoring – To monitor tuberworm moth populations, pheromone traps were placed along field borders. Traps were collected and replaced weekly. Pheromone lures were replaced every 3 weeks, or as needed.

Colorado Potato Beetle – Foliage samples and yellow sticky traps were also inspected for Colorado potato beetle (adults, larvae and eggs).

Beneficial insects – Yellow sticky traps used for pest monitoring were also inspected for beneficial insects, in particular predatory insects, including minute pirate bug, big-eyed bug, lacewing and ladybird beetle. These counts were used as an indication of the activity of natural enemies in a field.

Diagnostics – Psyllids were sent to Dr. Kylie Swisher's lab (USDA-ARS Wapato, WA) to test for the presence of the zebra chip bacterium. Because of personnel shortages, they have not been able to test the psyllids yet.

Other Pest and Disease Monitoring – Assistance was provided to growers and crop advisors in identifying other pest and diseases problems that they encountered.

Results

- Traps were monitored over a 10-week period from May 7 until July 21 when Shepody potatoes matured and fields were being prepared for harvest.
- Growers and crop advisors received up to date weekly reports within 1 day after traps were collected. Psyllids were first found during the first week of sampling. Populations increased through the remainder of the season, as has been typical (Figure 1).

- Potato psyllids were found beginning on May 21 (traps placed May 14). Psyllids were found in almost half of the monitored fields for that week. Normally, psyllids are not collected until the beginning of June and populations are sporadic until late June. Despite the early occurrence of psyllids, populations remained relatively stable through June. Populations did increase in July to a maximum of about 4.5 per field. Through July, psyllids were found in 75–90% of fields. Although psyllids occurred in throughout the season, populations were not as large as in 2020.
- Beet leafhoppers were present throughout the growing season with peak abundance in mid-June and then declining (Figure 1). This early season peak and decline in beet leafhopper populations is typical. Populations were higher than in 2020; however, we found no evidence of plants infected with potato purple top disease.
- Aphids were among the most common pests recorded and were abundant, especially after mid-July. Significant numbers of potato aphids were found the week of July 11, but relatively few green peach aphids, the primary vector of PVY were found (< 1 per field per week) (Figure 2). Although unusual, the mid-July increase in potato aphids is a pattern that has been seen frequently in the Treasure Valley.
- No potato tuberworm moths were found in 2021. This was the seventh consecutive year that no tuberworm moths were collected in Malheur County.
- The pest status of thrips and lygus in the Treasure Valley remains uncertain. Lygus are one of the most common insects in potato fields, with populations present throughout the season. However, area growers have not considered lygus or thrips to be economically important in potato.
- Populations of lygus and thrips peaked in early July. Thrips were predominately western flower thrips. Some onion thrips were present because of the proximity of potato fields to the onion fields. High numbers of thrips were recorded through July (Figures 3); populations of thrips were higher in 2021 than in 2020. Lygus populations were similar to levels found in 2020.
- Large numbers of big-eyed bug, pirate bug, ladybird beetle and lacewing probably helped to suppress psyllid, aphid and thrips populations, in particular (Figure 4). Populations of these beneficial predators peaked late in the season.

Acknowledgments

I appreciate growers for allowing access to their fields, and the assistance of Hannah Rose, Ian Trenkel, Aidan Dwyer, Eileen Froshiesar and Tessa Hart in collecting and analyzing traps. Funding for this project was provided by the Oregon Potato Commission.

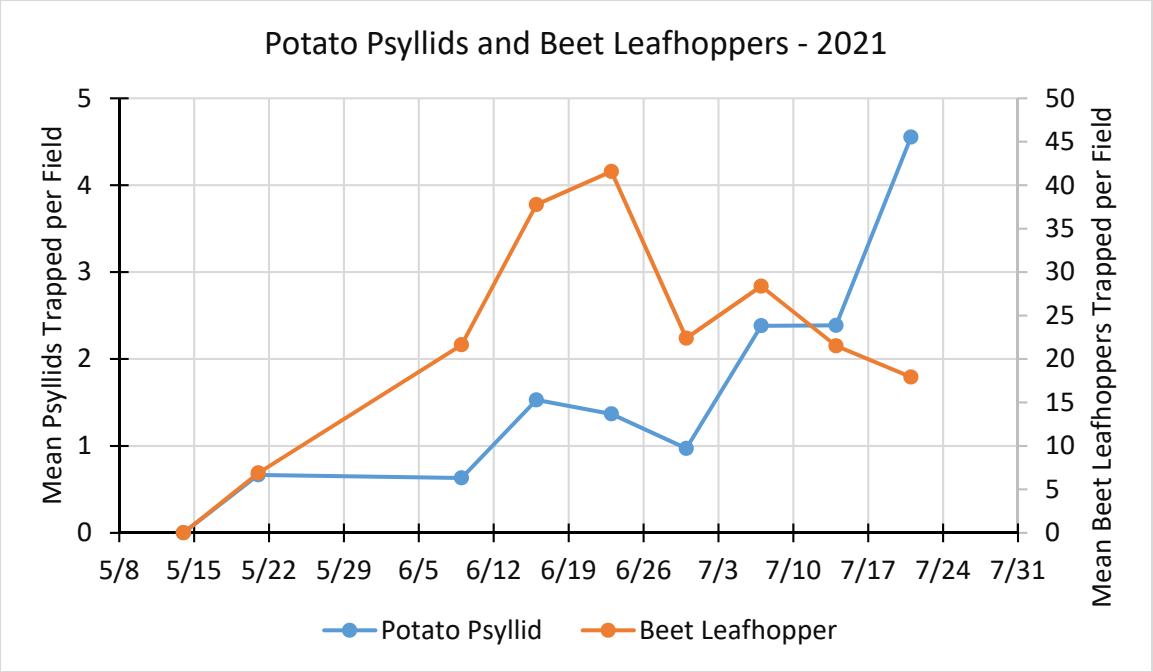

Figure 1. Seasonal dynamics of potato psyllid and beet leafhopper in potato fields in Malheur County, Oregon during 2021. Numbers are the mean per field per week for approximately 40 fields per week.

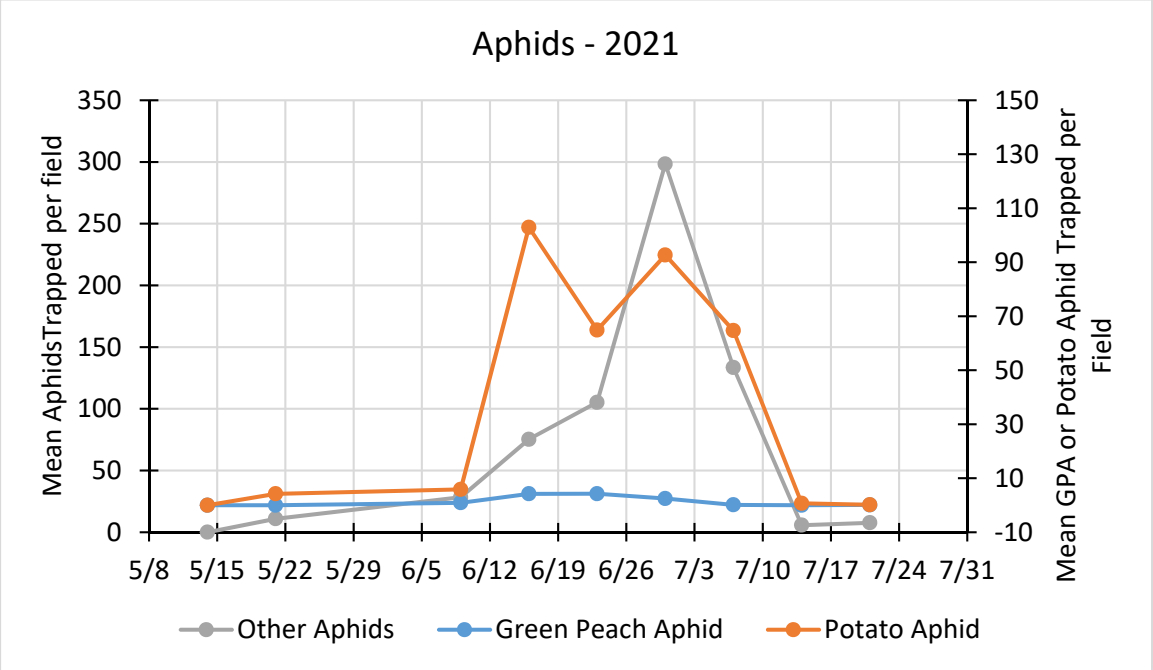

Figure 2. Seasonal dynamics of aphids found in potato fields in Malheur County, Oregon during 2021. Numbers are the mean per field per week for approximately 40 fields per week. Note the different scale for other aphids (0 – 350 per field) and the green peach aphid and potato aphid (0 – 150 per field).

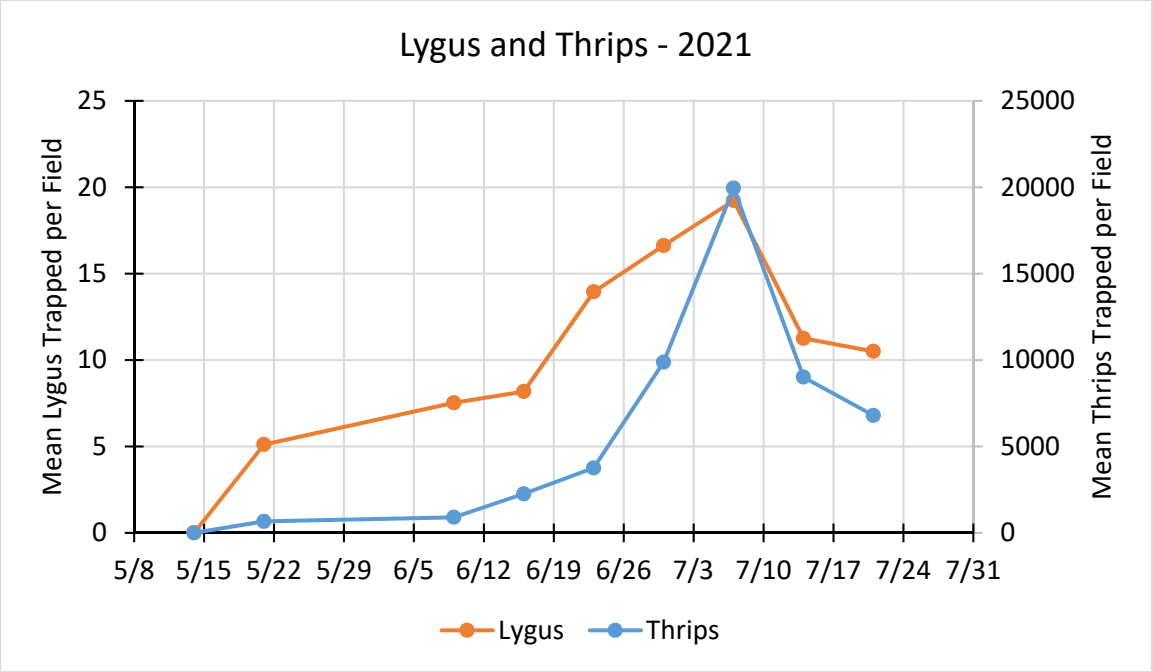

Figure 3. Seasonal dynamics of lygus bug and thrips in commercial potato fields in Malheur County, Oregon during 2021. Numbers are the mean per field per week for approximately 40 fields per week. Note the different axis scale for thrips (0 – 25000) and lygus bug (0 – 25).

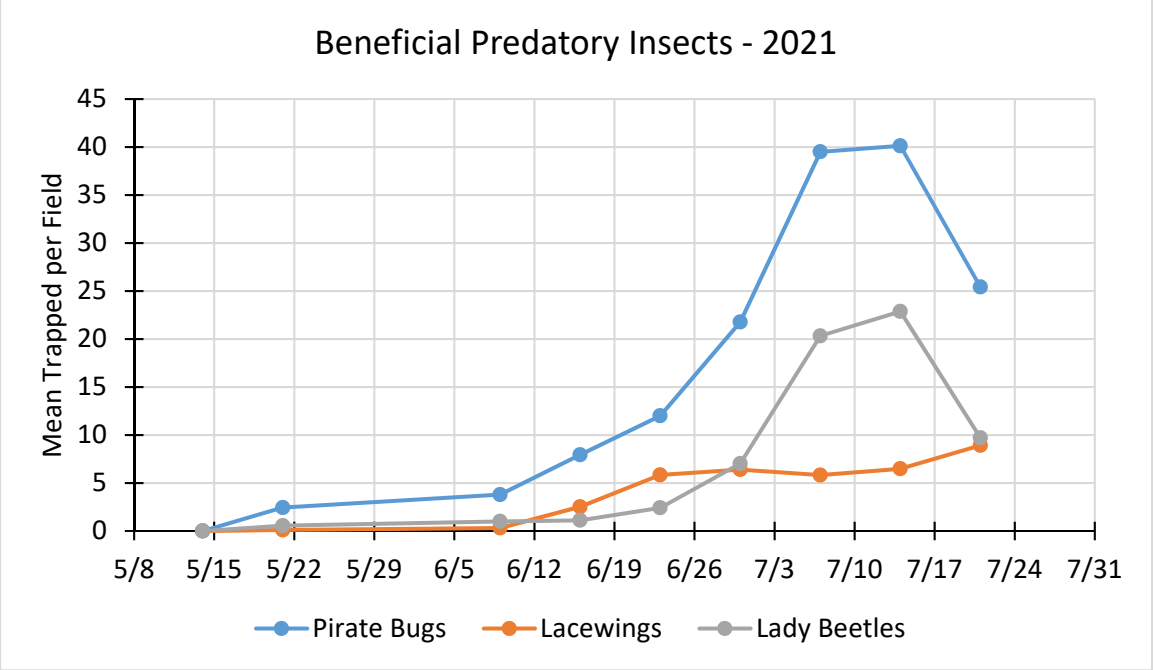

Figure 4. Seasonal dynamics of beneficial predatory insects found in potato fields in Malheur County, Oregon during 2021. Numbers are the mean per field per week for approximately 40 fields per week.