

MALHEUR COUNTY POTATO PEST MONITORING PROGRAM–2020

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Summary

Twenty-two potato fields throughout Malheur County were monitored for pest and beneficial insects. Traps were placed in fields on May 10 and monitored weekly through August 5 when harvest began in most fields. 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.pnwpestaalert.net/>) and shared with Erik Wenninger, University of Idaho, who oversees the Idaho psyllid monitoring program.

Potato psyllids were found beginning June 4. Populations developed slower in 2020 than in 2019 with only half of the fields recording psyllids by the end of June. The greatest number of psyllids collected was on July 30, with 302 individuals collected from all fields. The 908 potato psyllids from our traps were sent to Kylie Swisher's lab (USDA-ARS, Wapato, WA) to test for the zebra chip bacterium; none were positive. No zebra chip-infected plants were found in scouting of fields.

Beet leafhoppers were present throughout the growing season, but in relatively low numbers. No plants infected with purple top disease (transmitted by leafhoppers) were found during this year's monitoring program.

The pest status of thrips and lygus in the Treasure Valley is still uncertain. High numbers of thrips, predominately western flower thrips, were recorded in June and early July when plants were flowering. Lygus populations peaked in late July, with approximately 19 caught per field on the next to last sample date (July 30). Thrips and lygus populations were lower than in 2019.

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

OSU also advised growers and crop advisors on other pest problems. The monitoring project provided up-to-date information that allowed growers to make more informed pest management decisions and reduce their pesticide applications.

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, 4) potato tuberworms, 5) defoliating caterpillars and Colorado potato beetles, 6) thrips, 7)

spider mites, 8) lygus bugs, and 9) 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 Pacific Northwest (PNW).

Procedures

Trapping stations were set at 22 potato fields in Malheur County and were monitored from May until August, when harvest commenced. Trapping techniques specific for the different pests were used for monitoring. Because of COVID-19 concerns, we reduced the planned number of fields monitored and traps placed per field, and we were unable to collect traps for 2 weeks in July. We plan to resume normal monitoring practices in 2021.

Potato Psyllid

To aid growers in managing potato psyllids and zebra chip, yellow sticky cards were placed within potatoes fields, with two traps per field. Traps were collected and replaced weekly. Leafhopper traps (see below) were also examined for the presence of psyllids. Foliage samples, consisting of 10 leaves from each of up to six fields per week, were inspected for psyllid nymphs and eggs.

Beet Leafhopper

Additional yellow sticky traps were placed near ground level along borders of fields to monitor beet leafhoppers, which can transmit the pathogen that causes purple top. Traps were collected and replaced weekly, and the numbers of leafhoppers were 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, potato aphid, or other aphids.

Potato Tuberworm

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 beetles (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 bugs, bigeyed bugs, lacewings, and ladybird beetles. These counts were used as an indication of the activity of natural enemies in a field.

Diagnostics

Psyllids were tested by Kylie Swisher's lab (USDA-ARS Wapato, WA) for the zebra chip bacterium.

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 the 12-week period from May 10 until August 5, when most fields were near 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).
- Psyllids were first collected the week of June 4 and numbers were reported on the PNW Pest Alert Network and to Erik Wenninger, who oversees the Idaho psyllid monitoring network. Over 300 psyllids were collected the week ending July 30, which was an average of approximately 14 per field. No immature psyllids or psyllid eggs were detected in foliage samples.
- 908 potato psyllids were tested for *Candidatus Liberibacter solanacearum* (Lso), the bacterium that is the causal agent of potato zebra chip disease. Lso testing conducted by Dr. Kylie Swisher, USDA-ARS, Wapato, WA, found no positive psyllids. We found no evidence of infected plants in the field, suggesting that even with the high psyllid populations, zebra chip was not a significant problem.
- Beet leafhoppers were present throughout the growing season with numbers fluctuating week to week. Overall beet leafhopper numbers were relatively low, with populations peaking early in the season (approximately 11 per field) and then declining (Figure 1). The early season peak and decline in beet leafhopper populations is typical. 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 2020. This was the sixth 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 commonly encountered 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. 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 (Figure 3), although populations were not as high as in 2019. Lygus populations also peaked in late July but at a lower level than in 2019.

- Large numbers of bigeyed bugs, pirate bugs, ladybird, beetles and lacewings (Figure 4) probably helped to suppress psyllid, aphid, and thrips populations, in particular. All of the predators that were monitored are known to feed on these pests.
- Growers were advised of other pest and disease issues reported in other parts of the PNW. In particular, loopers and other caterpillars were found causing defoliation in several fields. Some fields had late-season outbreaks of white mold.

Malheur County potato growers have been strong supporters of IPM and continue to utilize information from this monitoring program. Their use of pest alert information reflects their commitment to providing consumers with safe, nutritious food. Growers were provided the latest recommendations and advice on potato psyllid management, which facilitated their pest management decisions and allowed them to better time and target pesticide applications.

Inclusion of various pests and natural enemies in the monitoring program provides growers with information to assess their individual pest management programs and decide when insecticide applications may or may not be necessary.

Acknowledgments

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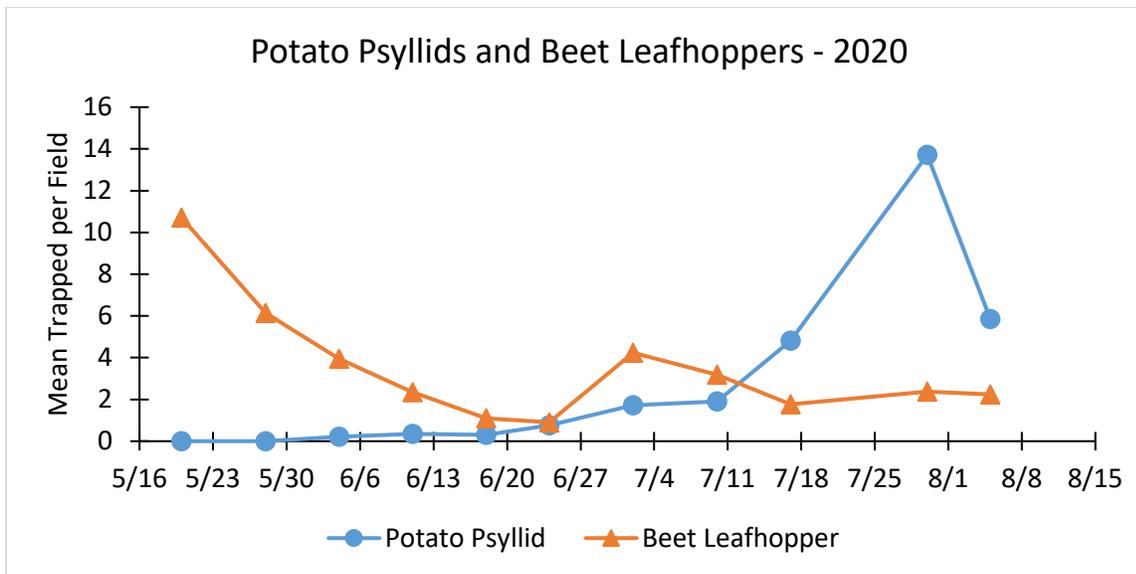


Figure 1. Seasonal dynamics of potato psyllids and beet leafhoppers in potato fields in Malheur County, Oregon, during 2020. Numbers are the mean per field per week for 22 fields.

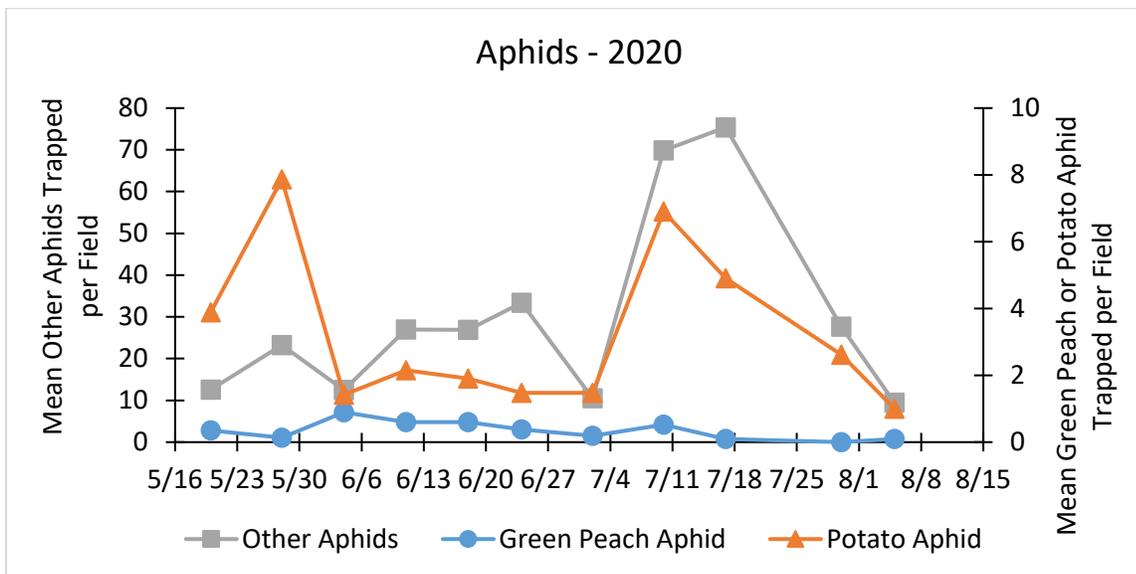


Figure 2. Seasonal dynamics of aphids found in potato fields in Malheur County, Oregon during 2020. Numbers are the mean per field per week for 22 fields. Note the different scale for other aphids (0–80 per field) and the green peach aphid and potato aphid (0–10 per field).

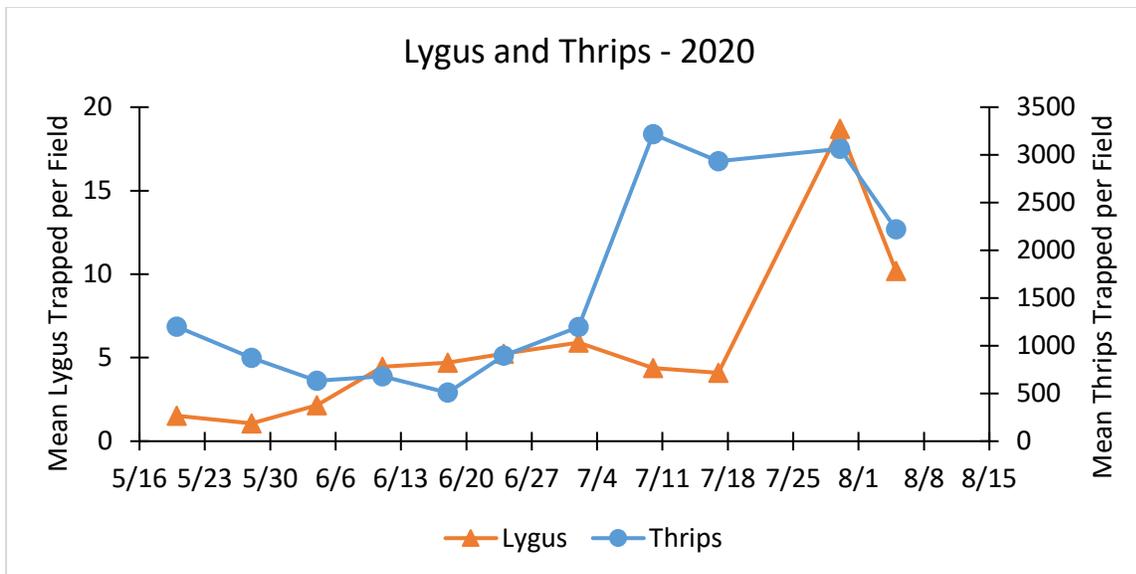


Figure 3. Seasonal dynamics of lygus bugs and thrips in commercial potato fields in Malheur County, Oregon during 2020. Numbers are the mean per field per week for 22 fields. Note the different axis scale for thrips (0–3500) and Lygus bugs (0–20).

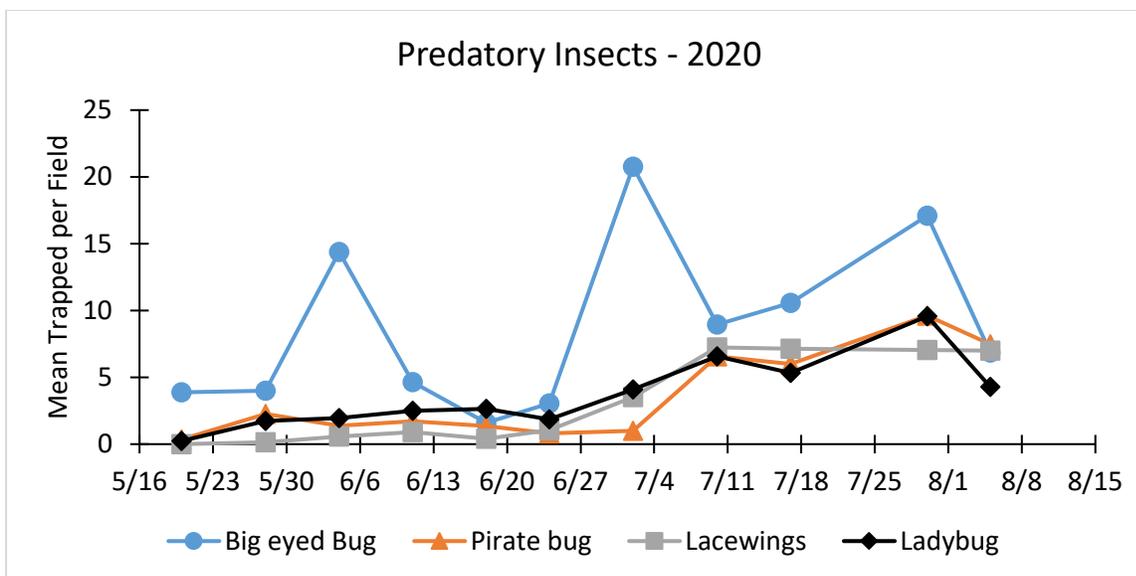


Figure 4. Seasonal dynamics of beneficial predatory insects found in potato fields in Malheur County, Oregon, during 2020. Numbers are the mean per field per week for 22 fields.