# MALHEUR COUNTY POTATO PEST MONITORING PROGRAM—2019

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## Summary

Twenty-five commercial potato fields throughout Malheur County, Oregon were monitored for pest and beneficial insects. Traps were monitored weekly from May 24 through the end of July, when harvest began. 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.

Because of wet spring conditions, planting was later than normal for most fields and monitoring did not begin until late May. Potato psyllids were found on the first sampling date (May 31) and high numbers of psyllids persisted throughout the season. All of the fields had psyllids by June 21. The greatest number of psyllids collected was 333, on July 26. The 1125 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 bugs 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 bug populations peaked in late July, with over 150 caught per field on the last sample date (July 26).

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.

OSU also kept growers and crop advisors up to date 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 in 2019.

## 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. Pests that were monitored included 1) potato psyllids, 2) aphids, 3) beet leafhoppers, 4) potato tuberworm moths, 5) thrips, 6) lygus bugs (a potential pest), 7) Colorado potato beetle, and 8) other pests. Associated beneficial parasites, predators, and pathogens were monitored to assess levels of naturally occurring biological control.

- Assist growers in scouting for other pests and diseases during the growing season.
- Assist growers 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.

## Procedures

Trapping stations were set at 25 potato fields in Malheur County and monitored from May until the end of July, when harvest commenced. Trapping techniques specific for the different pests were used for monitoring.

**Potato psyllid**. To aid growers in managing potato psyllids and zebra chip, yellow sticky cards were placed within potatoes fields, with four 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. Psyllids were tested by Kylie Swisher's lab (USDA-ARS, Wapato, WA) for the zebra chip bacterium (Lso).

**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.

**Aphids**. Aphids were also monitored with yellow sticky traps.

**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.

**Other pests and diseases**. Assistance was provided to growers and crop advisors in identifying other pest and diseases problems that they encountered.

## Results

- Traps were monitored over a 9-week period from May 24 until July 26, when fields were near harvest.
- Growers and crop advisors received up-to-date weekly reports within 1 day of trap collection. Psyllids were found during the first week of sampling. Populations increased through the remainder of the season, as has been typical (Figure 1).

- The early appearance of psyllids was reported on the PNW Pest Alert network and to Erik Wenninger, who oversees the Idaho psyllid monitoring network. The early findings prompted Idaho to begin their monitoring earlier than planned.
- Lso testing conducted by Dr. Kylie Swisher, USDA-ARS, Wapato, WA, found no positive psyllids.
- Beet leafhoppers were present throughout the growing season, with numbers fluctuating week to week. Overall beet leafhopper numbers were relatively low, with peak abundance less than 18 per field the week of July 6 (Figure 1). We found no evidence of plants infected with potato purple top disease.
- Aphids were among the most common pests recorded and were abundant, especially from late June into July. Significant numbers of potato aphids were found the week of July 12. Relatively few green peach aphids were found (< 2 per field per week) (Figure 2).
- No potato tuberworm moths were found in 2019. This was the fifth consecutive year that no tuberworm moths were collected.
- The pest status of thrips and lygus bugs in the Treasure Valley remains uncertain. Lygus bugs are one of the most commonly encountered insects in potato fields, with populations present throughout the season. However, area growers do not consider lygus bugs economically important. Thrips were predominately western flower thrips. Some onion thrips were present because of the proximity of potato fields to the area's onion fields. High numbers of thrips were recorded in June and July (Figures 3).
- The relatively large numbers of beneficial insects probably helped suppress pest populations. 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. They likely help suppress pest populations although they do not provide complete control (Figures 3, 4).
- Growers were advised of other pest and disease issues reported in other parts of the Pacific Northwest. In particular, loopers and other caterpillars were found to be causing defoliation in several fields.

## Impacts

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.

## Relation to Other Research

Monitoring results were shared with other research/extension personnel in Oregon and Idaho. We collected psyllids for a project led by Rodney Cooper, which is examining alternative hosts for psyllids as identified by their gut content. That research will continue in 2020.

The Malheur Experiment Station conducted another insecticide efficacy trial in 2019. In these trials, the effect of different products have been tested against key pests (e.g., potato psyllids) and other pest and beneficial species.

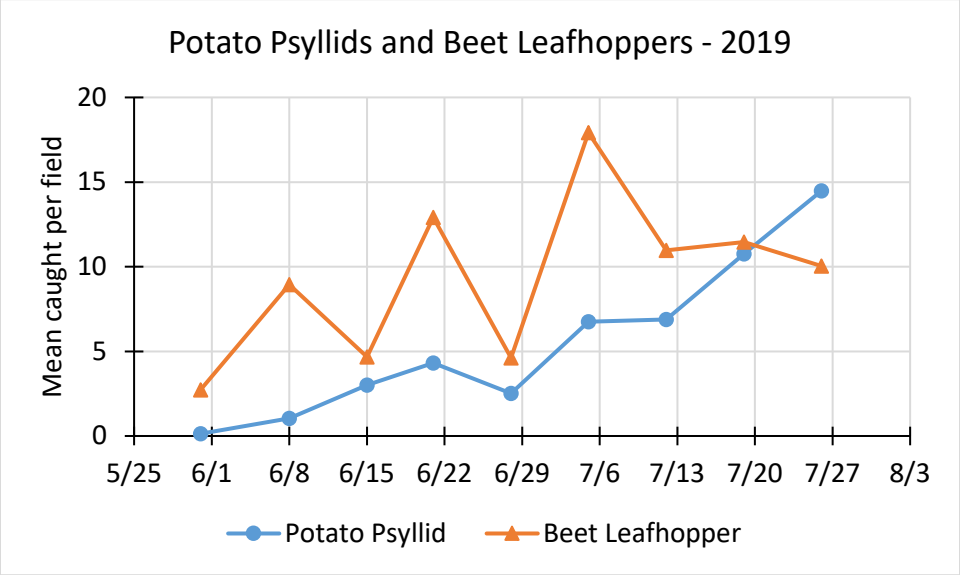


*Figure 1. Seasonal dynamics of potato psyllids and beet leafhoppers in commercial potato fields, Malheur County, OR, 2019. Numbers are the mean per field per week for 25 fields.*

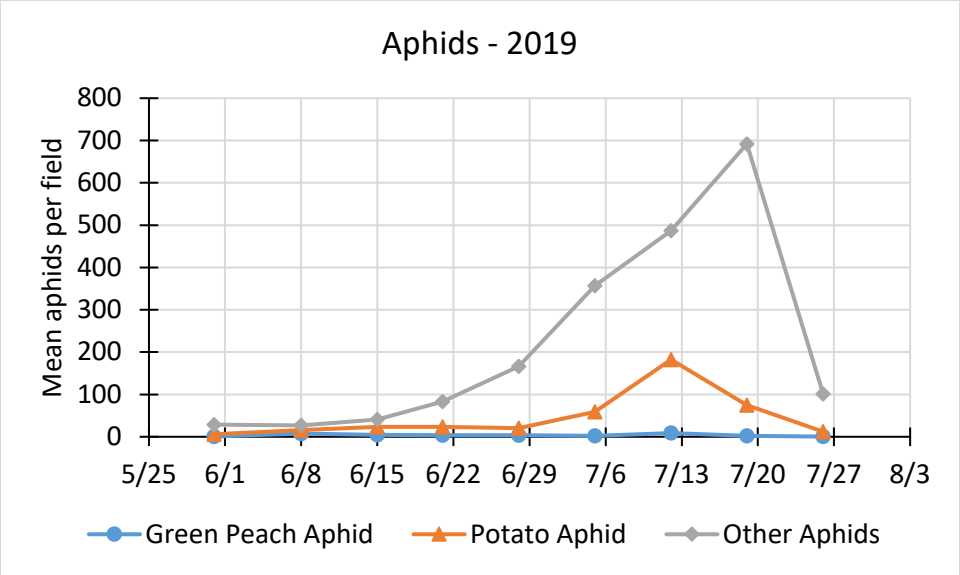


*Figure 2. Seasonal dynamics of aphids found in commercial potato fields, Malheur County, OR, 2019. Numbers are the mean per field per week for 25 fields.*

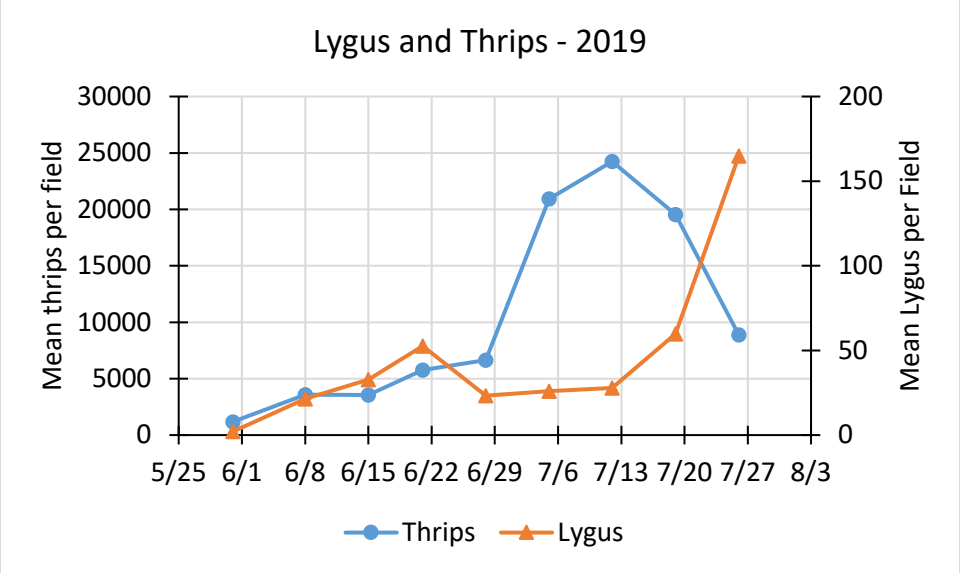


*Figure 3. Seasonal dynamics of lygus bugs and thrips in commercial potato fields, Malheur County, OR, 2019. Numbers are the mean per field per week for 25 commercial fields. Note the different axis scales for thrips and lygus bugs.*

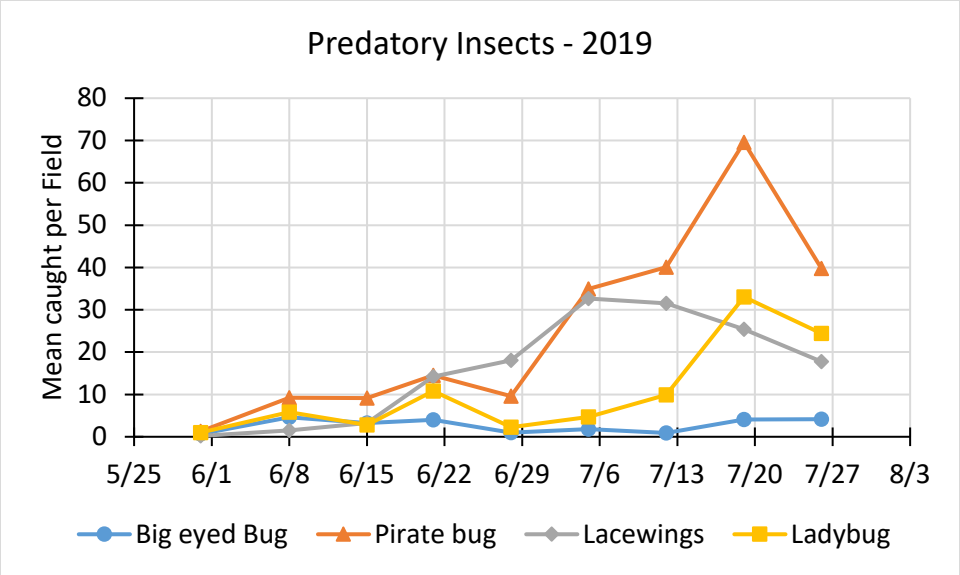


*Figure 4. Seasonal dynamics of beneficial predatory insects found in commercial potato fields, Malheur County, OR, 2019. Numbers are the mean per field per week for 25 fields.*