

## Section IX

### Extension & Consulting: Updates & Notes from the Field

#### **REGIONAL SURVEY FOR INSECT PESTS OF POTATO IN THE COLUMBIA BASIN OF WA AND “POTATO PEST ALERTS”**

Carrie H. Wohleb<sup>1</sup>, Andrew Jensen<sup>2</sup>, and Timothy D. Waters<sup>3</sup>.

<sup>1</sup>Washington State University Extension, Ephrata, WA 98823, [cwohle@wsu.edu](mailto:cwohle@wsu.edu)

<sup>2</sup>Washington State Potato Commission, Moses Lake, WA 98837;

<sup>3</sup>Washington State University Extension, Pasco, WA 99301.

The regional insect pest survey was established to monitor important insect pest populations in the Columbia Basin of Washington and report up to date information to the potato industry. It functions as an early warning system that prompts growers to intensify scouting in and around their potato fields when pests are detected in the region. The survey targets three key insect pests: green peach aphid (*Myzus persicae*) (GPA), beet leafhopper (*Circulifer tenellus*) (BLH), and potato tuberworm (*Phthorimaea operculella*) (PTW). Each of these pests should be monitored closely and managed as needed to minimize yield and quality losses that can result from the insects feeding, and in the case of GPA and BLH from the plant pathogens they transmit to potatoes. In addition to targeted pests, other foliar arthropod pests (thrips, spider mites, lygus bugs, caterpillars, etc.) and insect predators (big-eyed bugs, damsel bugs, etc.) are monitored and reported on when their numbers are significant. As well as providing current information about insects in potato fields, the survey contributes to a better understanding of how insect pests migrate, build up populations, transmit pathogens and/or damage potato crops in the region.

#### **Materials and Methods**

Thirty-six potato fields across the Columbia Basin of WA were surveyed for insects in 2011. Survey routes were established in the “North Basin” (Moses Lake, Warden, Othello, Connell), “Mattawa” (Mattawa), “West Basin” (Royal City, George, Quincy, Ephrata), and “South Basin” (Basin City, Eltopia, Pasco, Burbank, and Patterson). Aphids were sampled using a small bucket placed under a potato plant, which was vigorously shaken to dislodge insects into the bucket. This method was established by Dr. Keith Pike over several years of conducting his regional aphid survey. The bucket is easy to handle and prevents most of the insects from blowing, flying, or leaping away before they can be counted. Aphid counts were recorded on a per plant basis, and at least fifteen plants were sampled in every field. Other insects and arthropods collected in the bucket were also counted, especially thrips, Colorado potato beetles, lygus

bugs, spider mites, big-eyed bugs, and damsel bugs. Fields were sampled in the same location every week. Sampling was initiated a few weeks after emergence and concluded at vine kill. Beet leafhoppers were monitored using yellow sticky cards (5.25 x 3.75 inches) mounted on small stakes about 3 inches above the soil surface. Two cards were located near each potato field on the survey route, either at the field edge, on a ditch bank, or at the open field corner (away from irrigation). Flights of adult male PTW moths were monitored using delta traps with pheromone lures on sticky liners. The traps were hung from PVC pipe stands that suspended them about 12 inches from the ground. One trap was placed near each potato field on the survey route. Beet leafhopper and PTW moths collected on traps were counted weekly from mid April to October.

### **Reporting**

Results of the insect pest survey were reported to the potato industry via weekly e-mails, a.k.a. “potato pest alerts”. The alerts summarized current survey results and included web links to connect subscribers to further information, including maps to show insect counts at each location, graphs of insect population trends, and pest management recommendations. Reports on other pests or diseases of concern in the region were often included in the alerts, including information from Dr. Dennis Johnson’s late blight hotline. Alerts and other information about insect pests of potato are archived on the project website at <http://www.potatoes.wsu.edu/survey/PotatoInsectSurvey.html>.

### **“Potato Pest Alerts” Impact**

The local potato industry’s response to the e-mailed “potato pest alerts” has been very positive. There are 260 subscribers as of December 2011 (almost a 300% increase in the number of subscribers since the first alert was emailed in May 2010). Subscribers are mostly potato growers and crop advisors in the Columbia Basin. In December 2010, an online survey was sent to subscribers to get some feedback about the alerts. Response rate was 30% (57). Among respondents, 100% indicated that they found the potato pest alert system useful. A typical comment from respondents was, “It’s an excellent tool for crop advisors and growers. I hope the program continues”. More than 50% of the respondents indicated that they forwarded pest alerts via e-mail to other people. When asked how they used the pest alerts, 90% indicated that they used them to track regional insect populations, 68% indicated that they used them to know when to scout for insects in their fields, and 42% indicated that they used them to learn about insect pests and strategies for managing them in the field. Finally, 28% of respondents indicated that they applied strategies recommended in the alerts to manage pests in their fields.

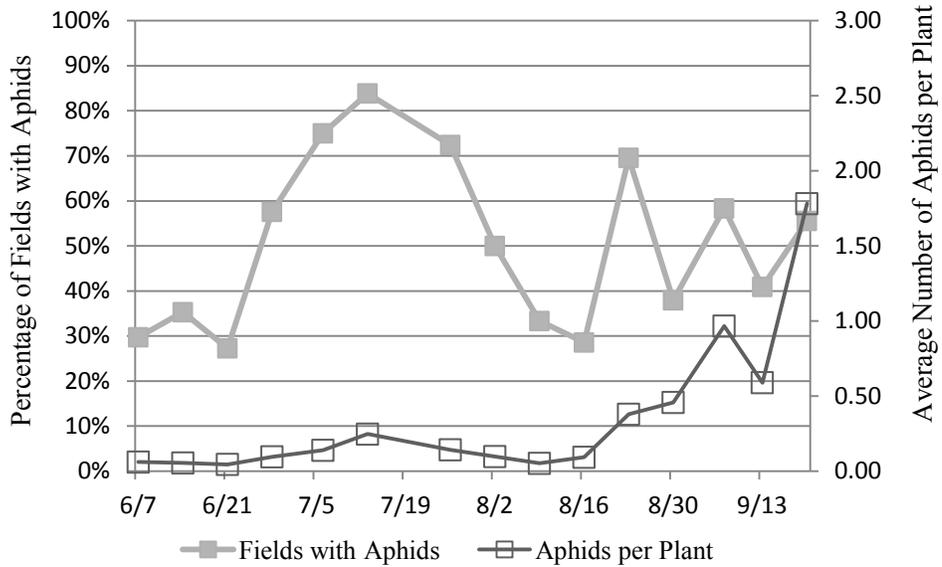
## **Insect Population Trends**

Results of the weekly surveys were evaluated at the end of the season to study insect population trends over time. Some of the more interesting results are reported here. Figure 1 shows weekly aphid sampling data in 2011; the graph includes the average percentage of fields in which we found aphids each week, and the average number of aphids per plant each week. Aphids were detected in as few as 27% of the surveyed potato fields and as many as 84% of the fields over the course of the season, but the populations rarely exceeded counts of 1 aphid per plant. The highest count in a field during the 2011 season was 8.3 aphids per plant on the August 25<sup>th</sup> sampling date; this is a small number compared to previous years of the survey, where counts of more than 500 aphids per plant have been recorded.. Figure 2 shows the average percentage of fields in which we observed big-eyed bugs and damsel bugs each week in 2011. These were the most common predator insect species observed in potato fields. Figure 3 shows the average weekly BLH trap counts in 2011 vs. the average for five-years (2007-2011). Beet leafhoppers were very slow to appear in 2011, and counts remained lower than usual for the entire season. Figure 4 shows the average weekly PTW moth counts on the South Basin route in 2011 vs. the average for five-years (2007-2011). Moth population development in the South Basin in 2011 was similar to populations observed over most seasons. As in most years, PTW moths were not observed on any of the other survey routes. These and other data are posted on the project website and are presented to the potato industry at the annual Washington State Potato Commission research review meetings in February.

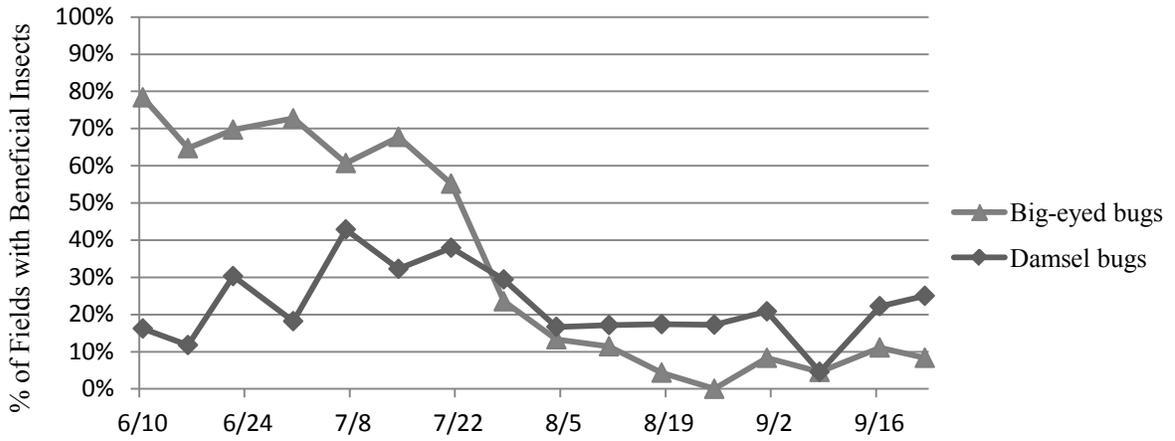
Insect population data from the survey will also be used by WSU entomologists, Dave Crowder and Bill Snyder, to study how landscape, especially adjacent crops, impact insect populations in potato fields.

This project is funded by the Washington State Potato Commission.

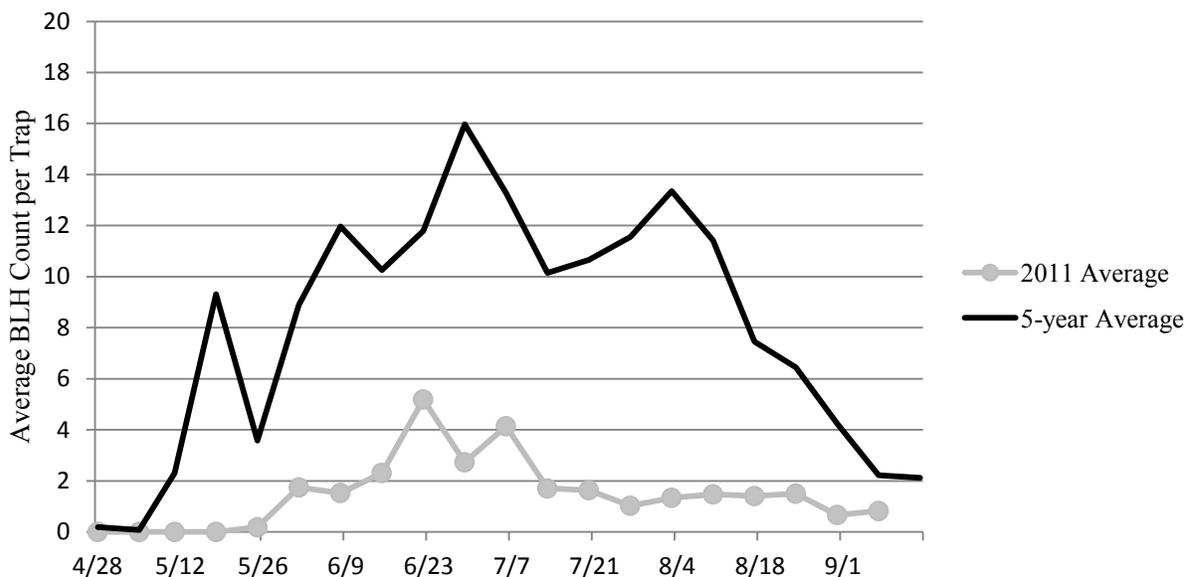
**Figure 1. Aphid Population Trends in the Columbia Basin**  
Weekly Potato Field Sampling Data in 2011



**Figure 2. Beneficial Insect Observations in the Columbia Basin**  
Weekly Potato Field Sampling Data in 2011



**Figure 3. Beet Leafhopper Population Trends in the Columbia Basin**  
Weekly Trapping Data in 2011 vs. Five Year Average



**Figure 4. Potato Tuberworm Moth Population Trends**  
Weekly Trapping Data (SOUTH Basin) in 2011 vs. Five Year Average

