Potato Progress

Research & Extension for the Potato Industry of Idaho, Oregon, & Washington

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Updates on Potato Psyllid and Zebra Chip (ZC)

Andy Jensen, Regional Research Director

Research and education work on potato psyllid and ZC is constantly ongoing in labs and field sites across the Northwest. We will try to keep you updated throughout the year as we learn new things or become aware of questions from industry members that we have not answered.

Answers to Common Questions Received During Psyllid Workshops

1. Q. Is potato psyllid the only insect that transmits Liberibacter, the causal agent of ZC, to potato?
   A. Yes.
2. Q. Is potato psyllid the only psyllid that feeds on potato?
   A. In the Northwest, potato psyllid is the only one that we will find reproducing on potato, but other species will be caught on yellow sticky traps in potato fields (see pages 3-6 of this *Potato Progress*). Therefore, the only psyllid nymphs and eggs you will find living on potato will be potato psyllid, but you may sometimes find adults of other species briefly settling on potato plants or getting caught on yellow sticky traps.
3. Q. Could greenhouse transplant producers and box store distributors be a source of psyllid and/or ZC?
   A. Theoretically, yes. Potato psyllid can be a very difficult pest to manage in greenhouses, and psyllids are likely to be found on greenhouse-produced tomatoes and peppers from time to time.
4. Q. When walking through a potato field, will the adult psyllids tend to fly away as I approach?
   A. No. Psyllids generally like to stay on their host plant once they've found one. While adult psyllids are capable of hopping and flying some distance, they will generally stay on the plant until the plant is severely shaken or beaten, as for a beating sheet or sweep net sample.
5. Q. Is a beating sheet or sweep net sampling method effective for measuring psyllid nymph numbers?
   A. No. Psyllid nymphs are generally securely holding onto their host plant. A few nymphs are dislodged in beating samples, but most hold fast to the plant.
6. Q. Why was ZC such a problem in 2011 and never before?
   A. One important factor in ZC severity and psyllid abundance is the weather. Both the insect and pathogen do best in moderate weather, which we had aplenty last season. Psyllid development and reproduction are severely curtailed in temperatures over 95 F. Another issue appears to be the introduction of the Liberibacter causal agent of ZC into the Northwest. Previous to 2011 the potato psyllid was an annual colonist of Northwest potato fields, but no ZC had been seen. It appears that somehow the ZC pathogen became common in parts of the Northwest in 2011, but how this happened is still unknown.

Potato Psyllid Overwintering in the Northwest

As many of you may have heard, a concerted effort on my part and by Silvia Rondon's lab at OSU Hermiston has been underway to determine whether potato psyllid can overwinter locally. We focused our attention on the perennial introduced weed known as bittersweet nightshade (*Solanum dulcamara*; see the photos). This plant is not an agricultural weed, but rather is a common plant along the banks of streams, rivers, lakes, and in perennial gardens. It produces long woody vines, which lose their leaves in late fall, persist through winter, and sprout new stems in spring. Patches of this plant can be large and dense as in the photo.

To make a long story short, we have confirmed successful overwintering by the potato psyllid in both the southern Columbia Basin and southwestern Idaho in association with large patches of bittersweet nightshade. How important this biology is to ZC in the potato crop will require much more study. It is still possible that migration from outside the Northwest is an important part of the story, and there are research efforts underway to answer questions along that line.

WSPC-Funded Psyllid Control Trial in Texas

With funding from the Washington State Potato Commission, Dr. Don Henne of Texas A&M University conducted a small field experiment this winter on potato psyllid control using some common inexpensive insecticides. The treatments were as follows:

1. Vydate C-LV, 34 fl oz/ac, 2 applications, 14 days apart, during flowering
2. Dimethoate, 16 fl oz/ac, applied post-flowering
3. Lannate, 32 fl oz/ac, applied post-flowering
4. Ambush, 12 fl oz/ac, 14 days apart, during flowering
5. Baythroid, 2.8 fl oz/ac, applied post-flowering
6. Untreated control

Bottom line of the results: no product worked better than the untreated control, meaning that the products we had tested have no useful effect on psyllids.

Psyllid Monitoring with Yellow Sticky Cards

Andy Jensen, Regional Research Director

One of the most common ways to monitor psyllid populations in potatoes involves yellow sticky traps. Unfortunately for all of us, this task is made challenging by several factors, for example:

1. Psyllids are small.
2. Yellow sticky traps catch several other kinds of psyllids, even when placed in potato fields.
3. Psyllids are often obscured by the vast number of other insects also caught on the traps.

Below are some guidelines and photos that will hopefully be helpful for those of you who want to use yellow sticky traps to watch for potato psyllids.

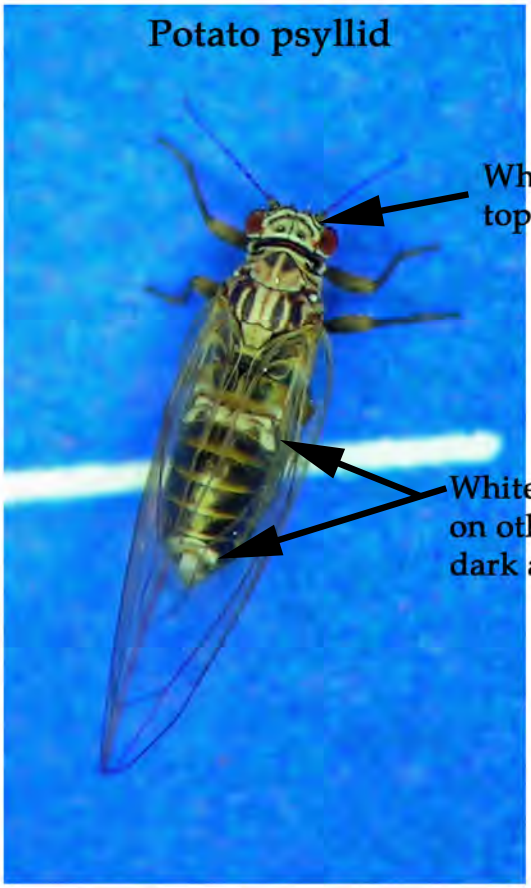
Setting the Traps

Traps meant to catch potato psyllids must be placed inside the potato fields, at about the height of the plant canopy. This contrasts to traps meant to catch beet leafhoppers, whch must be placed outside the crop. Traps should be placed near the field margin, within the outer few rows of potatoes.. How many traps per field? More is better, but as you'll see below, evaluating yellow traps for psyllids is challenging and time consuming.

Checking the Traps

Ideally, traps should be checked at least every few days. Traps should be changed once a week, or whenever they become covered in insects, dirt, feathers, hair, dead lizards, etc.

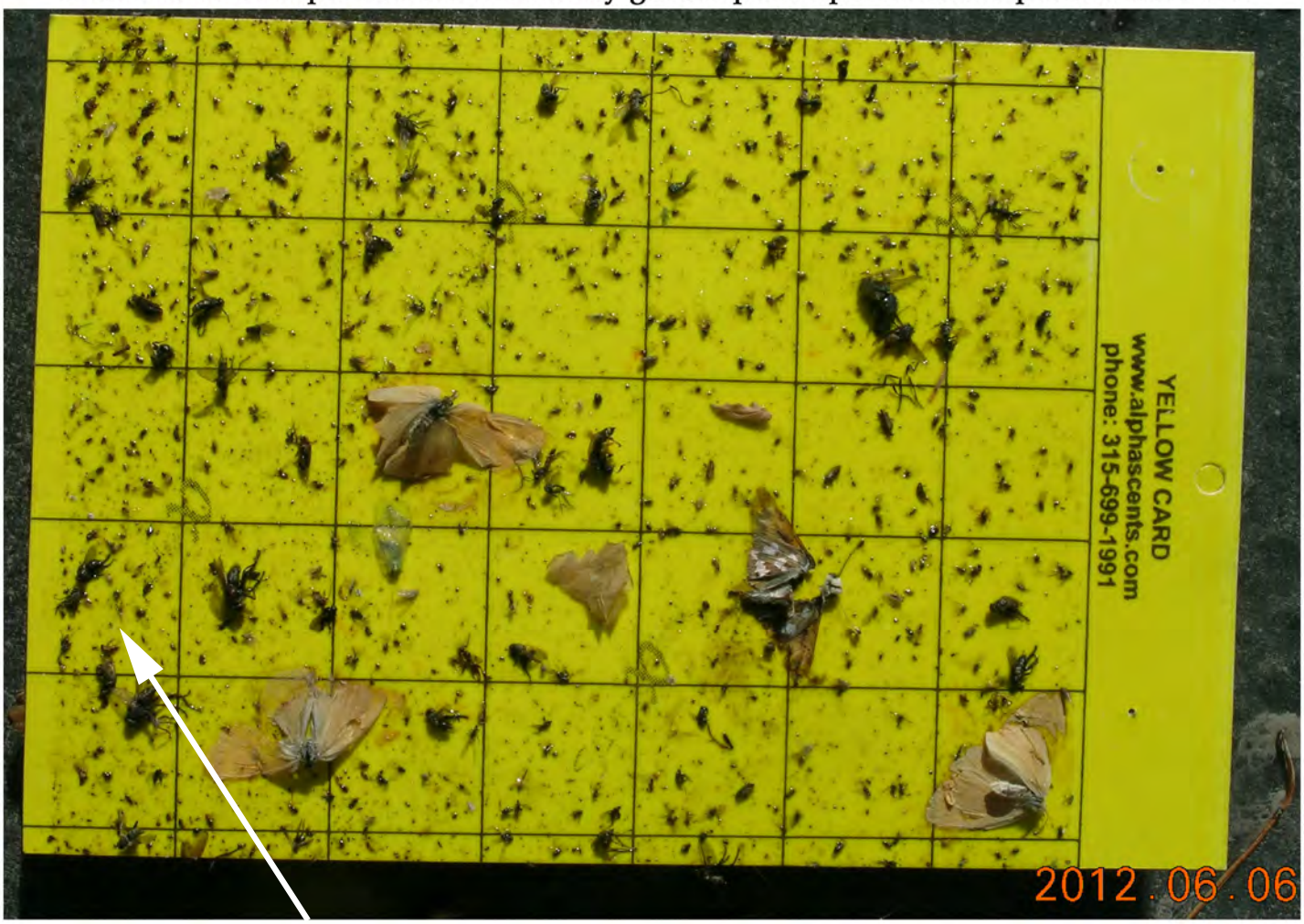
Potato Psyllid Features and Size



Recognizing Psyllids, and then Potato Psyllids, on Sticky Traps

Knowing which psyllids are potato psyllid is important because only potato psyllid can cause damage to potatoes. When evaluating yellow traps, the first task is to recognize the psyllids among all the insects and debris on the card. A strong magnifying glass or dissecting microscope is absolutely necessary. Without magnification, finding the psyllids on a card is very challenging, and identifying the potato psyllids is impossible.

Here is a card I experimented with in my garden potato patch. Each square is 1X1 inch.

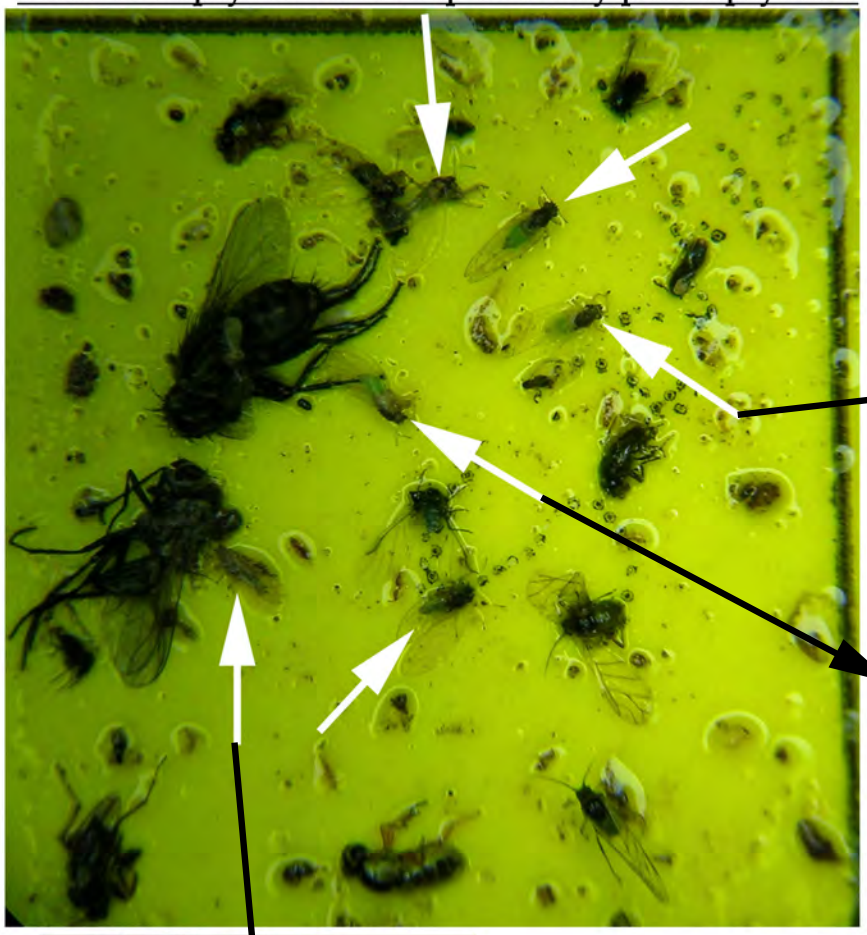


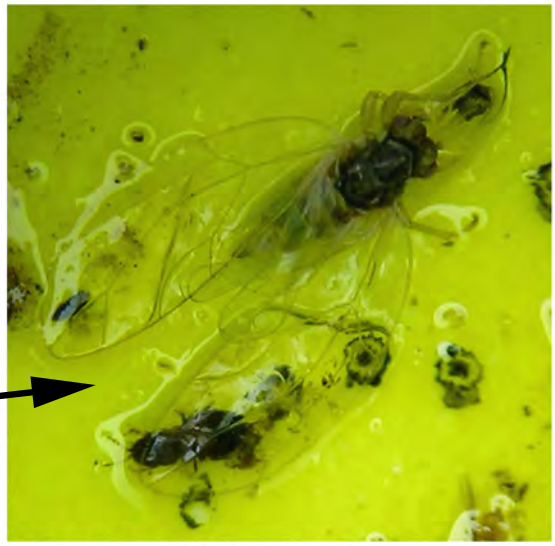
Let's focus on this square.

This is about 3X magnification; try to find the psyllids.

Recognizing Psyllids, and then Potato Psyllids, on Sticky Traps (continued)

There are 6 psyllids in this square. Any potato psyllids?





How about this one? Nope, abdomen is green, the head lacks white rim.

How about this one? Nope, abdomen is green, not dark/black.

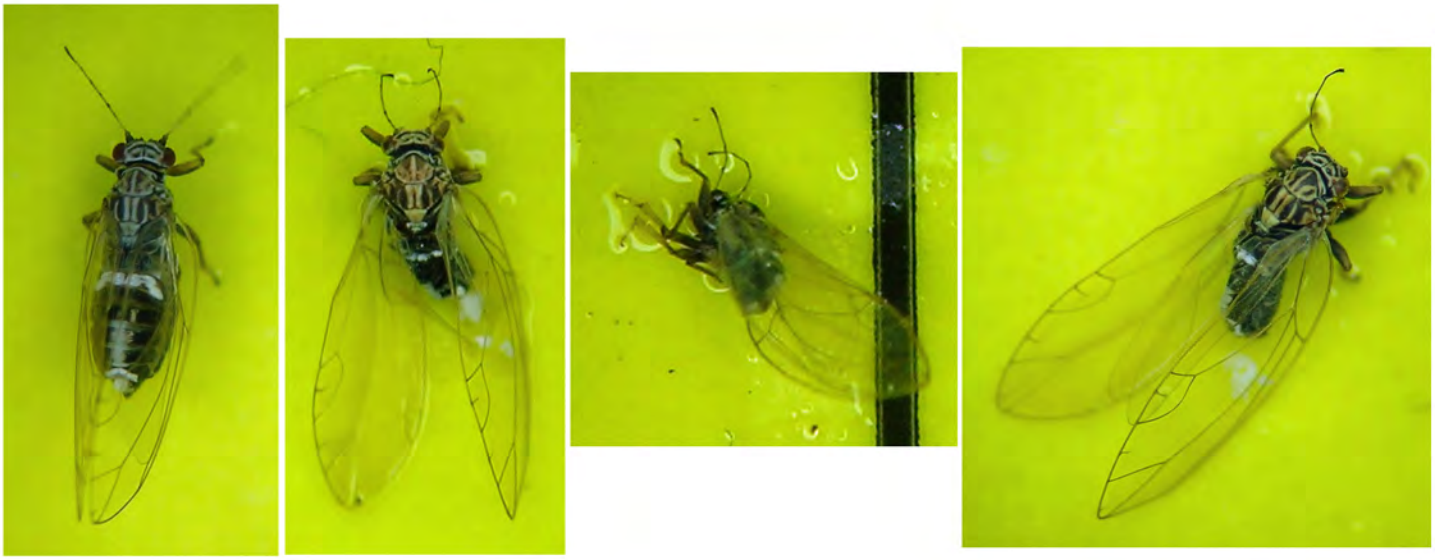
This one? Nope. Wing vein branches in two.

Seeing the wing veins takes a lot of magnification!

Bottom line: none of the 6 psyllids in this square were potato psyllids. In fact, none of the 40+ psyllids on this entire card, front and back, were potato psyllids.

Potato Psyllids Compared to other Psyllids

Photos of many psyllids, both potato psyllid and the other species, will hopefully help you calibrate your eye for recognition of the only damaging species, potato psyllid.



These four specimens are all potato psyllid. The one on the far left was alive when the photo was taken. After death on the card, psyllids shrivel to some degree and sometimes break into pieces.

These six specimens are **not potato psyllid**, and are representative examples of the type of specimens you will likely find on yellow sticky traps in the Northwest.