The potato psyllid and its associated pathogens
Overview

This presentation will discuss the potato psyllid, *Bactericera cockerelli*

- Host plants
- Life cycle
- Distribution
- Recognition
- Damage due to feeding and pathogen transmission
- Biosecurity issues
- Management
What is a psyllid?

- Psyllids are known as jumping plant lice.
- Adults are highly mobile and jump quickly when disturbed.
- Life stages include egg, nymph, and adult.

Photos: top and middle - Joe Munyaneza, USDA/ARS; bottom - Whitney Cranshaw, Colorado State University, Bugwood.org, #5369938
What is a potato psyllid?

Adult potato psyllid

Photos: Whitney Cranshaw, Colorado State University, www.bugwood.org, #1476083
Distribution map of the potato psyllid in the Americas

- Lighter blue areas are colonized intermittently.
- Note that half of North America has no potato psyllids.
Hosts of the potato psyllid

- Over 20 families and 40 plant species are hosts, but they prefer Solanaceous plants.
- Usually found on leaves.
- Can be on pepper fruit.
- Causes a regulatory hazard

Psyllid nymphs hide under the calyx of the peppers.

Photo: Susan Halbert FDACS/DPI
Life cycle of the potato psyllid

- Eggs
Life cycle of the potato psyllid

• Nymphs

Late stage nymph

Early stage nymph

Photos: Joe Munyaneza, USDA/ARS
Life cycle of the potato psyllid

- Adults

Potato psyllids have a distinctive pattern on the back of their head.

Photo: left - Joe Munyaneza, USDA/ARS; right - Susan Halbert, FDACS/DPI

protect u.s.
How to identify potato psyllids

- Slide mounted specimens required for identification by a trained taxonomist
- Your local county extension agent can advise you on sample submission for identification
- There are many similar species of psyllids that may look like potato psyllid, but they are found on other plants.
Are there other psyllids found on solanaceous crops?

• In Eurasia, South America, and Australia, there are other species of psyllids on solanaceous crops.
• If you find psyllids on solanaceous crops, and they do not look like the potato psyllid, notify your local extension agent.
Direct damage from potato psyllids

- Known as “psyllid yellows.”
- Observed for decades.
- Plants recover when psyllids are removed.

Damage to the stems of potato plants caused by the potato psyllid.

Psyllid yellows in ‘Atlantic’ potatoes.
Tuber damage from psyllid yellows

- Growth to slow or stop, tubers are commonly misshaped and can begin sprouting before harvest.

Tubers prematurely sprouting prior to harvest due to psyllid yellows.
Pathogen transmission by potato psyllids

- Potato psyllids transmit bacteria that cause zebra chip disease in potatoes.
- Symptoms occur in foliage and tubers.

Foliar symptoms of zebra chip disease

Photo: Joseph Munyaneza, USDA/ARS
Pathogen transmission by potato psyllids

- Tubers harvested from infected plants present a striped pattern when fried.

Photos: Joseph Munyaneza, USDA/ARS
If my potato plant is sick, does it have zebra chip disease?

• Solanaceous crops are subject to many disorders and diseases.

• Zebra chip disease can only be diagnosed by a laboratory.

• If you suspect that you have potato psyllids and your crop may have zebra chip disease, contact your local extension agent.
How do potato psyllids move?

Photos: Nina Zagvazdina and Susan Halbert, FDACS/DPI; truck -

Potato psyllid nymphs
Management of potato psyllids

• No cure for zebra chip disease.
• Management of psyllid populations is key.
• The first step in management is monitoring.
  – Use sweep nets and vacuum devices or sticky traps for adults.
  – Use visual inspection for eggs and nymphs.
Monitoring for potato psyllids

• Sweep nets and vacuum devices:
  – Use a very fine mesh net.
  – Do not beat the foliage – aim for the tips of the leaves.
  – Psyllids will be startled, and their instinct is to jump – right into the net!
  – Use an aspirator to collect the bugs.

Aspirator


Sweep net
Monitoring for potato psyllids

- Sticky traps:
  - Yellow sticky traps can also be used to monitor for adults.
  - A psyllid pheromone is being developed at ARS-Wapato.

Photos: Joseph Munyaneza, USDA/ARS
Monitoring for potato psyllids

• Visual inspection:
  – Look on the leaves and other above ground parts of the plant for eggs and nymphs.
  • 100 leaves (10 from 10 locations along field perimeter).
  • Labor-intensive

Photos: Joseph Munyaneza, USDA/ARS
Cultural control for potato psyllids

• Planting date may affect the occurrence of zebra chip disease
Biological control for potato psyllids

- Generalist predators:
  - lady beetle
  - minute pirate bug
  - damsel bug
  - lacewing
- Parasitoid wasp
  - *Tamarixia triozae*
- It has yet to be determined whether these natural enemies are effective at mitigating disease spread.
Chemical control for potato psyllids

- Currently, most management to control for zebra chip disease depend on chemical control.
- Application timing depends on monitoring efforts.
- Consult your local extension agent for specific recommendations for your area.
Regulatory measures

- State and federal regulations prohibit movement of psyllids and pathogens into areas where they are not known to occur.
- Seed testing and certification is required in most potato producing states.

Map of states with seed certifying agencies.
Questions?

• For more information, check out www.protectingusnow.org

• You can also contact:
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- National Plant Diagnostic Network (NPDN)
- Cooperative Agriculture Pest Survey Program (CAPS)
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