# **Presentation Summary: Thrips in Potatoes**

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# WHAT ARE THRIPS?

Photo: Szent István University



- Adult female: 1-1.5 mm long, antennae, 8 segments, reddishyellow to mid-dark brown, winged
- Adult male, Juvenile: translucent, yellowish body, reddish eyes
- Have piercing/sucking mouthparts, used to penetrate plant cells
- Short life cycle (egg to adult in as little as two weeks) under hot dry conditions

<u>Image above:</u> Thrips at various points of the life cycle –light coloured juveniles to the left and winged adult to the right (note that the male adult is also light coloured).

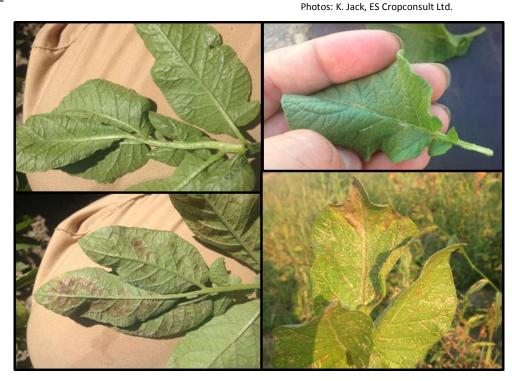
# WHY ARE THRIPS A CONCERN?

Thrips cause damage through:

- Feeding
- Egg laying
- Virus transfer

How to identify thrips damage:

- Shiny
- Speckled
- White or silvery scarring
- Hairspray-like
- Frass → dark specks
- Easier to see if moved in sunlight
- Rough lines
- Running along the veins
- Juvenile and adult thrips
- Predators of thrips



<u>Image above:</u> Varying levels of thrips feeding damage on potato leaves – underside (left), topside (right).

How thrips feeding damage differs from other feeding damage:

Thrips Damage	Other Insect Damage
<ul> <li>Likely to find feeding damage along the veins, and on the back of the leaf</li> <li>May find damage on both sides of leaves but does not show through from one side to the other</li> <li>Feeding damage silvery in colour and shiny</li> </ul>	<ul> <li>Lygus nymph damage → likely to find damage that breaks through the leaves, puckering of leaves</li> <li>Spider mites damage → visible through both sides of the leaf, likely to be webbing even if mites aren't present</li> <li>Aphid damage → look for presence of aphids or their corpses, also leaf yellowing/purpling</li> </ul>

### Virus transmission by thrips:

- Tomato spotted wilt virus (TSWV) of greatest concern
  - exists on weeds in the Fraser Valley
  - some thrips species found in local potato fields can transmit TSWV
  - has caused issues in Australia → reduced potato yield and compromised seed potatoes
  - difficult to ID in field, similarities to early and late blight and nutrient deficiencies on leaves (<u>Image right:</u> TSWV on potato leaves)
- Only thrips larvae acquire viruses, but both larvae and adults transmit the viruses to plants



Photo: M. McGrath, Cornell University

#### Climate concerns:

- The Fraser Valley is expected to experience hotter, drier summers and milder winters
  - o Thrips thrive under hot dry summer weather and are more likely to survive milder winters
- Data summarized from historical E.S. Cropconsult monitoring reports also demonstrates increasing thrips populations in potato fields
  - o In the late 1990's and early 2000's, thrips management recommendations were rarely made for more than one field per year
  - Since 2003, thrips management recommendations have been made in 5% to 20% of fields

# THRIPS PROJECT OUTLINE AND UPDATE

### PROJECT: Evaluation of thrips damage to potatoes in a changing climate

<u>Objective A</u>  $\rightarrow$  Evaluate yield loss due to thrips damage to potato crops in relation to growing season conditions.

- Four fields with trial plots, plots treated weekly with: Insecticide, Water, and Untreated
- Counted thrips on leaves and sticky cards and assessed thrips feeding damage weekly
- Treatments were effective on thrips damage less thrips damage in Insecticide plots compared to Water and Untreated plots

# **Objective A continued**

- Impact of thrips damage on yield loss was only significant in one field
- Analysis also revealed that early feeding damage may have more effect on yield loss
- Will repeat field trials in 2016 growing season

<u>Objective B</u>  $\rightarrow$  Assess occurrence of thrips vectoring tomato spotted wilt virus (TSWV) to potatoes within the Fraser Valley.

- Thrips and thrips-damaged leaves were collected for analysis from 16 fields
- Leaves were tested for TSWV with enzyme linked immunosorbent assay (ELISA)
- All samples tested negative for TSWV
- Different locations and varieties will be included in sampling in 2016

**Objective C** → Evaluate potato varietal difference in thrips attraction.

- Data was mined from E.S. Cropconsult's 2015 potato monitoring
- Potato variety differences were complicated by:
  - Surrounding crop → grass, grains, strawberries and peas harbouring more thrips
  - Geographic orientation → more thrips at south, east and west edges due to wind from the south east and south west

<u>Objective D</u> → Increase grower knowledge of the effect of thrips on potato yield and quality, and which varieties can be used to adapt to thrips issues as the climate changes.

- Survey completed in fall 2015 with 30 growers (high response rate of 79%)
  - Most growers have heard of thrips
  - o Clear concern was raised about climate change and subsequent thrips issues
  - Knowledge gaps identified:
    - Thrips and thrips damage identification
    - Varietal susceptibility
    - Climate which thrips thrive under
    - Management practices
- Updates on findings will be distributed to growers directly involved in virus and yield testing

# **KEY TAKE-HOME MESSAGES**

- Thrips can cause damage through feeding, egg laying and virus transmission
- As climate changes we will likely have more thrips issues
- It appears that early season feeding damage can have an effect on yield
- No TSWV was found so far
- Variety, surrounding crop, and geographic orientation all appear to play a role in risk of thrips issues
- Finally, most growers are aware of thrips, many are concerned about climate and thrips, and there are knowledge gaps related to thrips identification and management

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