

Evaluation of Thrips in Potatoes in a Changing Climate

Prepared by Kiara Jack P.Ag, E.S. Cropconsult Ltd.

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Project Background

- Thrips can cause damage through feeding, egg laying and virus transfer and have been found in higher numbers in fields over the past 12 years
- Thrips can spread tomato spotted wilt virus (TSWV) which is known to be present in the Fraser Valley
- Thrips thrive under hot dry summer weather and are likely not killed as easily in mild winters – both climate changes expected for BC
- Thrips issues are likely to increase given climate change

Objectives

- 1) Evaluate yield loss due to thrips damage to potato crops in relation to growing season conditions.
- 2) Assess occurrence of thrips vectoring tomato spotted wilt virus (TSWV) to potatoes within the Fraser Valley.
- 3) Evaluate potato varietal difference in thrips attraction.
- 4) 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.

Link to final report: www.bcagclimateaction.ca/project/fi04

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Potato Industry
Development
Fund

Project Activities

Objective 1: Damage impacts on yield

- Four fields each year (2015 and 2016) in Delta, BC with the variety Goldust
- Plots with thrips, without thrips and with thrips before flowering only were compared
- Counted thrips on leaves and sticky cards and assessed thrips feeding damage on leaves weekly
- Yield assessment made at end of season

Objective 2: Virus transmission (TSWV)

- Samples taken from 16 fields each year (2015 and 2016) throughout the Fraser Valley, BC
- 41-45 leaves sampled per field for TSWV with enzyme linked immunosorbent assay (ELISA)

Objective 3: Varietal attraction of thrips

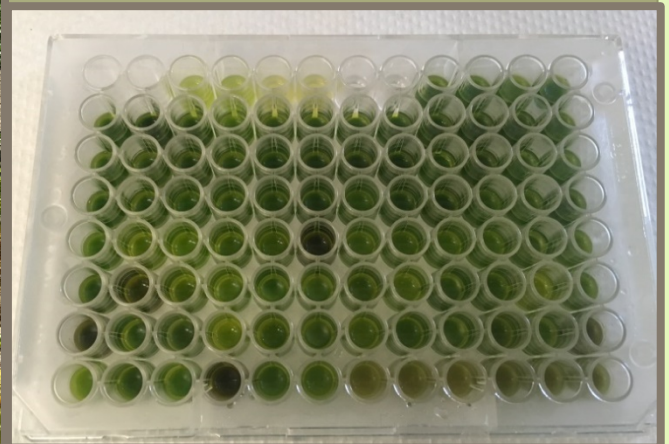
- Data was analyzed from over 200 fields each year (2015 and 2016) from E.S. Cropconsult's potato monitoring throughout the Fraser Valley, BC

Objective 4: Knowledge transfer

- Knowledge surveys were completed in 2015, 2016 and 2017
- Project updates were distributed to growers, industry, government and researchers at meetings
- Presentations were made in 2016 and 2017 at the Lower Mainland Horticulture Improvement Association Short Course
- Thrips and their damage were demonstrated at the BC Potato Industry Variety Trial Field Day
- Participating growers received TSWV reports



Field H showing plot set up



ELISA plate testing for TSWV

Project Results

Objective 1

- Thrips numbers, damage and yield varied between fields and years
- In 2015, thrips on cards indicated a significant though small increase in yield (likely due to plant compensation)
- In 2016, thrips on cards did not have a significant impact on yield
- Currently the risk of thrips reducing yield appears to be fairly low as found with Goldust

Objective 2

- No TSWV was found

Objective 3

- Delta field edges are more likely to have higher thrips numbers than Abbotsford
- Organic field edges are more likely to have higher thrips numbers than conventional
- Field edges with Satina are more likely to have higher thrips numbers than AC Peregrine, Imola, Kennebec and Orchestra
- Geographic orientation (N,S, E or W) does not appear to impact thrips numbers

Objective 4

- Growers are concerned about thrips and knowledge gaps in thrips identification, virus transmission, and management tools were identified
- A variety of strategies used to share project findings and address knowledge gaps were found to be successful

Management Tools

Biological

- ❖ Attract predators with diverse plants ensuring season long pollen, nectar and habitat availability
- ❖ Conserve predators by minimizing chemical treatments
- ❖ Avoid creating dust as it affects predators
- ❖ Experiment with predator releases (efficacy not well known)



Orius- a common thrips predator

Physical

- ❖ Use irrigation to remove from plants and slow down life cycle

Cultural

- ❖ If concerned about thrips choose varieties that are less attractive
- ❖ Avoid late plantings near mature grass and grain fields
- ❖ Wait until potatoes are harvested before harvesting or cultivating neighbouring grass and grain fields

Chemical

- ❖ Use seed piece treatments
- ❖ Use foliar insecticide sprays if necessary- ensure appropriate timing (depending on weather and thrips presence) and full coverage

Recommendations for future work

- ❖ Continue looking for TSWV
- ❖ Continue monitoring thrips in potatoes and other crops
- ❖ Evaluate thrips yield impacts on multiple varieties
- ❖ Evaluate thrips yield impacts in different areas
- ❖ Evaluate further thrips and neighbouring crop influences

Identification



Thrips:

- Adults are 1-1.5 mm long, have wings and can be light or dark coloured
- Juveniles are very small, don't have wings and are light yellow coloured
- Thrips are most often found on the underside of leaves and sometimes along the veins of the topside of leaves.



Underside



Topside

Leaf 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



Tomato Spotted Wilt Virus (TSWV) damage:

- Concentric rings on leaves and or tubers
- Leaf spots resemble blights

