EPIDEMIOLOGY AND CONTROL OF POTATO VIRUS Y IN HIGH GRADE SEED POTATO PRODUCTION AREA IN FINLAND

UNECE Meeting, Oulu 10.9.2015
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Downgrading and rejection of potato seed lots due to viruses in Finland in 2003–2013

Data from Finnish Food Safety Authority Evira
Objectives

- Characterise the species composition and phenology of the aphid fauna in Tyrnävä-Liminka area.
- Determine the incidence of aphid species with ability to transmit PVY and to use a modelling approach to determine their relative importance as vectors including timing of transmission.
- Evaluate the application of straw mulch in comparison with mineral oil and chemical practices for control of PVY.

Partners and participants

- MTT Agrifood Research Finland, University of Helsinki, Ministry of Agriculture and Forestry, Finnish Food Safety Authority Evira, Seed potato growers, Seed potato companies
Total number of winged aphids caught with a suction trap in Tyrnävä in 2000–2011

Birch aphid (*Euceraphis* spp.)
Weekly numbers of aphids caught with yellow pan traps in 2007 - 2010

Kirchner et al. 2013. PLOS One
Modelling: Data collection

<table>
<thead>
<tr>
<th>Field</th>
<th>PVY% in seed</th>
<th>PVY% in yield</th>
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<tr>
<td>...</td>
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</tbody>
</table>

Kirchner et al. 2011. Annals of Applied Biology
The main vector of PVY in the Finnish HG-area is bean aphid (*Aphis fabae*).
The early season is the main period of transmission.
Winter host of bean aphid is snowball tree (*Viburnum opulus*).
Control strategy: ground cover during early vector flight

Straw effect

- Altering host finding behaviour
- Background of the plants is very important
Small scale experiments
The incidence of PVY in the small scale experiments

PVY-% in seed

2009: 4.0
2010: 3.5
2011: 4.7

Kirchner et al. 2014. Potato Research
Large scale experiments
The incidence of PVY in the large scale experiments

2011

PVY-% in seed: 0.3

2012 a

PVY-% in seed: 0.7

2012 b

PVY-% in seed: 3.5

Kirchner et al. 2014. Potato Research
Conclusions

In the Finnish HG-area

- NTN is the predominating strain of potato virus Y.
- *Aphis fabae* is the main vector of PVY.
- Transmission of PVY occurs in the early season.
- No colonizing aphids.
- The incidence of seed-borne PVY infection and the early season vector flight are the most important factors contributing to the incidence of PVY in the yield.
- Straw mulch consistently reduced transmission of PVY in the potato crop.
- Mineral oil was not as reliable as straw mulch in reducing the incidence of PVY.
- Insecticides did not protect potato crop against PVY.
- Straw mulch together with the low PVY level in the seed seems effective way to manage PVY.
Further information in the following publications:


Thank you!