Virus Prevalence in Irish Seed Potato Crops

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What is a virus?

- A tiny particle that enters a cell and reproduces
- All living things can be infected by a virus
- Viruses cause yield loss in potatoes
## Viruses & Transmission

<table>
<thead>
<tr>
<th>Virus</th>
<th>Transmission</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potato Virus X</td>
<td>mechanical</td>
<td></td>
</tr>
<tr>
<td>Potato Virus S</td>
<td>mechanical &amp; aphid</td>
<td>non-persistent</td>
</tr>
<tr>
<td>Potato Virus A</td>
<td>aphid</td>
<td>non-persistent</td>
</tr>
<tr>
<td>Potato Virus Y</td>
<td>aphid</td>
<td>non-persistent</td>
</tr>
<tr>
<td>Potato Virus LR</td>
<td>aphid</td>
<td>persistent</td>
</tr>
</tbody>
</table>

Viruses can be transmitted through seed
Mechanical Transmission
Non-persistent virus transmission by aphids

- Feeding for several seconds on infected plant infecting its mouthparts.
- Aphid moves to a new plant and feeds on it, spreading virus
- The aphid remains infective for only a short time; approximately two hours

*Potato Virus Y*
*Potato Virus A*
*Potato Virus S*
Persistent virus transmission by aphids

- Aphid feeds on infected plant material for up to 30 minutes
- Incubation period of several hours once the virus has entered the aphid’s body
- During this time the aphid cannot infect any plants
- The virus remains in the aphid’s body for the rest of its life

Potato Leafroll Virus
Virus incidence in seed crops

DAFM data 2006-2012

To look at effect of:

- Variety
- Region
- Seed class

N.B. Positive = some virus in crop [could be at very low levels]

12,845 Tests
2,265 Positive
Main Varieties

- British Queen
- Golden Wonder
- Home Guard
- Kerr's Pink
- Lady Claire
- Lady Rosetta
- Maris Piper
- Record
- Rooster

2006-2012
Regions

- Donegal
- West
- South West
- South
- South East
- East
- North East
Seed Classes

- Pre-Basic 1
- Pre-Basic 2
- Pre-Basic 3
- Pre-Basic 4
- Super Elite 1
- Super Elite 2
- Super Elite 3
- Elite
Virus present in varieties

- British Queen
- Golden Wonder
- Home Guard
- Kerr's Pink
- Lady Claire
- Lady Rosetta
- Maris Piper
- Record
- Rooster

The Irish Agriculture and Food Development Authority
Lady Claire – highest incidence of PVY

The Irish Agriculture and Food Development Authority
Golden Wonder – highest incidence of PVA
Kerr’s Pink – highest incidence of PVX
Low virus incidence of PLRV & PVS

The Irish Agriculture and Food Development Authority
North East – Highest incidence of PVY

The Irish Agriculture and Food Development Authority
South West – Highest incidence of PVA
Donegal– Highest incidence of PVX

The Irish Agriculture and Food Development Authority
Low incidence of PVS & PLRV across all regions

The Irish Agriculture and Food Development Authority
% of virus across seed classes

- PBTC
- PB1
- PB2
- PB3
- PB4
- SE1
- SE2
- SE3
- Elite

Total
PVY incidence increased through generations

The Irish Agriculture and Food Development Authority
PVA incidence increased through generations
PVX incidence increased through generations
PVS & PLRV - slight increase through generations

The Irish Agriculture and Food Development Authority
Guidelines

Pay attention to susceptible varieties and high risk regions e.g.

<table>
<thead>
<tr>
<th>Variety</th>
<th>High Risk Virus</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kerr's Pink</td>
<td>PVX</td>
<td>Donegal</td>
</tr>
<tr>
<td>Golden Wonder</td>
<td>PVA</td>
<td>South West</td>
</tr>
<tr>
<td>Lady Claire</td>
<td>PVY</td>
<td>North East</td>
</tr>
</tbody>
</table>
Virus Reduction Guidelines

- No single tool provides total control of virus
- Use clean/certified seed
- Eliminate sources of infection
- Control insect vector transmission
- Avoid mechanical transmission
- Roguing (seed crops)
Crop Protection

- Apply insecticide every 7 days from emergence
  (early sprays are more important than later sprays)

- Mineral oil reduces aphids capacity to transmit non-persistent viruses – N.B. may reduce yield directly
Conclusions

- High quality seed reduces risk of all viruses
- Predominant viruses vary by region and variety
- Control measures should be targeted
Acknowledgements

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Go raibh mile maith agat

感謝你