Onward into battle

*Dickeya (Erwinia chrysanthemi)* gets the upper hand

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What is *Dickeya*?

- Previously called *Erwinia chrysanthemi*
- Now one of at least 6 species
- Closely related to *Pectobacterium atrosepticum* (previously called *Erwinia atroseptica*)
- Causes blackleg, wilt, soft rot diseases of potato
- Wider host range than *P. atrosepticum*
World distribution of *Dickeya* spp.

(CAB International, 2005)
Distribution of *Dickeya dianthicola* on all hosts in Europe (updated from CAB International, 2005)

- *D. dianthicola* thought to be main *Dickeya* on potato in Europe
Big brother joins the battle

New research indicates that a new highly virulent species (No. 7) is becoming prevalent – DUC-1 (or *D. solani*).

Recent potato strains (Biovar 3):
- Israel
- Poland
- Finland
- The Netherlands

European potato strains ≤ 1995
Dickeya strains at different temperatures
D. dianthicola vs P. atroseptica on stems

![Graph showing lesion length at different temperatures for D. dianthicola and P. atrosepticum.]

- **D. dianthicola NCPPB3534 (Ddi 3534)**
- **P. atrosepticum SCRI1039 (Pba 1039)**
### Dickeya strains at different temperatures

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Weight of rot (g)</th>
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<tbody>
<tr>
<td>18-21°C</td>
<td>1043</td>
</tr>
<tr>
<td>21°C</td>
<td>3534</td>
</tr>
<tr>
<td>24°C</td>
<td>3530</td>
</tr>
<tr>
<td>27°C</td>
<td>3344 (18°C+)</td>
</tr>
<tr>
<td>27°C+</td>
<td>3345</td>
</tr>
<tr>
<td>30°C</td>
<td>3542</td>
</tr>
<tr>
<td>33°C</td>
<td>2222</td>
</tr>
</tbody>
</table>

**SCRI data**

*P. atrosepticum*  
*D. dianthicola*  
*D. solani*
Low temp *D. dianthicola* at 21°C

SCRI data
High vs low temp *D. dianthicola* at 27°C
D. dianthicola vs D. solani at 27°C

SCRI data
Symptoms similar to ring rot?
Dickeya Research Consortium

- UK
- The Netherlands
- France
- Belgium
- Poland
- Finland
- Israel
- Dickeya Workshop May 2009 SASA
Blackleg / soft rot in Finland

Survey 2004-2005

*Dickeya* also recovered from river water

(Minna Pirhonen, University of Helsinki, Finland)
Blackleg / soft rot in Poland

First report of *Dickeya* on Polish potatoes 2005

(Ewa Łojkowska, University of Gdańsk, Poland)
Indications that *Dickeya* more of a problem in warm years

(Yves Le Hingrat, FNPPPT, France)
Blackleg / soft rot in the Netherlands

(Jan Van Der Wolf; PRI, Wageningen, NL)
Blackleg / soft rot in the Netherlands

- Between 2002-2007 losses in the Netherlands from due to Dickeya have increased 5 fold from €5m to €25m – flower bulbs €15m

Source: NAK
Symptoms

Initial wilting of top leaves

Leah Tsror
ARO, Gilat Research Center, Israel
Symptoms

Wilting of lower leaves followed with desiccation of foliage
Symptoms

Severe wilting
External darkening of the stem base
Symptoms

Discoloration of vascular system in stem base
Symptoms

In severe infections the stem or the whole plant is dried out
Symptoms

Symptoms are usually associated with a soft rot of the mother.
Symptoms

Soft rot of the daughter tubers (depending on level of infection)
Blackleg / soft rot in the England / Wales
Blackleg / soft rot in the England / Wales

- *Dickeya* was found on 1.2% of 258 seed samples taken in England / Wales in 2007
- *Dickeya* was isolated from 35% of 48 watercourses in England / Wales
Last words

- *Dickeya* is increasing and causing serious problems in Europe
- A new highly virulent species of *Dickeya* (*solani*) is increasing in prevalence
- *Dickeya* is now being found routinely in England / Wales
- It has been found in a limited number of Scottish waterways
- But has not yet been found on Scottish seed
• Scotland has a major advantage over other countries in terms of its seed quality
• Freedom from *Dickeya* is a major selling point, especially for export
• *Dickeya* will arrive in Scotland unless we stop it
• Risk of *Dickeya* increases every time imported seed is grown
Last words

- Currently control is voluntary – no quarantine checks
- Test imported seed for *Dickeya* (John Elphinstone, FERA)
- Join Safe Havens Scheme
- If you suspect *Dickeya* on your crops arrange a diagnostic
- If you have a suspected or confirmed case inform SASA