

# Onward into battle

*Dickeya* (*Erwinia chrysanthemi*) gets the upper hand



Ian Toth (SCRI), John Elphinstone (FERA), Gerry Saddler (SASA)

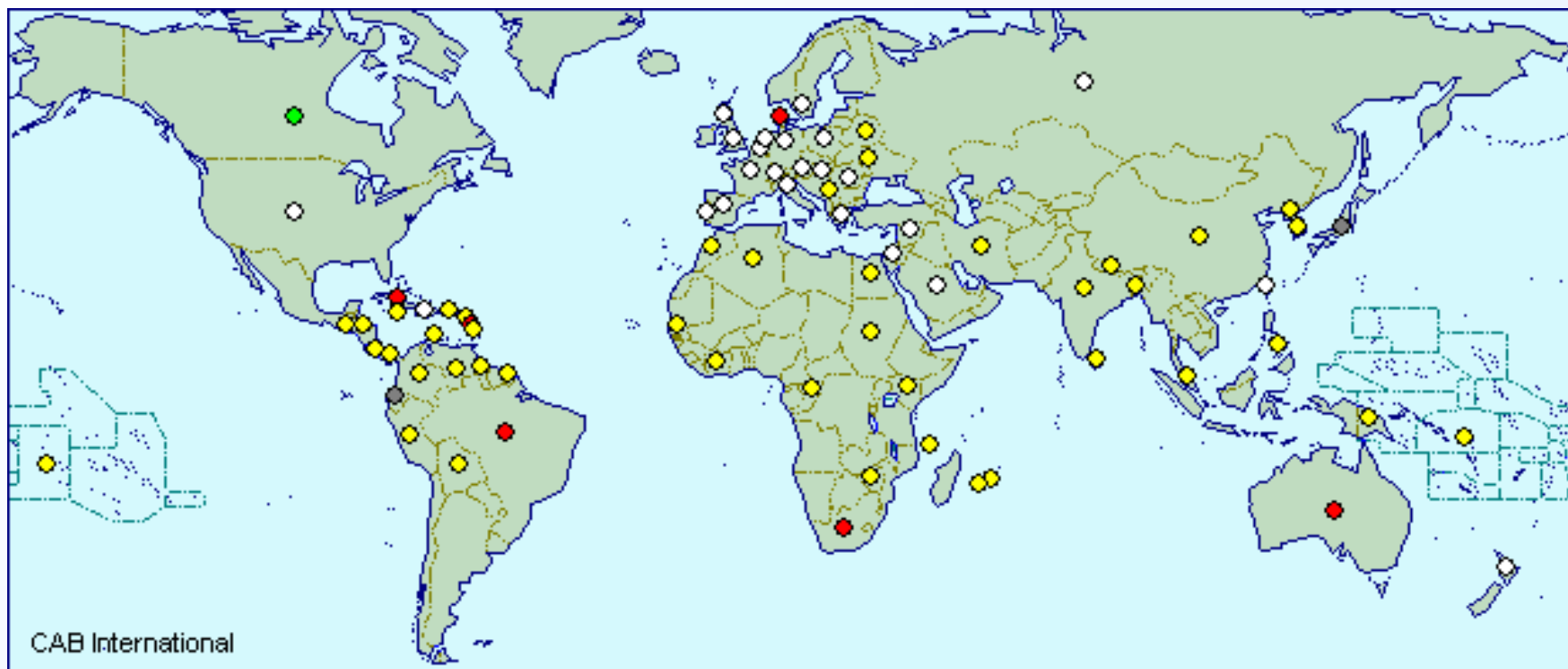
# What is *Dickeya*?



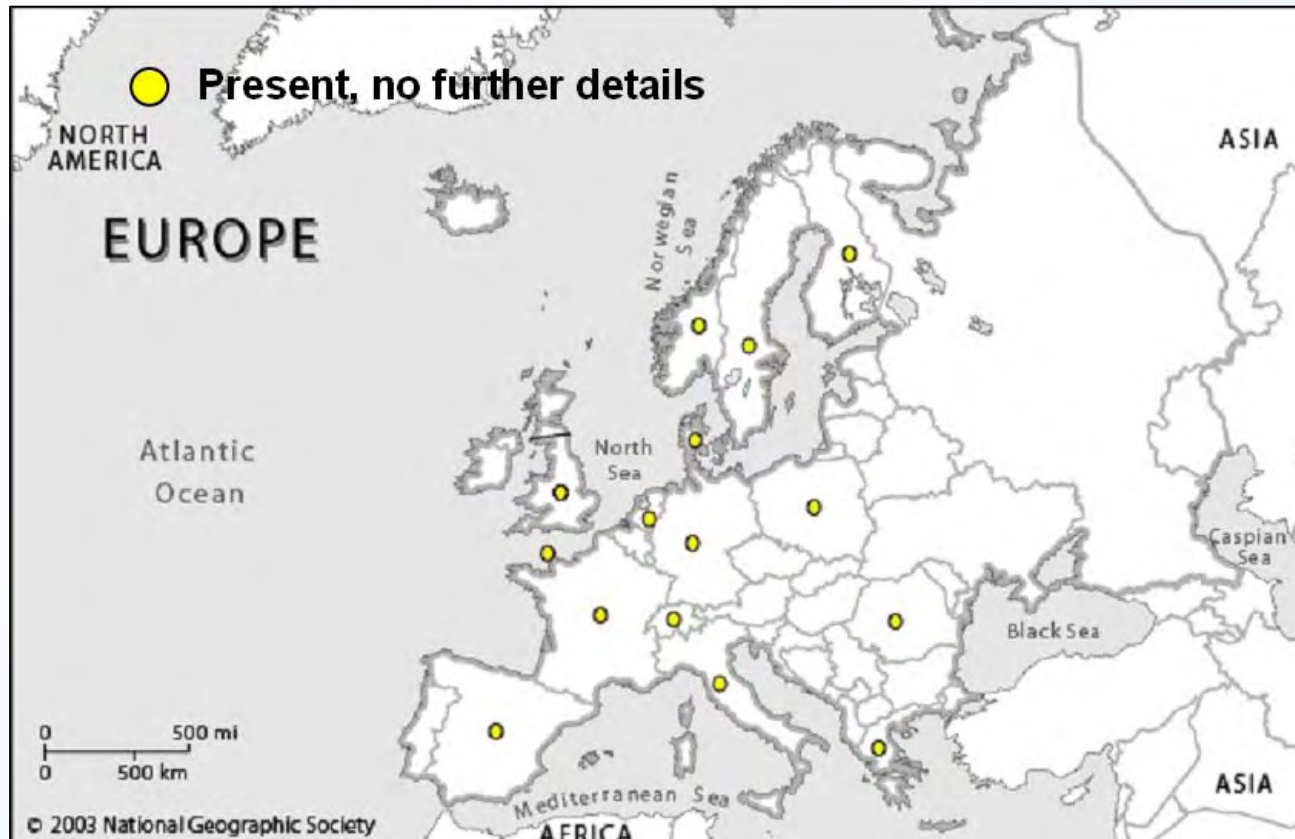
- Previously called *Erwinia chrysanthemi*
- Now one of at least 6 species
- Closely related to *Pectobacterium atrosepticum* (previously called *Erwinia atroseptica*)
- Causes blackleg, wilt, soft rot diseases of potato
- Wider host range than *P. atrosepticum*

# World distribution of *Dickeya* spp.

(CAB International, 2005)

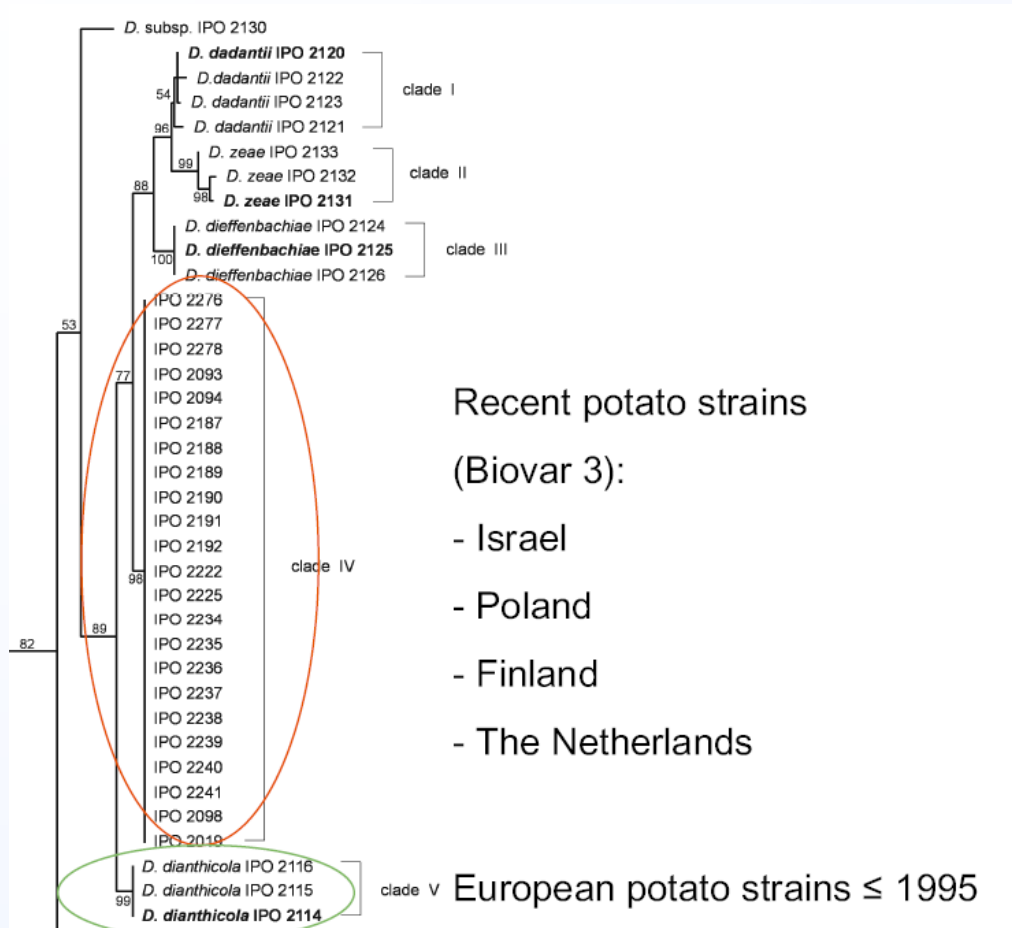


# Distribution of *Dickeya dianthicola* on all hosts in Europe (updated from CAB International, 2005)



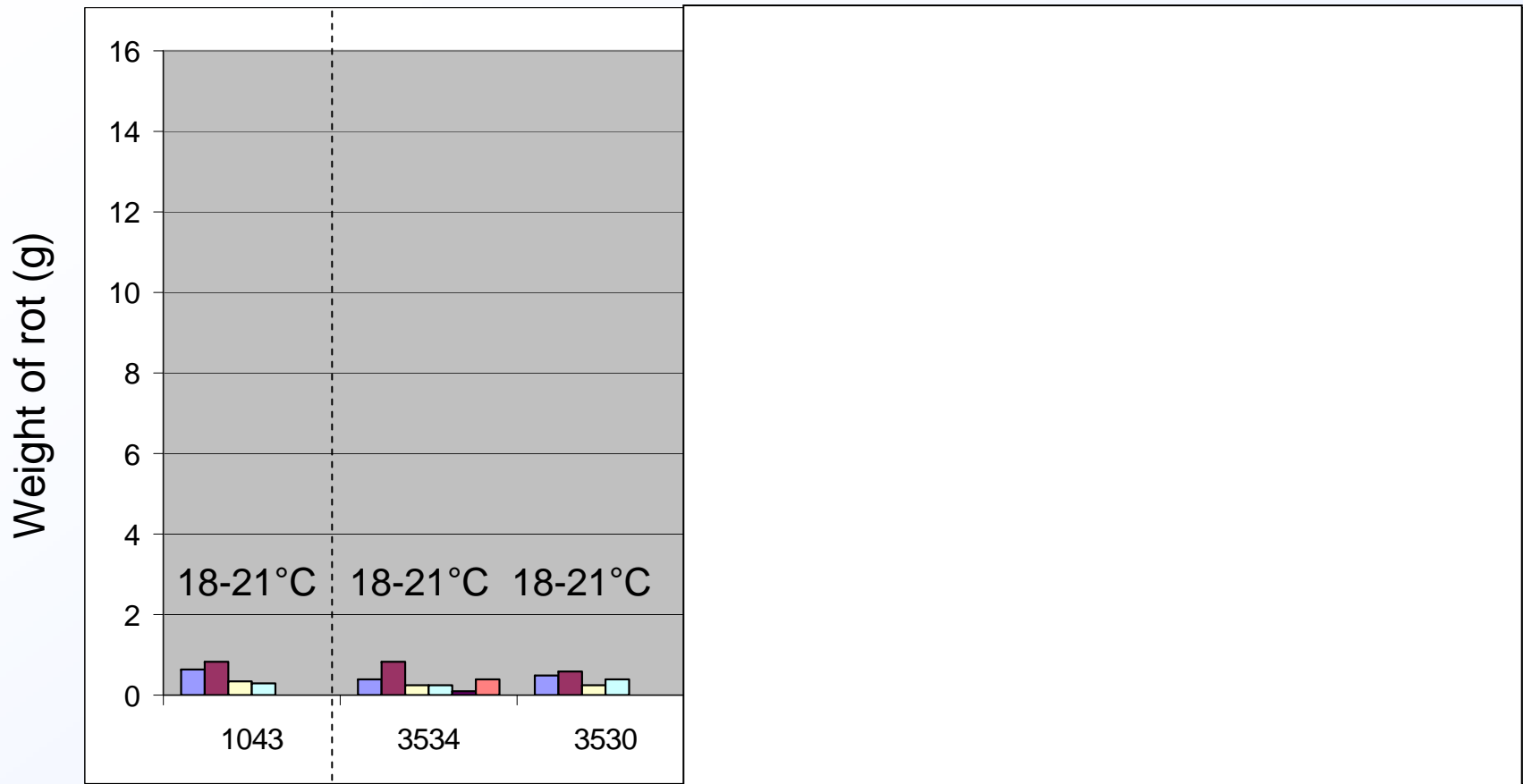
- *D. dianthicola* thought to be main *Dickeya* on potato in Europe

# Big brother joins the battle



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

# *Dickeya* strains at different temperatures



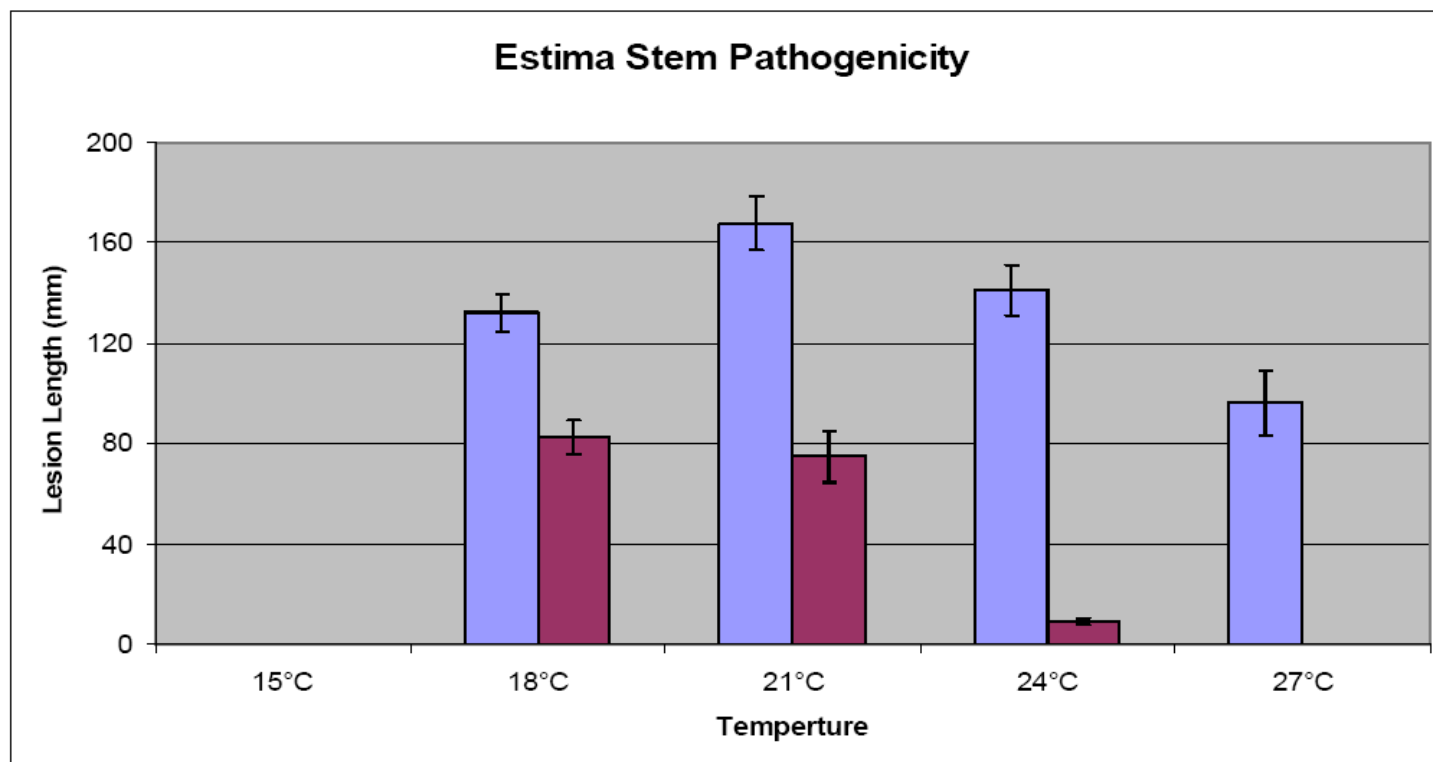
*P. atrosepticum*

*D. dianthicola*

*D. solani*

SCRI data

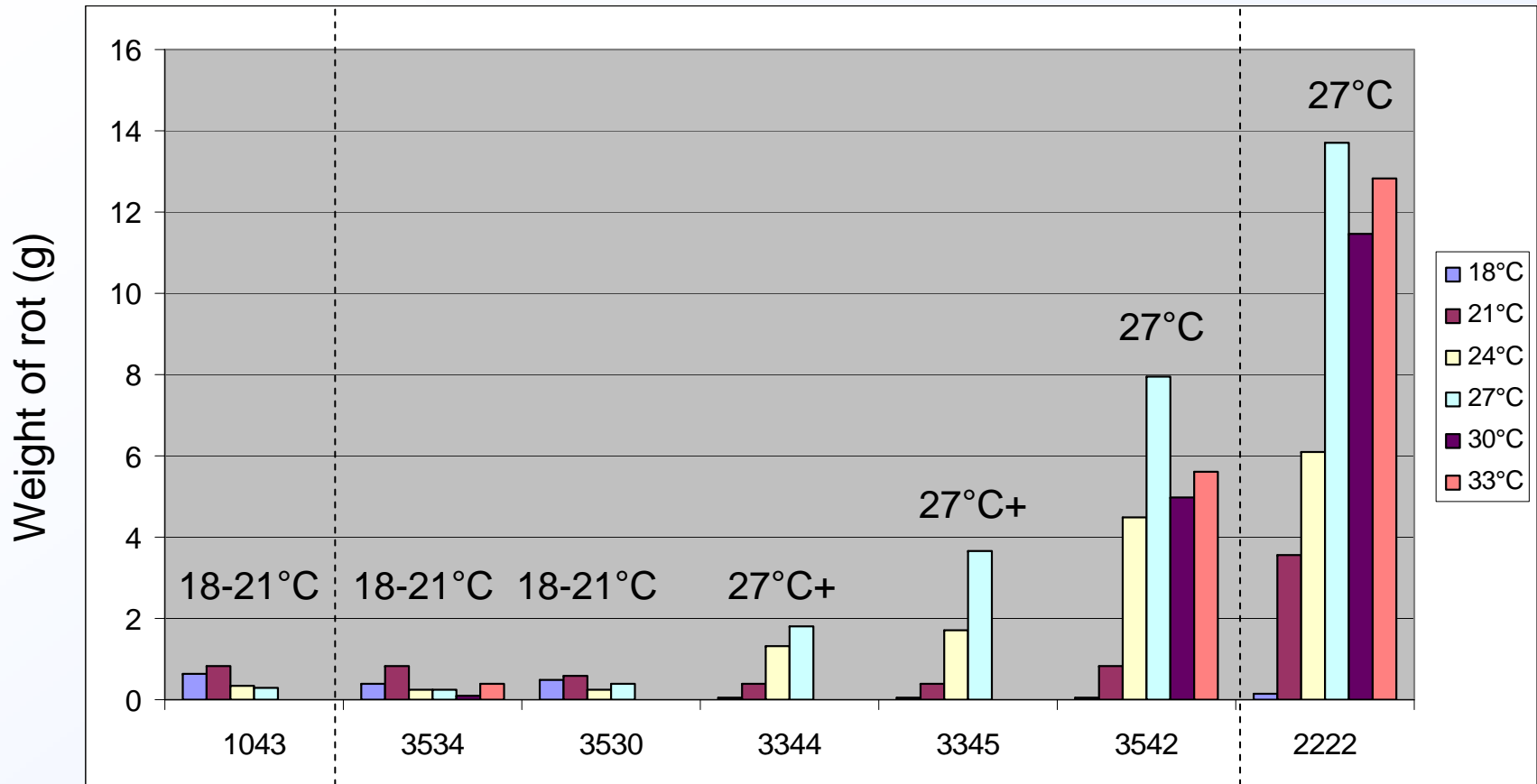
# *D. dianthicola* vs *P. atroseptica* on stems



 *D. dianthicola* NCPPB3534 (*Ddi* 3534)

 *P. atrosepticum* SCRI1039 (*Pba* 1039)

# *Dickeya* strains at different temperatures



*P. atrosepticum*

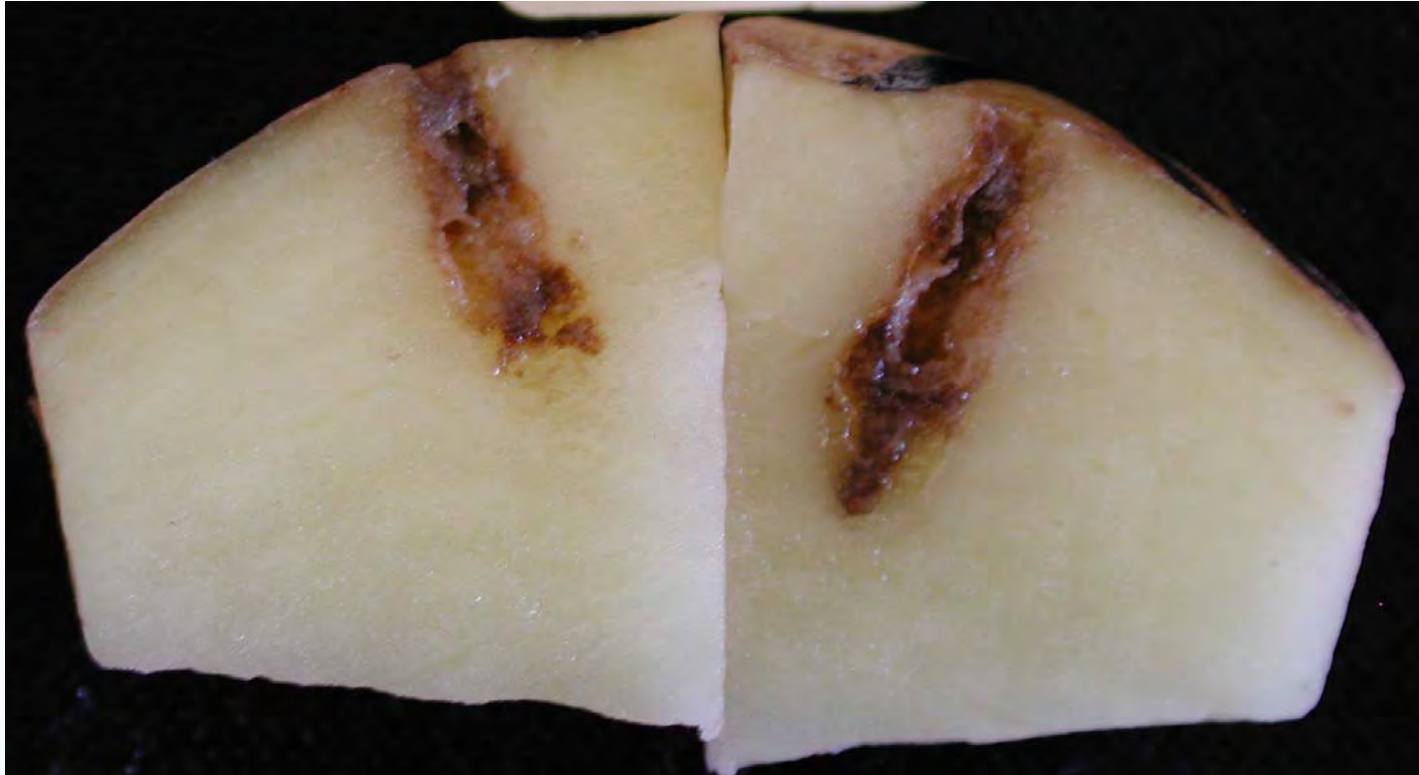
*D. dianthicola*

*D. solani*

SCRI data



# Low temp *D. dianthicol*a at 21°C



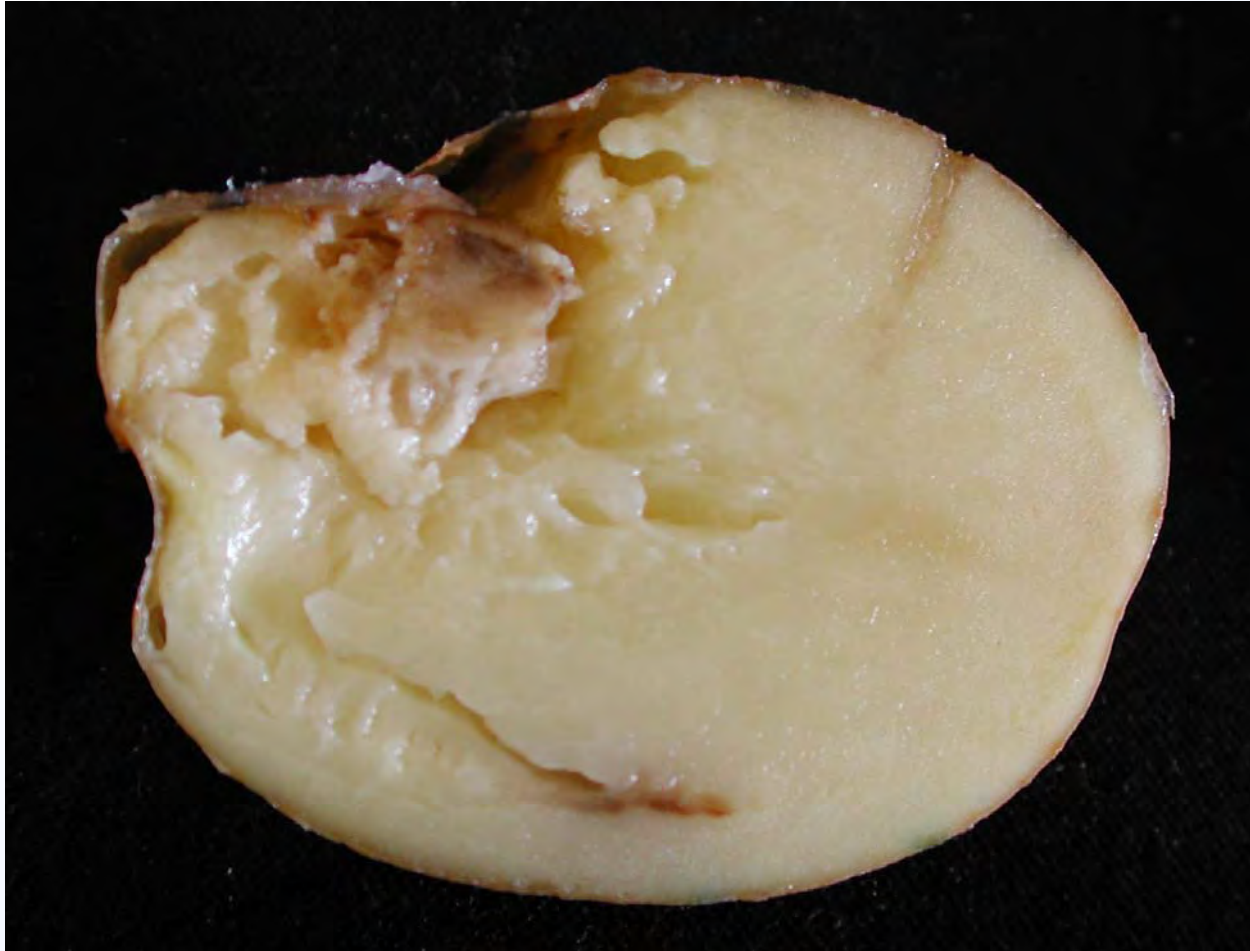
SCRI data

# High vs low temp *D. dianthicol* at 27°C



SCRI data

## *D. dianthicola* vs *D. solani* at 27°C



*D. solani* vs  
low temperature  
*D. dianthicola*  
at 27°C

SCRI data

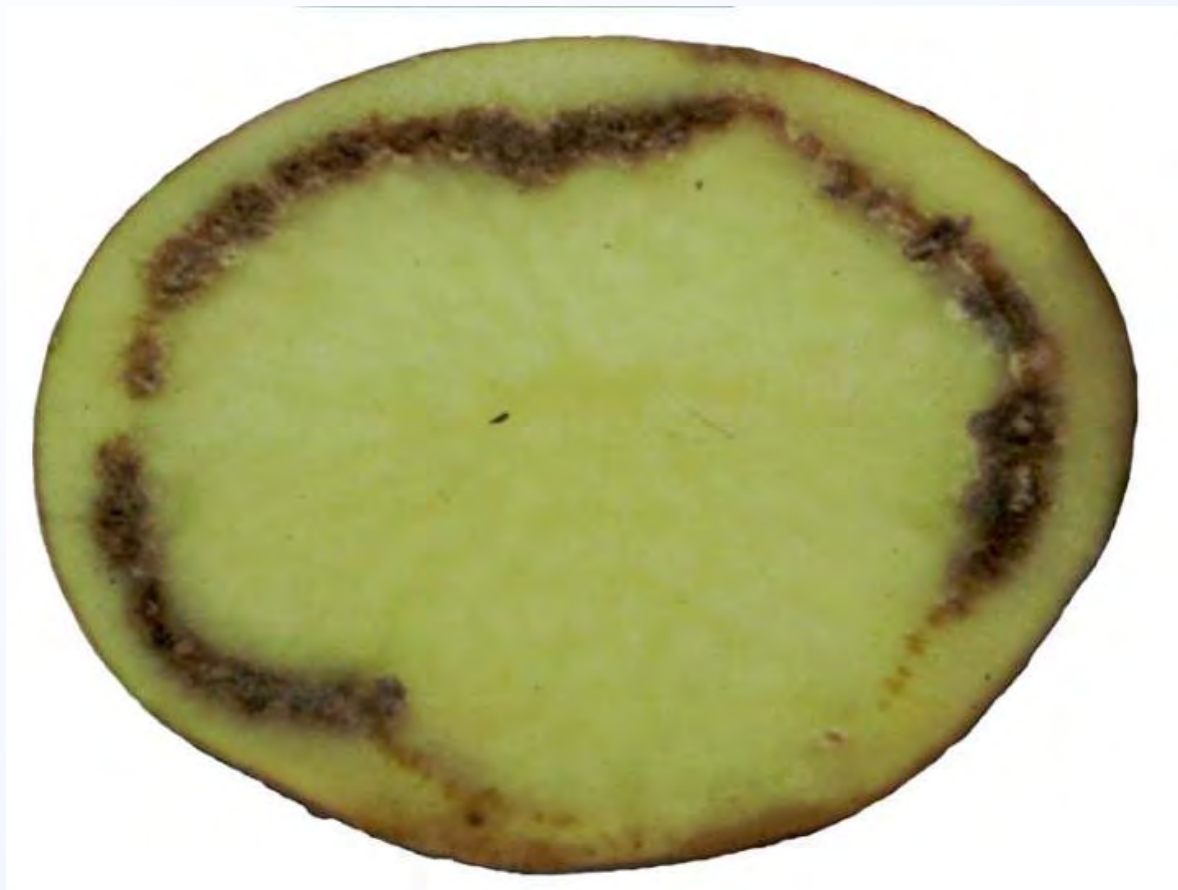
## *D. solani* at 27°C



SCRI data



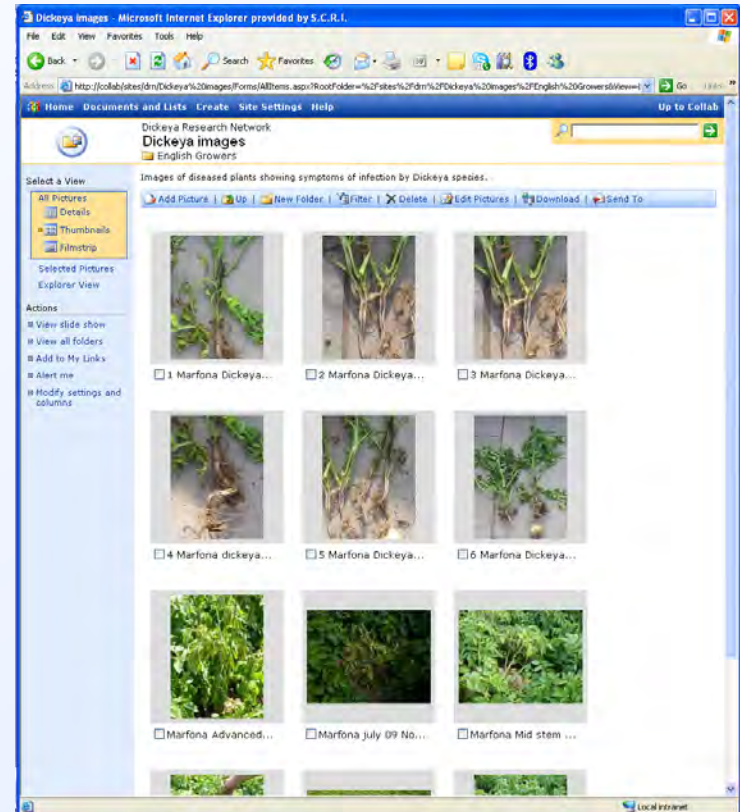
# Symptoms similar to ring rot?



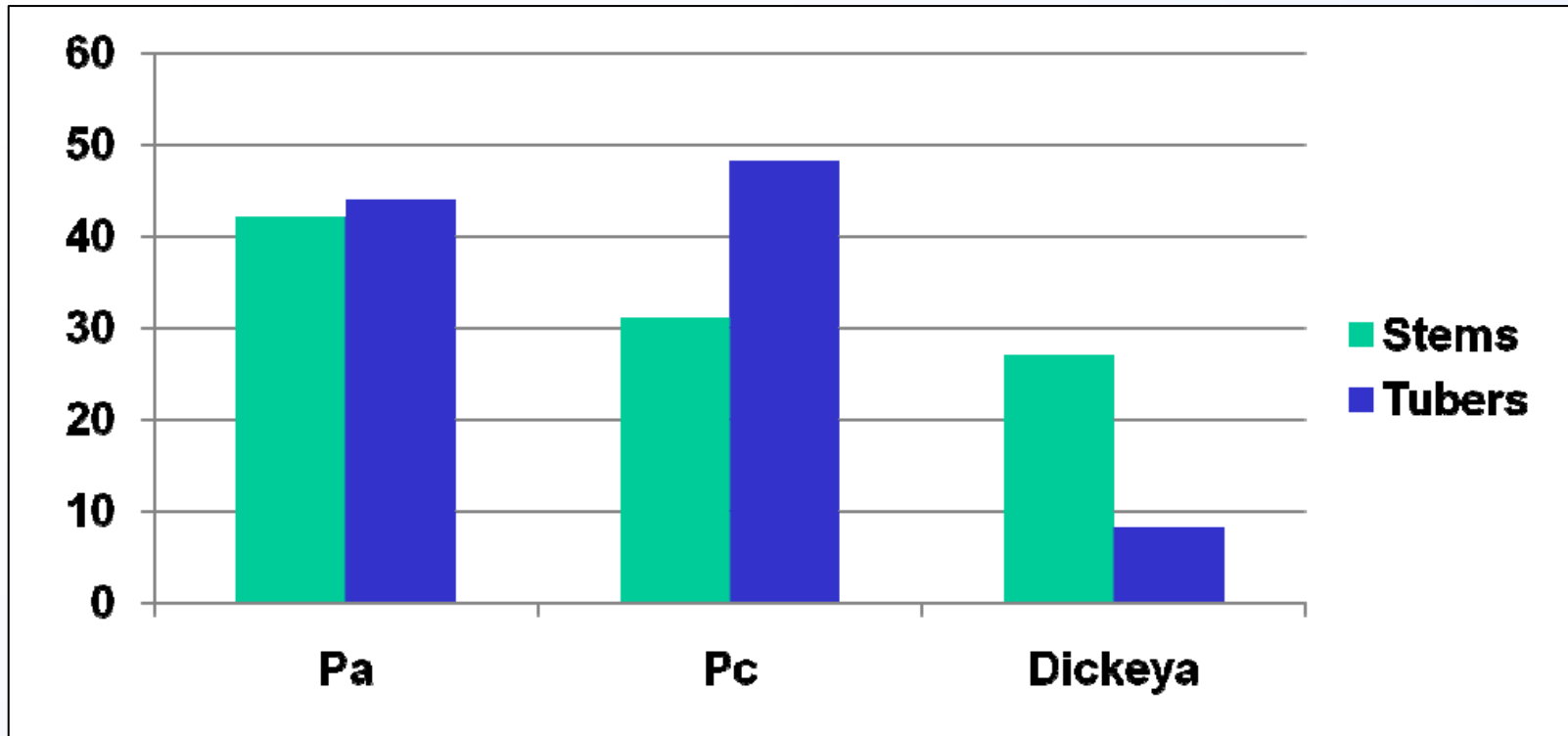
# Dickeya Research Consortium



- UK
- The Netherlands
- France
- Belgium
- Poland
- Finland
- Israel
- *Dickeya* Workshop May 2009 SASA



# Blackleg / soft rot in Finland

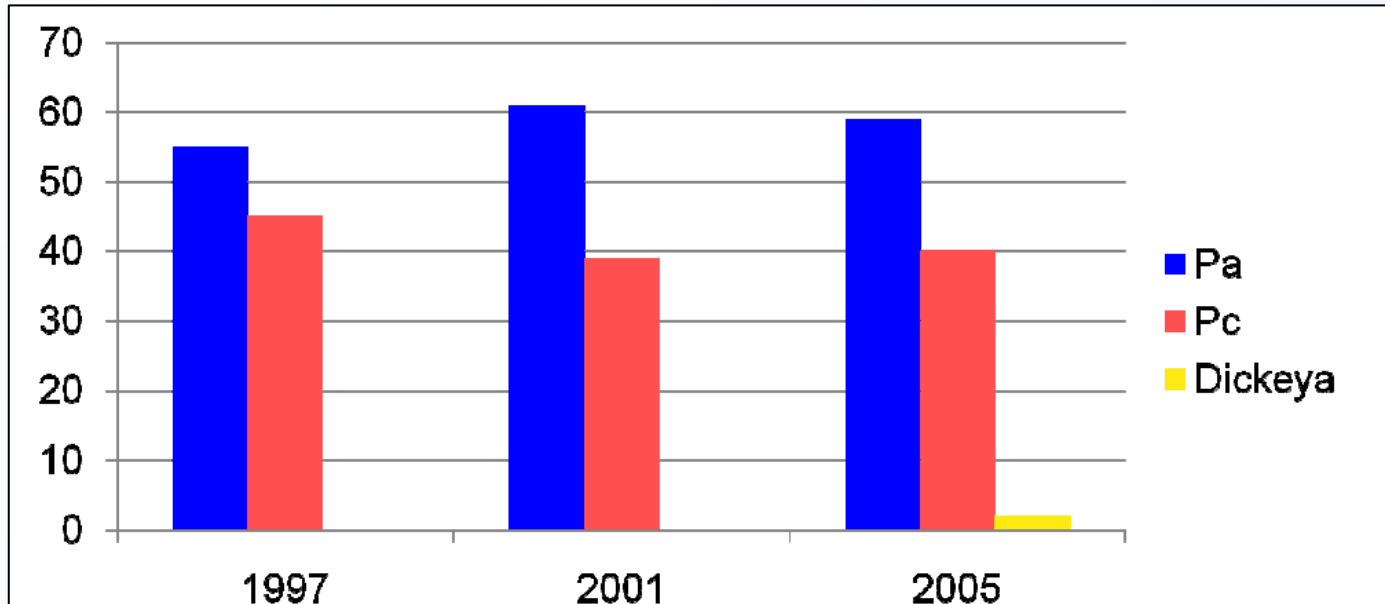


Survey 2004-2005

*Dickeya* also recovered from river water

(Minna Pirhonen, University of Helsinki, Finland)

# Blackleg / soft rot in Poland

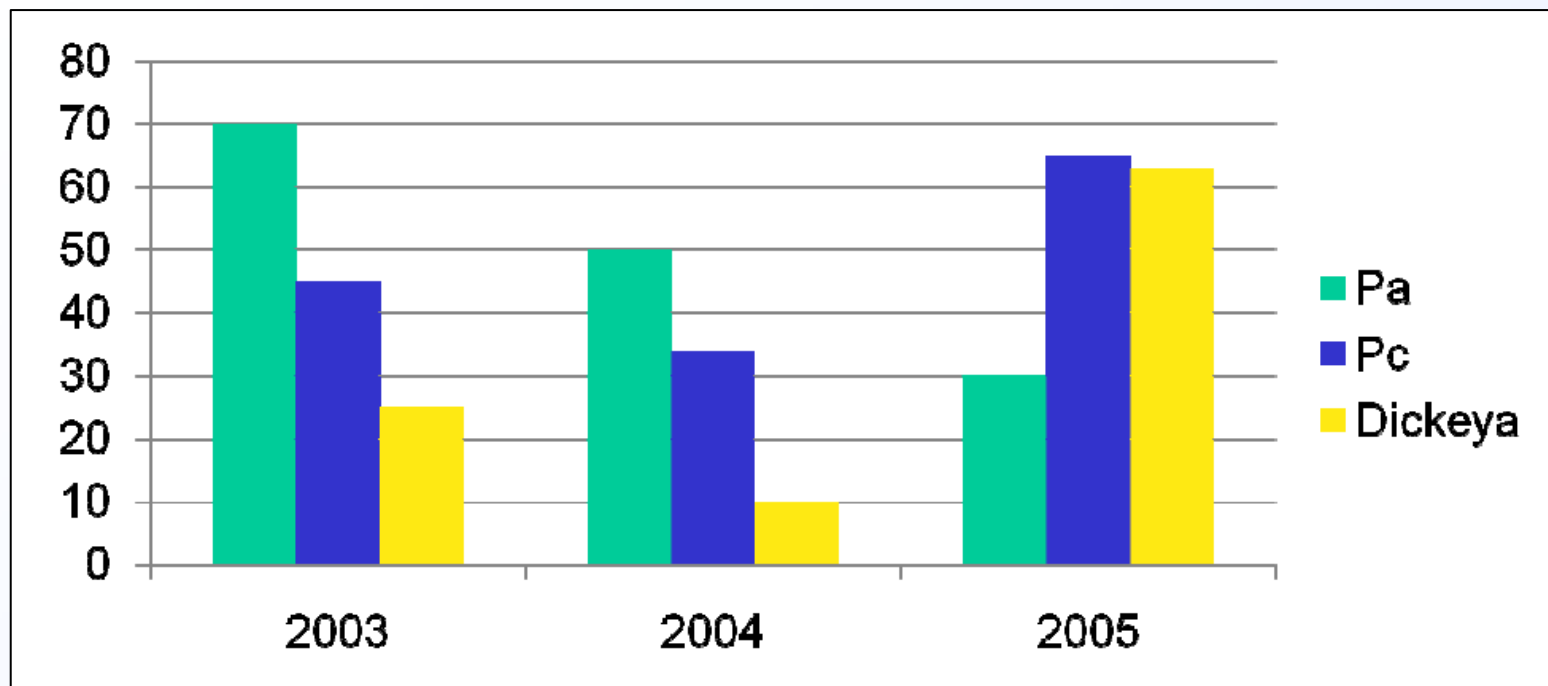


First report of *Dickeya* on Polish potatoes 2005

(Ewa Łojkowska, University of Gdańsk, Poland)



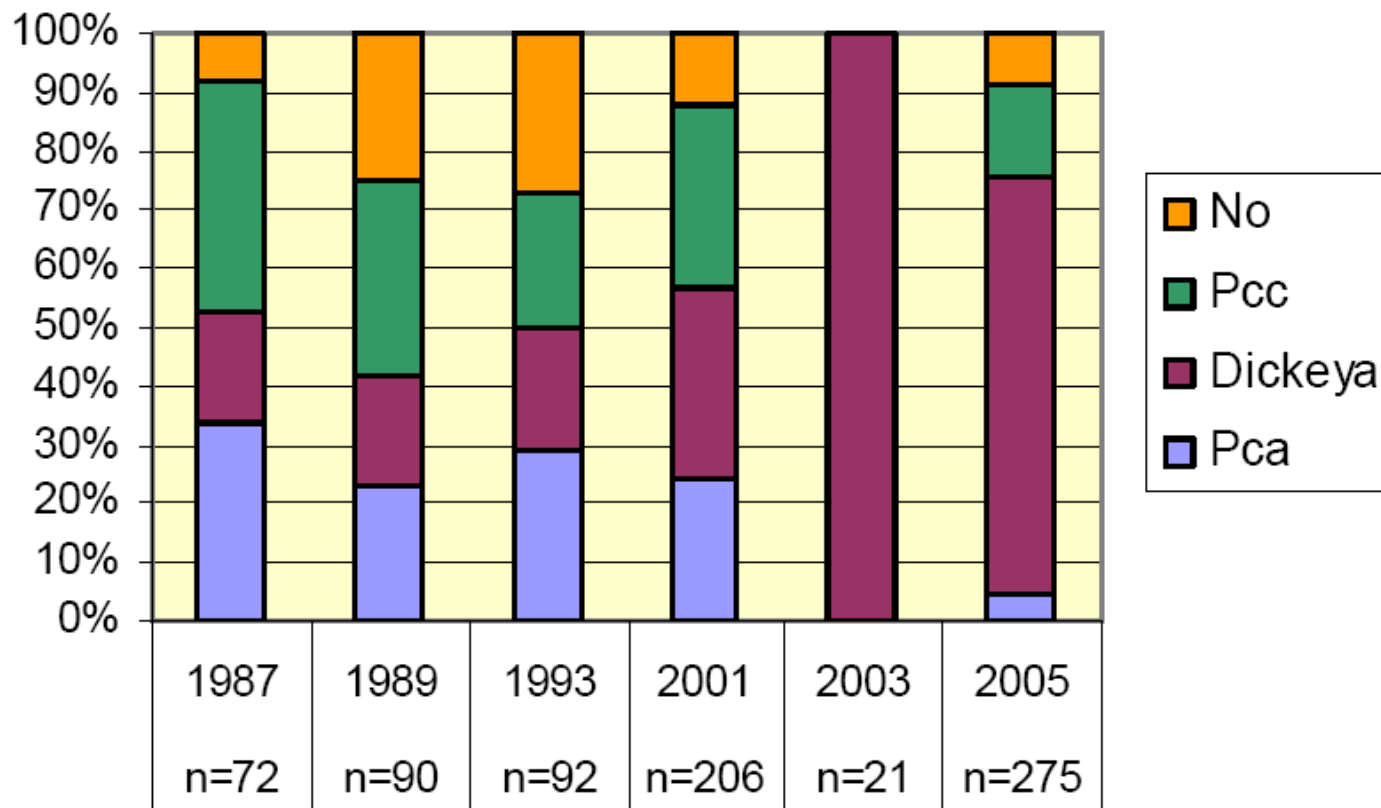
# Blackleg / soft rot in France



Indications that *Dickeya* more of a problem in warm years

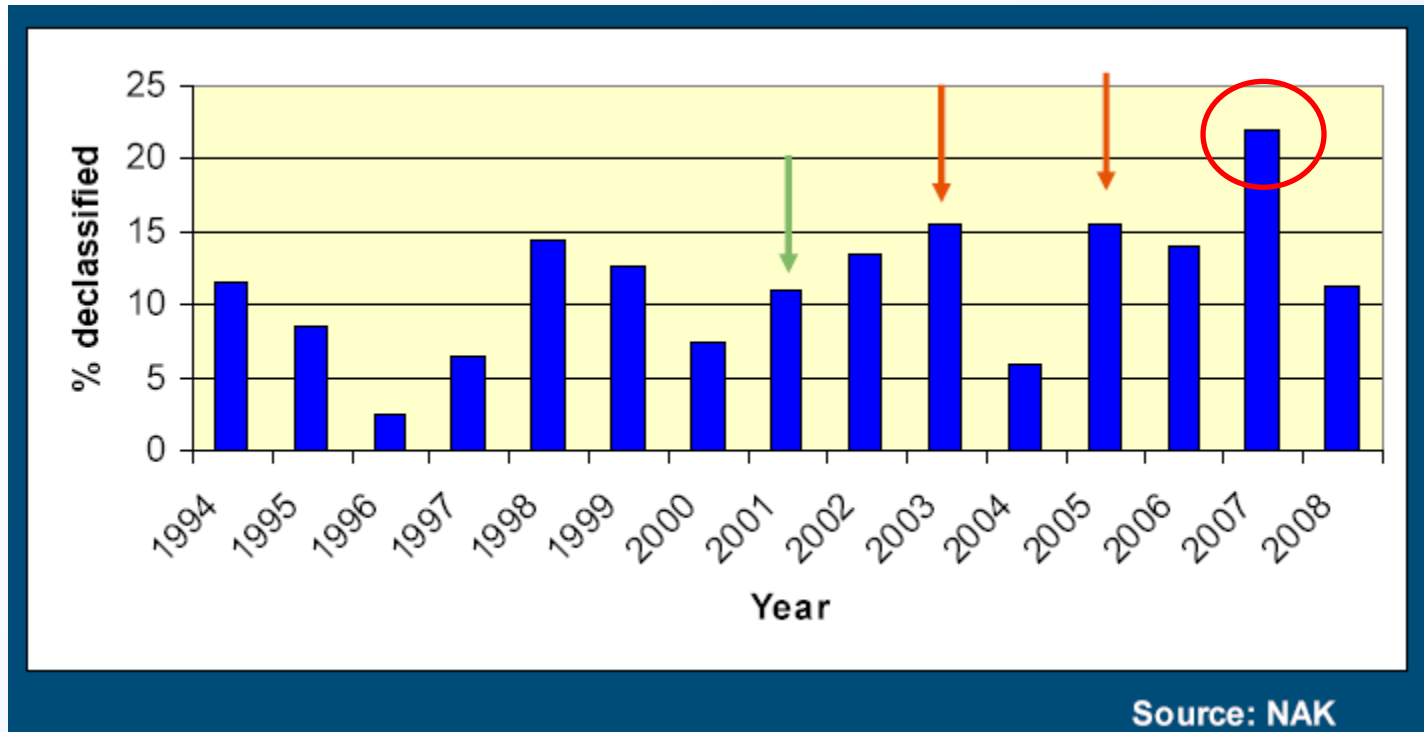
(Yves Le Hingrat, FNPPPT, France)

# 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

# Symptoms



Initial wilting of  
top leaves

**Leah Tsrer**  
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



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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

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- *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



# Last words



- 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

