

Vegetable -Matters-of- Fact

Number 29
February
2006



POTATO

PCN Resistant Cultivars

Key Points:

- PCN is a quarantine pest which threatens interstate and export trade
- Good farm hygiene and resistant cultivars will reduce the risk of PCN spread.
- Use of resistant cultivars will accelerate the natural decline of PCN in soil.
- Victoria has a PCN quarantine facility and screening methods to study PCN .



PCN cysts on the roots of a susceptible cultivar



Symptoms of PCN affected cultivars

Potato Cyst Nematode (PCN) is the most damaging potato pest in the world and is present in around 60 countries. In 1986, PCN was found in Perth, and at Gembrook in 1991 and in Koo-Wee-Rup in 2003. In all cases the only species found has been *G. rostochiensis*, race 1.

PCN resistance screening

A PCN-resistance screening trial was established in 2005 at DPI Knoxfield, as a collaborative exercise between the National Potato Breeding program, DPI Plant Health, Biosecurity Victoria and LaTrobe University.

Over 200 commercial potato cultivars and breeding-lines were tested for resistance to the Koo-wee-rup PCN population. The screening methods were developed in collaboration with Crop and Food Research in New Zealand and the Scottish Crop Research Institute in the UK.

A quarantine glasshouse facility was established to house the trial with strict quarantine and hygiene protocols to ensure the safe handling and disposal of PCN cysts. Some of the measures taken include restricted-access, full-body protective suits, drain-traps and the sterilisation of all materials leaving the facility.

PCN Resistant Cultivars

will accelerate the natural decline of PCN in soil

What was done?

- In total, 224 potato cultivars were screened.
- The cultivars included those grown in the Koo-wee-rup production area, the major commercial cultivars and important selections from the National Potato Breeding Program.
- Each cultivar was grown in pots containing a mixture of potting mix and infested soil, and the roots were assessed when PCN cysts reached the golden stage.
- The highly susceptible cultivar **Ilam Hardy** was used as a positive control.
- The trial was restricted to the cooler winter months (below 24°C) to allow the nematode to complete its lifecycle.

Results and recommendations

Of the 20 cultivars that are grown commercially in the Koo-wee-rup swamp, 10 were assessed as being resistant to PCN. These 10 resistant cultivars represent 86% of production in the area.

The majority of the non-resistant cultivars were fresh market types. It is strongly advised that these be substituted with suitable resistant cultivars.

Of the 75 commercial cultivars assessed, 29 were identified as being resistant to PCN. These 29 resistant cultivars represent only 36% of production in Victoria. This poses a risk to growers outside Koo-wee-rup, should PCN be found in areas where susceptible cultivars are being grown.

Potato Cyst Nematode resistance of the main commercial potato cultivars

Cultivar	Comment
Atlantic	Resistant
FI 1867	Resistant
Nadine	Resistant
Nicola	Resistant
Pike	Resistant
Simcoe	Resistant
Coliban	Susceptible
Desiree	Susceptible
Exton	Susceptible
Wilwash	Susceptible
Kennebec	Susceptible
Lustre	Susceptible
Ranger Russet	Susceptible
Red Rascal	Susceptible
Ruby Lou	Susceptible
Russet Burbank	Susceptible
Sebago	Susceptible
Sequoia	Susceptible
Spunta	Susceptible
Trent	Susceptible
Shepody	Susceptible?
Harmony	Susceptible?

? = not yet confirmed

Further work

This study has provided the potato industry with facilities and protocols to facilitate PCN research in Australia.

There are still considerable gaps in our understanding of PCN in Australia including cultivar resistance, cyst decline rates and the role of common weeds.

For more information please contact:

Tony Slater (National Breeding Program)

Rob Faggian (Plant Health-DPI)

Craig Murdoch (Biosecurity Victoria)

all at DPI-Knoxfield 03 9210 9222

The complete list of 75 commercial cultivars is listed in the Seed Buyers Directory 2006.

Useful Websites for more information:

http:
//www.nre.vic.gov.au/agvic/ihd/projects/cqp-ma1.htm
//plpnemweb.ucdavis.edu/nemaplex/Taxadata/G053s2.htm

Are you on our mailing list?

If you would like to receive your own copy of **Vegetable Matters-of-Facts** or have changed your address, please contact the editor: **Rob Dimsey T: 03 5152 0600**

Check us out and view our other fact sheets:

<http://www.dpi.vic.gov.au→agriculture→horticulture→vegetables→vegcheque>

For more information please contact your local VegCheque officer :

Neville Fernando	Gippsland	5624 2267
Sally-Ann Henderson	Northern Vic	5051 4500
Bruce Fry	South West Vic	5233 5510
Slobodan Vujovic	Melbourne	9210 9279
Elizabeth Wharton		0429799987

Vegetable Matters-of-Fact is published as part of DPI's VegCheque extension program. Editor: Rob Dimsey T: 03 5152 0600
Disclaimer: This publication may be of assistance to you but the state of Victoria and its employees do not guarantee that the publication is without flaw of any kind or is wholly appropriate for your particular purpose and therefore disclaims all liability for any error, loss or other consequences which may arise from you relying on any information in this publication.

The State of Victoria, Department of Primary Industries, 2006.

ISSN: 1445-5676