

The recombinant potato virus Y (PVY) strain, PVY^{NTN}, identified in potato fields in Victoria in south-eastern Australia

What's it about?

Potato virus Y is a major issue for potato production in all Australian states and, indeed, worldwide. However, it exists as a complex of different strains. The symptoms that develop depend on the cultivar and the environment.

The issue is further complicated by recombination between virus lineages, with up to 36 recombinant types already identified. One of these recombinant strains is PVY^{NTN}. This is now the dominant strain in the US as well as found in many other countries.

In this study, ninety samples were collected from Australian potato crops where the leaves were showing mosaic symptoms.

In total, 59 were positive for potato virus Y. All were shown to be recombinant strains and more than half (33) were PVY^{NTN}. Further analysis showed that although these strains of PVY^{NTN} were not related to those from nearby regions, they all belonged to a single clade. That is, they all had a common ancestor.



Potato virus Y symptoms

What was concluded?

While it is not known how this virus entered Australia, the authors conclude that it is likely to be from a single breach of biosecurity.

As PVY^{NTN} is the major cause of potato tuber necrotic ringspot disease, growers need to be aware of its presence and take mitigation strategies, especially if growing varieties susceptible to this disease.



Short Communication

The Recombinant Potato virus Y (PVY) Strain, PVY^{NTN}, Identified in Potato Fields in Victoria, Southeastern Australia

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Abstract

Potato virus Y (PVY) is one of the main viruses affecting potato in Australia. However, molecular characterization of PVY isolates circulating in potato in different states of Australia has not yet been thoroughly conducted. Only nonrecombinant isolates of three biological PVY strains collected from potato were reported previously from Western Australia and one from Queensland. Here, PVY isolates collected from seed potato originating in Victoria, Australia, and printed on FTA cards, were subjected to strain typing by RT-PCR, with three isolates subjected to whole genome sequencing. All the 59 PVY isolates detected during two growing seasons were identified to be

recombinants based on two RT-PCR assays. No nonrecombinant PVY isolates were identified. All the RT-PCR typed isolates belonged to the PVY^{NTN} strain. Sequence analysis of the whole genomes of three isolates suggested a single introduction of the PVY^{NTN} strain to Australia but provided no clues as to where this introduction originated. Given the association of the PVY^{NTN} strain with potato tuber damage, growers in Australia should implement appropriate strategies to manage PVY^{NTN} in potato.

Keywords: PVY^{NTN}, PTNRD, FTA, multiplex PCR
