



## First report of potato tuber necrotic ringspot disease associated with PVY recombinant strains in Ireland

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Potato tuber necrotic ringspot disease (PTNRD) as described by Kus *et al.*, (1992) is found worldwide but has not previously been identified in Ireland. In recent years necrotic symptoms, veinal necrosis, spots, mottling, mosaics and chlorosis have been observed on potato foliage in different regions across Ireland. In 2011 and 2012 affected leaves were serologically tested by double antibody sandwich-enzyme-linked immunosorbent assay (DAS-ELISA) according to the method of Clarke *et al.*, (1977). In some instances these symptoms were associated with PVY. Further analysis of PVY positive samples using RT-PCR, as described by Lorenzen *et al.*, (2006) confirmed the presence of the recombinant strains PVY<sup>NTN</sup> and PVY<sup>N:O</sup> (Fig. 1). No tuber samples were available to determine if their presence was associated with PTNRD.

In 2013, foliage of the cultivar Nicola grown in County Carlow, Ireland showing mosaic, veinal necrosis and chlorosis (Fig. 2) was sampled and serologically and molecularly analysed as described above. Presence of PVY was confirmed by DAS-ELISA, and RT-PCR analysis confirmed the presence of both PVY<sup>NTN</sup> and PVY<sup>N:O</sup>. Tubers from the infected plants were harvested and, following storage at ambient temperature for 28 days, developed the typical superficial necrotic ringspot disease (Beczner *et al.*, 1984) (Fig. 3). This is the first report of PTNRD associated with PVY recombinant strains in Ireland.

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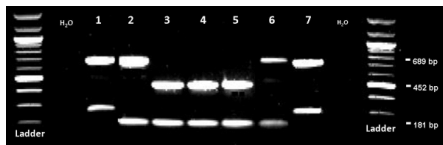


Figure 1



Figure 2



Figure 3

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### References

- Beczner L, Horváth J, Romhányi I, Förster, H (1984). Studies on the etiology of tuber necrotic ringspot disease in potato. *Potato Research* **27**, 339–352. [<http://dx.doi.org/10.1007/BF02357646>]
- Clark MF, Adams AN, 1977. Characteristics of microplate method of enzyme linked immunosorbent assay for the detection of plant viruses. *Journal of General Virology* **34**, 475–483. [<http://dx.doi.org/10.1099/0022-1317-34-3-475>]
- Kus M, 1992. Potato tuber necrotic ringspot disease. Varietal differences in appearance of ringspot necrosis symptoms on tubers. In: Colección Congressos No. 7. *Proceedings of the Virology Section Meeting of the European Association of Potato Research*, Vitoria-Gasteiz, Spain. Servicio Central de Publicaciones del Gobierno Vasco, 81–83.
- Lorenzen JH, Piche LM, Gudmestad NC, Meacham T, Shiel P, 2006. A multiplex PCR assay to characterize *Potato virus Y* isolates and identify strain mixtures. *Plant Disease* **90**, 935–940. [<http://dx.doi.org/10.1094/PD-90-0935>]

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