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DISEASE NOTES

First Report of the Root-lesion Nematode *Pratylenchus scribneri* Infecting Potato in North Dakota

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ABSTRACT

Root-lesion nematodes (*Pratylenchus* spp.) are the most common nematode pests of potato. Five soil samples were collected in October 2014 from a potato field near Cogswell (Sargent Co.), ND, to investigate the occurrence of root-lesion nematodes. Nematodes were extracted from soil using the sugar centrifugal flotation method. All of the samples contained root-lesion nematodes ranging from 125 to 1,628 (average 791) per kg of soil. In April 2015, the field was resampled and one soil sample with 1,540 root-lesion nematodes per kg soil was used to inoculate potato cultivar All Blue (n = 4). After 10 weeks of growth in a greenhouse room maintained at 22°C, the root-lesion nematode population was found to have increased substantially. The final population density in soil was 9,163 ± 4,515 root lesion nematodes per kg soil. Potato roots were washed and brown lesions were observed on lateral roots. The clean roots were cut into 1-cm segments for nematode extraction using the Whitehead tray method. After 48 h, lesion nematodes were recovered from the root tissues with 48 ± 28 nematodes per g of roots, indicating that this root-lesion nematode parasitized this potato cultivar. Nematodes from soil and potato roots were examined morphologically and molecularly for species identification. Morphological measurements of adult females (n = 10) included body length (range = 407.0 to 532.0 µm, mean = 476.5 µm), stylet (15.0 to 15.5, 15.0), tail (25.0 to 28.0, 25.6), body width (21.1 to 28.0, 23.5), anterior end to basal bulb (98.0 to 107.0, 101.4), a = (17.7 to 24.6, 20.4 µm), b = (4.0 to 5.2, 4.6), c = (16.2 to 22.4, 18.5), and V (75.5 to 78.7%, 77.2%). The lip region had two annules. The postuterine sac in females was approximately 23 µm long, equal to the width of the nematode at the vulva. The morphology and morphometrics of this population are within the range of the original description and of the redescription (Castillo and Vovlas 2007) of *Pratylenchus scribneri*

Steiner 1943. Molecular analysis of 28S rRNA and ITS region of rDNA confirmed the identity as *P. scribneri.* DNA was extracted from single nematodes (*n* = 9) isolated from soil and potato roots in 20 µl of worm lysis buffer (Yan and Smiley 2010). The 28S D2/D3 region and ITS region were amplified with primers D2A/D3B (Subbotin et al. 2008) and primers 18S/26S (Yan and Smiley 2010), respectively, and then cloned and sequenced. Sequence (GenBank Accession No. KT873859, 785 bp) from the 28S rRNA was 100% identical to one population of *P. scribneri* (JX047001) from China and one (EU130864) from California. Sequence (KT873860, 1,103 bp) from the ITS rDNA was 98% homologous with four populations of *P. scribneri* from China (JX046934, JX046932, JX046933, and KP995312). While *P. scribneri* was reported as common in the northern Great Plains (Donald and Hosford 1980), to our knowledge, this is the first report of *P. scribneri* infecting potato in North Dakota. Several *Pratylenchus* species including *P. scribneri* are detrimental to potato (Mahran et al. 2010). The resistance and susceptibility of various potato cultivars to this root-lesion nematode are being identified.

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