

# plant disease

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## Disease Notes

### First Report of the Pale Cyst Nematode, *Globodera pallida*, in the United States

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In 2006, a cyst nematode was discovered in tare dirt at a potato (*Solanum tuberosum*) processing facility in eastern Idaho. The nematode was found during a routine survey conducted jointly by the Idaho State Department of Agriculture and the USDA Animal and Plant Health Inspection Service through the Cooperative Agricultural Pest Survey program. Extensive additional sampling from two suspect fields led to the identification of the same nematode in a 45-acre (18.2-ha) field located in northern Bingham County. The morphology of cysts and second-stage juveniles and molecular analyses established the identity of the species as the pale cyst nematode *Globodera pallida* (Stone 1973) Behrens 1975. Morphological characters used for identification included cyst shape, characteristics of cyst terminal cone including nature of fenestration, cyst wall pattern, anal-vulval distance, number of cuticular ridges between anus and vulva, and Granek's ratio (1,4). The second-stage juvenile morphologies critical for identification were the following: body and stylet length, shape of stylet knobs, shape and length of tail and hyaline tail terminus, and number of refractive bodies in the hyaline part of tail (1,4). Diagnosis as *G. pallida* was clearly confirmed by two molecular tests. First, PCR-RFLP (restriction fragment length polymorphism) profiles of a ribosomal DNA fragment using restriction enzymes *Rsa*I, *Taq*I, and *Alu*I (2) were consistent with a *G. pallida* control and not *G. rostochiensis*. Second, the ribosomal DNA region that extends from the 3' end of the 18S ribosomal subunit and includes all of ITS1, 5.8S, and ITS2 to the 5' end of the 28S ribosomal subunit was used to generate sequence for the most accurate species determination. Sequences obtained from three individual juveniles were compared with those from several *Globodera* species (3), revealing unequivocal similarity to *G. pallida*. This detection represents a new country record for *G. pallida* in the United States. Collection of additional information regarding distribution of this nematode within the region is underway.

*References:* (1) J. G. Baldwin and M. Mundo-Ocampo. Heteroderinae, Cyst- and Non-cyst-forming Nematodes. Pages 275-362 in: *Manual of Agricultural Nematology*. W. R. Nickle, ed. Marcel Dekker, New York, 1991. (2) V. C. Blok et al. *J. Nematol.* 30:262, 1998. (3) L. A. Pylypenko et al. *Eur. J. Plant Pathol.* 111:39, 2005. (4) A. R. Stone. *Nematologica* 18:591, 1973.