First Report of Damping-Off of Canola Caused by *Rhizoctonia solani* AG 2-1 in Washington State

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In early September 2003, winter canola (*Brassica napus* L) cv. Inca was direct seeded into plots previously cropped with spring barley at the Washington State University Dryland Research Station at Lind, WA. Before planting, the plots received 80 mm of water by sprinkler irrigation, and 2 weeks later, volunteer barley was killed with Paraquat contact herbicide. In late September, 3 weeks after planting, canola seedlings exhibited postemergence damping-off and lesions on the hypocotyls, resulting in significant stand reductions. *Rhizoctonia solani* was isolated from infected hypocotyls using water agar amended with chloramphenicol (100 µg/ml). Cultures on potato dextrose agar produced dark brown colonies with dark brown microsclerotia. Three isolates were grown on autoclaved oat seed for 3 weeks in 1-liter Erlenmeyer flasks at 22°C, and colonized seed was air dried in a laminar flow hood, ground in a coffee grinder, and added to a Thatuna silt loam at 1% (w/w). The infested soil was placed into 4- × 20.5-cm plastic tubes and planted with five canola seeds per tube, five tubes per isolate. In the control treatment, soil was not infested. Plants were grown in a temperature-controlled room in a greenhouse at 16°C, 12-h light/dark. Isolates caused pre- and postemergence damping-off after 1 week, and the surviving seedlings had significantly less plant height and dry weight. Isolates were identified as AG 2-1 by pairing cultures with AG 8, 2-1, and 10 on agar-coated slides (1). Selected isolates were also identified as AG 2-1 by sequencing of the ITS 1 and 2 regions of the rDNA and matching them to sequences in GenBank. On a farm north of Pullman, WA in 2004, *R. solani* was isolated from soil in spring and winter wheat fields using a toothpick baiting method (2). *R. solani* was found primarily from sites previously cropped with winter and spring canola. These isolates were identified as AG 2-1 and five isolates were tested in the greenhouse, as described above, on canola (cv. Inca), lentil (*Lens culinaris* Medik. cv. Merrit), wheat (*Triticum aestivum* L. cv. Madsen), barley (*Hordeum vulgare* L. cv. Baronesse), pea (*Pisum sativum* L. cv. Stirling), and chickpea (*Cicer arietinum* L. cv. Sierra). Three of five isolates significantly reduced emergence of canola, and all isolates significantly reduced dry weight of canola seedlings and caused lesions on hypocotyls. None of the isolates reduced emergence of the other crops. All isolates reduced the dry weight of pea and three isolates reduced plant height. None of the isolates reduced the dry weight of lentil, chickpea, wheat, or barley. One of the isolates was also tested on *Arabidopsis thaliana* and found to be pathogenic. *R. solani* AG 2-1 has been reported as an important pathogen on canola in Canada and Australia, but has not been reported from the Pacific Northwest of the United States. *R. solani* AG 2-1 is also pathogenic on rapeseed, mustard, and subterranean clover and has been isolated from wheat, sugar beets, and potato (3). Canola is a minor rotation crop in cereal-based cropping systems in eastern Washington (1,600 ha in 2005), but there is increasing interest in this oilseed crop for biodiesel production. However, *R. solani* AG 2-1 may reduce stands and yield of canola.

References: (1) W. C. Kronland and M. E. Stanghellini. Phytopathology 78:820, 1988. (2) T. C. Paulitz and K. L. Schroeder. Plant Dis.89:767, 2005. (3) B. Sneh et al. Identification of *Rhizoctonia* species. The American Phytopathological Society. St. Paul, MN, 1991.