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Disease Notes

First Report of Ascochyta Blight Caused by QoI-Resistant Isolates of *Ascochyta rabiei* in Chickpea Fields of Nebraska and South Dakota

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Ascochyta blight, caused by *Ascochyta rabiei*, is a serious disease of chickpea (*Cicer arietinum*) and fungicide applications are used to manage the disease in the North Central plains (4). During the 2010 growing season, a commercial field near Stanley, SD was treated with pyraclostrobin (Headline, BASF, NC) and called a management failure by the grower. Similarly, limited efficacy of pyraclostrobin was observed in an ascochyta research trial near Scott's Bluff, NE. In both locations, symptoms and signs consistent with *A. rabiei* infection existed on leaves, stems, and pods; namely, circular brown lesions with concentric rings of dark brown pycnidia. Symptomatic samples were collected, disinfected with 95% ethanol for 1 min, rinsed with sterile water, placed in 0.5% NaOCl for 1 min, and rinsed again with sterile water for 1 min (4). Samples were air dried, placed on potato dextrose agar (PDA) plates for 3 to 7 days, and colonies with morphological characteristics typical of *A. rabiei* were single-spored and transferred to new PDA plates and incubated

for 7 to 14 days. Three and six putative *A. rabiei* isolates were obtained from South Dakota and Nebraska samples, respectively. Morphological characteristics were consistent with *A. rabiei*; cultures were brown with concentric rings of dark, pear-shaped pycnidia with an ostiole, and conidia were hyaline, single-celled, and oval-shaped (2). Comparison of the internal transcribed spacer (ITS) region amplified from the genomic DNA of 3-day-old liquid cultures using ITS4/ITS5 primers by BLASTN searches using the nr database in GenBank (Accession Number FJ032643) also confirmed isolates to be *A. rabiei*. Mismatch amplification mutation assay (MAMA) PCR was used for detection of sensitive and resistant isolates to QoI fungicides (1). Confirmation of the presence of the G143A mutation was carried out by cloning an mRNA fragment of the cytochrome b gene using cDNA synthesized from total RNA of *A. rabiei* and CBF1/CBR2 (1,3). Total RNA was extracted from 3-day-old liquid cultures and it was used instead of genomic DNA for this PCR to avoid large intronic regions commonly present in mitochondrial genes. The G143A mutation has previously been correlated with resistance to QoI fungicides in other fungal plant pathogens (3). Also, these isolates were determined to be QoI-resistant in vitro by PDA amended with a discriminatory dose of 1 µg/ml of azoxystrobin (4). To our knowledge, this is the first report of QoIresistant *A. rabiei* isolates causing infections on chickpeas in South Dakota and Nebraska. QoI-resistant isolates were reported in North Dakota and Montana in 2005 and 2007, respectively (4). Of nearly 300 isolates collected from these states from 2005 and 2007, approximately 65% were determined to be QoI resistant (4). The widespread occurrence of QoIresistant isolates and reduction of fungicide performance in fields led the North Dakota State University Cooperative Extension Service to actively discourage the use of QoI fungicides on chickpeas in North Dakota and Montana (4). It is likely that similar recommendations will need to be adopted in South Dakota and Nebraska for profitable chickpea production.

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