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R. M. Harveson

Panhandle Research and Extension Center, rharveson2@unl.edu

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Disease Notes

Widespread Occurrence of the Perfect Stage of Powdery Mildew Caused by *Erysiphe polygoni* on Sugar Beets in Nebraska

R. M. Harveson

University of Nebraska, Panhandle Research and Extension Center, Scottsbluff 69361

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Powdery mildew, caused by *Erysiphe polygoni* DC (synonym *E. betae* [Vanha] Weltzien), has been a sporadic and relatively minor problem for sugar beet (*Beta vulgaris* L.) growers in western Nebraska. Yield losses in this region have been limited, in part because of the use of effective fungicides, but also because infection occurs late enough in the season that treatment has often been unnecessary. The perfect stage had been reported only once in the United States until 2001-2002 when it was identified from Idaho and Colorado (1). The teleomorph was also noted from several fields in Scotts Bluff County in Nebraska in October 2002. The first appearance of the disease in 2003 occurred during the second week of August within five miles of the fields where the perfect stage was noted in 2002. On the basis of these observations, a survey was conducted between mid-August and mid-October to map the appearance and distribution of the perfect stage of *E. polygoni* within the Nebraska Panhandle growing region. During this time, between 45 and 50 fields were surveyed in six Nebraska counties. This represented the majority (70%) of the sugar beet acreage in Nebraska. The first finding of the perfect stage occurred in early September from multiple fields in the vicinity of and including the field where the asexual stage was first reported in August 2003. Ascomata measured 85 to 110 µm with one to four (mostly three) ascospores per ascus, resembling previous pathogen descriptions (2). Subsequently, every other field in the North Platte Valley where the oidial stage had been found also contained the perfect stage by the third week in September, including the Nebraska counties of Scotts Bluff (15 fields) and Morrill (7 fields). Outside the North Platte Valley, powdery mildew was not detected until mid-September and mid-October for the Northern Panhandle (Box Butte County) and Southern Panhandle (Kimball, Banner, and Cheyenne counties) growing areas, respectively. By October 1, the perfect stage was found in 9 of 10 fields exhibiting the disease in the North Panhandle, whereas the perfect stage was not found in the Southern Panhandle before harvest. Over 85% of surveyed fields infected with powdery mildew also harbored the perfect stage (31 of 36). Not only is the new and continued

presence of the perfect stage potentially problematic for managing fungicide resistance and developing new cultivars with pathogen resistance (1), but it may also provide a means for overwintering in this area. This could result in earlier and more severe infections that would additionally require uncustomary treatment for powdery mildew control. The unusually early appearance of the disease and the high incidence of the perfect stage in Nebraska fields during 2003 further highlights these concerns and warrants closely monitoring future crops for continued epidemics.

References: (1) J. J. Gallian and L. E. Hanson. Plant Dis. 87:200, 2003. (2) E. G. Ruppel. Powdery mildew. Pages 13–15 in: Compendium of Beet Diseases and Insects. E. D. Whitney and J. E. Duffus, eds. The American Phytopathological Society, St. Paul, MN, 1986.