

RESISTANCE TO EYESPOT DISEASE OF WHEAT AND ITS WILD RELATIVES

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Eyespot of wheat is a chronic, yield-limiting disease in many temperate areas of the world including the United States Pacific Northwest (PNW) region. Although foliar fungicides can be used to control the disease, genetic disease resistance is preferred because of its effectiveness and lower cost. Eyespot resistance gene *Pch1*, which was derived from the wheat relative *Aegilops ventricosa*, is the most widely used gene worldwide in wheat improvement programs. Over 20 eyespot-resistant cultivars are available to growers in the PNW, and all contain *Pch1*. The goal of this research was to identify new sources of eyespot resistance in wild relatives of wheat to broaden the genetic basis of resistance and, potentially, pyramid resistance genes to improve its effectiveness. A seedling test for eyespot resistance using β -glucuronidase-transformed isolates of the pathogens, *Oculimacula yallundae* and *O. aciformis*, was used to screen 15 different wheat relatives for eyespot resistance. All 12 diploid species, three of five tetraploid species, and two complex polyploid species contained accessions that were resistant to eyespot. Based on these studies, eyespot resistance is more common in wheat relatives than in cultivated hexaploid bread wheat, which likely results from a bottleneck during polyploidization during the evolution of bread wheat.