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OCCURRENCE OF SHARP EYESPOT IN SPRING CEREALS GROWN IN SOME REGIONS OF POLAND

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Abstract: Occurrence of sharp eyespot was determined in the period 2006–2008, on commercial fields of spring cereals, localized in northern and central Poland. Percent of infected stems, and the disease index were evaluated. Occurrence of sharp eyespot on spring cereals, especially on oat, was low. Slight infection was mostly observed. In some farm fields, disease symptoms were not observed. A significant difference in the occurrence of sharp eyespot on barley in respective years was noted. On commercial farms, the effect of previous crop and fungicidal treatment on occurrence of sharp eyespot was not observed. Significant variation of the infection was noted only for barley. Presence of *Rhizoctonia cerealis* and *R. solani* in the damaged tissues was confirmed by mycological analysis as well as PCR assay.

Key words: sharp eyespot, *Rhizoctonia cerealis*, *R. solani*, spring cereals, barley, oat, wheat, triticale, occurrence, PCR

INTRODUCTION

The main agent of sharp eyespot is considered to be *Rhizoctonia cerealis* (Boerema and Verhoeven 1977). The pathogen can also cause seedling rot (Cromey *et al.* 2005). *R. solani* is especially dangerous at the emergence stage. Due to the higher rate of mycelium growth of that pathogen, compared to *R. cerealis*, it is considered to be a potentially more dangerous pathogen of seedlings (Wiese 1987; Gill *et al.* 2001). Usually it infects roots and less considerably – the stem base. It demonstrates a wider range of hosts than *R. cerealis*. Despite cereals, the fungus can infect numerous plant species from different families. Sometimes it is reported that *R. solani* does not demonstrate pathogenicity towards cereals or that it is considered to be poor pathogen (Sneh 1996).

There is a constant presence of fungi of *Rhizoctonia* genus in soil, making the protection of cereals from fungi difficult (Żółtańska 1996). The fungi can survive in soil developing saprotrophically on plant residue and, additionally, they produce sclerotium, which often constitute the main source of primary infection. The literature presents reports on the samples of chemical control of *Rhizoctonia* spp. in cereals, however, results do not show high effectiveness (Kataria *et al.* 1991; Kataria and Gisi 1996). There are currently no registered means of cereal protection from these pathogens.

Commonly it is considered that sharp eyespot occurs at small intensity and that it does not cause considerable losses in cereal yield. In the papers on the occurrence of root and foot rot diseases in spring cereals, the disease is most often disregarded. Currently on some winter cereal fields there is an observed increase in the importance of sharp eyespot. However, there is no coverage on its occurrence in spring cereal production fields.

The aim of the present observations was to determine the intensity of the occurrence of sharp eyespot on spring cereals grown in production fields, depending on the previous crop, fungicide protection, and the cultivar.

MATERIALS AND METHODS

Observations of the occurrence of sharp eyespot were performed over the time period of 2006–2008, on production fields of spring cereals. We evaluated a total of 58 barley samples, 41 oat samples, 35 wheat samples and 12 triticale samples, derived from fields located in 6 provinces, mainly the Kujawy-Pomerania Province (96) and the Pomerania Province (37), as well as the Wielkopolska Province (8), the Łódź Province (2), West Pomerania Province (2) and Mazovia Province (1). Detailed data concerning the origin of plant samples are given in Tables 1–4. At the milk stage of grain (75–77 according to the BBCH scale), along the diagonal of the field, random samples were taken. One sample, consisting of 100 plants, was taken from each farm field. In the laboratory, samples were washed and the ear-bearing shoots were torn off. Then, the percentage of stems with symptoms of sharp eyespot were evaluated. The degree of the intensity of sharp eyespot was determined, applying the 0–4° scale. The degrees of infection were transformed into the Disease index (DI) according to the Townsend and Heuberger modification (Wenzel 1948).

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