



Can minimal soil tillage be included in the integrated control of winter wheat diseases?

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Abstract

Minimal soil tillage and monocultures are widespread technologies of winter wheat production in Latvia. The aim of our investigations is to estimate development of winter wheat leaf diseases depending on methods of soil tillage. Long-term field experimental plots were established at the Study and Research Farm „Peterlauki” of the Latvia University of Agriculture in the autumn of 2008. The experiments were carried out in conditions very similar to real crop production conditions. Total plot area was 6 ha, area for each treatment – 0.25 ha. Two-factor trials were established: A – soil tillage: 1) conventional ploughing – plough tillage (0.22 – 0.23 m) with mouldboard plough, 2) minimal tillage – shallow (0.10 – 0.12 m) tillage with disc harrow; B – crop rotation: 1) wheat after wheat, 2) wheat after non-wheat. Fungicide (with active ingredient epoxiconazole) was used after flowering in all plots. The most important diseases of winter wheat were tan spot (*Pyrenophora tritici-repentis*) and leaf blotch caused by *Septoria tritici*. Other diseases were observed sporadically and their development was not influenced by the method of soil tillage. Severity of leaf blotches was affected by pre-crops, and a significant influence of soil tillage was determined. In the years 2009 and 2010, severity of septoria leaf blotch was higher in plots with minimal soil tillage (17% and 11% respectively) compared to the variants with conventional ploughing (4% and 7% respectively). In 2011, the disease level was insignificant. The influence of soil tillage on tan spot development was more clearly expressed. Severity of the disease at the stage of tillering fluctuated depending on pre-crop and year from 2% to 15% in fields without ploughing, but in plots with conventional soil tillage – only from 0.1% to 0.5%. At the stage of milk ripening, severity of tan spot was respectively 17% and 49% in 2009, 44% and 65% in 2011, but in 2010 the level of the disease was lower and similar in both variants – around 22%. Further investigations are necessary to evaluate the complex influence of soil minimal tillage.

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