Spatio-temporal dynamics of fungicide resistance in French populations of Zymoseptoria tritici

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SPEAKER ABSTRACTS

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Septoria leaf blotch caused by *Zymoseptoria tritici*, is one of the most damaging diseases of wheat. The use of fungicides, aiming to control this disease, is however impeded by the selection of resistant strains. Therefore, optimizing anti-resistance strategies is one of the keys of fungicides sustainability and needs a detailed knowledge of population dynamics over time and space. This was studied while statistically analyzing the 10-year database produced by the «Performance network», a trial network managed by the French cereals technical institute Arvalis-Institut du Végétal. Our work aims to (i) identify the spatial and temporal scales structuring fungicide resistance, and (ii) to evaluate the influence of regional fungicides strategies on this structure. Six Z. tritici resistant phenotypes were studied. Their frequencies were collected over France between 2004 and 2014, in 60-70 trials yearly. The spatial structure was determined using a spatial classification tool (SpoDT) and the temporal evolution was tested using a linear mixed model. The influence of fungicide strategies was measured by a conventional linear model. Our results showed a regional delimitation for some phenotypes. Contrasted expansion rates were calculated, according to modes of action. These structures were linked to the regional use of some molecules. Nevertheless, other determinants (e.g. soil and climate variables) should also be considered.