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LEAF BLOTCH ON DURUM WHEAT IN FRANCE: POPULATION GENETICS, HOST SPECIALIZATION AND FUNGICIDE RESISTANCE

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### DESCRIPTION RÉSUMÉE

Session 2: Space-time and multi-scales approaches: diagnostic, epidemiology and ecology in the field

Leaf blotch, caused by *Zymoseptoria tritici* and *Parastagonospora nodorum*, is a major disease complex of wheat worldwide. In France, these diseases have been reported to cause severe yield losses in bread wheat, most of which were due to *Z. tritici*. In contrast, our knowledge of the fungal species causing leaf blotch on durum wheat is limited whereas the occurrence of epidemics has been increasing in recent years. We recently conducted a 3 years survey of leaf blotch on durum wheat and bread wheat in four main French growing regions. More than 1100 isolates of *Z. tritici* were sampled from naturally infected fields (treated and untreated fields) of bread and durum wheat and genotyped using 12 microsatellite markers. The frequencies of occurrence among sites of the two fungal species in leaves were also evaluated using

microbiological isolation methods and qPCR detection. Lastly, the level of host specialization and aggressiveness of a subset of *P. nodorum* and *Z. tritici* isolates were also determined by cross inoculation experiments on a panel of bread and durum wheat varieties. Based on molecular test results and isolation assays, *Z. tritici* was detected in all French regions on durum wheat and bread wheat. *P. nodorum* was detected on durum wheat in most French regions but was quantified only at low levels by qPCR on bread wheat. French durum wheat cultivars were highly susceptible to the French *P. nodorum* isolates tested. The genetic diversity of *Z. tritici* was structured by host and location of sampling. Inoculation experiments pointed out specialist, generalist and maladapted strains of *Z. tritici* in relation with population genetic groups. No differences between *Z. tritici* bread wheat populations and durum wheat populations were observed for fungicide resistance. These

results show that control of leaf blotch on durum wheat, in France, needs to take into account the presence of both species and growing regions. These results may help to adapt sustainable disease management strategies.

Keywords: *Z. tritici*, *P. nodorum*, durum wheat, resistance, population genetics.

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