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## Mixing wheat varieties with contrasted architecture to reduce *Septoria tritici* blotch splash-dispersed epidemics

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## POSTER SESSION ABSTRACTS

### Session 2: Epidemiology, cultural management and fungicide resistance

THU-8

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#### **Mixing wheat varieties with contrasted architecture to reduce *Septoria tritici* blotch splash-dispersed epidemics**

Mixing varieties with different levels of disease resistance provide a way to limit the progression of polycyclic epidemics. In such mixture configurations, susceptible varieties are protected by the presence of more resistant ones through two main mechanisms: barrier and dilution effects within the mixture. However, the effectiveness of these mixtures in terms of disease reduction can vary widely depending on the pathosystem, the dispersion mechanism and climatic conditions. Such variability has notably been pointed out in the case of the rain-splash dispersed disease, *Septoria tritici* blotch (STB, caused by *Zymoseptoria tritici*). Considering the impact of crop architecture on epidemic development within pure stands, the architectural lever, which consists of mixing plants, which differ in their architectural properties, appears as a candidate to improve mixture efficiency to control epidemics. The work presented here aimed at assessing if contrasted architecture between varieties could be an additional lever to design cultivar mixtures in addition to resistance. To this end, we conducted a micro-plot field trial in which we studied mixtures of cultivars with contrasted resistance to STB and either similar or contrasted architecture (difference in straw height). These cultivars were also grown in pure stands as a reference. Pathogen vertical dispersal gradients, STB severity at leaf scale, crop architecture and microclimatic conditions were monitored and compared between the different types of mixtures and pure stands during an annual epidemic. We highlighted the relative protection of susceptible short-strawed wheat in mixture with partially resistant tall-strawed wheat compared to the pure stand and the mixture with partially resistant short-strawed wheat. Mixed with a partially resistant tall-strawed wheat, severity of the three upper leaves of the susceptible cultivar was reduced by 53% compared to the conventional mixture and by 68% compared to the pure stand. The number of new lesions on the susceptible component was also reduced in mixtures with contrasted architecture of their components partly due to a stronger umbrella effect (raindrops interception by resistant leaves). This study outlines that mixtures efficiency to control STB progress can be improved by combining components of contrasted architecture in the design of cultivar mixtures in addition to resistance.