O.14 - Preserving durable resistance to Phoma stem canker in oilseed rape: epidemiological key factors

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A more efficient and durable control of *Phoma* stem canker in oilseed rape requires a better understanding of the adaptation of *Leptosphaeria maculans* populations to resistant varieties. Season-to-season transmission of virulence in *L. maculans* populations is mainly due to ascospore production after sexual reproduction. We hypothesize that at low pathogen population densities, sexual reproduction could be restricted both by the low probability of mating between virulent individuals and by limited ascospore dispersal between oilseed rape fields. To test these hypotheses, we investigated (i) the rain-splash dispersal of pycnidiospores, (ii) the systemic growth in stem and (iii) the spatial genetic structure of populations to infer ascospore dispersal distances. Pycnidiospores were splash-dispersed over short distances from *Phoma* leaf spots, while oilseed rape stubble carrying pycnidia constituted a potential source of primary infections. Stem canker expression via systemic growth increased with the number of infection sites on cotyledon and decreased on polygenic resistant hosts, while density-dependent competition between isolates was shown. Most genotypic (minisatellite markers) diversity was found within a population and the absence of genetic differentiation between populations did not allow inferring restricted gene flow and distances of ascospore dispersal. In the field, stubble management could prevent asexual survival of virulent strains. Varieties combining specific and partial resistance could prevent ascospore production by reducing systemic growth. The spatial scale of ascospore exchanges between fields should be accounted for in spatial deployment of specific resistance genes.