



**Figure S9** Plot of SNP S9\_57272115 associated with total lesion length (TLL) in *Macrophomina phaseolina* based on across year combined data for Manhattan locations. (a) Single-locus mixed model (marked in red; Bonferroni-corrected threshold of 0.05; dashed horizontal line); (b) Multi-locus mixed model (MLMM) identifies the SNP on chromosome 9 (marked in red) from the optimum model. The vertical axis indicates the  $-\log_{10}$  of P-value scores, and the horizontal axis indicates chromosomes and physical positions of SNPs.