



**KEY**

- SNP density (MAF  $\geq 0.05$ )
- Gene density
- GWAS Black spot disease severity 2014
- GWAS Black spot disease severity 2015
- GWAS Black spot disease severity 2016
- SNP with  $q$ -value  $\leq 0.20$
- SNP with  $q$ -value  $\leq 0.10$
- SNP with  $q$ -value  $\leq 0.05$
- Density of SNPs with  $p$ -value  $\leq 0.01$  (2014)
- Density of SNPs with  $p$ -value  $\leq 0.01$  (2015)
- Density of SNPs with  $p$ -value  $\leq 0.01$  (2016)
- 2014 QTL (Old Blush \* Rosa x wichuriana only)
- 2021 Meta-QTL from Lopez Arias et al. 2020
- Candidate R genes