

# DNA TESTS FOR PEACH



## Fruit Bacterial Spot Resistance Ppe-Xap

Bacterial spot, caused by *Xanthomonas arboricola* pv. *pruni* is a serious disease of peach that causes premature defoliation, weak vigor, unmarketable fruit, and decline in yield. Effective control methods are lacking; anti-bacterial sprays are only partially effective and their use is controversial. Incorporating genetic sources of bacterial spot resistance into new cultivars is a more promising control measure. Progress has been made in developing resistant cultivars, yet few such resistant cultivars have achieved commercial success because of the difficulties in combining bacterial spot resistance with high fruit quality.

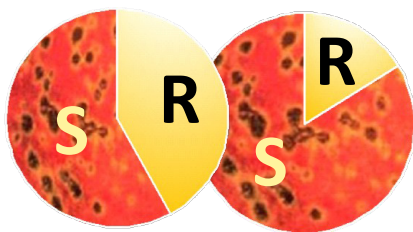
### Genetics of the Trait

Bacterial spot resistance is quantitative in nature, and there is a high level of variation in susceptibility. One genomic region on chromosome 1 accounts for up to 35% of the observed phenotypic variation for fruit bacterial spot resistance. The Ppe-Xap DNA test was developed to target this locus to maximize the ability to identify resistant germplasm.

### Alleles Available

Two distinct alleles were detected in RosBREED's large set of U.S. cultivars and breeding germplasm. These alleles are labeled as "R" for resistant and "S" for susceptible.

Ppe-Xap allele frequencies in U.S. cultivars and selections at two resistance loci



Genotype	Example Cultivar	Trait Level
S   S	O'Henry	Very susceptible
S   R	Clayton	Resistant
R   R	White County	Very resistant

\*CPPCT040b is adapted from a previous test developed by researchers at INRA, France

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### When to Assay

Ppe-Xap has a range of breeding uses, such as:

- *Parent pool selection*, to identify parents carrying one, or preferably two, R alleles at each locus.
- *Cross choices*, to help choose parental combinations that will most effectively provide R-alleles at each locus as well as impart superior fruit quality.
- *Seedling selection*, to cull susceptible seedlings and only advance those expected to confer durable resistance.

### Predictive Capacity

This DNA test explains ~35% of observed phenotypic variation in resistance to fruit bacterial spot disease in U.S. breeding germplasm. By crossing and selecting for specific allelic combinations, you can directly target durable resistance coupled with high fruit quality. The predictive power of Ppe-Xap was confirmed in the RosBREED project on four U.S. peach breeding programs. Confirm the effects in your own germplasm before widespread application.



### Technical Details

Ppe-Xap is a simple PCR-based test consisting of four primer pairs multiplexed into a single assay. For more details on this DNA test, other peach tests, or tests for other rosaceous crops, visit [www.rosbreed.org/breeding/dna-testing](http://www.rosbreed.org/breeding/dna-testing).

## RosBREED

Combining disease resistance  
with horticultural quality  
in new rosaceous cultivars



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