

DNA TESTS FOR PEACH

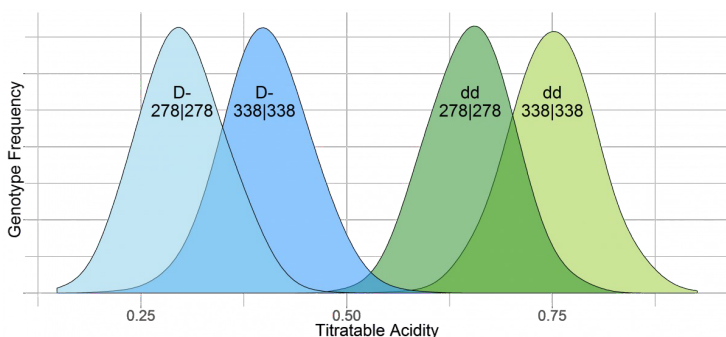


Peach Acidity Ppe-Acid

Acidity is an important aspect of flavor in peach. Too much acid and the fruit has an unpleasant bite; too little and the fruit is bland. Peaches fit into two main acidity groups, high and low, although wide variation is found within both. The ability of a breeder to select individuals with fruit acidity that is high but not too high, or low but not too low, is key to the development of successful new flavorful cultivars.

Genetics of the Trait

Most genetic variation for acidity observed in U.S. commercial peach germplasm is controlled by two genomic regions, the D locus and the G7Flav locus. A DNA test was developed that targets both of these regions by combining two tests, CPPCT040b* and G7Flav-SSR, into a single, powerful test: Ppe-Acid.



CPPCT040b targets the D locus which is responsible for the difference between high (d|d) and low (D|D or D|d) acid peaches. Low acid is dominant to high acid. G7Flav-SSR targets the G7Flav locus that is needed to differentiate acidity levels within the two main acidity groups. One allele, 278, increases the acidity within each group and another allele, 338, reduces the acidity within each group.

Genotype	Example Cultivar	Trait Level
D - & 278 278	Sugar Lady	Very low acidity
D - & 338 338	Amoore Sweet	Low acidity
d d & 278 278	Contender	High acidity
d d & 338 338	Tropic Prince	Very high acidity

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

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When to Assay

As with all DNA tests, there is benefit to be gained from testing parents for cross selection, but the peach acidity test really shines when used for seedling selection. Many of the allelic combinations of CPPCT040b and G7Flav-SSR are undesirable resulting in acidity that is either too high or too low. With the Peach Acidity DNA test of Ppe-Acid, you can cull inferior seedlings early that would otherwise be planted and grown to maturity over two to three years before being phenotypically tested and eventually discarded!

Predictive Capacity

With just CPPCT040b, the two major acidity groups can be differentiated. By also incorporating G7Flav-SSR, the extremes within the high acid or low acid groups, which are likely too high or too low for consumers' liking, can be routinely identified. The average titratable acidity (TA) for a low acid peach in commercial U.S. germplasm ranges from ~0.2 to ~0.5 TA (mEq/L) as predicted by CPPCT040b alone. The individuals with very low acidity as predicted by CPPCT040b & G7Flav-SSR have an average of ~0.25 TA while those predicted to be mid-low acidity have an average of ~0.45 TA. The predictive power of these tests combined was confirmed in the RosBREED project on four U.S. peach breeding programs and is now being routinely used. Confirm the effects in your own germplasm before widespread application.

Technical Details

Ppe-Acid is a simple PCR-based test consisting of two SSR markers, each targeting a different locus, 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.

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31 DEC 2017**