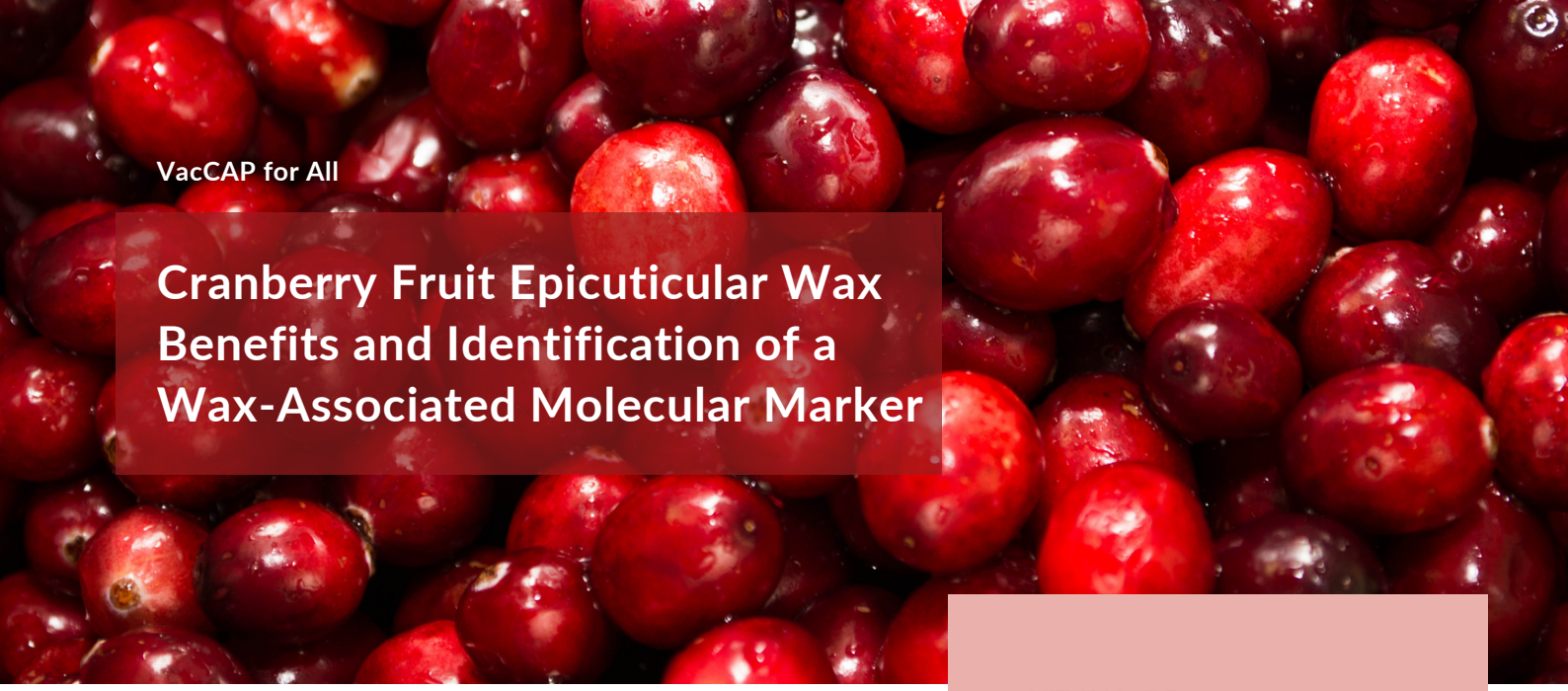


VacCAP for All

Cranberry Fruit Epicuticular Wax Benefits and Identification of a Wax-Associated Molecular Marker

BACKGROUND

As the global climate changes, North American cranberry growing regions will struggle with high temperature extremes and drought conditions. One consequence is sunscald, which damages developing berries and reduces yields. Epicuticular wax may be useful in mitigating sunscald in cranberry. This study assessed the function of Epicuticular wax in cranberries to ease stresses associated with sunscald by subjecting high and low epicuticular wax cranberries to controlled desiccation—extreme dryness—and light/heat exposure.

RESULTS

High epicuticular wax on cranberries imparts protection from heat and desiccation

Cranberries with high epicuticular wax lost less mass percent and maintained a lower surface temperature than fruit with low wax.

QTL Analysis identifies a locus and candidate genes associated with epicuticular wax in cranberry

QTL analysis identified a marker on chromosome 1 at position 38,782,094 bp associated with the epicuticular wax phenotype.

Epicuticular wax phenotypes can be predicted from genotyping assays

Genotyping assays revealed that cranberry selections homozygous for a selected SNP have consistently high epicuticular wax scores. A candidate gene (GL1-9), associated with epicuticular wax synthesis, was also identified near this QTL region.

CONCLUSIONS

High cranberry epicuticular wax load may help reduce the effects of primary contributors to sunscald. The molecular marker identified in this study can be used in marker assisted selection to screen cranberry seedlings for the potential to have high fruit epicuticular wax. This work serves to advance the genetic improvement of cranberry crops in the face of global climate change.

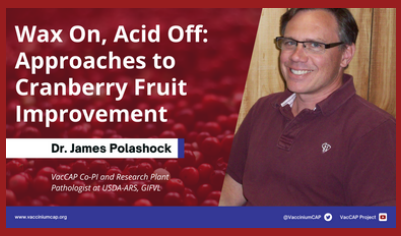
KEY WORDS

Epicuticular Wax

- A waxy coating that forms highly crystalline structures on plant surfaces.
- Functions as a barrier to various environmental stresses in other fruit crops.
- Plants regulate their cuticular wax load and chemical composition in response to water shortage, temperature, and excess heat—three environmental factors associated with sunscald in cranberry.

Want to learn more?

Watch Dr. James Polashock's webinar on the importance of epicuticular wax in resistance to heat scald, the value in reducing organic acids in the fruit, and the development of markers for these traits to be used in breeding and selection. Now on YouTube.



Full Article and Citations Here