

Nutrient Imbalance & Bitter Pit in 'Honeycrisp'

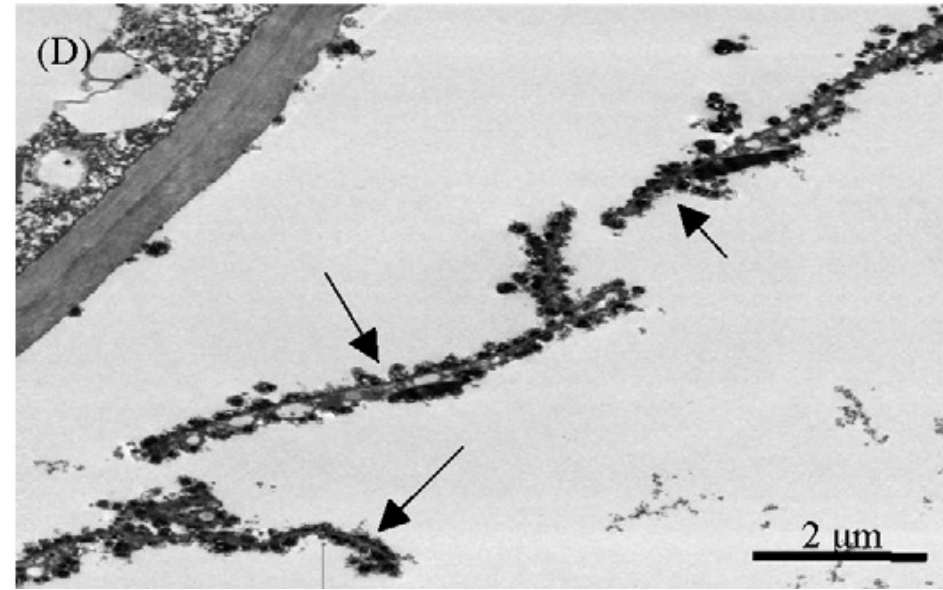
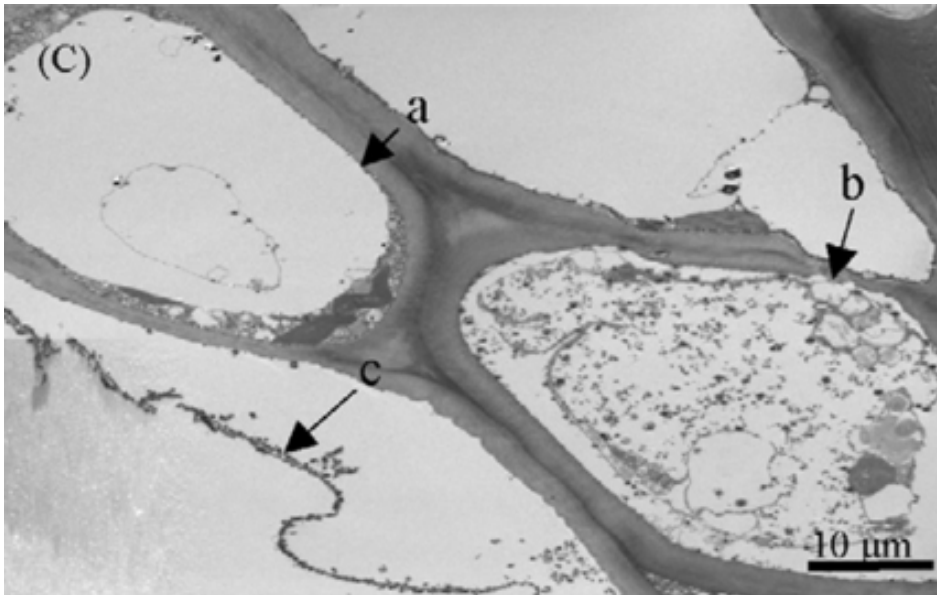


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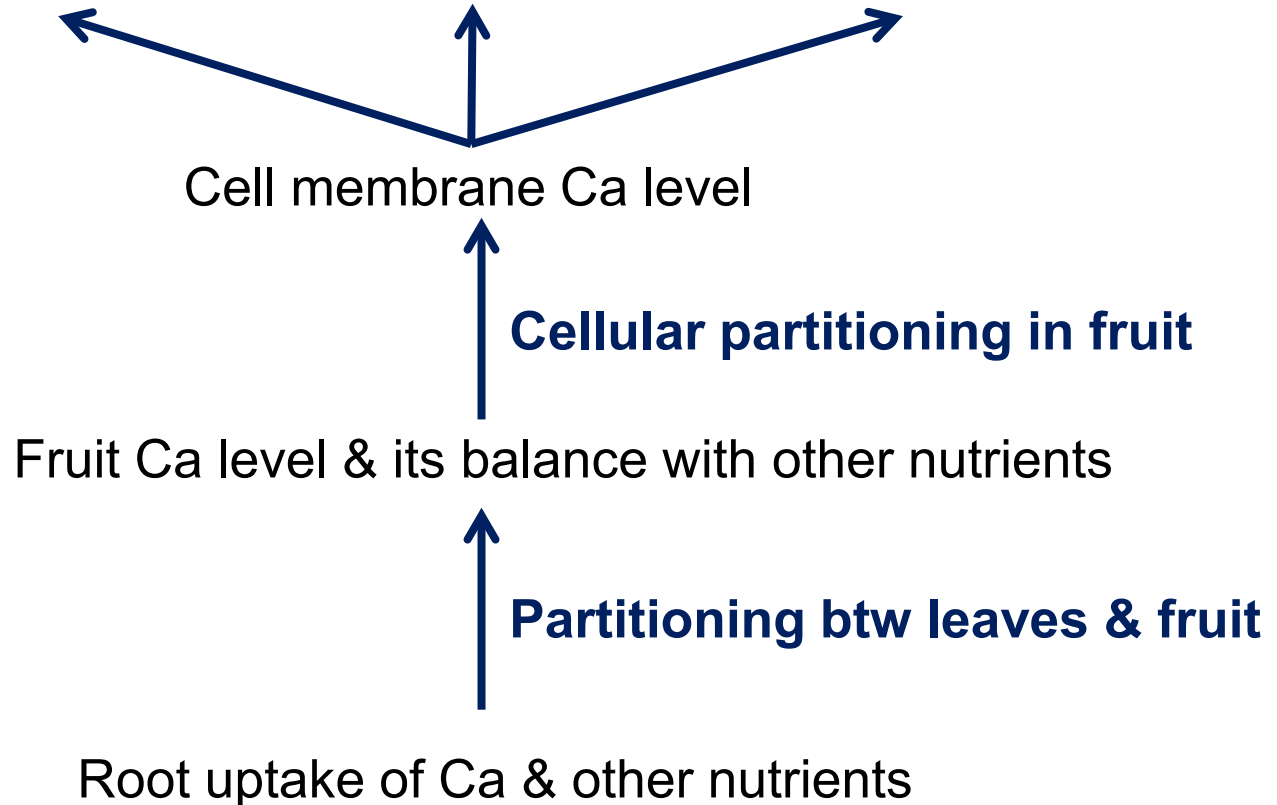


Cellular Membrane Disintegration of Pitted Fruit Tissue

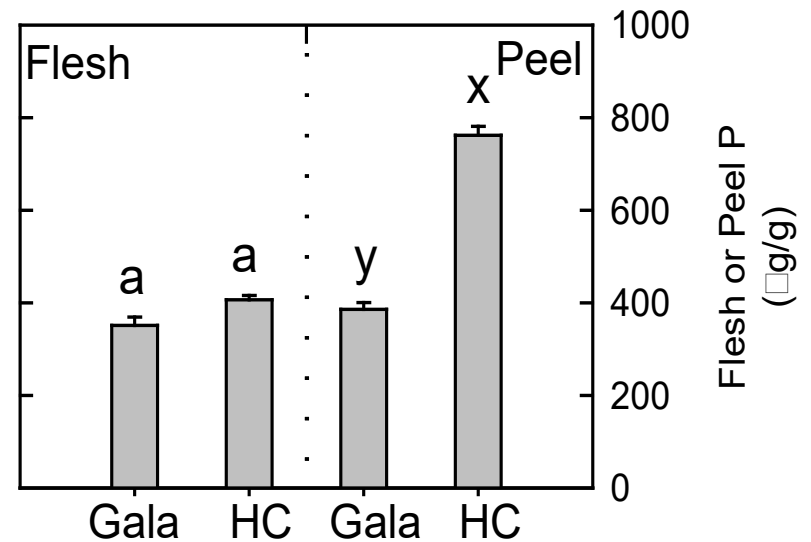
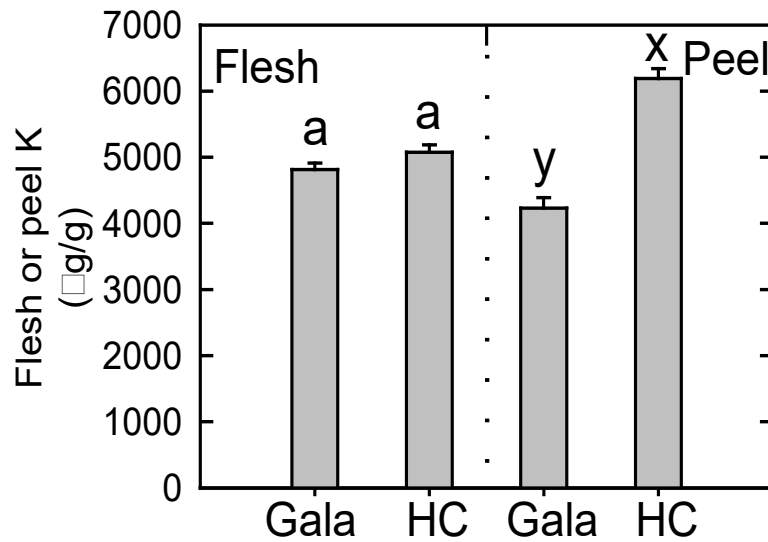
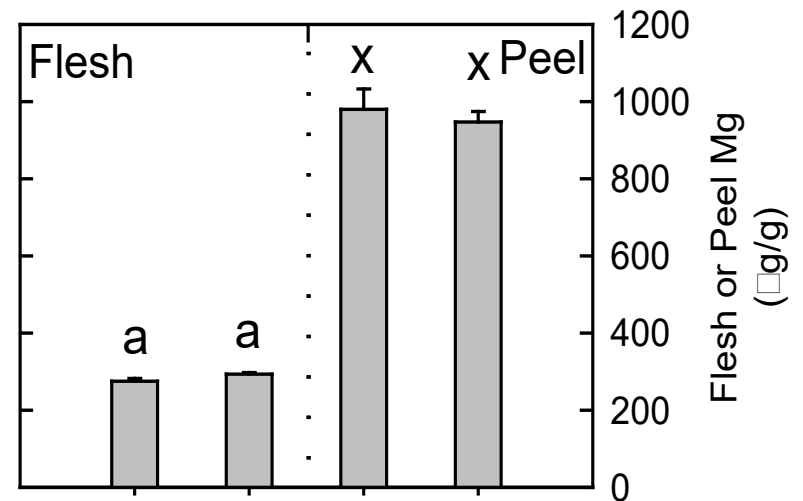
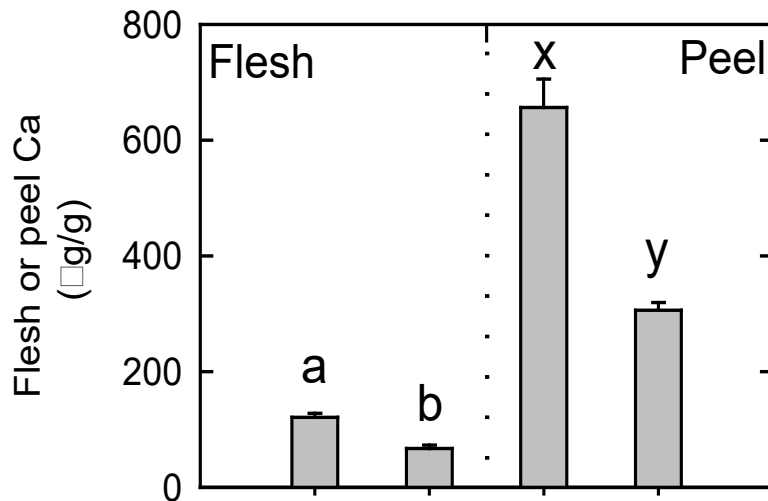


De Freitas et al 2010

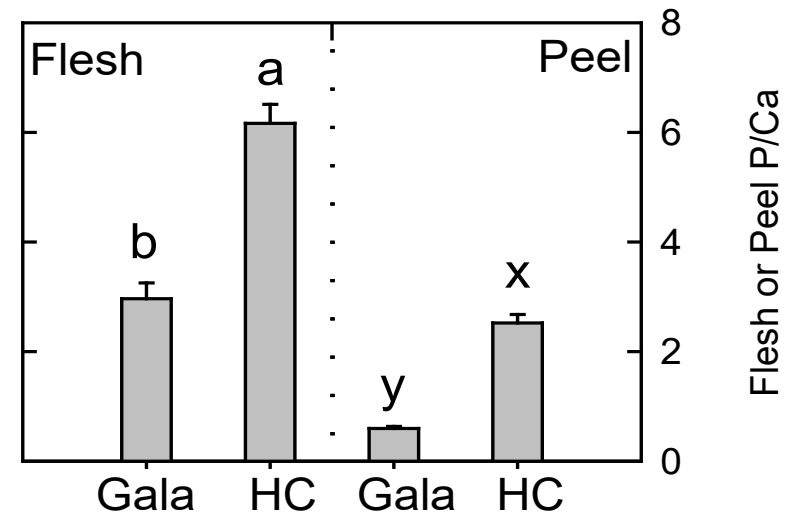
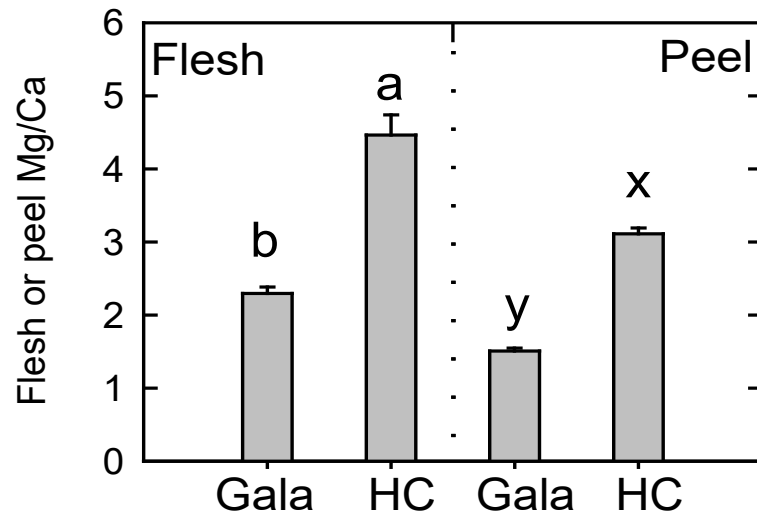
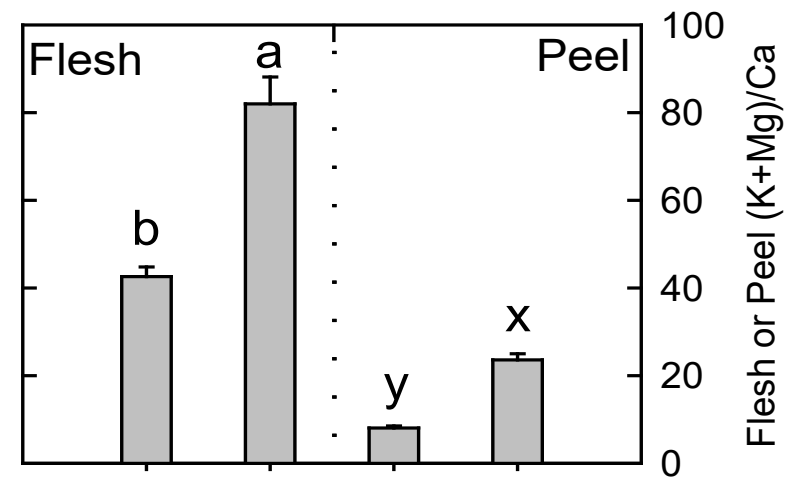
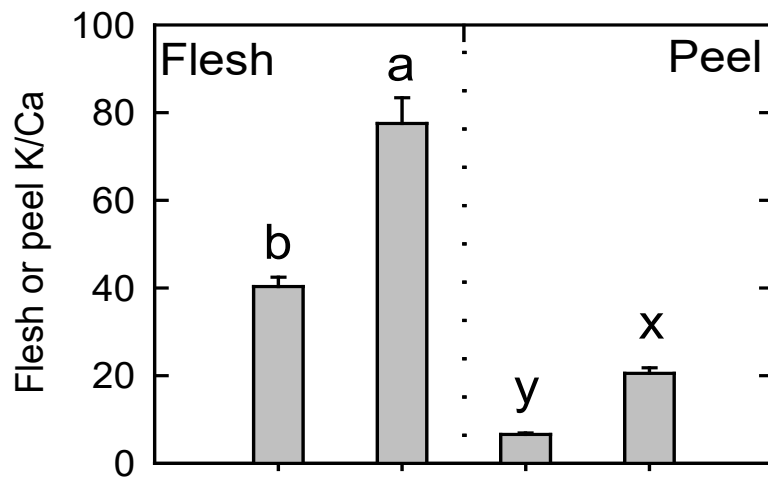
Bitter Pit Susceptibility



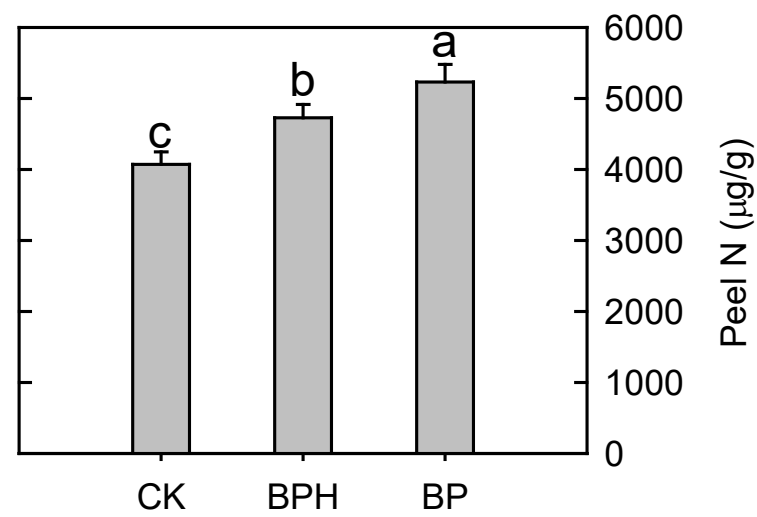
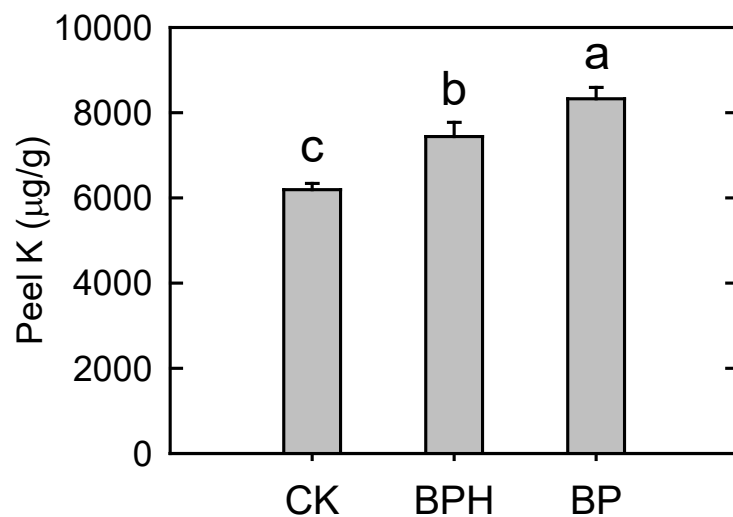
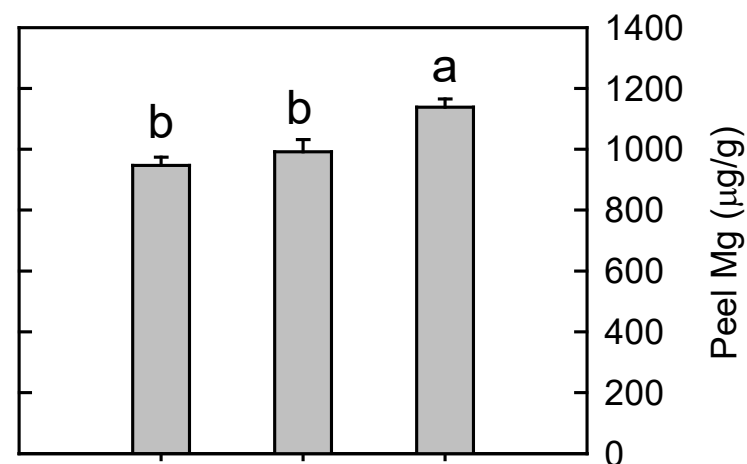
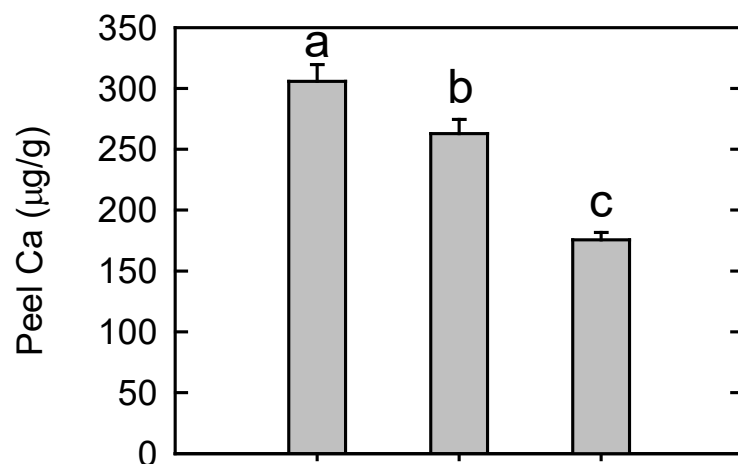
Fruit Nutrient Levels in 'Gala' and 'Honeycrisp'



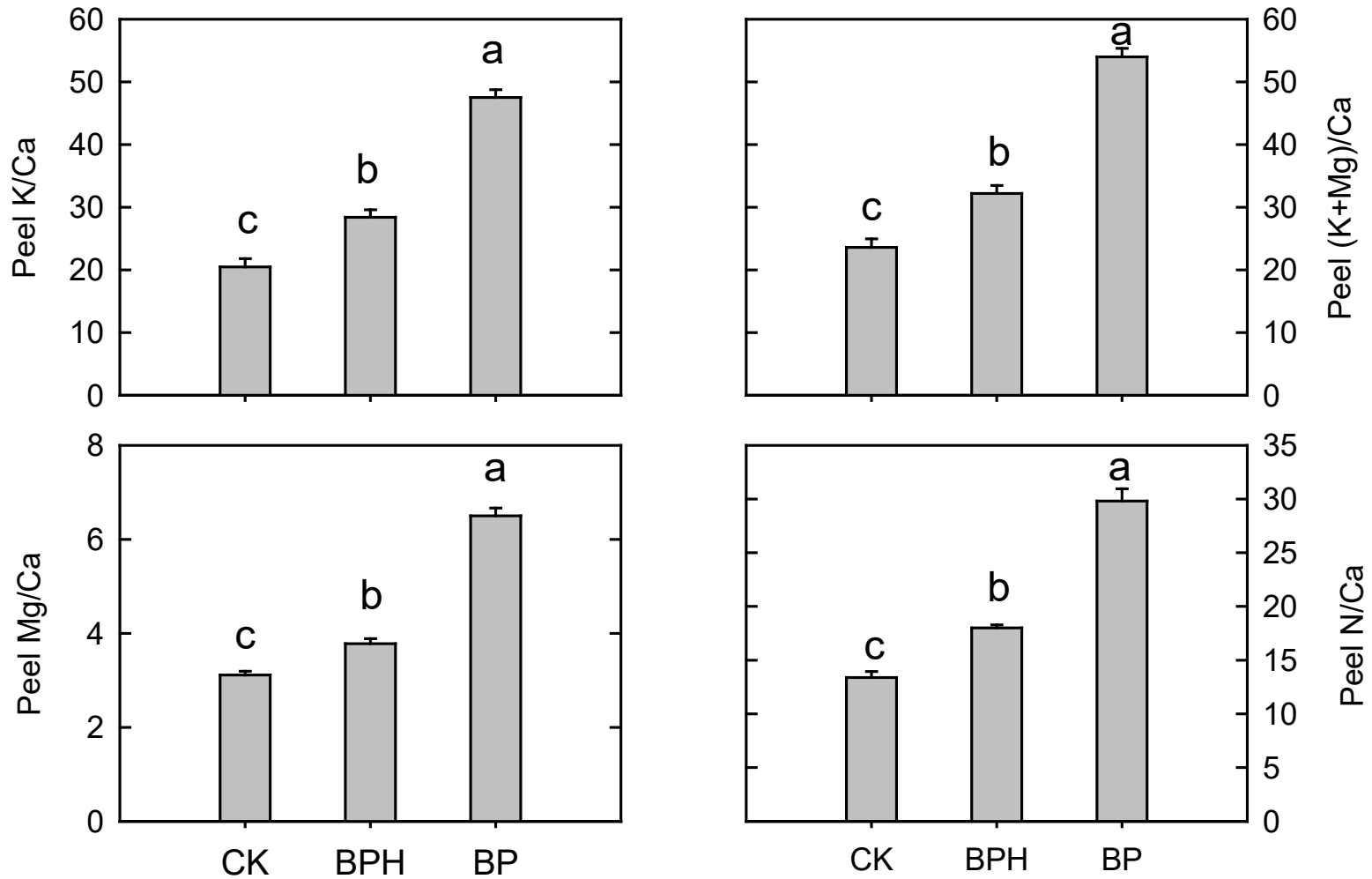
Fruit Nutrient Ratios in 'Gala' and 'Honeycrisp'



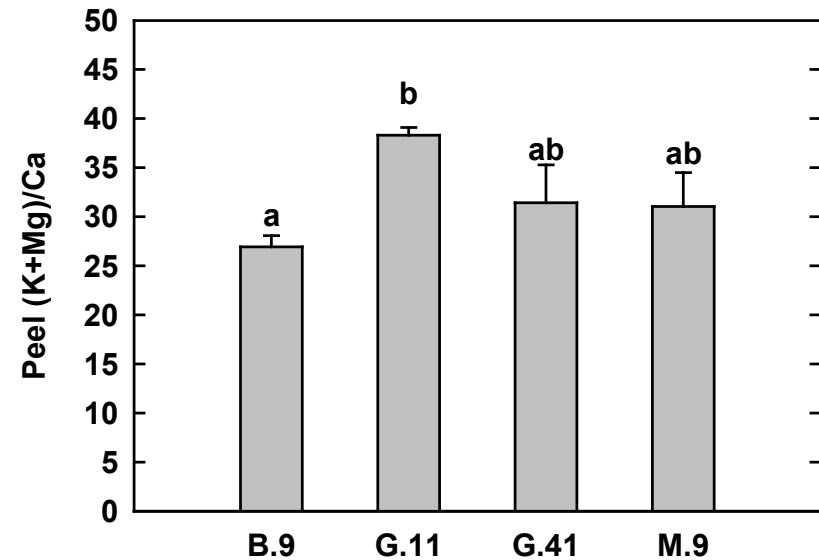
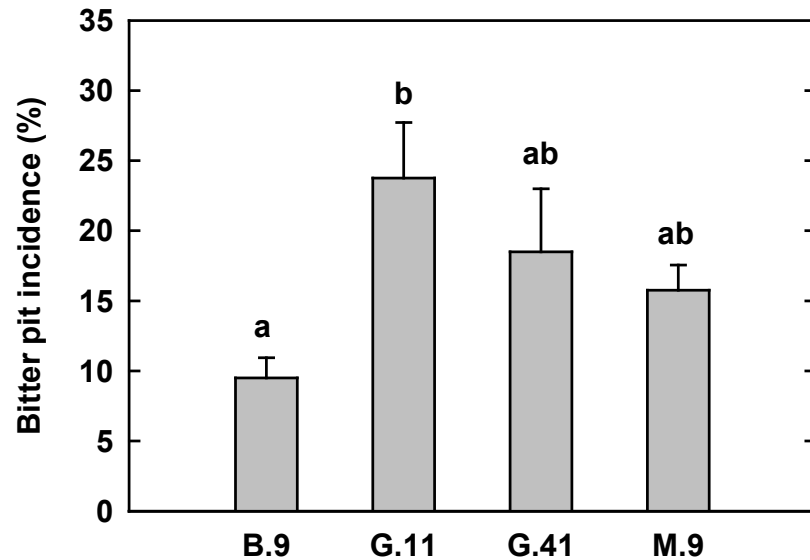
Peel Nutrient Levels in 'Honeycrisp' Fruit



Peel Nutrient Ratios in 'Honeycrisp' Fruit



Rootstock Effects on Bitter Pit Incidence of 'Honeycrisp'



Summary

- ‘Honeycrisp’ bitter pit is related to imbalance of Ca with K, Mg, P and N.
- Peel K/Ca above 20-25, (K+Mg)/Ca above 25-30, N/Ca above 10-15 appear to be associated with higher risk of bitter pit incidence.

Implications for Mitigation of Bitter Pit

- Use rootstocks that provide more balanced nutrition.
- Ensure adequate Ca supply in soil and root growth & function for Ca uptake (B, Zn, water, etc).
- Make foliar (fruit) Ca sprays.
- Strictly control K supply to balance fruit Ca with K. Target leaf K level at 1.0 to 1.2%.
- Strictly control N supply to keep leaf N at 2.0 to 2.2%.
- Adjust crop load to medium level.
- Try to use peel tissue or sap analysis to assess the risk of bitter pit.

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