

## P2

### **Magnesium-associated fruit quality of diverse tomato cultivars under organic low-input management**

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The demand for organically grown tomatoes has rapidly increased on the consumer side. However, there is a lack of tomato cultivars suitable for organic farming that are both high yielding and of superior fruit quality. In the present study, the variation in plant growth and fruit quality of tomato cultivars was assessed to identify the traits associated with higher yield and improved fruit quality. Sixty tomato cultivars, cocktail and salad tomatoes, were grown under organic low-input conditions in 2015 and a subset of 20 cultivars for further evaluation in 2016. The results revealed a high variability among 60 cultivars in all 28 traits that were observed. Salad cultivars that have been selected for intensive indoor cultivation exhibited the highest yield components. A cross-year evaluation of the 20 cultivars showed that salad cultivars had 10–70% lower fruit quality including minerals, dry matter, total soluble solids, and total phenolic compounds (TPC), but 10–60% higher fruit yield and leaf minerals than cocktail cultivars. Cocktail cultivars with improved yield performance were derived from organic breeding. Depending on the cultivar, there was a trade-off between fruit yield and fruit quality. Interestingly, salad cultivars with high magnesium (Mg) concentration in the leaves also contained high Mg concentration in the fruits. Moreover, fruit Mg correlated positively with titratable acidity and TPC of the salad cultivars, as well as with fruit phosphorus, potassium, and sulfur in both cocktail and salad cultivars. The results indicate the contribution of Mg in improving flavor, health related-compound and nutritional quality of tomato fruits. This information provides a novel path for further studies to improve plant-available Mg in organic tomato production to enhance fruit mineral concentration and fruit quality.

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