

P-034: Antioxidants in tomatoes are influenced by potassium fertilization

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Tomato (*Solanum lycopersicum* L.) fruit contain several health beneficial antioxidants [1]. Their contents can be greatly influenced by abiotic factors such as light, temperature, or the nutritional status [2]. The macronutrient potassium (K) is essential for several physiological functions in plants, e. g. translocation of assimilates, activation of enzymes, maintenance of turgescence, and stomata regulation.

The aim of the study was to investigate the impact of increasing K fertilization on the antioxidants ascorbic acid, phenolic compounds, carotenoids, and tocopherols in tomatoes. Three cocktail tomato cultivars (Primavera, Resi, and Yellow Submarine) raised in an outdoor pot experiment were treated with five rising K doses in the first study year 2014. In 2015, Primavera and Resi were selected for a subsequent experiment using the lowest and highest K doses. In this experiment, the lipophilic antioxidants were additionally measured in three different tomato ripening stages.

Increasing levels of K fertilization distinctly affected the contents of antioxidants in cocktail tomatoes (Table 1). However, most of the effects were not consistent across all three cultivars and the two study years. In 2014, K fertilization level positively correlated ($p \leq 0.05$ or 0.01) with ascorbic acid and γ -tocopherol in Resi and with *p*-coumaric acid in Primavera, while significant negative correlations were observed for narigenin and β -carotene in Primavera and for β -tocopherol and δ -tocopherol in Yellow Submarine. In contrast, significant positive correlations between K fertilization level and ascorbic acid, *p*-coumaric acid and caffeic acid were demonstrated for both, Primavera and Resi, in 2015. As opposed to 2014, the tocopherols in Resi and Primavera negatively correlated with increasing K fertilization. The only antioxidant that consistently showed positive correlations with increasing K doses across cultivars and study years was *p*-coumaric acid.

In summary, the content of plant antioxidants in cocktail tomatoes cultivated outdoors can be positively or negatively affected by K fertilization. However, other abiotic factors, such as variation in light and temperature may impact or even inverse those effects [3,4].