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High genotypic variation of cocktail tomato yield and quality under different potassium supply

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There is evidence that potassium (K) fertilization enhances the yield of medium and large-sized tomato cultivars. Many authors observed positive effects of K fertilization on fruit color, texture, total soluble solids (TSS) and titratable acids (TA) [3, 6]. The market for small-sized cocktail tomatoes is currently growing due to their preferable taste [5] which is positively related to increasing levels of TSS and TA [1, 2, 4].

We hypothesize, that K improves yield and quality of cocktail tomatoes. In order to test our assumption, we carried out pot experiments in two consecutive years. In a pot (6 L) experiment, three cocktail tomato cultivars (Primavera, Resi and Yellow Submarine) were fertilized with five K levels (3.1, 6.3, 9.4, 12.5 and 18.7 g K/pot applied in total over 19 weeks) to find out ideal dosages for well and deficient fertilized plants. Interestingly, the K effect on yield and most quality parameters was highly cultivar specific: while Primavera and Yellow Submarine reached a yield increase of more than 100% from the lowest to the highest K dose, no response of Resi was observed. In contrast to Primavera and Yellow Submarine, Resi showed only weak K fertilization effects on fruit quality aspects. Therefore, in a second experiment we grew the cultivars Primavera and Resi with two K doses (deficient and well-fertilized). In a third treatment, we interrupted K fertilization in order to induce a response in the cv. Resi to a sudden shortage of K. In contrast to Primavera, Resi showed no yield response to K fertilization like in the first experiment. The low yielding cv. Resi seemed to be more K efficient compared to Primavera. We conclude that the effect of K on yield and quality of cocktail tomatoes depends on the cultivar.

Literatur

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