EFFECTS OF ABSCISIC ACID ON TOMATO FRUIT AROMA VOLATILES

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Aroma volatiles are derived from a diverse set of precursors, such as amino acids, fatty acids and carotenoids in tomato fruit. Many of these volatiles enhance the main flavor components in fruit, particularly soluble sugars and organic acids. There are no published reports on the effect of ABA on aroma volatiles in tomato (Solanum lycopersicum) fruit. ABA is derived from the carotenoid pathway and there may be an indirect connection to flavor volatiles through this pathway. Therefore, the purpose of this study was to examine the influence of ABA on tomato fruit aroma volatiles. Seeds of ‘Mt. Fresh Plus’ tomato were grown in the greenhouse at 25/20 °C (day/night) under a 16 h photoperiod. Plants were treated with ABA applications weekly. Ca treatments were applied at three different treatment levels of 60, 90, and 180 mg·L⁻¹. Ca treatments were applied to the plants via the irrigation lines. ABA treatments were applied as a combination of foliar sprays and root applications. For foliar ABA applications, treatments consisted of DI water control (0.0 mg ABA·L⁻¹) or 500 mg ABA·L⁻¹. For ABA root applications, treatments consisted of a DI water control (0.0 mg ABA·L⁻¹) or 50 mg ABA·L⁻¹ applied via the irrigation lines. ABA spray treatments were applied once weekly till dripping from the foliage, while root applications were applied four times per day with the irrigation cycle. This study identified five flavor volatile compounds that were consistently present in ‘Mt. Fresh Plus’ tomato fruit tissue. They were 2-methyl furan, (E)-2-hexenal, 1-hexanol, hexenal, and 6-methyl-5-hepten-2-one. The majority of the volatiles identified did not differ between the ABA treated plants and the control plants. However, ABA treatments did significantly decrease (E)-2-hexenal. These results indicated that while ABA treatments are beneficial for increasing quality by influencing soluble sugar and organic acid content, the treatments did not have a major effect on the aroma volatile profile of the fruit.