

Title Effects of selenium enrichment of tomato plants on fruit physiology and technological parameters

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Abstract

Selenium is a natural antioxidant and an effective anticarcinogenic agent. Se could delay plant senescence and decrease the postharvest losses of agricultural plants. We investigated the effect of Se addition on production and quality traits of *Solanum lycopersicon* cv Red Bunch. Selenium was added as sodium selenate at rate of 0, 0.5 and 1 mg Se L⁻¹ to the nutrient solution. Se was absorbed by roots and accumulated in leaves and fruits, but it did not affect plant production. Se concentration followed a gradient, decreasing from the basal to the apical part of the plant. Leaves absorbed higher amount of Se than fruits, and fruits on the lower trusses accumulated higher amount of Se than fruits of higher trusses. The chlorophyll content was reduced by Se addition, whereas β -carotene and lutein increased at 0.5 mg Se L⁻¹, but decreased at 1.0 mg Se L⁻¹. Lycopene increased either at 0.5, and less markedly at 1.0 mg Se L⁻¹, compared to control. Fruit ripening appeared to be slightly delayed in Se-treated plants. Ethylene evolution throughout ripening was not significantly affected by Se addition. However, at harvest the percentage of ripe fruits on the truss was higher in the control (12%) compared to Se treated plants (3%). After 30 days of storage at 22°C the percentage was 36% in the control and 13% in the Se treated plants. Results indicate that tomato fruit can accumulate Se and that this element appears to be effective in delaying fruit ripening and prolong shelf-life.