

EFFECT OF ORGANIC GROWING SUBSTRATES AND SELENIUM ON FRUIT QUALITY AND YIELD OF STRAWBERRY CULTIVARS IN HYDROPONIC CULTURE

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Executive Summary

The choice of appropriate growing substrates is an *important* factor in promoting the optimum *growth* of crops, like strawberry plants. Mixing of coarser materials with growing substrates at different ratio can improve the physicochemical properties of growing substrates. Selenium is another important mineral for human health. The content of selenium in strawberry can be increased by application of selenium during cultivation. Therefore, an experiment was carried out to evaluate the physicochemical properties of the organic growing substrate mixture and their influence on growth of the plant and yield of strawberry cultivars with application of selenium in hydroponic system. Treatments considered four types of organic growing substrate mixtures (*viz.*, M₁ = 60% rice husk + 30% coconut coir + 10% vermicompost, M₂ = 60% coconut coir + 30% khoa + 10% vermicompost, M₃ = 60% sawdust + 30% khoa + 10% vermicompost, and M₄ = 60% ash + 30% khoa + 10% vermicompost) four levels of selenium (*viz.*, Se₀ = 0 mg L⁻¹ Selenium, Se₁ = 1.0 mg L⁻¹ Selenium, Se₂ = 2.0 mg L⁻¹ Selenium and Se₃ = 3.0 mg L⁻¹ Selenium) and three varieties (*viz.*, V₁: Local Strawberry-1, V₂: Local Strawberry-2 and V₃: Local Strawberry-3). Physicochemical properties of growing substrate mixtures and growth, yield, physiological traits, quality of fruits and phytochemicals of strawberry cultivars were measured. The highest pH (7.74) was found in M₄ which was not suitable for strawberry production while suitable pH (6.10) was found in M₁. Water holding capacity, air filled porosity and dry weights of substrate mixtures were higher in M₁ and lower in M₃. The highest plant height (26.16cm), number of fruits per plant (13.08), individual fruit weight (23.85g), fruit length (4.51cm), fruit diameter (4.14cm), fruit volume (22.23cc), yield per plant (321.8g) and ascorbic acid content (70mg/100g FW), TSS (16.14°Brix), total phenolic content (150.77mg/100g FW), total anthocyanin content (8.25mg/100g FW), total flavonoid content (5.97mg/100g FW) and selenium contents in fruits (1.63 mg/100g DW) were found in M₁ while the lowest in M₃. The highest number of fruits per plant (11.96), individual fruit weight (24.93g), fruit length (4.89cm), fruit diameter (4.26cm), fruit volume (20.38cc), yield per plant (305.95g), ascorbic acid content (68.12mg/100g FW), TSS (14.25°Brix) and selenium contents in fruits (3.28 mg/100g DW) were found in Se₃ and quality in Se₂ while the lowest in Se₀. The highest total phenolic content (139.37mg/100g FW), total anthocyanin content (7.44mg/100g FW) and total flavonoid content (5.0mg/100g FW) were found in Se₂. The highest plant height (23.65cm), number of fruits per plant (14.13), individual fruit weight (25.70g), fruit length (4.61cm), fruit diameter (4.11cm), fruit volume (20.52cc), yield per plant (367.99g) and ascorbic acid content (70.41mg/100g FW), TSS (16.15°Brix), total phenolic content (150.14mg/100g FW), total anthocyanin content (8.63mg/100g FW), total flavonoid content (5.86mg/100g FW) and selenium contents in fruits (1.59mg/100g DW) were found in V₁ while the lowest in V₃. Therefore, Se₂ formulation can be used for fruit quality and Se₃ formulation can be used for growth and yield of strawberry cv. Local strawberry-1 along with M₁ growing formulation in solid hydroponic system in Bangladesh.

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