

EVALUATION OF PERFORMANCES OF AQUAPONIC SYSTEM WITH ORNAMENTAL AND TABLE FISH

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Aquaponic system is an integration of fish and hydroponics in a closed recirculating system. The present study was aimed to investigate the suitable fish species and evaluate the performances of tomato plants in the aquaponic systems. The experiment was conducted as Complete Randomized Design with three treatments. Hydroponic system was setup as the control and two aquaponic systems with ornamental (Koi carp) and table fish (Tilapia) were used as treatments. A total of 100 fingerlings were stocked in each aquaponic system. Three replicates, each with six tomato plants were maintained for two systems. Three plants were randomly selected from each replicate for data collection. Body weight, standard length and girth of ornamental and table fish were measured. Data were analyzed using one way ANOVA in SAS. Results revealed that tomato yield showed a significant difference ($p < 0.05$) among systems. Hydroponic system reported the highest tomato yield (303 ± 41 g per plant). The tomato yields in the aquaponic systems with ornamental and table fish were 191 ± 41 g and 112 ± 41 g per plant, respectively. Leaf length, leaf width and number of leaves were significantly different ($p < 0.05$) among systems. However, plant height did not differ significantly ($p > 0.05$). Hydroponic system showed the higher leaf length (26 ± 1 cm), leaf width (17 ± 0 cm) and number of leaves (16 ± 0.6). Table fish (Tilapia) reared in the aquaponic system performed better (final average body weight; 61.4 g, length; 11.3 cm and girth; 6.7 cm) than ornamental fish (Koi carp)(final average body weight; 16 g, length; 8.4 cm, girth; 4 cm). It is concluded that tomato plants in the hydroponic system perform better than aquaponic systems. In addition, table fish in the aquaponic system performs better in terms of growth parameters. Tomato plants perform better in terms of yield in the aquaponic system with ornamental fish.

Keywords: Aquaponic, Hydroponic, Ornamental fish, Table fish