

EFFECT OF PLANT DENSITY ON GROWTH AND YIELD OF GREEN-HOUSE  
GROWN TOMATO (*Lycopersicon esculentum* Mill.)

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Cultivation of tomato (*Lycopersicon esculentum* Mill.) under protected environment is one of the options available to meet the increasing demand for high quality tomato in Sri Lanka. The huge gap between the potential and average yield in open field cultivation, with stagnation in production, owing to multitude of constrains can be minimized by this technology, though there are no recommendations by the Department of Agriculture. A research was undertaken to determine the effect of plant density on growth and yield of greenhouse grown tomato using, variety-Volcano, a F<sub>1</sub> hybrid. The experiment was conducted with 7 different spacing, 40 x 180 cm (2.8 plants/m<sup>2</sup>), 50 x 180 cm (2.2 plants/m<sup>2</sup>), 60 x 180 cm (1.85 plants/m<sup>2</sup>), 40 x 150 cm (3.3 plants/m<sup>2</sup>) and 50 x 150 cm (2.7 plants/m<sup>2</sup>), 60 x 150 cm (2.2 plants/m<sup>2</sup>) and a control treatment of 80 x 50 cm (2.5 plants/m<sup>2</sup>), in Randomized Complete Block Design during the 2007/2008, Maha season, at Horticultural Crop Research and Development Institute, Gannoruwa.

The treatment with the highest plant density showed the highest LAI, 1.11 in contrast to the lowest plant density (0.53) at 6 weeks after transplanting. The marketable yield per plant ranged from 2.95kg to, 3.34kg, though not significantly different among treatments. In the highest plant density treatment, a significantly higher marketable yield of 9.8kg and 98 average numbers of fruits/m<sup>2</sup> was recorded compared to all other 6 treatments. The vegetative characters like plant height, total leaf number, leaf width and length at 1<sup>st</sup> cluster, canopy diameter, percentage ground cover and leaf area had

no significant differences among treatments. The average number of fruits/plant, average fruit size and average weight of fruits did not show a significant difference. The total cost and net returns increased with the increase in plant density. The 3.3 plants/m<sup>2</sup> treatment gave the highest yield and net returns, indicating the possibility of further increasing the density as it is positively co-related with LAI and yield/m<sup>2</sup>.

*Key words:* Tomato, Protected Environment, Plant Density