Performance of Lettuce (*Lactuca sativa)* in a newly formulated Hydroponic media

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Hydroponics culturing is one of the most intensive methods of crop production in today's agricultural industry. A balanced nutrient solution is one of the main requirements for any hydroponics system. There are few nutrient mixtures available in the market but they are expensive and not crop specific. Lettuce requires very low amounts of nutrients and all the available formulations contain excessive amounts of nutrients for lettuce. Therefore the performance of lettuce in a newly formulated low cost hydroponics medium, which is specific for lettuce was compared with Albert's solution.

Lettuce (Var. Grand Rapids) was grown in a protected house, in a non- culturing system with PVC tunnels, using two hydroponics solutions (Albert's solution and new solution) in a Completely Randomized Design (CRD) with four replicates. Each replicate was a growing tube with seven plants.

To assess the performance, climatological data, growth parameters and solution data were recorded and finally an economic evaluation was done.

The mean daily temperatures of the protected house were higher by about 1.6 ^{0}C, compared to ambient. The recorded temperatures during the research period were above the optimum temperature range for Lettuce(optimum range : 21 ^{0}C -27 ^{0}C) The light intensity inside the protected house was sufficient for Lettuce production and ranged between 13500-64900 Lux and the relative humidity was in the range of 68% and 87%. Results revealed that the growth parameters were same in two media and mean fresh yield of 93.30 g/plant and 88.20 g/plant could be obtained in Albert's solution and in proposed new solution respectively. However, the difference of yield obtained in two solutions was statistically not significant. Solution costs per 1 kg of Lettuce production in Albert's solution and proposed new solution were Rs 5.15 and Rs 4.30 respectively. Considerably high wastage of remaining nutrients occurs in the Albert's solution after the harvest. There is no such wastage in the new solution. This shows that the solution preparation is done with the careful analysis of individual iron requirement for Lettuce. It was revealed that proposed new solution can be economically used for growing lettuce, hydroponically.

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