

# Standardizing the Device of Hydroponics System for Study of Different Parameter of the Plant Growth in Laboratory

**K. D. Shriwastao, S. A. Rathod\*, P. P. Umale**

Shri Shivaji College of Arts, Commerce and Science, Akola, Maharashtra, India

Corresponding Author: shubhamarathod95@gmail.com

**Abstract:** *Hydroponics technique of plant cultivation is trending as an innovative and novel method in crop production without soil. The mass level established hydroponics system are available. But the procuring such large set of hydroponics systems for small research laboratories is not economically viable. In current research a small affordable hydroponics system is developed that required the minimum resources, space and maintenance. This hydroponics set up is found very helpful to study the effect of different parameters on the plant growth under given conditions. Here the effect of parameter like light exposure, liquid nutrients, aeration conditions on the plant growth and development was noted, and feasible recommendations are made for betterment of plant growth.*

**Keywords:** Hydroponics, light exposure, liquid nutrients, plant growth

## REFERENCES

- [1]. Al-Kodmany, K. (2018). The vertical farm: A review of developments and implications for the vertical city. Buildings, 8(2), 24.
- [2]. Chatterjee, A., Debnath, S., & Pal, H. (2020). Implication of urban agriculture and vertical farming for future sustainability. In Urban horticulture-Necessity of the future. IntechOpen.
- [3]. Chauhan, B. S., Mahajan, G., Sardana, V., Timsina, J., & Jat, M. L. (2012). Productivity and sustainability of the rice-wheat cropping system in the Indo-Gangetic Plains of the Indian subcontinent: problems, opportunities, and strategies. Advances in agronomy, 117, 315-369.
- [4]. Despommier, D. (2017). Vertical Farming Using Hydroponics and Aeroponics. In Urban Soils (pp. 313-328). CRC Press.
- [5]. Dutta Gupta, S., & Jatothu, B. (2013). Fundamentals and applications of light-emitting diodes (LEDs) in in vitro plant growth and morphogenesis. Plant Biotechnology Reports, 7(3), 211-220.
- [6]. Gupta, S. D., & Karmakar, A. (2017). Machine vision based evaluation of impact of light emitting diodes (LEDs) on shoot regeneration and the effect of spectral quality on phenolic content and antioxidant capacity in Swertia chirata. Journal of Photochemistry and Photobiology B: Biology, 174, 162-172.
- [7]. MacDonald, I. R. (1976). Gravity counteracts light-induced inhibition of root growth. Nature, 263(5578), 584-585.
- [8]. Sharma, N., Acharya, S., Kumar, K., Singh, N., & Chaurasia, O. P. (2018). Hydroponics as an advanced technique for vegetable production: An overview. Journal of Soil and Water Conservation, 17(4), 364-371.
- [9]. Srivani, P., & Manjula, S. H. (2019, December). A controlled environment agriculture with hydroponics: variants, parameters, methodologies and challenges for smart farming. In 2019 Fifteenth International Conference on Information Processing (ICINPRO) (pp. 1-8). IEEE.
- [10]. Toulaitos, D., Dodd, I. C., & McAlinsh, M. (2016). Vertical farming increases lettuce yield per unit area compared to conventional horizontal hydroponics. Food and energy security, 5(3), 184-191.