

## **Review of optimum temperature, humidity, and vapour pressure deficit for microclimate evaluation and control in greenhouse cultivation of tomato: a review**

### **ABSTRACT**

Greenhouse technology is a flexible solution for sustainable year-round cultivation of Tomato (*Lycopersicon esculentum* Mill), particularly in regions with adverse climate conditions or limited land and resources. Accurate knowledge about plant requirements at different growth stages, and under various light conditions, can contribute to the design of adaptive control strategies for a more cost-effective and competitive production. In this context, different scientific publications have recommended different values of microclimate parameters at different tomato growth stages. This paper provides a detailed summary of optimal, marginal and failure air and root-zone temperatures, relative humidity and vapour pressure deficit for successful greenhouse cultivation of tomato. Graphical representations of the membership function model to define the optimality degrees of these three parameters are included with a view to determining how close the greenhouse microclimate is to the optimal condition. Several production constraints have also been discussed to highlight the short and long-term effects of adverse microclimate conditions on the quality and yield of tomato, which are associated with interactions between suboptimal parameters, greenhouse environment and growth responses.

**Keyword:** Optimal air temperature; Relative humidity; Vapour pressure deficit; Greenhouse; Tomato; Membership functions