

A theoretical approach of developing a thermal model for greenhouse

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■ **ABSTRACT** : The thermal behaviour of a greenhouse in any climatic condition can be studied by developing analytically a suitable thermal model with the help of which the inside environmental conditions can be predicted corresponding to the outside atmospheric situation. Based on the predicted inside conditions, heating and cooling requirements for a particular crop can be decided to maintain suitable environment for the growth of the crop. The various controlling parameters *i.e.*, solar radiation, ambient air temperature, transmittance of greenhouse cover, ventilation, relative humidity etc. are generally taken into consideration for studying the thermal behaviour of the naturally ventilated greenhouse. For quantitative analysis of the thermal model, numerical calculations can be done to predict the effects of the above controlling parameters on the thermal behaviour of the greenhouse. The developing model can be validated for studying its accuracy and applicability under various situations. Various controlling parameters can accordingly be adjusted suitable for the better growth of a plant inside the greenhouse after studying the thermal behaviour of greenhouse through the developing model.

■ **KEY WORDS** : Thermal modeling, Solar energy, Greenhouse

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