

Evaluation of evaporation measuring methods for reference evapotranspiration within Greenhouse

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ARTICLE INFO

Received : 28.01.2020

Revised : 01.03.2020

Accepted : 14.03.2020

KEY WORDS :

Class A pan, Reduced pan_{20cm Ø},
Reduced pan_{60cm Ø}, Evapotranspiration,
Linear regression

ABSTRACT

Alternative methods for estimating reference evapotranspiration (ET_o) within greenhouses are explored due to the large area occupied by a Class A pan. Based on the locations, the evapotranspiration difference between inside and outside greenhouse varies. Research results about what pan co-efficient (K_p) should be utilized inside the greenhouse are not conclusive. Therefore the main objective of the work was to compare ET_o calculated by various methods within and outside a greenhouse. A Class A pan (CA_{Pi}), a reduced pan (RP_{i60cm Ø}) and a reduced pan (RP_{i20cm Ø}) were installed inside a greenhouse, and another Class A pan (CA_{Po}) was installed outside. ET_o estimates, obtained by CA_{Pi}, RP_{i60cm Ø} and RP_{i20cm Ø} were 54 per cent, 57 per cent and 59 per cent of those estimated by CA_{Po}, respectively. A simple linear regression showed positive coefficients R = 0.76 for the CA_{Po} x CA_{Pi}, R = 0.96 for the CA_{Pi} and the RP_{i60cm Ø}, R = 0.98 for the CA_{Pi} and the RP_{i20cm Ø}. The study concluded that it is possible to use reduced pans to estimate the ET_o inside the greenhouse and replacement of reduced pan would increase the space available for cultivation in the greenhouse.

How to view point the article : Sujitha, E., Shanmugasundaram, K. and Thiyagarajan, G. (2020). Evaluation of evaporation measuring methods for reference evapotranspiration within Greenhouse. *Internat. J. Plant Protec.*, **13**(1) : 62-66, DOI : 10.15740/HAS/IJPP/13.1/62-66, Copyright © 2020: Hind Agri-Horticultural Society.

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