551.573

ESTIMATION OF EVAPOTRANSPIRATION

1. In locations, where lysimeters are not available, evapotranspiration is estimated indirectly using open pan evaporation. Multiplying the Potential Evapotranspiration (PET) by the crop coefficient (k_c), the Actual Evapotranspiration (AET) for a particular crop could be obtained. Again, computation of PET following standard methods (Doorenbos and Pruit 1977) for a specific location requires several weather parameters and involves lengthy calculations. A simple method of estimating PET of a location is suggested using a simple statistical relation between PET and open pan evaporation for the location Gandhi Krishi Vigyana Kendra, Bangalore (Lat. 12° 58'N Long. 77° 35'E, altitude 930 m amsl).

2. Following the Penman's modified equation (Doorenbos and Pruit 1977) the weekly PET has been computed for the period 1975 to 1992. The mean weekly PET and mean weekly open pan evaporation for the period under consideration have been computed for all the 52 meteorological standard weeks.

3. In Fig. 1, the mean weekly PET and open pan evaporation values are plotted against standard weeks. From the figure, it is observed that PET values are lower than the open pan evaporation. Both the curves have identical trend. The following simple regression equation is fitted to relate the PET with open pan evapoation.

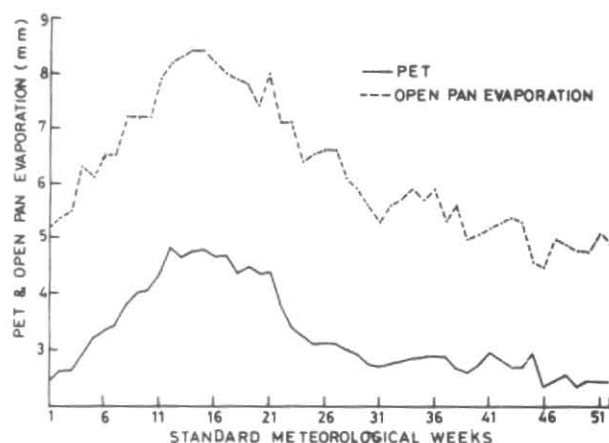$$Y = 0.636\ X - 0.695 \qquad (1)$$

where,

$$R^2 = 0.923$$

Fig. 1. Mean weekly PET and open Pan Evaporation (based on 1975-1992 data) at GKVK Bangalore

Standard error of Y estimate = 0.218,

Standard error of X estimate = 0.026

where, Y is the mean weekly PET and X is the mean weekly open pan evaporation in mm. Using Eqn. (1), PET could be obtained from the open pan evaporation values in absence of lysimeter.

Reference

Doorenbos, J. and Pruit, W. O., 1977, Guidelines for predicting crop water requirements, FAO Irri. Drainage Paper, 24. FAO. Rome.

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13 September 1993. Modified 16 December 1993

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