Research Paper:

Measurement of AET in soybean and estimation of PET by various methods and its comparison with AET

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SUMMARY

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A field experiment was conducted at experimental farm, Department of Agricultural Meteorology Marathwada Agricultural University, Parbhani. The experiment was conducted with soybean crop cv. MAUS-71 in a field where two weighing types of lysimeter were installed. The experiment was nonreplicated and estimation of reference crop evapotranspiration was measured on daily basis. At the same time, the daily weather data were recorded at near by observatory and were tabulated. The PET were estimated and compared with lysimetric observatins. The study ravealed that among the methods tested, modified Penman method was found to be suitable for advocating the irrigation scheduling as it matched well throughout the crop season. The Blaney and Criddle and pan evaporation estimation methods under estimated the values when compared with lysimetric data. As these methods are based on only air temperature, pan evaporation and other parameters such as radiation, relative humidity, bright sunshine hours, wind factor were not included which also played a significant role in affecting ET. The results obtained through these methods are not comparable.

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Key words : AET, PET, Crop coefficient **S**oybean (*Glycine max* (L.) Merrill.) is often called as wonder bean due to its high seed protein (38-43%) and edible oil content (18-20%). Maharashtra ranks as second largest growing state contributing nearly 30% area (23.07 lakh ha.) and 34% production (23.99 lakh tones) of the country next to Madhya Pradesh. In respect of productivity Maharashtra stands first in the country with average productivity of 1040 kg/ha⁻¹. (Anonymous 2006).

Soybean is grown as rainfed crop, which is exposed to varying sets of weather conditions in general and rainfall distribution is particular. The acute need of water at critical growth stages, through lysimetric observations and its comparison with different approaches may provide information for decision making in irrigation scheduling the measurement of AET by means of lysimeter and it is essential to establish a relationship between the measured value of AET by lysimeter and the estimated PET by different empirical formulae. Keeping these points in mind, a research project was estimation planned on of crop evapotranspiration in soybean crop through

lysimeter and its comparison with the different approaches already published, with the following objectives: to measure daily, weekly and phenophasewise actual evapotranspiration of soybean crop under field conditions, using weighing type lysimeters, to estimate weather based, weekly and phenophase wise potential evapotranspiration in soybean crop, by using the approaches suggested by Blaney criddle, Thronthwaite, modified Penman's and pan evaporation, to asses the ratio of AET : PET in different phenophases and to suggest proper timing for life saving irrigation during crop growing season.

MATERIALS AND METHODS

A field experiment was conducted at experimental farm, Department of Agricultural Meteorology Marathwada Agricultural University, Parbhani. The experiment was conducted with soybean crop cv. MAUS-71 in a field where two weighing types of lysimeter were installed. The experiment was nonreplicated and estimation of reference crop evapotranspiration was measured on daily

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