## **Research Paper:**

See end of the article for

authors' affiliations

Correspondence to :

Zonal Agricultural Research Station,

SOLAPUR (M.S.)

INDIA

J.D. JADHAV

# Phenophase and Metweekwise PET estimation and AET measurement in soybean [*Glycine max* (L.)]

V.G. MANIYAR, P.S. KAMBLE AND J.D. JADHAV

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#### **SUMMARY**

Soybean [*Glycine max* (L.)] is grown as rainfed crop, 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 in lysimeter and the estimated PET by different empirical formulae. It can be concluded from the field study that the modified penman method was found to be suitable and ideal for assessing the crop water requirements. The Blanney and criddle, Thornthwaite and pan evaporation methods do not give correct prediction of PET, due to estimated Kc values do not give correct estimation at various phenophases. For estimation of PET under Marathwada region at Parbhani condition the modified penman method is the most suitable having found theoretical formulation and more accuracy in estimation as compared with the Blaney and criddle, Thornthwaite and pan evaporation as compared with the Blaney and criddle, Thornthwaite and pan evaporation to soybean during pod formation (AET) for soybean is found to be 353.59 mm at Parbhani to be less than the seasonal water requirement for this crop. This again necessities the application of protective irrigation to soybean during pod formation to grain formation stage by the modified penman method.

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I ndia has an agriculture base and the agricultural sector plays dominating role in Indian economy. However, it is erratic in nature and its distribution is inconsistent at any place during years. Average annual rainfall of the country is 119 cm; out of which about 400 M ha-m goes as surface runoff, whereas, only 215 M ha-m is infiltrated (Anonymous, 1998). Although, large irrigation potential has been created country since independence taking it from 22.6 M ha to 91 M (Sivanappan, 2000), however about 60 percent of the country's total cultivated area (145.6 M ha) is still rainfed.

Under the Marathwada region, the soybean [*Glycine max* (L.)] is grown as a rainfed crop,. 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 is an expensive procedure and beyond reach of individual farmer, therefore, it is essentinal to establish a relationship between the measured value of AET by in lysimeter and the estimated PET by different empirical formulae, keeping these points in mind a research project was planned 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 and to suggest proper timing for life saving irrigation during crop growing season.

## MATERIALS AND METHODS

The present investigation was carried out by laying out experiment on soybean with objectives to study of the measurement of AET in soybean and estimation of PET by various

### Key words : Phenophase,

Metweek ,Water requirement

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