Utility of empirical models and pan evaporation method to estimate chickpea evapotranspiration in mollisol of Tarai region of Uttrakhand

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SUMMARY

The experiments were conducted at the Crop Research Centre of G.B. Pant University of Agriculture and Technology, Pantnagar, Uttrakhand with the objectives for quantifying evapotranspiration (ET) losses of chickpea under Tarai conditions, and to select some suitable empirical methods based on meteorological parameters for estimating ET from chickpea. Evapotranspiration of chickpea was measured with weighing type lysimeter. Data on pan evaporation measured with USWB class A pan evaporimeter and chickpea parameters for the corresponding period were collected from Meteorological observatory of G.B. Pant University of Agriculture and Technology, Pantnagar, Uttrakhand. Evapotranspiration from chickpea was also estimated by using empirical methods of Thornthwaite, Turc, Stephens-Stewart, Jensen-Haise, Blaney-Criddle and modified Penman. Evapotranspiration of chickpea during 2005-06 and 2006-07 were about 416.5 and 475.6 mm, respectively. The average total rainfall during 2005-06 and 2006-07 were 18.2 and 275 mm, respectively. Thus, supplementary irrigation was required during crop season due to low rainfall. The pan evaporation did not give accurate estimate of ET, both on seasonal and as well as weekly basis. Thus, the pan evaporation does not seem to be good criterion for the estimation of ET. Modified Penman method was found to be most very suitable for estimation of ET in Tarai region of Uttrakhand.

Key words: Chickpea, Lysimeters, USWB class, Pan evaporimeter, Empirical methods.