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TEST MODELS FOR ESTIMATING RADIATION BALANCE IN DIFFERENT SCALES FOR JABOTICABAL, SP

TESTE DE MODELOS PARA ESTIMATIVA DE BALANCO DE RADIAÇÃO EM DIFERENTES ESCALAS PARA A REGIÃO DE JABOTICABAL, SP

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The net radiation (Rn) in agroecosystems is the amount of energy that is available in the environment to heating processes of living organisms, air and soil; perspiration of animals and plants; photosynthesis and water evaporation. The Rn defines the type of climate and weather conditions prevailing in a region affecting the availability and thermal water, the fundamental understanding of genotype-environment, which ultimately determine the productivity of the agricultural system. Rn usually is used in models of weather and climate studies. The sustainability and economic viability of zootechnical activity is dependent on the positive interaction between animal and environment. Environmental factors such as water, shading, thermal exchanges sensible heat (conduction, convection and radiation skin) and latent heat losses (evaporation and transpiration), conditioned by Rn, must be managed to provide the best results. The present study was conducted to develop and test models for accurate and precise radiation balance on the scales daily, monthly and seasonal ten-day for Jaboticabal - SP, due to the importance of estimates of net radiation for agricultural activities. We used daily meteorological data from weather station located in Jaboticabal, SP (coordinates: 21 ° 14'05 "South, 48 ° 17'09" West, 615m altitude) at Universidade Estadual Paulista "Júlio Mesquita Filho" - FCAV/UNESP in a situation of default grass "Bahiagrass" during the period 20/08/2005 to 20/01/2012. The data used were the maximum temperature (T_{max}), minimum (T_{min}) and mean (T_{MED}); maximum relative humidity ($UR_{Máx}$), minimum ($UR_{Mín}$) and average ($UR_{Méd}$) precipitation (mm), average velocity (m/s), Qo, solar radiation (MJ m-2), sunshine (hour) meter (MJ m²), soil temperature at two depths ($Tsoil_{2CM}$, $Tsoil_{5CM}$) and class A pan evaporation (TCA) (mm). The measures taken by the balance radiometer were taken as a reference to test other models. The models tested were those reported by NORMAN *et al*. 1995 and PRIESTLEY and TAYLOR, 1972. The models used were developed and tested regressions with MAPE (Mean Absolute Percentage Error), R^2 (Accuracy) and RMSEs (root mean error quadratic systematic) in different time scales. The mechanistic models, PRIESTLEY-TAYLOR and NORMAN, had low accuracy in all analyzes; the maximum MAPE was equal to 498.12%. This was due to the high amplitude of the estimated data regarding observed, making the R^2 values (accuracy) low. The equation used all data, called Rn = f (all), in most cases showed the best result. However, for the purpose of practical use was not indicated because his job will be to need a lot of information collection difficult. The standard methodology for estimating Rn is recommended by FAO, however, this method presents some difficulties to be measured is required sensor (balance-radiometer) which often has the meteorological its high value. Thus, the use of regressions using Qg as an indicator ends up getting compromised handling. By equations using Q_0 as the independent variable is the most suitable. Seeking greater practicality without losing the precision, accuracy and utilization. The equation Rn = f (Q^0, n) in this work is indicated by having high precision and high convenience for use.

Key words: net energy, energy balance, heat stroke.