ESTIMATING EVAPORATION FROM INSOLATION[a]

Discussion by Marvin E. Jensen

MARVIN E. JENSEN,[31] M. ASCE.—The writer indicated that the ratio Q_e/Q_s was correlated with plant growth by Jensen and Haise[4] and with air temperature by Stephens and Stewart.[5] The paper by Jensen and Haise[4] that was cited by the writer presented only part of the results obtained in the study completed during the summer of 1962. In their study, Jensen and Haise also correlated Q_e/Q_s for crops having a full vegetative canopy and adequate soil moisture with mean air temperature. The Q_e data were obtained from irrigated crops in several states in the western United States. They obtained the relation

$$\left[\frac{Q_e}{Q_s}\right]_p = 0.014\ T - 0.37 \quad \ldots\ldots\ldots\ldots\ldots\ldots (23)$$

in which $(Q_e/Q_s)_p$ represents the potential ratio, and T is the mean air temperature, in degrees Fahrenheit. In Eq. 23 Q_s is expressed as the evaporation equivalent of solar radiation assuming a constant heat of vaporization (1 gram water = 590 calories), thus Q_e and Q_s have the same dimensions. The paper Jensen and Haise summarizing the results of the completed study is available.[32]

If a constant heat of vaporization is assumed, and Q_s is the total solar radiation for the month instead of the mean daily value ($\overline{E}$ is the total for the month), Eq. 4 becomes

$$\frac{\overline{E}}{Q_s} = 0.013\ \overline{T}_a - 0.26 \quad \ldots\ldots\ldots\ldots\ldots\ldots (24)$$

which is similar to the potential obtained by Jensen and Haise.

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17 Carberry, J. J., and Bretton, R. H., "Axial Dispersion of Mass in Flow Through Fixed Beds," Journal of the American Institute of Chemical Engineers, Vol. 4, No. 3, September, 1958, pp. 367–375.

[a] September, 1964, by Robert K. Lane (Proc. Paper 4025).

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