the bottom layer of the profile is equal to $FLUX(L)$. For convenience, this value is converted to mm and set equal to $DRAIN$. $DRAIN$ then represents the total outflow from the lowest layer of the soil profile and is an available output variable for those interested in the time course of drainage out of the soil profile.

Evapotranspiration and upward flow

The soil water balance subroutine requires calculations for potential evaporation from the soil and plant surfaces. The equations to predict evaporation are primarily those described in Ritchie (1972). The main difference between this part of the soil water balance subroutine and the Ritchie model is that a Priestley–Taylor (1972) equation for potential evapotranspiration is used instead of the Penman equation. This was done to eliminate the need for vapor pressure and wind inputs while providing sufficiently accurate evapotranspiration information.

Calculation of potential evaporation with a modified Priestley–Taylor equation requires an approximation of daytime temperature (TD) and the soil-plant reflection coefficient ($ALBEDO$) for solar radiation. For the approximation of the daytime temperature a weighted mean of the daily maximum ($TEMPMX$) and minimum ($TEMPMN$) air temperatures is used

$$\boxed{TD = 0.6 \times TEMPMX + 0.4 \times TEMPMN}$$

The combined crop and soil albedo ($ALBEDO$) is calculated from the model estimate of leaf area index (LAI) and the input bare soil albedo ($SALB$). Prior to germination, $ALBEDO$ is equal to $SALB$. For pre-anthesis conditions the value for $ALBEDO$ is

$$\boxed{ALBEDO = 0.23 - (0.23 - SALB) \times \exp(-0.75 \times LAI)}$$

For post-anthesis, the $ALBEDO$ is calculated, assuming that the maturing canopy results in an increased albedo,

$$ALBEDO = 0.23 + (LAI - 4) \times 2/160$$

An equilibrium evaporation rate (EEQ) defined in Priestley and Taylor (1972) is calculated from $ALBEDO$, TD, and the input solar radiation $SOLRAD$. The equation was developed in a simplified mathematical form, but gives quite similar results to the more formal equation in which long wave radiation calculations are made separately. The EEQ calculation also estimates daytime net radiation instead of 24-hour net radiation.

$$\boxed{\begin{aligned} EEQ = {} & SOLRAD \times (4.88 \times 10^{-3} - 4.37 \times 10^{-3} \times ALBEDO) \\ & \times (TD + 29) \end{aligned}}$$

The units of EEQ is mm day^{-1} and $SOLRAD$ is MJ m^{-2} day^{-1}. A graphical