EXAMPLE 35 (corrected by errata, Feb. 2006)
Estimation of crop evapotranspiration with the dual crop coefficient approach

Estimate the crop evapotranspiration, ETc, for ten successive days. It is assumed that:
- the soil is a sandy loam soil, characterized by $\theta_{FC} = 0.23 \text{ m}^3 \text{ m}^{-3}$ and $\theta_{WP} = 0.10 \text{ m}^3 \text{ m}^{-3}$,
- the depth of the surface soil layer that is subject to drying by way of evaporation, $Z_e$, is 0.1 m,
- during the period, the height of the vegetation $h = 0.30 \text{ m}$, the average wind speed $u_2 = 1.6 \text{ m s}^{-1}$, and $\text{RH}_{\text{min}} = 35\%$,
- the $K_c$ on day 1 is 0.30 and increases to 0.40 by day 10,
- the exposed soil fraction, $(1-f_c)$, decreases from 0.92 on day 1 to 0.86 on day 10,
- all evaporable water has been depleted from the evaporation layer at the beginning of calculations ($D_{e, i-1} = \text{TEW}$),
- irrigation occurs at the beginning of day 1 ($I = 40 \text{ mm}$), and the fraction of soil surface wetted by irrigation, $f_w = 0.8$,
- a rain of 6 mm occurred at the beginning of day 6.

From Tab. 19  $\text{REW} = 8 \text{ mm}$
From Eq. 73  $\text{TEW} = 1000 \times (0.23 - 0.5(0.10)) \times 0.2 = 18 \text{ mm}$
From Eq. 72  $K_{c, \text{max}} = 1.2 + [0.04(1.6-2) - 0.004(35-45)](0.3/3)^{0.3} = 1.21$

All evaporable water has been depleted at the beginning of calculations, $D_{e, i-1} = \text{TEW} = 18 \text{ mm}$
Day number.

ET<sub>c</sub> is given. Note that ET<sub>c</sub> would be forecast values in real time irrigation scheduling but are known values after the occurrence of the day, during an update of the calculations.

(P-RO) are known values after the occurrence of the day, during an update of the calculations.

Net irrigation depth for the part of the soil surface wetted by irrigation.

(1-<i>f</i><sub>i</sub>) is given (interpolated between 0.92 m on day 1 and 0.86 m on day 10).

If significant rain: <i>f</i><sub>W,i</sub> = 1.0   (Tab. 20)
If irrigation: <i>f</i><sub>W,i</sub> = 0.8   (given),
otherwise: <i>f</i><sub>W,i</sub> = <i>f</i><sub>W,i-1</sub>.

Eq. 75. Fraction of soil surface from which most evaporation occurs.

K<sub>e</sub> is given (interpolated between 0.30 on day 1 and 0.40 on day 10).

De<i,i</i> (depletion at start of day)

If precipitation and irrigation occur early in the day then the status of depletion from the soil surface layer (at the start of the day) should be updated:

De<sub>i</sub> = Max(De<sub>i-1</sub> - <i>I</i><sub>i</sub>/<i>f</i><sub>i</sub> - (P-RO)<sub>i</sub>, or 0). where De<sub>i-1</sub> is taken from column 14 of previous day.
If P and I occur late in the day, then col (6) should be set equal to De<sub>i</sub> (col. (14) of previous day).

K<sub>c</sub> ≤ K<sub>few</sub> K<sub>c</sub> = K<sub>c</sub> max - K<sub>c</sub> (e.g., Ke = min(K<sub>c</sub> (K<sub>c</sub> max - K<sub>c</sub> max), <i>K</i><sub>e</sub> ETo/<i>f</i><sub>few</sub>).

Eq. 71 where DP<sub>e</sub> ≥ 0. (This is deep percolation from the evaporating layer). In this example, even though P and I are assumed to occur early in the day, and DP<sub>e</sub> and De<sub>i</sub> are calculated for the end of the day.
DP<sub>e</sub> from the surface layer is presumed to occur shortly after the wetting event and is therefore based on the De<sub>i</sub> for the previous day (De<sub>i-1</sub>).

De<sub>i</sub> (depletion at end of day) is from Eq. 77 where De<sub>i-1</sub> is the value in column 14 of previous day.

Mean evaporation expressed as distributed over the entire field surface = K<sub>e</sub> ETo.

K<sub>c</sub> = K<sub>c</sub> max + Ke.

Eq. 69.

Note that values in col. (9)-(11), and (14)-(17) will change slightly if values for col. (5) and (8) are entered as printed, due to exact internal interpolation for (5) and (8) in the actual calculation spreadsheet, or if values for col. (9) and (14) are rounded each calculation, rather than carried as exact values internal to the spreadsheet used to create the table.