EPIC1102 version 2023-12-07, release note

Under certain conditions, a bug in NAJN subroutine was generating negative values for the soil NH3 content. The bug was eliminated by modifying the initial IF statement to consider the possibility of crop nutrient demand equal zero. The source code has been modified as follows:

Original version: `IF(X2<1..AND.DMD>0.)THEN`

Modified version: `IF(X2<1.0.OR.DMD==0.0)THEN`

The format of the DHS output file has been slightly modified by adding an extra space between variables. Modifications done in BSIM, format 682 for the variables and 731 for the header.

EPIC1102 version 2023-08-28, release note

A bug related to variable ISW was preventing the model from printing the correct information on the method selected to estimate field capacity and wilting point if ISW was set to 2 or 3. The error is removed in this version.

EPIC1102 version 2023-01-21, release note

The DGN output file has been modified removing the plant output variables. This eliminate confusion when more than one plant is simulated at the same time. In fact, the DGN file report output on one line per day printing information only for one plant when more than one are growing at the same time. A future modification could be the calculation of cumulated values (e.g. total biomass, total LAI, etc.) for all the plants that are growing at the same time.

EPIC1102 version 2022-09-07, release note

A bug related to the simulation of soil temperature is now corrected (because of a typo a variable was not correctly initialized).

The header has been added to the pesticide table (PESTCOM.DAT file) to make it consistent with the format used by the model to read this file.

EPIC1102 version 2022-05-04, release note

When automatic nitrogen or phosphorous fertilization is activated, the EPIC model assigns a default fertilizer for this operation if a specific fertilizer is not defined by the user. In this version of EPIC1102, the source code and the fertilizer table have been modified to be consistent with each other.

In the model source code, the default fertilizer Elemental nitrogen (Elem-N) with ID 21 is set for automatic nitrogen fertilization. Default fertilizer elemental phosphorous (Elem-P) with ID 22 is set for automatic phosphorous fertilization. These two fertilizers will be used for automatic nitrogen and phosphorous fertilization if a specific fertilizer is not defined by the user.

In the fertilizer table (FERT2012.DAT), the ID number for Elem-N, Elem-P, and Elem-K (not used) has been updated to be consistent with the model source code. Names for other fertilizers have been added.

In the site file provided in the example (umstead.SIT), the fertilizer ID 21 has been assigned to variable IDF0, and fertilizer ID 22 has been assigned to variable 22.

The input files distributed with this version include the modifications mentioned in this release note.

This version includes all the modifications listed in this document.

EPIC1102 version 2022-01-13, release note

Based on the previous version available on the Blackland Research Center website, includes the new enhanced cosine (eCOS) and pseudo heat transfer (PHT) approaches to estimate the soil temperature. Important modifications in this version are:

1. The control table is now space delimited. **Adjustment of the control table used in any previous version is required.**
2. A new variable has been added to the control table. The new variable is called ISLT and is placed at the end of the second row of the control table. It allows the user to select the approach used to estimate the soil temperature. ISLT has the following three options:
   - 0 = original EPIC cosine approach (subroutine SOLT is called)
   - 1 = enhanced cosine approach (subroutine SOLT_eCOS is called)
   - 2 = pseudo heat transfer approach (PHT) (subroutine SOLT_PHT is called)

   For more details on these approaches see Doro et al., 2021, Environ. Model. Softw., Volume 144, 2021, 105140, ISSN 1364-8152, https://doi.org/10.1016/j.envsoft.2021.105140.

3. New parameters are added to the PARM file. Parameters from number 97 to number 102 have been added. As a consequence, the general parameters in the parm file go from row 31 to row 41. The new parameters are defined as follows:
   - PARM(97): Sets the upper limit of the vegetative cover factor.
     Range is 0.1_0.9.
     Default value is 0.7
   - PARM(98): Sets the upper limit of the snow cover factor.
     Range is 0.75_0.99.
     Default value is 0.95
   - PARM(99): Used in the eCOS approach. It regulates the effect of actual daily weather on the soil surface temperature. It adjusts the difference between the soil surface temperature calculated with the cosine function and the soil surface temperature calculated considering the soil radiation, air temperature, and soil cover factor.
     Range is 0.5_0.95
     Default value is 0.6
   - PARM(100): Used in the eCOS approach. It regulates the effect of soil layer depth and damping depth on the predicted soil layer temperature.

Range is 0.7_2.0

Default value is 2.0

- PARM(101): Used in the pseudo heat transfer (PHT) approach, it adjusts the temperature transfer coefficient.

  Range is 0.0_1.0; 1.0 gives the full effect of daily weather and soil cover tends to cause large variations in soil temperature estimation from day to day. However, as it approaches 0.0, soil temperature becomes a smooth cosine curve repeating itself every year.

  Default value is 0.6 (which gives some effect of daily weather and soil cover without extreme daily variations).

- PARM(102): Used in the pseudo heat transfer (PHT) approach, it adjusts the heat transfer between soil layers.

  Range is 0.0_1.0

  Default value is 0.9

- PARM(102): Used in the pseudo heat transfer (PHT) approach, it adjusts the heat transfer between soil layers.

  Range is 0.0_1.0

  Default value is 0.9

- PARM(103): Used in the pseudo heat transfer (PHT) approach. It regulates the soil temperature in the bottom layers as a function of the soil depth and damping depth.

  Range is 1.0_3.0

  Default value is 1.5

The input files distributed along this version include the modifications mentioned in this release note.