Modelación agroclimática con ORYZA(v3.0)

Jeferson Rodriguez E.

Practica 4. Creación de Archivos de Suelo (*.SOL)

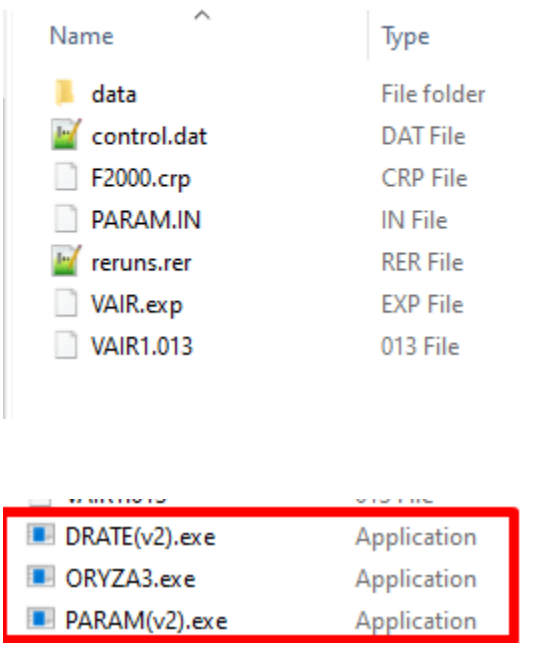
Datos del experimento:

Base de datos:

https://www.dropbox.com/s/ldmz5qdlzobf8s1/VAIR_F2000.xlsx?dl=0

Cree una carpeta de trabajo - clonar practica 4

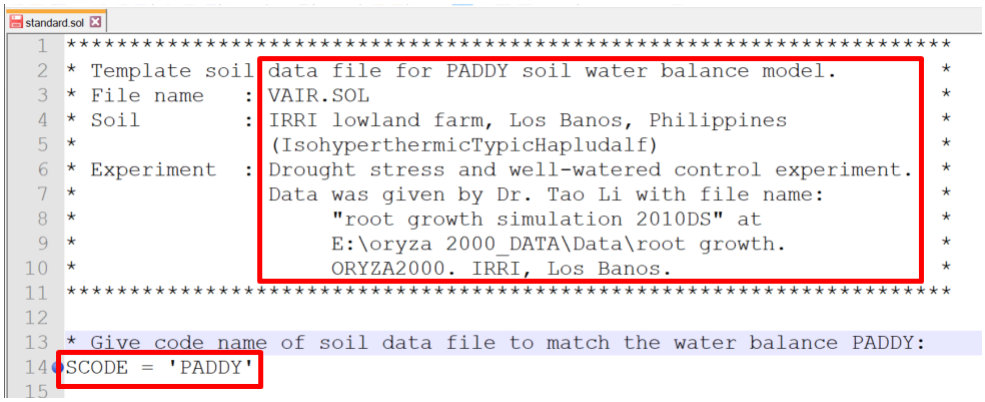
1. Cree un proyecto de simulación en la carpeta de la practica 4. Agregue los ejecutables (ORYZA3.exe, DRATE(v2).exe y PARAM.exe) disponibles en https://www.dropbox.com/sh/np9roum2ds3ogir/AAClWMDJbVQZJo3CAI0CDCzDa?dl=0



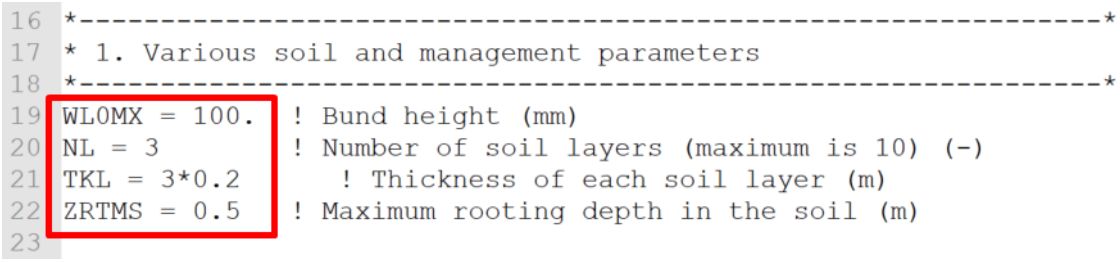
2. Despues de agregar los ejecutables, solo queda faltando del archivo de suelo.

Procedimiento para crear un archivo de suelo

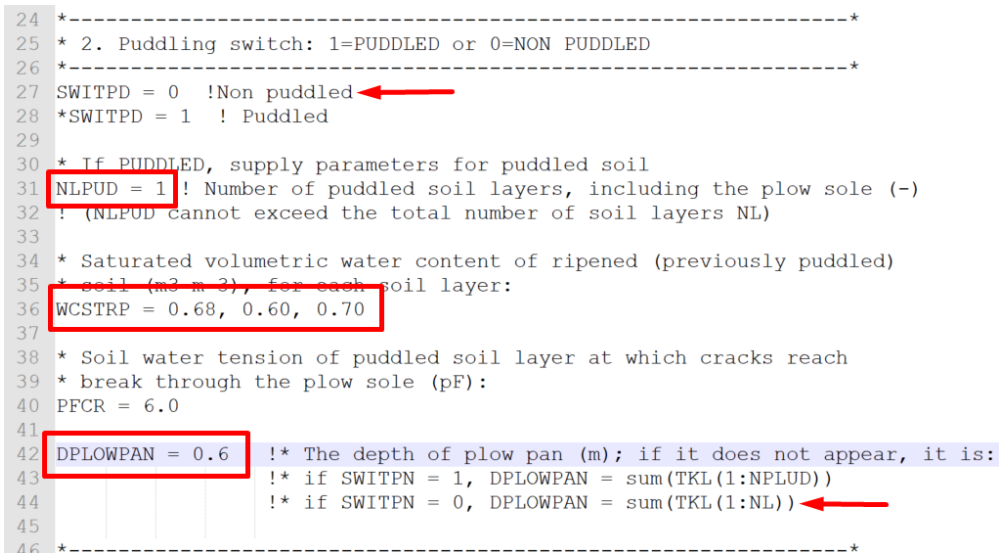
1. Abra el archivo de suelo – ***standard.sol*** –:
    - Agregue la información que considere necesaria, por ejemplo, Su nombre, institución, etc. Trabajaremos con el modelo ***PADDY***



- Configure los parámetros de manejo:



- Defina los parámetros de preparación de suelo. Iguale WCSTRP = Contenido de agua a saturación



- Modifique la variable SWITGW = 0 , Nivel freático profundo/ Sin efecto de capilaridad

```
*-------------------------------------------------------------*
* 3. Groundwater switch: 0=DEEP (i.e., not in profile), 1=DATA
* (supplied), 2=CALCULATE
*-------------------------------------------------------------*
SWITGW = 0 ! Deep groundwater
*SWITGW = 2 ! Calculate groundwater
*SWITGW = 1 ! Groundwater data
```

- Configure los datos de percolación. Percolacion fija. FIXPERC = SSKS/10 en layer mas profundo

```
*-------------------------------------------------------------*
* 4. Percolation switch
* Value for SWITVP cannot be 1 (CALCULATE) for non-puddled soil
*-------------------------------------------------------------*
SWITVP = -1 ! Fixed percolation rate
*SWITVP = 0 ! Percolation as function of the groundwater depth
*SWITVP = 1 ! Calculate percolation
*SWITVP = 2 ! Fixed percolation rate as function of time

* If SWITVP = -1, supply fixed percolation rate (mm d-1):
FIXPERC = 6.69
```

- Configure la conductividad – SWITKH = 0 !No data. Y los parámetros de retención SWITPF = 0 ! Data

```
*-------------------------------------------------------------*
* 5. Conductivity switch: 0=NO DATA, 1=VAN GENUCHTEN or 2=POWER
*  OR 3= SPAW  function used
*-------------------------------------------------------------*
SWITKH = 0  ! No data
*SWITKH = 2  ! Power
*SWITKH = 1  ! vanGenuchten
*SWITKH = 11 !Spaw function

*-------------------------------------------------------------*
* 6. Water retention switch: 0=DATA; 1=VAN GENUCHTEN. When DATA, data
* have to be supplied for saturation, field capacity,
* wilting point, and at air dryness
*-------------------------------------------------------------*
SWITPF = 0  ! Data
*SWITPF = 1  ! van Genuchten
*SWITPF = 11 ! SPAW FUNCTION
```

- Ingrese los parámetros de propiedades físicas – Recuerde convertir a las unidades que requiere ORYZA

```
*-----------------------------------------------------------------*
* 7.Soil physical properties, these parameters will be used when model
* runs under actual water or nitrogen condition, or even both. Otherwise
* these parameters will not be used.
*-----------------------------------------------------------------*
CLAYX = 0.15, 0.15, 0.15      !soil clay content, fraction
SANDX = 0.39, 0.38, 0.40      !soil sand content, fraction
BD =  1.53, 1.71, 1.66     !soil bulk density (g/cm3)

*Soil organic carbon and nitrogen content in kg C or N/ha
SOC = 20258., 38877., 21551.      ! Soil organic C (kg C/ha)
SON = 1245.29, 3126.15, 1265.82        ! Soil organic N (kg N/ha)

SNH4X = 15.89, 27.18, 15.935      !*soil NH4-N (kg N/ha)
SNO3X = 12.48, 35.47, 11.95       !*soil NO3-N (kg N/ha)
```

- Configure los parámetros de retención de agua en el suelo – Asegurese de utilizar las unidades correctas:

standard.sol | SDTOS1MADRI.sol

```
*-----------------------------------------------------------------*
* 8. Soil hydrological properties. Required type of data input    *
* according to setting of conductivity and water retention switch *
*-----------------------------------------------------------------*
* Saturated hydraulic conductivity, for each soil layer
* (cm d-1) (always required!):
KST = 40.10, 32.55, 27.91      !):

* Saturated volumetric water content, for each soil layer
* (m3 m-3)(always required!):
WCST = 0.68, 0.60, 0.70       !):

* Van Genuchten parameters, for each soil layer
* (needed if SWITKH = 1 and/or SWITPF = 1):
VGA = 2*0.0195,0.0177,0.0147,0.0145,0.0189,0.558        !* a parameter (cm-1)
VGL = -1.945,-1.945,-1.8365,-3.773,-1.646,-0.563,1.268  !* l parameter (-)
VGN = 1.104,1.104,1.120,1.062,1.096,1.097,1.0264        !* n parameter (-)
VGR = 7*0.01                                            !* residual water content (-)

* Power function parameters, for each soil layer (-)
* (needed if SWITKH = 2):
*PN = 3*-2.5, 3*-2.5, 2*-2.5, -2.5

*!* Volumetric water content at field capacity, for each soil layer
* (m3 m-3)(needed if SWITPF = 0):
WCFC = 0.41, 0.35, 0.36

*!* Volumetric water content at wilting point, for each soil layer
* (m3 m-3) (needed if SWITPF = 0):
WCWP = 0.22, 0.16, 0.17

*!* Volumetric water content at air dryness, for each soil layer
* (m3 m-3) (needed if SWITPF = 0):
WCAD = 0.08, 0.06, 0.07
```

- Configure las condiciones iniciales. WCLI = WCFC

```
*-----------------------------------------------------------------*
* 9. Initialization conditions, and re-initialization
*-----------------------------------------------------------------*
WL0I = 0.   ! Initial ponded water depth at start of simulation (mm)

* Initial volumetric water content at the start of simulation,
* for each soil layer (m3 m-3):  USE ALWAYS FIELD CAPACITY, OR 0.5 TIMES WCST
WCLI = 0.41, 0.35, 0.36
! Initial ponded water depth at start of simulation (mm)

* Initial ponded water depth and water contents may be reset:
* Ponded water depth: at minimum of WL0I and WL0MX
* Water contents in all soil layers: at saturation value
*   for direct-seeded rice, this happens at sowing,
*   for transplanted rice, this happens at transplanting
* Re-initialize switch RIWCLI is YES or NO
RIWCLI = 'NO'
*RIWCLI = 'YES'
```

- Para las condiciones de temperatura del suelo, asumiremos 23 grados en promedio/ anual

```
*-----------------------------------------------------------------*
* 10. Initialization of soil thermal conditions
*-----------------------------------------------------------------*
SATAV = 23.0       ! Soil annual average temperature of the first layers
SOILT = 23.0, 20.0, 18.0
! Initial soil temperature in each layer
! Have to provide either one or two of the above parameter, otherwise,
! model starts the calculation of soil temperature at 0 degree
```

- Modifique la tabla de interpolación de acuerdo al número de capas de su suelo:

```
* Table for interpolation of water content between soil layers for
* those layers for which no observations were made: first number is
* the soil layer for which interpolation needs to be done, the second
* is the number of the underlying soil layer, the third is the number
* of the overlying soil layer. No interpolation is performed when all
* three numbers are the same:
WCLINT = 1,1,1,
         2,2,2,
         3,3,3
```

2. Guarde el archivo de suelo con el nombre ***VAIR.SOL***