

Modelación agroclimática con ORYZA(v3.0)

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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/AACIWMDJbVQZJo3CAI0CDCzDa?dl=0>

Name	Type
data	File folder
control.dat	DAT File
F2000.crp	CRP File
PARAM.IN	IN File
reruns.rer	RER File
VAIR.exp	EXP File
VAIR1.013	013 File

DRATE(v2).exe	Application
ORYZA3.exe	Application
PARAM(v2).exe	Application

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**

```
standard.sol
1 *****
2 * Template soil data file for PADDY soil water balance model. *
3 * File name : VAIR.SOL *
4 * Soil : IRRI lowland farm, Los Banos, Philippines *
5 * (IsohyperthermicTypicHapludalf) *
6 * Experiment : Drought stress and well-watered control experiment. *
7 * Data was given by Dr. Tao Li with file name: *
8 * "root growth simulation 2010DS" at *
9 * E:\oryza 2000 DATA\Data\root growth. *
10 * ORYZA2000. IRRI, Los Banos. *
11 *****
12
13 * Give code name of soil data file to match the water balance PADDY:
14 * SCODE = 'PADDY'
15
```

- Configure los parámetros de manejo:

```
16 *-----*
17 * 1. Various soil and management parameters
18 *-----*
19 WLOMX = 100. ! Bund height (mm)
20 NL = 3 ! Number of soil layers (maximum is 10) (-)
21 TKL = 3*0.2 ! Thickness of each soil layer (m)
22 ZRTMS = 0.5 ! Maximum rooting depth in the soil (m)
23
```

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

```
24 *-----*
25 * 2. Puddling switch: 1=PUDDLED or 0=NON PUDDLED
26 *-----*
27 SWITPD = 0 !Non puddled
28 *SWITPD = 1 ! Puddled
29
30 * If PUDDLED, supply parameters for puddled soil
31 NLPUD = 1 ! Number of puddled soil layers, including the plow sole (-)
32 ! (NLPUD cannot exceed the total number of soil layers NL)
33
34 * Saturated volumetric water content of ripened (previously puddled)
35 * soil (m3 m-3), for each soil layer:
36 WCSTRP = 0.68, 0.60, 0.70
37
38 * Soil water tension of puddled soil layer at which cracks reach
39 * break through the plow sole (pF):
40 PFCR = 6.0
41
42 DPLOWPAN = 0.6 !* The depth of plow pan (m); if it does not appear, it is:
43 !* if SWITPN = 1, DPLOWPAN = sum(TKL(1:NPLUD))
44 !* if SWITPN = 0, DPLOWPAN = sum(TKL(1:NL))
45
46 *-----*
```

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

```

46 *-----*
47 * 3. Groundwater switch: 0=DEEP (i.e., not in profile), 1=DATA
48 * (supplied), 2=CALCULATE
49 *-----*
50 SWITGW = 0 ! Deep groundwater ←
51 *SWITGW = 2 ! Calculate groundwater
52 *SWITGW = 1 ! Groundwater data
53

```

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

```

66 *-----*
67 * 4. Percolation switch
68 * Value for SWITVP cannot be 1 (CALCULATE) for non-puddled soil
69 *-----*
70 SWITVP = -1 ! Fixed percolation rate ←
71 *SWITVP = 0 ! Percolation as function of the groundwater depth
72 *SWITVP = 1 ! Calculate percolation
73 *SWITVP = 2 ! Fixed percolation rate as function of time
74
75 * If SWITVP = -1, supply fixed percolation rate (mm d-1):
76 FIXPERC = 6.69
77

```

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

```

90 *-----*
91 * 5. Conductivity switch: 0=NO DATA, 1=VAN GENUCHTEN or 2=POWER
92 * OR 3= SPAW function used
93 *-----*
94 SWITKH = 0 ! No data
95 *SWITKH = 2 ! Power
96 *SWITKH = 1 ! vanGenuchten
97 *SWITKH = 11 !Spaw function
98
99 *-----*
100 * 6. Water retention switch: 0=DATA; 1=VAN GENUCHTEN. When DATA, data
101 * have to be supplied for saturation, field capacity,
102 * wilting point, and at air dryness
103 *-----*
104 SWITPF = 0 ! Data
105 *SWITPF = 1 ! van Genuchten
106 *SWITPF = 11 ! SPAW FUNCTION

```

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

```

108 *-----*
109 * 7. Soil physical properties, these parameters will be used when model
110 * runs under actual water or nitrogen condition, or even both. Otherwise
111 * these parameters will not be used.
112 *-----*
113 CLAYX = 0.15, 0.15, 0.15      !soil clay content, fraction
114 SANDX = 0.39, 0.38, 0.40      !soil sand content, fraction
115 BD = 1.53, 1.71, 1.66        !soil bulk density (g/cm3)
116
117 *Soil organic carbon and nitrogen content in kg C or N/ha
118 SOC = 20258., 38877., 21551.  ! Soil organic C (kg C/ha)
119 SON = 1245.29, 3126.15, 1265.82 ! Soil organic N (kg N/ha)
120
121 SNH4X = 15.89, 27.18, 15.935  !*soil NH4-N (kg N/ha)
122 SNO3X = 12.48, 35.47, 11.95  !*soil NO3-N (kg N/ha)
123

```

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

```

standard.sol SDTOS1MADRI.sol
129 *-----*
130 * 8. Soil hydrological properties. Required type of data input *
131 * according to setting of conductivity and water retention switch *
132 *-----*
133 * Saturated hydraulic conductivity, for each soil layer
134 * (cm d-1) (always required!):
135 KST = 40.10, 32.55, 27.91    !):
136
137 * Saturated volumetric water content, for each soil layer
138 * (m3 m-3) (always required!):
139 WCST = 0.68, 0.60, 0.70     !):
140
141 * Van Genuchten parameters, for each soil layer
142 * (needed if SWITKH = 1 and/or SWITPF = 1):
143 VGA = 2*0.0195, 0.0177, 0.0147, 0.0145, 0.0189, 0.558    !* a parameter (cm-1)
144 VGL = -1.945, -1.945, -1.8365, -3.773, -1.646, -0.563, 1.268 !* l parameter (-)
145 VGN = 1.104, 1.104, 1.120, 1.062, 1.096, 1.097, 1.0264    !* n parameter (-)
146 VGR = 7*0.01                                              !* residual water content (-)
147
148 * Power function parameters, for each soil layer (-)
149 * (needed if SWITKH = 2):
150 *PN = 3*-2.5, 3*-2.5, 2*-2.5, -2.5
151
152 *!* Volumetric water content at field capacity, for each soil layer
153 * (m3 m-3) (needed if SWITPF = 0):
154 WCFC = 0.41, 0.35, 0.36
155
156 *!* Volumetric water content at wilting point, for each soil layer
157 * (m3 m-3) (needed if SWITPF = 0):
158 WCWP = 0.22, 0.16, 0.17
159
160 *!* Volumetric water content at air dryness, for each soil layer
161 * (m3 m-3) (needed if SWITPF = 0):
162 WCAD = 0.08, 0.06, 0.07
163

```

- Configure las condiciones iniciales. $WCLI = WCFC$

```

164 *-----*
165 * 9. Initialization conditions, and re-initialization
166 *-----*
167 WLOI = 0. ! Initial ponded water depth at start of simulation (mm)
168
169 * Initial volumetric water content at the start of simulation,
170 * for each soil layer (m3 m-3): USE ALWAYS FIELD CAPACITY, OR 0.5 TIMES WCST
171 WCLI = 0.41, 0.35, 0.36
172 ! Initial ponded water depth at start of simulation (mm)
173
174 * Initial ponded water depth and water contents may be reset:
175 * Ponded water depth: at minimum of WLOI and WLOMX
176 * Water contents in all soil layers: at saturation value
177 *   for direct-seeded rice, this happens at sowing,
178 *   for transplanted rice, this happens at transplanting
179 * Re-initialize switch RIWCLI is YES or NO
180 RIWCLI = 'NO'
181 *RIWCLI = 'YES'
182

```

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

```

183 *-----*
184 * 10. Initialization of soil thermal conditions
185 *-----*
186 SATAV = 23.0 ! Soil annual average temperature of the first layers
187 SOILT = 23.0, 20.0, 18.0
188 ! Initial soil temperature in each layer
189 ! Have to provide either one or two of the above parameter, otherwise,
190 ! model starts the calculation of soil temperature at 0 degree
191

```

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

```

208 * Table for interpolation of water content between soil layers for
209 * those layers for which no observations were made: first number is
210 * the soil layer for which interpolation needs to be done, the second
211 * is the number of the underlying soil layer, the third is the number
212 * of the overlying soil layer. No interpolation is performed when all
213 * three numbers are the same:
214 WCLINT = 1,1,1,
215         2,2,2,
216         3,3,3
217

```

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

