10.1071/AR06365_ AC
©CSIRO 2007
Accessory Publication: Aust. J. Agric. Res., 2007, 58(8), 802-810.

Accessory Publication

Parameters used in setting up APSIM simulations

The parameters are soil or soil-crop dependent parameters used in all APSIM simulations.

a. Parameters that apply to a whole soil and used for all sites

Soil Parameter	Value		Description
Cona	2[a]	3.5[b]	coefficient of cumulative second stage evaporation against the square root of time
U	2[a]	6.0[b]	amount of cumulative evaporation before supply of moisture from the soil surface falls below atmospheric demand
Salb	0.13		bare soil albedo
Diffus_const	44		coefficient defining diffusivity
Diffus_slope	16		coefficient defining diffusivity
CN2-bare	73		runoff curve number for bare soil
CN_red	20		reduction in curve number due to vegetation cover
CN_cov	0.8		fraction of vegetation cover that maximises CN_red
Root CN	40		C:N ratio of residual roots
Root Wt	1500		weight of residual roots (kg/ha)
Soil CN	12		C:N ratio for the soil
Pot_decomp_rate	0.1		Potential decomposition rate of surface residues (day^{-1})
Residue_wt	1000		Initial surface residues (kg/ha)
Residue_cnr	80		C:N ratio of surface residues
Residue_type	wheat		Type of surface residue (determines specific area of residue)

[a]this value applies between 1st April and 30th Sept.
[b]this value applies between 1st October and 31st March.

b. Soil property values by layers as used for all sites

layer	1	2	3	4	5	6	7	Layer number
dlayer	100	200	200	200	200	200	200	Layer depth (mm)
kl	0.06	0.06	0.04	0.04	0.04	0.04	0.02	rate of soil water extraction
xf	1.0	1.0	1.0	1.0	1.0	1.0	1.0	root hospitality factor
swcon	0.3	0.3	0.3	0.3	0.3	0.3	0.3	rate of flow of water under saturated conditions
fbiom	0.035	0.02	0.015	0.015	0.015	0.01	0.01	proportion of the non-inert carbon in the BIOM pool
finert	0.40	0.55	0.70	0.85	0.95	0.95	0.95	proportion of initial organic C assumed inert
oc	1.3	1.04	0.65	0.325	0.195	0.13	0.13	Organic carbon (%)

c. Soil property inputs measured for each site:

CLL **C**rop lower limit
DUL Soil's drained upper limit
OC Organic carbon (measured in some soils, default values used for other soils)
SW Initial soil water content (volumetric)
pH Soil pH (in 1:5 soil:water suspension)
no3 Initial nitrate N (mg/kg)
nh4 Initial ammonium N (mg/kg)
amp Temperature amplitude (^{0}C) = difference between highest and lowest mean monthly air temperatures calculated from nearest weather station data
tav Mean annual air temperature calculated from nearest weather station data

d. Values derived from measured values using rules

Parameter	Description	Rule
LL15	Soil moisture at 15 bars pressure	LL15 for all depths is set to the values used for the CLL of the top three layers
Air_Dry	Soil moisture limit to which soil can dry by evaporation	50% of LL15 in the top layer, 80% in the second layer and 100% for the rest of the profile
Saturation	Saturated soil moisture content	Add 0.5 to value of DUL
BD	Soil bulk density (g dry soil per cm^3 moist soil)	Calculated from DUL using the formula of Gardner *et al.* (1984).

e. Management input values

sow_pop Population density (plants/m^2)
Fert_rate Nitrogen fertilizer rate (kgN/ha)
Fert_day Date fertilizer was added (date)
Start_sw Date sw was initialized (date)
Start_no3 Date no3 was initialized (date)

f. Wheat cultivar specific phenology parameters

Cultivar	Vern_sens	Photop_sens
H45	1.5	1.5
Wollaroi	1.5	1.5
Baxter	1.5	3.0
Yallaroi	1.5	3.0
Babbler	1.5	3.5
Hybrid Meteor	1.5	3.5
Strzelecki	2.5	4.0
Sunbrook	3.0	4.0