

Table 6 The input file SOIL.INP: soil chemical and soil physical data

Description of variable	Unit	Range	R	DT	Mnemonic
Label for specification of geometry data	-	>profil:	*	C8	LABEL
Number of soil horizons for which data are provided (should correspond with file SWATRE.UNF or WATBAL.UNF)	-	[1 ... MANH]	*	I	NUHO
Thickness of the virtual reservoir where fertilizer additions are leached from proportional to the cumulative precipitation since the fertilization event	m	[0.0 ... 0.2]	*	R	HETOP
Thickness of compartment on top of the soil surface (in case of ponding)	m	[0.0 ... 10.0]	-	R	HE(0)
Fraction of surface runoff passing the surface reservoir and flowing either to surface waters or to the first soil layer	-	[0.0 ... 1.0]	*	R	LEFRRV
Fraction of runoff passed through the surface reservoir that passes the first soil layer	-	[0.0 ... 1.0]	-	R	LEFRSO
Depth of the initial root zone	m	[0.0 ...]	*	R	RODP
Label for specification of temperature data	-	>tempar:	*	C8	LABEL
Frequency of annual temperature wave	rad d ⁻¹	[0.015 ... 0.02]	*	R	FQTE
Thermal diffusivity	m ² d ⁻¹	[0.01 ... 0.1]	-	R	TESMCF
Amplitude of annual sine wave	°C	[0.0 ... 30.0]	*	R	APTE
Average annual temperature at soil surface	°C	[-30.0 ... 30.0]	-	R	AVTE
Phase shift of temperature wave	rad	[0.0 ... 6.28]	-	R	PHSH
Label for first specification of diffusion and soil physical data	-	>sophy1:	*	C8	LABEL
Array with constant in oxygen diffusion relation per horizon in air filled part of the soil according to: $\frac{D_{soil}}{D_{air}} = p_1 (gas\ fraction)^{p_2}$	-	[0.0 ... 10.0]	*	R	PMDf1HN, PMDf2HN (NUHO)
Array with saturated conductivity per horizon	m d ⁻¹	[0.0 ... 10.0]	*	R	CDSAHN (NUHO)
Array with dry bulk density per horizon	kg m ⁻³	[0.001 ... 2700.0]	*	R	RHBDHO (NUHO)
Array with C/N-ratio per horizon	-	[5.0 ... 60.0]	*	R	CNRATIOHO (NUHO)
Array with temp. response coefficient for organic transformations and nitrification per horizon	J mol ⁻¹	[0.0 ... 100000.0]	*	R	ACRDTEHO (NUHO)
Array with temp. response coefficient for transformation of dissolved organic matter (Arrhenius) per horizon	J mol ⁻¹	[0.0 ... 100000.0]	-	R	ACRDTEISHO (NUHO)
Reduction factor for decomposition rate of soil organic matter (humus) in subsoil	-	[0.0 ... 1.0]	*	R	RDFADCHU
Label for second specification of soil physical data	-	>sophy2:	*	C8	LABEL
Switch to select distribution of evapotranspiration flux EVROSE=0: uniform root extraction EVROSE=1: root extraction decreases linear with depth	-	[0 ... 1]	*	I	EVROSE
Switch to select kind of input of soil physical variables NUPF-SCPF OPTPFHN=0: values are provided for two zones (root zone and subsoil) OPTPFHN=1: values are provided for each soil horizon (only relevant for regional SIMGRO applications)	-	[0 ... 1]	*	I	OPTPFHN

This label only if soil temperatures are not provided by the result of the hydrological model

This label only if IWA=1

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Description of variable	Unit	Range	R	DT	Mnemonic	
If OPTPFHN = 0: K = 2 If OPTPFHN = 1: K = NUHO						
Array with number of data-pairs the moisture retention curve is described with of horizon HN for every K	-	[3 ... 100]	*	I	NUPF(K)	
Array with volume moisture fractions of horizon HN for every NUPF(K)	m ³ m ⁻³	[0.0 ... 1.0]	*	R	MOFRPF (NUPF(K))	
Array with suction values of pF-curve of horizon HN for every NUPF(K)	cm	[0.0 ... 1.0E+7]	*	R	SCPF(NUPF(K))	
Capillary height: distance between root zone and groundwater level if capillary rise flux equals 0.1 mm d ⁻¹ under steady state conditions	m	[0.1 ... 3.0]	*	R	HECZ	Only if OPTPFHN ≠ 1
Label for specification of soil chemical data	-	>sochem:	*	C8	LABEL	
Array with pH-H ₂ O per horizon	-	[3.0 ... 9.0]	*	R	PHHO(NUHO)	
Array with NH ₄ -N sorption coefficient per horizon	m ³ kg ⁻¹	[0.0 ... 0.05]	*	R	SOCFNHHO (NUHO)	
Label for specification of soil chemical data for phosphorus	-	>soalfe:	*	C8	LABEL	
Switch for type of input concerning Al and Fe input OPTALFE = 0 no values for Al and Fe are given in Soil.Inp file (Values should be specified in the file Chempar.inp) (Not optional) OPTALFE = 1 Sum of Al and Fe per horizon is specified OPTALFE = 2 Both Al and Fe per horizon are specified	-	[0 ... 2]	*	I	OPTALFE	This label only if IPO=1
Array with Al+Fe-content of horizons 1-NUHO	mmol kg ⁻¹	[5.0 ... 1000.0]	-	R	ALFEHO (NUHO)	Only if OPTALFE=1
Array with Al-content of horizons 1-NUHO	mmol kg ⁻¹	[5.0 ... 500.0]	-	R	ALHO (NUHO)	Only if OPTALFE=2
Array with Fe-content of horizons 1-NUHO	mmol kg ⁻¹	[5.0 ... 500.0]	-	R	FEHO(NUHO)	
Label for specification of macro pore data (Not operational in ANIMO version 4.0!)	-	>MPdscf:	*	C8	LABEL	
Diffusion coefficient for NH ₄ -N	m ² d ⁻¹	[0.0 ... 0.1]	*	R	DSCFNH	This label only if ioptMP=1
Diffusion coefficient for NO ₃ -N	m ² d ⁻¹	[0.0 ... 0.1]	-	R	DSCFNI	
Diffusion coefficient for dissolved organic matter	m ² d ⁻¹	[0.0 ... 0.1]	-	R	DSCFDIOR	
Diffusion coefficient for PO ₄ -P	m ² d ⁻¹	[0.0 ... 0.1]	-	R	DSCFPO	Only if IPO=1
Label for specification of sandy soil	-	>nisand:	*	C8	LABEL	
Array with switch for indicator of sand per horizon 0: no sandy soil horizon 1: sandy soil horizon	-	[0 ... 1]	*	I	Flsand(NUHO)	This label only if ioptAE=1
Use this label if distinction has to be made between sandy and not sandy soils concerning critical value of the moisture response of denitrification. See label '>sonic2:' in MATERIAL.INP. Only to be used in the framework of a STONE model application.						