

Reference Manual

AquaCrop Version 4.0

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List of principal symbols

Symbol	Description	Unit
B	dry (above ground) biomass	Mg ha^{-1}
CC	Green Canopy Cover	m^2 m^{-2}
CC*	Green Canopy Cover adjusted for micro advection	m^2 m^{-2}
cc_o	Canopy size of the average seedling at 90% emergence	cm^2
CC_o	Canopy Cover at 90% emergence or after transplanting	m^2 m^{-2}
CC_x	Maximum green Canopy Cover	m^2 m^{-2}
CDC	Canopy Decline Coefficient	d^{-1} or °C-d^{-1}
CGC	Canopy Growth Coefficient	d^{-1} or °C-d^{-1}
CN_{II}	Curve Number for antecedent moisture class II	-
CR	Capillary Rise	mm d^{-1}
Dr	Root zone depletion	mm
DP	Deep percolation	mm d^{-1}
E	Soil evaporation	mm d^{-1}
E_x	Soil evaporation in Stage I (wet soil surface)	mm d^{-1}
ECe_n	Electrical conductivity of the saturated soil-paste extract: lower threshold (at which soil salinity stress starts to occur)	dS m^{-1}
ECe_x	Electrical conductivity of the saturated soil-paste extract: upper threshold (at which soil salinity stress has reached its maximum effect)	dS m^{-1}
EC_w	Electrical conductivity of the irrigation water	dS m^{-1}
ET	Evapotranspiration (soil water evaporation and crop transpiration)	mm d^{-1}
ET_o	Reference crop evapotranspiration (evaporating power of the atmosphere)	mm d^{-1}
f	Adjustment factor	-
f_{age}	Reduction coefficient describing the effect of ageing, nitrogen deficiency, etc. on the crop transpiration coefficient	d^{-1}
f_{sen}	Reduction coefficient describing the effect of canopy senescence on the crop transpiration coefficient	-
f_{yield}	Reduction coefficient describing the effect of the products synthesized during yield formation on the normalized water productivity	-
FC	Field Capacity	
GDD	Growing Degree Days	°C-d
HI	Harvest Index	%
HI_o	Reference Harvest Index	%
I	Irrigation	mm d^{-1}
K_{sat}	Saturated hydraulic conductivity	mm d^{-1}
Kcb	Crop transpiration coefficient	-
Kcb_x	Crop transpiration coefficient when complete canopy cover (CC = 1) but prior to senescence	-
Ke	Soil evaporation coefficient for fully wet soil surface	-
Ke_x	Soil evaporation coefficient for fully wet and non-shaded soil surface	-

Kr	Evaporation reduction coefficient	-
Ks_{aer}	Water stress coefficient for water logging (aeration stress)	-
Ks_{b}	Cold stress coefficient for biomass production	-
Ks_{CCx}	Soil fertility stress coefficient for maximum Canopy Cover	-
$Ks_{exp,f}$	Soil fertility stress coefficient for canopy expansion	-
$Ks_{exp,w}$	Water stress coefficient for canopy expansion	-
$Ks_{pol,c}$	Cold stress coefficient for pollination	-
$Ks_{pol,h}$	Heat stress coefficient for pollination	-
$Ks_{pol,w}$	Water stress coefficient for pollination	-
Ks_{salt}	Soil salinity stress coefficient	-
Ks_{sen}	Water stress coefficient for canopy senescence	-
Ks_{sto}	Water stress coefficient for stomatal closure	-
Ks_{WP}	Soil fertility stress coefficient for Water Productivity	-
$p_{exp, lower}$	Fraction of TAW at which CGC becomes 0	-
$p_{exp, upper}$	Fraction of TAW at which CGC starts to be reduced	-
p_{pol}	Fraction of TAW at which pollination starts to fail	-
p_{sen}	Fraction of TAW at which early canopy senescence is triggered	-
p_{sto}	Fraction of TAW at which stomata start to close	-
P	Precipitation	$mm.d^{-1}$
PWP	Permanent Wilting Point	
RAW	Readily Available soil Water in the root zone	mm
REW	Readily Evaporable Water	mm
RO	Surface runoff	$mm.d^{-1}$
S	Root extraction term	$m^3.m^{-3}.d^{-1}$
S_x	Maximum root extraction term	$m^3.m^{-3}.d^{-1}$
t	Time	GDD or d
T	Air temperature	°C
T_{avg}	Average air temperature	°C
T_{base}	Base temperature (below which crop development does not progress)	°C
T_n	Daily minimum air temperature	°C
T_{upper}	Upper temperature (above which crop development no longer increases with an increase in air temperature)	°C
T_x	Daily maximum air temperature	°C
Tr	Crop transpiration	$mm.d^{-1}$
Tr_x	Maximum crop transpiration (for a well watered crop)	$mm.d^{-1}$
TAW	Total Available soil Water (between FC and PWP) in the root zone	mm
Wr	Soil water content of the root zone expressed as an equivalent depth	mm
WP	Crop water productivity	$Mg\ ha^{-1}mm$
WP^*	Crop water productivity normalized for ET_o and air CO_2 concentration	$Mg\ ha^{-1}$
$Z_{e,surf}$	Evaporating soil surface layer	m
$Z_{e,top}$	Top soil layer from which water flows to the evaporating surface layer	m
Z	Effective rooting depth	m

Z_n	Minimum effective rooting depth	m
Z_x	Maximum effective rooting depth	m
Δz	Soil compartment (depth layer)	m
θ	Volumetric soil water content	$m^3.m^{-3}$
$\theta_{air\ dry}$	Soil water content when air dry	$m^3.m^{-3}$
θ_{FC}	Soil water content at FC	$m^3.m^{-3}$
θ_{PWP}	Soil water content at PWP	$m^3.m^{-3}$
θ_{sat}	Soil water content at soil saturation	$m^3.m^{-3}$
τ	Drainage coefficient	-

Table of contents

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List of principal symbols

Chapter 1. AquaCrop – FAO crop-water productivity model to simulate yield response to water

1.1 From the Ky approach to the AquaCrop model..... 1-1
1.2 AquaCrop operation 1-5
1.2.1 Calculation scheme 1-5
1.2.2 Simulation of the soil water balance 1-7
1.2.3 Step 1 – simulation of green canopy development (CC) 1-9
1.2.4 Step 2 – simulation of crop transpiration (Tr) 1-11
1.2.5 Step 3 – simulation of the above-ground biomass (B) 1-13
1.2.6 Step 4 – partitioning of biomass (B) into yield (Y) 1-15
1.3 Input requirement 1-16
1.3.1 Weather data 1-16
1.3.2 Crop characteristics 1-17
1.3.3 Soil characteristics 1-18
1.3.4 Management characteristics 1-18
1.4 Applications 1-19
References 1-19

Chapter 2. Users guide

Running AquaCrop

2.1 The AquaCrop environment 2-2
2.2 Main menu 2-3
2.3 Default settings at start 2-4
2.3.1 Selected input 2-4
2.3.2 Program settings 2-5
2.4 Selecting input files and undoing the selection 2-6
2.4.1 Selecting a file 2-6
2.4.2 Undo the selection 2-6
2.5 Displaying and updating input characteristics 2-7
2.5.1 Displaying input data 2-7
2.5.2 Updating input data 2-8
2.6 Creating input files 2-9
2.6.1 The save on disk command 2-9
2.6.2 The save as command 2-9
2.6.3 Create file 2-10
- Create climate file 2-10
- Create ETo, Rain or Temperature file 2-10
- Create crop file 2-11
- Create irrigation file 2-11
- Create soil profile file 2-12
- Create groundwater file 2-12
- Create project file 2-13
- Create field data file 2-13

2.7 To exit and close a menu 2-14

Menu reference

Hierarchical structure of the menus 2-15
Main menu - Environmental panel 2-15
- Climate 2-15
- Crop 2-15
- Management 2-16
- Soil 2-17

Main menu – Simulation panel 2-18
Main menu – Project/Field data panel 2-19
2.8 Climatic data 2-21
2.8.1 Minimum and maximum air temperature 2-21
2.8.2 Reference evapotranspiration (ETo) 2-22
2.8.3 Rainfall 2-22
2.8.4 Mean annual atmospheric CO_2 2-23
2.8.5 Program settings 2-23
2.9 Crop characteristics 2-24
2.9.1 Description 2-26
- Display modes of crop parameters 2-26
- Type of edit fields (cells) 2-26
- Protected files 2-26

2.9.2 Development 2-31

- Initial canopy cover 2-32
- Canopy development 2-34
- Flowering and yield formation (fruit/grain producing crops) 2-37
- Root/Tuber formation (root/tuber crops)....3-39
- Root deepening 2-40
- Temperatures for growing degree days (GDD) 2-43

2.9.3 Evapotranspiration 2-44
- Coefficients 2-44
- Water extraction pattern 2-45

2.9.4 Production 2-47
- Crop water productivity normalized for climate and CO_2 (WP*) 2-47
- Performance under elevated atmospheric CO_2 concentration 2-48
- Reference Harvest Index (HI_o) 2-49

2.9.5 Water stress 2-52
- Canopy expansion, stomatal conductance and early canopy senescence ..2-52
- Effect of soil salinity stress on the thresholds for soil water depletion 2-56
- Aeration stress 2-57
- Harvest Index 2-59

2.9.6 Temperature stress 2-66
- Biomass production 2-66
- Pollination 2-67

2.9.7 Soil fertility stress 2-68
- Display of the effects of soil fertility stress 2-68
- Simulation of the effect of soil fertility stress 2-69
- Calibration of the crop response 2-69

2.9.8 Calibration for soil fertility stress 2-70
- Reference and stressed field 2-70
- Crop response to soil fertility stress 2-71
- The effect of stress on biomass is not yet considered (not calibrated) 2-72
- The effect of stress on biomass is considered (calibrated) 2-76

2.9.9 Soil salinity stress 2-78
- Ks curve 2-78
- Display of the effects of soil salinity stress 2-80
- Calibration of the crop response 2-80

2.9.10 Calibration for soil salinity stress 2-81
- Crop response to soil salinity stress 2-81
- The effect of stress on biomass is not yet considered 2-83
- The effect of stress on biomass is considered 2-86

2.9.11 Calendar 2-88

2.9.12 Program settings 2-89

2.10 Start of the growing cycle 2-90

2.10.1 Specified date....2-90

2.10.2 Generated onset....2-90
- Onset generated based on rainfall 2-90
- Onset generated based on air temperature 2-92

2.11 Irrigation management 2-94

2.11.1 No irrigation (rainfed cropping) 2-94

2.11.2 Determination of net irrigation water requirement 2-94

2.11.3 Irrigation schedule (specified events) 2-95

2.11.4 Generation of irrigation schedules 2-96

2.11.5 Irrigation method 2-98
2.11.6 Irrigation water quality....2-98
2.12 Field management 2-99
2.12.1 Soil fertility....2-99
2.12.2 Mulches 2-102
2.12.3 Field surface practices 2-103
2.12.4 Program settings 2-104
2.13 Soil profile characteristics.... 2-105
2.13.1 Soil horizons and their physical characteristics 2-105
- Soil water content at saturation, field capacity and permanent wilting point 2-105
- Saturated hydraulic conductivity (K_{sat}) 2-106
- Total Available soil Water (TAW) and drainage coefficient (tau) 2-106

2.13.2 Indicative values for soil physical characteristics 2-106
2.13.3 Characteristics of the soil surface layer 2-108
2.13.4 Restrictive soil layer 2-109
2.13.5 Capillary rise 2-110
2.13.6 Program settings 2-111
2.14 Groundwater characteristics 2-112
2.14.1 Constant depth and salinity 2-112
2.14.2 Characteristics vary throughout the year....2-113
- Characteristics are not linked to a specific year 2-113
- Characteristics are linked to specific year(s) 2-115

2.15 Simulation period 2-117
2.16 Initial conditions.... 2-118
2.16.1 Initial soil water content 2-118
2.16.2 Initial soil salinity 2-119
2.16.3 Water between soil bunds 2-120
2.16.4 Program settings 2-121
- Soil compartments 2-121
- Settings at start of the simulation run 2-121

2.17 Off season conditions.... 2-122
2.17.1 Mulches in the off-season 2-122
2.17.2 Irrigation events in the off-season 2-122
2.18 Project characteristics.... 2-124
2.18.1 Single run and multiple run projects 2-125
2.18.2 Selecting and creating a project 2-126
- Selecting a project....2-126
- Creating a project....2-126

2.18.3 Updating project characteristics 2-130
2.19 Field data 2-131
2.19.1 Access to field data menus and data base 2-131
2.19.2 Specifying field data 2-132
2.20 Simulation run 2-133
2.20.1 Display of simulation results 2-133
- Climate-Crop-Soil water sheet 2-133
- Sheet with selected parameter 2-134
- Soil water profile sheet....2-136
- Soil salinity sheet....2-136

- Climate and Water balance sheet....2-137
- Production sheet....2-138
- Totals Run sheet....2-139
- Simulated environment sheet....2-141

2.20.2 Numerical output 2-142
2.20.3 Evaluation of simulation results 2-143
- Graphical and numerical displays 2-143
- Statistical indicators 2-145

2.20.4 Output files 2-149
- Daily results....2-149
- Seasonal results....2-149

Input/Output and program settings Files

2.21 Input files 2-152
2.21.1 Climate file (*.CLI)....2-153
2.21.2 Temperature (*.TMP), ETo (*.ETo) and Rainfall (*PLU) files....2-154
2.21.3 CO2 file (*.CO2) 2-155
2.21.4 Crop file (*.CRO) 2-156
2.21.5 Irrigation file (*.IRR)....2-156
2.21.6 Field management file (*.MAN) 2-156
2.21.7 Soil profile file (*.SOL) 2-156
2.21.8 Groundwater file (*.GWT)....2-156
2.21.9 File with initial conditions file (*.SW0)....2-156
2.21.10 File with off-season conditions (*.OFF) 2-156
2.21.11 Single run Project fiel (*.PRO)....2-156
2.21.12 Multiple run Project file (*.PRM)....2-156
2.21.13 File with field data (*.OBS) 2-156

2.22 Files with program settings 2-157

2.23 Output files 2-158
2.23.1 Crop development and production....2-158
2.23.2 Soil water balance 2-159
2.23.3 Soil water content (profile and root zone)....2-160
2.23.4 Soil salinity (profile and root zone) 2-160
2.23.5 Soil water content (compartments) 2-161
2.23.6 Soil salinity (compartments) 2-162
2.23.7 Net irrigation requirement....2-163
2.23.8 Seasonal output 2-164

Chapter 3. Calculation Procedures

3.1 The root zone as a reservoir 3-2
3.1.1 Incoming and outgoing water fluxes 3-2
3.1.2 Stored soil water and root zone depletion 3-3
- Stored soil water expressed as a equivalent depth 3-3
- Root zone depletion 3-3
- Total Available soil Water (TAW) 3-4

3.2 Stresses 3-5
3.2.1 Stress response functions 3-5
- Linear shape 3-5
- Convex shape 3-6
- Logistic shape 3-6
3.2.2 Soil water stress 3-7
3.2.3 Air temperature stress 3-9
3.2.4 Soil fertility stress 3-10
3.2.5 Soil salinity stress 3-12
- Soil salinity stress coefficient 3-12
- Simulating the effect of soil salinity on crop production 3-13

3.3 Growing Degree Days 3-14
3.3.1 Method 1 3-14
3.3.2 Method 2 3-14
3.3.3 Method 3 3-15

3.4 Green canopy cover for optimal conditions 3-16
3.4.1 Green canopy cover throughout the crop cycle 3-16
3.4.2 Canopy development 3-17
3.4.3 Germination and initial canopy cover at 90% crop emergence 3-18
3.4.4 Maximum canopy cover (CC_x) 3-18
3.4.5 Green canopy cover decline 3-18
3.4.6 Green canopy cover for forage crops 3-19

3.5 Green canopy cover for stress conditions 3-20
3.5.1 Period of potential vegetative growth 3-21
3.5.2 Adjustment of canopy growth coefficient due to water stress 3-22
3.5.3 Early canopy senescence under severe water stress conditions 3-24
3.5.4 Canopy development when transpiration is inhibited 3-26
3.5.5 Canopy development for soil fertility or soil salinity stress 3-26
3.5.6 The effect of soil salinity stress on the thresholds for soil water depletion 3-28

3.6 Effective rooting depth 3-29
3.6.1 Effective rooting depth at planting (Z_n) 3-30
3.6.2 Expansion of the root zone in a well watered soil 3-30
3.6.3 Rooting depth for Forage crops 3-31
3.6.4 Expansion of the root zone when the crop is water stressed 3-31
3.6.5 Expansion of the root zone in a shallow soil 3-33

3.7 Soil water balance 3-34
3.7.1 Time -depth grid 3-34
3.7.2 Calculation scheme 3-35

3.7.3 Redistribution and drainage subroutine 3-36
- Drainage function....3-36
- Drainage characteristic τ (tau) 3-37
- Calculation procedure 3-38
3.7.4 Runoff subroutine 3-40
3.7.5 Infiltration subroutine....3-42
3.7.6 Capillary rise....3-43
- Capillary rise for various depths of the groundwater table 3-43
- Generation of the parameters for capillary rise 3-46
- Equilibrium at field capacity 3-46
- Calculation procedure 3-48
3.7.7 Processing of 10-day and monthly climatic data....3-53
- Daily climatic data 3-53
- Estimation of surface runoff....3-54
- Estimation of effective rainfall and deep percolation 3-54
- Estimation of soil evaporation....3-56

3.8 Salt balance.... 3-57
3.8.1 Movement and accumulation of salts in the soil profile 3-57
3.8.2 Cells 3-57
3.8.3 Salt diffusion....3-59
3.8.4 Vertical salt movement in response to soil evaporation....3-61
3.8.5 Vertical salt movement as a result of capillary rise....3-63
3.8.6 Soil salinity content....3-63

3.9 Soil evaporation.... 3-64
3.9.1 A two stage calculation method....3-65
- Stage I - energy limiting stage....3-65
- Stage II - falling rate stage....3-65
3.9.2 Readily Evaporable Water (REW)....3-65
3.9.3 Soil evaporation coefficient for wet soil surface (Ke) 3-66
3.9.4 Adjustment of Ke for withered canopy, mulches and partial wetting by irrigation 3-68
- Sheltering effect of withered canopy cover....3-68
- Adjustment for mulches 3-69
- Adjustment for partial wetting by irrigation....3-69
- Adjustment for mulches and partial wetting by irrigation 3-69
3.9.5 Evaporation reduction coefficient (Kr) 3-70
3.9.6 Calculation of soil evaporation (E)....3-71
- Energy limiting stage (Stage I)....3-71
- Falling rate stage (Stage II) 3-71

3.10 Crop transpiration 3-73
3.10.1 Crop transpiration coefficient (Kc_{Tr})....3-74
3.10.2 Coefficient for maximum crop transpiration ($Kc_{Tr,x}$)....3-75
3.10.3 Adjustment of $Kc_{Tr,x}$ for ageing and senescence 3-75
- Adjustment of $Kc_{Tr,x}$ for ageing effects....3-75
- Adjustment of $Kc_{Tr,x}$ once senescence is triggered....3-76
3.10.4 Soil water stress coefficient (Ks) 3-77
- Water stress coefficient for stomatal closure (Ks_{sto})....3-77
- Effect of soil salinity in the water stress coefficient for stomatal closure..3-78

- Water stress coefficient for deficient aeration conditions 3-79
3.10.5 Soil water extraction 3-81
- Calculation procedure 3-81
- Maximum root extraction (Sx) and the total extraction rate ($\Sigma S_x dz$).....3-82
3.10.6 Feedback mechanism of transpiration on canopy development.....3-83

3.11 Above-ground biomass..... 3-84
3.11.1 Normalized crop water productivity (WP^*) 3-85
- Normalization for atmospheric CO_2 3-85
- Normalization for the climate.....3-85
- Classes for C3 and C4 crops.....3-85
3.11.2 Adjustment of WP^* for atmospheric CO2, type of products synthesized, and soil fertility 3-86
- Adjustment of WP^* for atmospheric CO_2 (f_{CO2}).....3-86
- Adjustment of WP^* for type of products synthesized (f_{yield}).....3-89
- Adjustment of WP^* for soil fertility and soil salinity stress (Ks_{WP}) 3-90
- Adjustment of WP^* for atmospheric CO_2, type of products synthesized and soil fertility or soil salinity stress 3-91
3.11.3 Air temperature stress coefficient for biomass production 3-92
3.11.4 Above ground biomass production between cuttings 3-92

3.12 Partition of biomass into yield part (yield formation) 3-93
3.12.1 Reference Harvest Index (HI_0) 3-94
3.12.2 Building up of Harvest Index 3-94
- Building up of Harvest Index for leafy vegetable crops 3-94
- Building up of Harvest Index for root/tuber crops.....3-95
- Building up of Harvest Index for fruit/grain producing crops.....3-96
3.12.3 Adjustment of HI_0 for inadequate photosynthesis 3-97
3.12.4 Adjustment of HI_0 for water stress before the start of yield formation 3-98
3.12.5 Adjustment of HI_0 for failure of pollination (only for fruit/grain producing crops) 3-101
- Flowering.....3-101
- Failure of pollination.....3-101
3.12.6 Adjustment of HI_0 for water stress during yield formation.....3-105
- Upward adjustment of HI_0.....3-105
- Downward adjustment of HI_0.....3-107
- Combined effect on HI_0.....3-108
3.12.7 Total effect of water and temperature stress on the Harvest Index 3-109

3.13 Schematic outline of the model operation 3-111

3.14 Simulation of the effect of soil fertility stress 3-112
3.14.1 Calibration of the crop response to soil fertility stress 3-112
3.14.2 Selection of a soil fertility level for simulation 3-113
3.14.3 Running a simulation 3-114

3.15 Simulation of the effect of soil salinity stress 3-115
3.15.1 Calibration of the crop response to soil salinity stress 3-115
3.15.2 Soil salinity stress coefficient 3-117
3.15.3 Simulating the effect of soil salinity on biomass production 3-118
3.15.4 The effect of soil salinity stress on thresholds for soil water depletion....3-120

References 3-122

Chapter 4. Calibration guidance

Annexes

I. Crop Parameters

I.1 Cotton A-3
I.2 Maize A-7
I.3 Potato A-11
I.4 Quinoa A-15
I.5 Rice A-19
I.6 Soybean A-23
I.7 Sugar Beet A-27
I.8 Sunflower A-31
I.9 Tomato A-35
I.10 Wheat A-39
I.11 Barley A-43
I.12 Sugar Cane A-47
I.13 Sorghum A-51
I.14 Tef A-55

II. Indicative values for lengths of crop development stages

III. Indicative values for soil salinity tolerance for some agriculture crops