Supplementary tables

Table S1. *AquaCrop* parameters applied in all simulations.

Data file	Parameter	Symbol	Value
Crop development and production (*.CRO)	Mean canopy size per plant at time of 90% emergence, cm²/plant	cc_o	3
	Sowing/planting density, plants/ha		47619
	Initial canopy cover, %	CC_o	0.14
	Max canopy cover, %	CC_x	70
	Canopy cover growth coefficient, % per degree day	CGC	1.1
	Water Productivity normalized for ETo and CO_2, g/m²	WP^*	33.7
	Reference Harvest Index, %	HI_o	45
	Minimum effective rooting depth, m	Zn	030
	Maximum effective rooting depth, m	Zx	1.2
	Root zone expansion shape factor	n	1.3
Field management (*.MAN)	Mulches, bunds		none
	Weed management		*very good*
	Relative cover of weeds over season, %		5
Soil (*.SOL)	Ready evaporable water from soil surface, mm	REW	11
	Runoff Curve Number	CN	61
	Reduction in Runoff Curve number due to weed management, %		15
	Groundwater depth (constant), m		4
	Capillary rise into rooting depth, mm/day		0
Layer 1 (Silty Loam)	Thickness, m		0.3
	Stoniness (gravel), % wt		0
	Penetrability (root expansion rate), %		100
Layer 2 (Clay)	Thickness, m		2
	Stoniness (gravel), % wt		0
	Penetrability (root expansion rate), %		50
Soil fertility stress (*.CRO)	Class		*Severe*
	Reduced max canopy cover, %	$CCx(adj)$	42
	Reduced WP*, g/m²	$WP^*(adj)$	13.5
	Reduced biomass production, % of potential	$B(adj)$	41
	Adjusted Canopy cover growth coefficient, % per degree day	$CGC(adj)$	0.84

Table S2. Atmosphere CO_2 concentrations (Mauna Luo, ppm) and *AquaCrop* derived growing season related crop phenology parameters (number of days from day 1 after sowing) for each study year.

Parameter	1990	2011	2012
CO_2	354	392	394
Seedling emergence	14	14	14
Max canopy cover	57	60	60
Flowering	62	66	65
Senescence	87	93	92
Max rooting depth	91	97	96
Maturity (harvesting)	91	93	96
Build-up of HI, days	29	31	31
Duration of flowering, days	19	21	21