Supplementary materials

Figures :

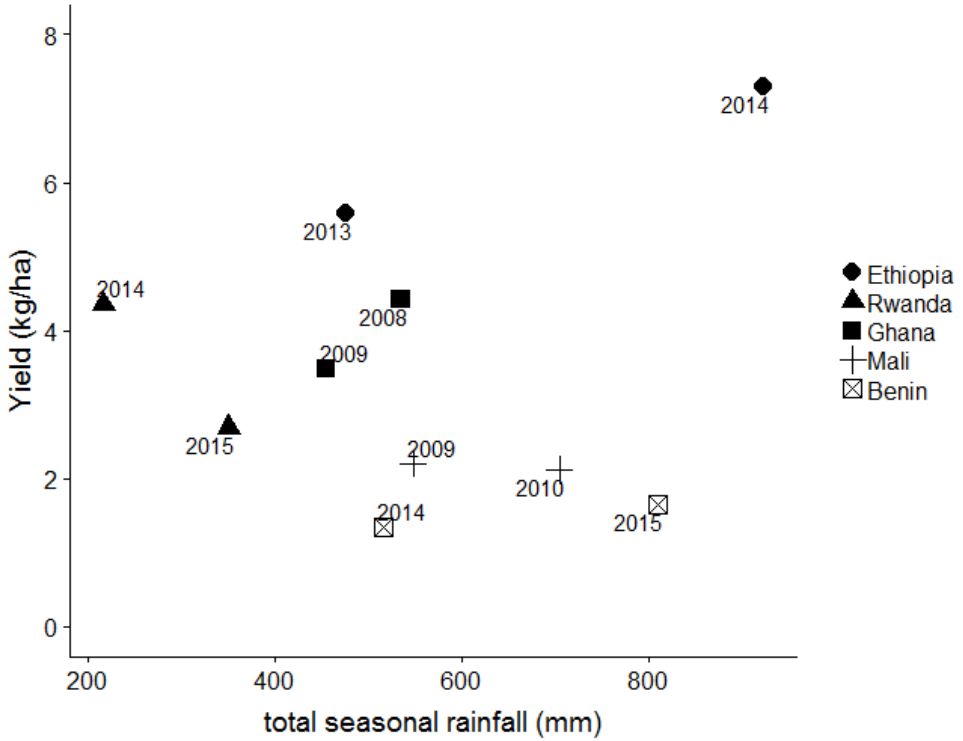

Figure S1: Yield and total seasonal (sowing to maturity) rainfall (mm) at the five study sites in sub-Saharan Africa for the different experimental years.

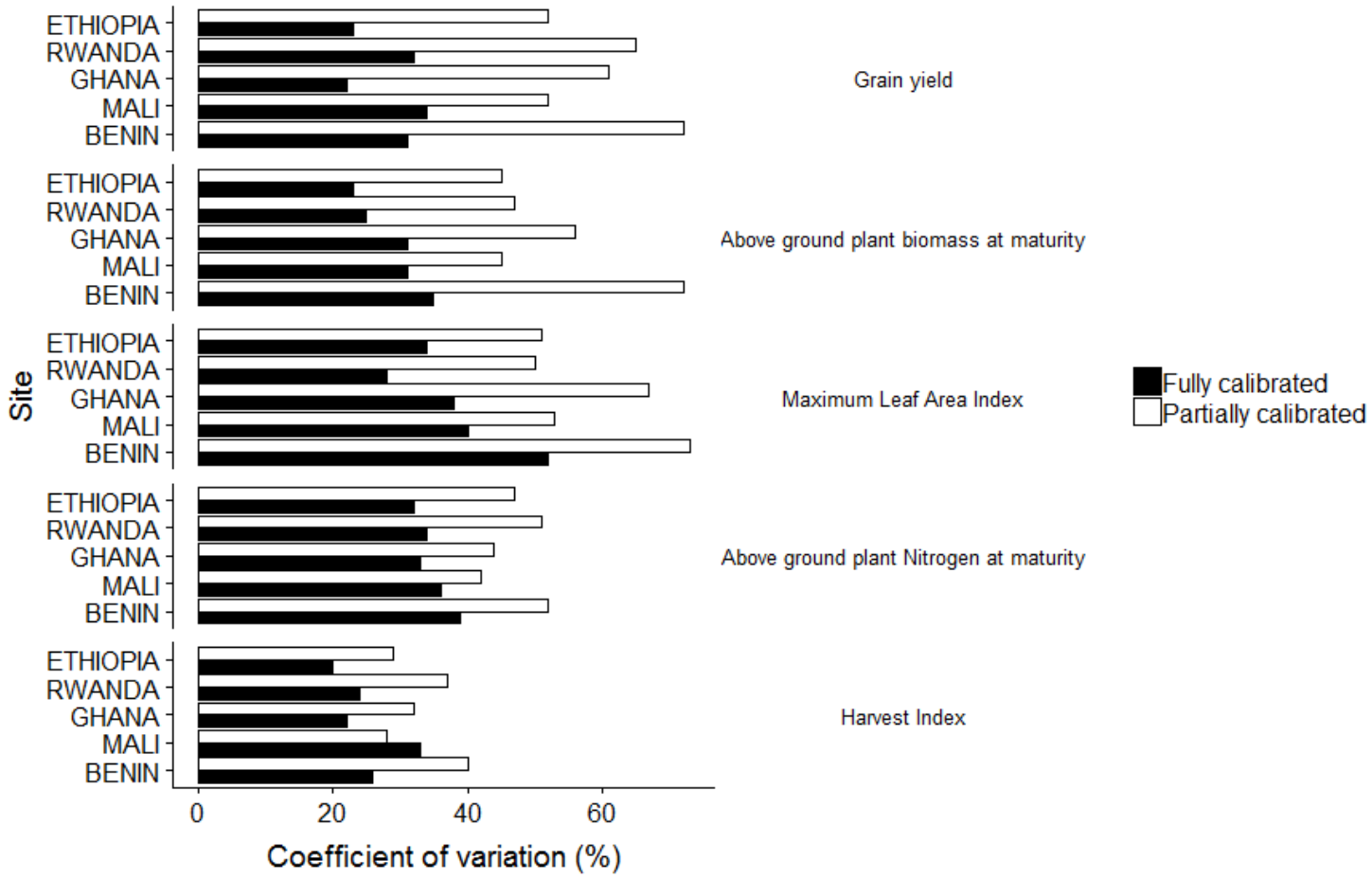

Figure S2: Coefficient of variation of 25 model simulations at the five study sites for five crop variables.

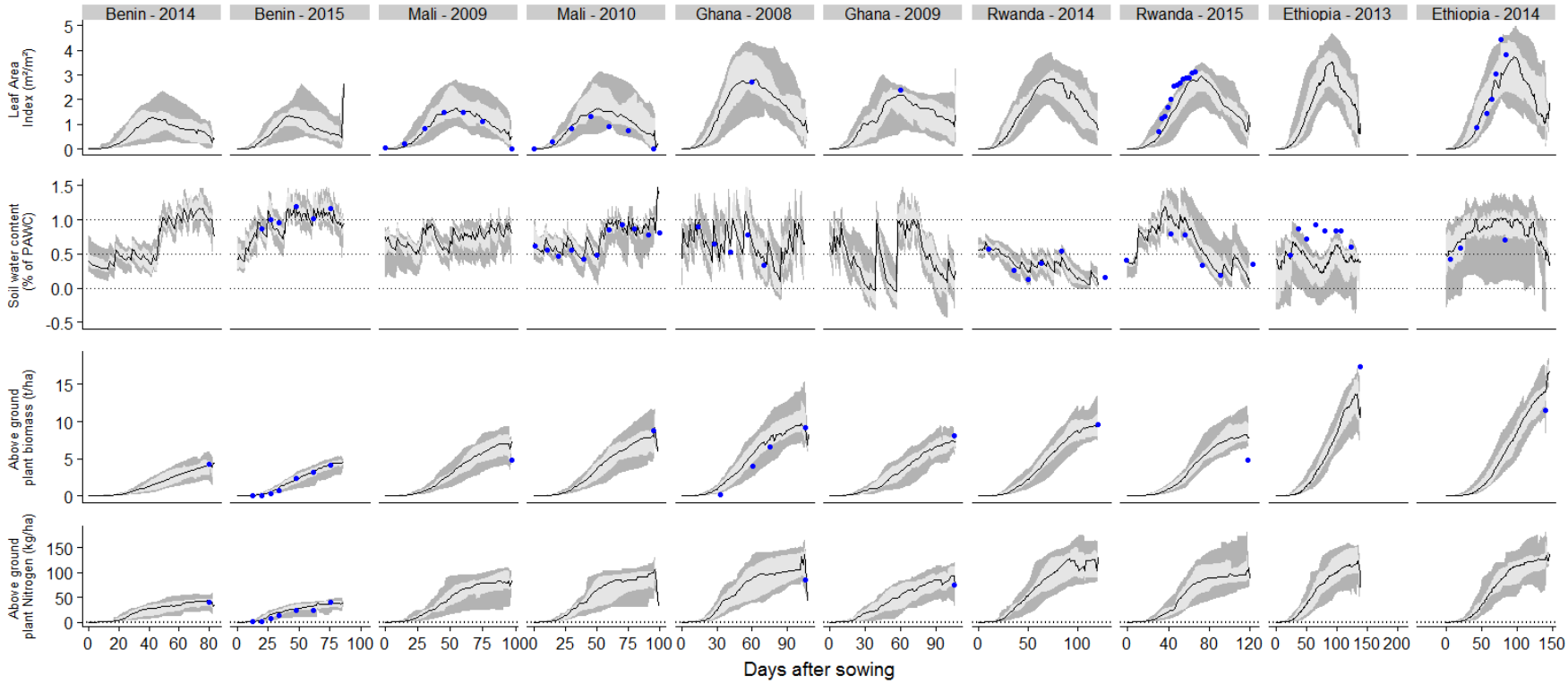

Figure S3: Measured (blue dots) and simulated values of four in-season crop and soil variables for the five study sites and two growing seasons across sub-Saharan Africa, Leaf area index (LAI, m²/m²), soil water content (% of maximum PAWC), aboveground plant biomass (Biom, t/ha) and aboveground plant N (kg/ha). Black solid lines are medians of the simulations. Dark gray areas indicate the 10th to 90th percentile range and light gray areas the 25th to 75th percentile range of the values simulated by fully calibrated maize crop models.

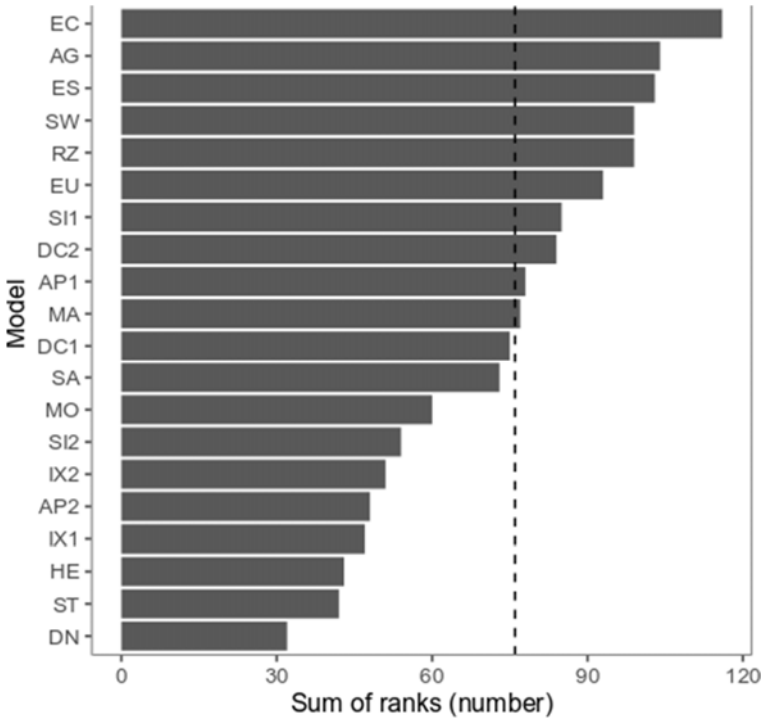

Figure S4: Sum of ranks (based on rRMSE for maize grain yield, total aboveground plant biomass at maturity, maximum LAI, aboveground plant N at maturity, harvest index and in-season soil water content) for the 20 fully calibrated models belonging to class 3. The vertical dotted line indicates the median sum of ranks. For description of model codes and model classes, see Table 2 in the main manuscript.

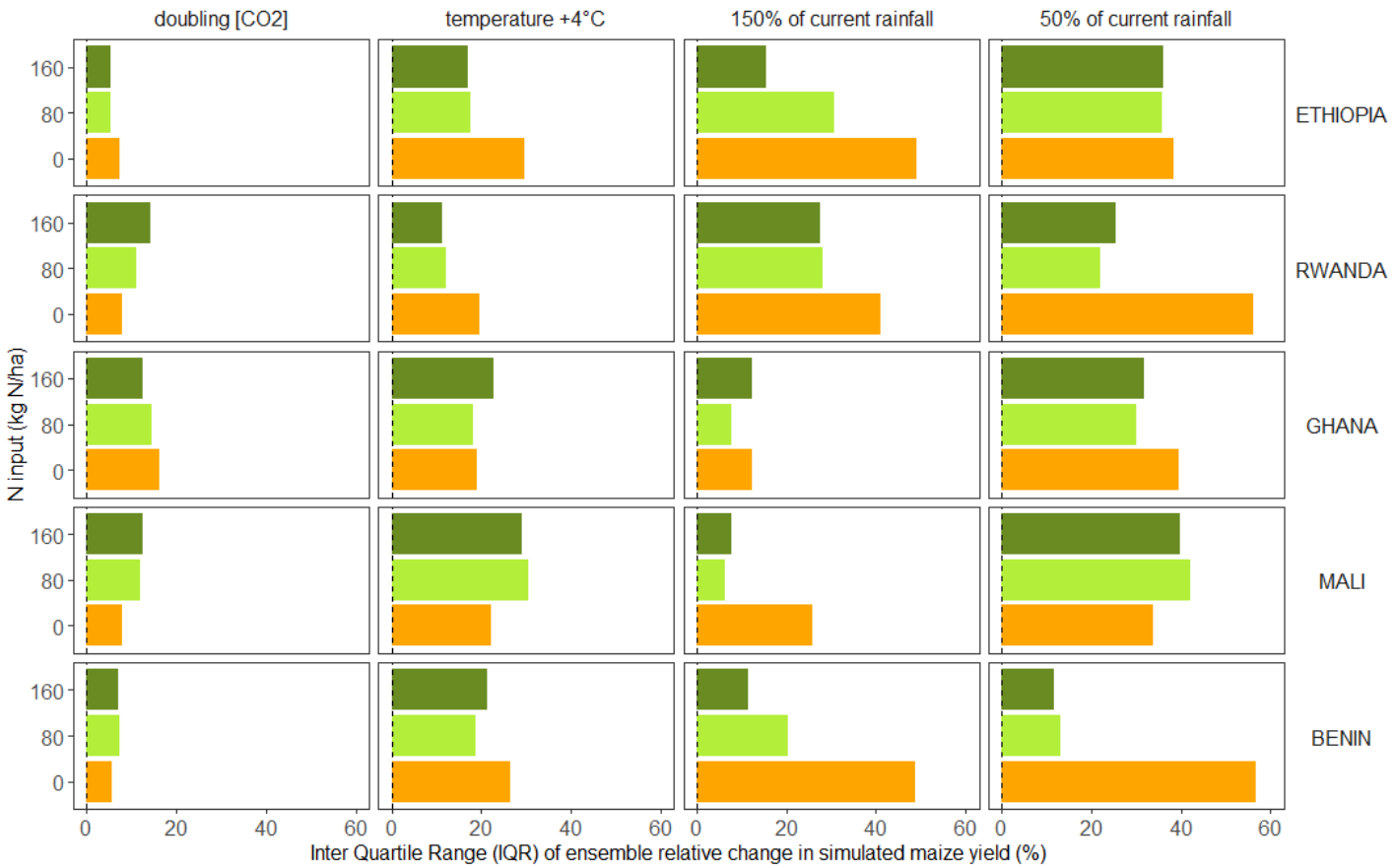

Figure S5: Uncertainty in model response (*i.e.* Inter Quartile Range (IQR) of ensemble relative change in simulated maize yield) when doubling [CO_2], increasing temperature by +4°C, increasing and decreasing rainfall (150% and 50% of baseline rainfall) at five sites across sub-Saharan Africa and for three N fertilizer inputs of 0, 80 and 160 kg N ha^{-1}. Simulations are from 24 maize models with full calibration (one model did not perform the sensitivity analysis).

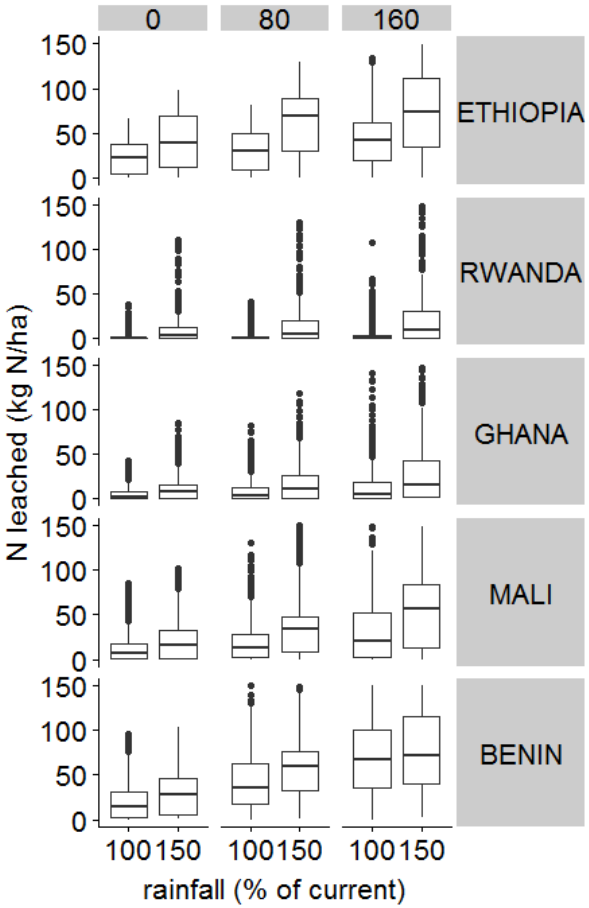

Figure S6: 30-year average of simulated leached nitrogen (kg N/ha) during the cropping season by the 20 models belonging to class 3 (see Table 2) at five sites across sub-Saharan Africa and for three N inputs of 0, 80 and 160 kg N ha^{-1}. The horizontal line in the box and the height of the box are the median and the interquartile range respectively. The whiskers extend from the edge of the box to the most extreme data point below 1.5 interquartile range. Black dots are outliers.

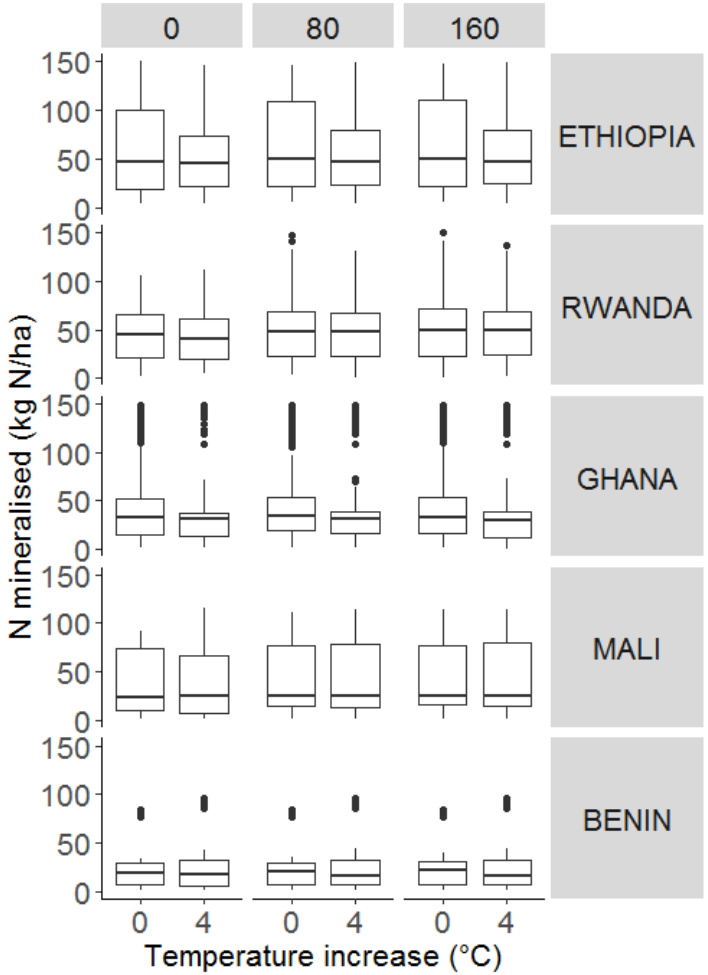

Figure S7: 30-year average of simulated mineralized nitrogen (kg N/ha) during the cropping season by 20 models belonging to class 3 (see Table 2) at five sites across sub-Saharan Africa and for three N inputs of 0, 80 and 160 kg N ha^{-1}. The horizontal line in the box and the height of the

box are the median and the interquartile range respectively. The whiskers extend from the edge of the box to the most extreme data point below 1.5 interquartile range. Black dots are outliers.

Tables:

Table S1: Soil initial conditions for the 10 field experiments in the experimental sites in Benin, Mali, Ghana, Ethiopia and Rwanda.

Site Country	Growing season	Soil layer base depth (cm)	Water content at the lower extraction limit of the maize crop (mm3/mm3)	Water content at the drained upper limit (mm3/mm3)	Initial water content (mm3/mm3)	Initial N-NO3- amout (kg/ha)
Benin	2015	20	0.050	0.205	0.116	15.7
		40	0.085	0.254	0.118	15.7
		60	0.090	0.292	0.147	15.7
	2014	20	0.050	0.205	0.116	10.6
		40	0.085	0.254	0.118	10.6
		60	0.090	0.292	0.147	10.6
Mali	2010	10	0.148	0.283	0.226	1.8
		20	0.14	0.272	0.226	1.8
		30	0.171	0.304	0.226	1.8
		40	0.114	0.283	0.209	1.8
		60	0.086	0.206	0.154	3.5
		80	0.107	0.25	0.184	3.5
		120	0.107	0.25	0.184	6.6
	2009	10	0.148	0.283	0.226	1.8
		20	0.14	0.272	0.226	1.8
		30	0.171	0.304	0.226	1.8
		40	0.114	0.283	0.209	1.8
		60	0.086	0.206	0.154	3.5
		80	0.107	0.25	0.184	3.5
		120	0.107	0.25	0.184	6.6
Ghana	2008	15	0.206	0.335	0.271	16.8
		30	0.243	0.327	0.285	8.6
		45	0.275	0.366	0.321	4.4
		60	0.287	0.372	0.33	2.2
		75	0.297	0.383	0.34	0.9
		100	0.297	0.383	0.301	1.5
	2009	15	0.220	0.335	0.255	9.3

		30	0.256	0.347	0.283	5.1
		45	0.285	0.376	0.312	5.1
		60	0.287	0.372	0.313	2.2
		75	0.297	0.383	0.323	0.9
		100	0.297	0.383	0.323	1.5
Rwanda	2014-2015	15	0.050	0.170	0.114	-
		25	0.075	0.195	0.120	-
		35	0.085	0.195	0.121	-
		50	0.075	0.200	0.119	-
		80	0.070	0.140	0.107	-
		100	0.080	0.195	0.112	-
	2013-2014	15	0.050	0.170	0.116	-
		25	0.075	0.195	0.163	-
		35	0.085	0.195	0.151	-
		50	0.075	0.200	0.157	-
		80	0.070	0.140	0.121	-
		100	0.080	0.195	0.108	-
Ethiopia	2014	15	0.150	0.300	0.012	-
		25	0.200	0.340	0.078	-
		35	0.200	0.400	0.142	-
		50	0.300	0.500	0.241	-
		80	0.350	0.500	0.278	-
		100	0.200	0.375	0.253	-
		120	0.200	0.375	0.253	-
	2013	15	0.150	0.300	0.128	-
		25	0.200	0.340	0.151	-
		35	0.200	0.400	0.231	-
		50	0.300	0.500	0.237	-
		80	0.350	0.500	0.199	-
		100	0.200	0.375	0.206	-
		120	0.200	0.375	0.206	-

Table S2: References and documentation for the 25 models used for assessment of climate change effect on maize yield in smallholder low-input cropping systems.

Model name	Model code	References			Documentation
DNDC	DN	Li et al. (2012)	Giltrap et al. (2010)	Smith et al. (2020)	http://www.dndc.sr.unh.edu/model/GuideDNDC95.pdf
EXPERT-N-Ceres	EC	Stenger et al. (1999)	Biernath et al. (2011)		
EXPERT-N-Spass	ES	Stenger et al. (1999)	Biernath et al. (2011)		
EXPERT-N-Sucros	EU	Stenger et al. (1999)	Biernath et al. (2011)		
HERMES	HE	Kersebaum (2007)	Kersebaum (2011)		http://www.zalf.de/de/forschung_lehre/software_downloads/Seiten/default.aspx
SWB	SW	Annandale et al. (2000)	van der Laan et al. (2010)		Annandale et al. (1999)
SIMPLACE-Lintul + Option 1*	SI1	Addiscott and Whitmore (1991)	Faye et al. (2018)	Corbeels et al. (2005)	http://www.simplace.net
SIMPLACE-Lintul + Option 2**	SI2	Gaiser et al. (2013)	Addiscott and Whitmore (1991)		http://www.simplace.net/doc/simplace_modules/
PEGASUS	PE	Deryng et al. (2011)	Deryng et al. (2014)		Please see ref 1 & 2
CELSIUS	CE	Affholder et al. (2013)	Ricome et al. (2017)		
SARRA-H	SR	Barron et al. (1999)	Baron et al. (2005)		http://sarra-h.teledetection.fr/SARRAH_Home.html
Agro-IBIS	AG	Kucharik and Brye (2003)	Twine et al. (2013)		
RZWQM2	RZ	Saseendran et al. (2014)	Sadhukhan et al. (2019)		Ahuja et al. (2000)
MAIZSIM	MA	Kim et al. (2012)	Yang et al. (2009)		
APSIM-maize + Option 2	AP2	Keating et al. (2003)	Holzworth et al. (2014)		
APSIM-maize + Option 1	AP1	Keating et al. (2003)	Holzworth et al. (2014)		
GLAM	GL	Challinor et al. (2004)			http://www.see.leeds.ac.uk/see-research/icas/climate_change/glam/download_glam.html
MCWLA - Maize	MC	Tao et al. (2009)	(Tao and Zhang, 2010)		
MONICA	MO	Nendel et al. (2010)			https://github.com/zalf-rpm/monica/wiki
STICS	ST	Brisson et al. (1998)	Brisson et al. (2002)	Brisson et al. (2009)	
SALUS	SA	Basso et al. (2010)			
DSSAT-CERES-Maize+Century	DC1	Jones et al., (1986)	Porter et al. (2010)	Ritchie et al. (1998)	
DSSAT-CERES-Maize+Ceres-SOM	DC2	Jones et al., (1986)	Porter et al. (2010)	Ritchie et al. (1998)	
DSSAT-IXIM-Maize+Century	IX1	Lizaso et al. (2011)	Porter et al. (2010)	Ritchie et al. (1998)	
DSSAT-IXIM-Maize+Ceres-SOM	IX2	Lizaso et al. (2011)	Porter et al. (2010)	Ritchie et al. (1998)	

* ET FAO-56 + Heat stress with crop temperature

** ET Hargreaves + Heat stress with air temperature

Tables S3: Parameters calibrated by crop modelers with values for the partial (PC) and full calibration (FC) for the experimental sites in Benin, Mali, Ghana, Rwanda and Ethiopia.

				Benin		Mali		Ghana		Rwanda		Ethiopia	
Model name	Model class	Description of parameter	Unit	PC	FC	PC	FC	PC	FC	PC	FC	PC	FC
MCWLA	1	Yield gap parameter		0.2638	0.51019	0.6142	0.7043	0.4913	0.4899	0.95762	0.9084	0.583068	0.35869
MCWLA	1	Harvest index parameter		0.0158	0.00947	0.0167	0.0102	0.0155	0.0097	0.00707	0.0142	0.010335	0.01001
MCWLA	1	Relative growth rate of root depth and leaf area index		2.0757	3.09504	0.6193	0.3432	2.6313	4.6231	4.51308	0.323	0.681083	3.17705
MCWLA	1	Critical threshold value of soil water stress to affect growth		0.5794	0.56909	0.7224	0.2176	0.3645	0.7216	0.22425	0.7766	0.697614	0.79656
MCWLA	1	Photosynthesis scaling prameter (leaf to canopy)		0.272	0.50862	0.2655	0.5138	0.2383	0.5826	0.52084	0.6489	0.752714	0.61925
MCWLA	1	Intrinsic quantum efficiency of CO2 uptake in C4 plant		0.0558	0.05542	0.0504	0.0582	0.0337	0.0642	0.0357	0.0529	0.044025	0.05564
MCWLA	1	Maximum daily transpiration rate	mm/m^2/day	6.6226	3.47465	13.72	10.033	4.8046	10.735	5.26472	3.1335	6.823794	8.46657
MCWLA	1	Empirical parameter in demand function		6.8086	9.93687	8.9964	9.8113	9.3093	9.5578	3.59215	9.5863	2.267218	2.88015
MCWLA	1	Parameter balancing pi (intercellular partial pressure of CO_2) and pa(ambient partial pressure of CO_2)		0.4674	0.362	0.4953	0.261	0.4619	0.5277	0.58244	0.2684	0.247067	0.36963
MCWLA	1	Maintenance respiration at 25 ^oC	g C/m^2/day	0.7859	0.29052	0.7467	0.6505	0.3612	0.7682	0.40138	0.737	0.22883	0.36809
MCWLA	1	An empirical parameters in calculating maintenance respiration	g C/m^2	36.371	29.169	41.021	85.354	33.071	61.657	38.5629	31.844	37.31505	30.0141
MCWLA	1	Growth respiration parameter		0.1532	0.44149	0.4278	0.1727	0.1992	0.2415	0.23185	0.3997	0.271974	0.3488
MCWLA	1	The initial biomass at emergence	g C/m^2	0.0478	0.15412	0.1284	0.0226	0.0864	0.0706	0.0631	0.1244	0.03442	0.16561
MCWLA	1	Mean rate of LAI decrease after flowering to maturity		-0.02	-0.0542	-0.02	-0.053	-0.02	-0.0936	-0.02	-0.0936	-0.02	-0.0374
CELSIUS	2	hmax: massic soil water content at field capacity (average 0-max soil depth)	g water /100g soil	18	20	13	11	25	23	29	26.3	15	15
CELSIUS	2	hmin: massic soil water content at wilting point (average 0-max soil depth)	g water /100g soil					19	17.5				
CELSIUS	2	Stockinit estimated so that simulated matches observed value for RWBU1401, where initial value was provided for a date later than sowing date	mm			130.6	120.6					90.4	35
CELSIUS	2	dlaimax	unit lai/°C (thermal time)	0.0021	0.00166	0.0021	0.0017	0.0021	0.0017	0.00207	0.0017	0.00207	0.00166
CELSIUS	2	bdens	plant/m2	4.3	4	4.3	4	4.3	4	4.3	4	4.3	4
CELSIUS	2	adens		-0.8	-0.545	-0.8	-0.88	-0.8	-1.159	-0.8	-2.4	-0.8	-0.955
CELSIUS	2	resulting LAImx under potential growth conditions		5.2	4.3	6	4.3	7.7	4.3	5.8	4.3	6.2	4.3
CELSIUS	2	Zsurf (thickness of soil layer impacted by evaporation)	cm	20	20	20	60	20	20	20	80	20	80

CELSIUS	2	Typsurf	code determining a set of 4 parameters of runoff function corresponding to"low","medium" and "high" crusting of soil surface	low	low	low	low	low	low	low	low	low	medium
CELSIUS	2	season average N mineralization rate	% of Norg (kg/ha/season)	2	6	2	1.8	2	2	2	4	2	2
CELSIUS	2	ebmax	g/MJ	4	3.8	4	3.8	4	3.8	4	3.8	4	3.8
CELSIUS	2	viitircarb	per thermal time	0.0156	0.023	0.0156	0.012	0.0156	0.0156	0.0161	0.0156	0.0156	0.011
CELSIUS	2	cgrain	(g.day)^-1	76	76	76	100	76	76	76	95	76	76
CELSIUS	2	cgrainV0	dimensionless	674	674	674	-200	674	300	674	400	674	674
PEGASUS	2	Nutrient stress factor fN	dimensionless	0.5426	0.8196	0.6266	0.8296	0.6686	1.0196	0.6496	0.7496	0.6816	0.7996
SARRA-H	2	KrdtPotA	kg/kg	0.8	0.6	0.8	0.5	0.8	0.9	0.5	0.8	0.8	1
SARRA-H	2	TxConversion	g/Mj	3.47	3.7			5.8	5.6	5.8	5.4		
SARRA-H	2	FeuiAeroPente	None	-7E-05	-4E-05	-5E-05	-0.0001	-5E-05	-9E-05	-5E-05	-7E-05		
SARRA-H	2	SlaMin	Ha/kg	0.0016	0.002	0.0016	0.0015					0.0016	0.002
SARRA-H	2	SlaMax	Ha/kg					0.0065	0.0045	0.0065	0.006	0.0065	0.005
SARRA-H	2	AeroTotPente	None							3.5E-05	2E-05		
APSIM 7.9	3a	tt_emerg_to_endjuv	°C days	250		285		360		350		270	
APSIM 7.9	3a	est_days_endjuv_to_init	°C days	20		20		20		20		20	
APSIM 7.9	3a	tt_flag_to_flower	°C days	10		10		10		10		10	
APSIM 7.9	3a	tt_flower_to_maturity	°C days	610		550		750		580		730	
APSIM 7.9	3a	tt_flower_to_start_grain	°C days	190		170		190		190		170	
APSIM 7.9	3a	tt_maturity_to_ripe	°C days	1	1	1	1	1	1	1	1	1	1
APSIM 7.9	3a	Head_grain_no_max			500	550	900		900		900		520
APSIM 7.9	3a	Grain_gth_rate	mg/grain/day		9	10.5	10		10		10		9

APSIM 7.9	3a	F-inert				0.4	1						
DNDC	3a	Field Capacity	WFPS	0.435	0.545	0.387	0.337	0.71	0.71	0.668	0.76	0.68	0.62
DNDC	3a	Wilting Point	WFPS	0.106	0.33	0.133	0.133	0.437	0.437	0.367	0.567	0.36	0.36
DNDC	3a	Humads	fraction	0.0151	0.25	0.0214	0.0214	0.0167	0.25	0.0171	0.22	0.0147	0.25
DNDC	3a	Humus	fraction	0.9749	0.74	0.9686	0.9686	0.9733	0.74	0.9729	0.77	0.9753	0.74
DNDC	3a	Leaf Partition	fraction	0.22	0.25	0.2	0.175	0.2	0.22	0.2	0.2	0.2	0.275
DNDC	3a	Stem Partition	fraction	0.22	0.25	0.2	0.175	0.2	0.22	0.2	0.2	0.2	0.275
DNDC	3a	Root Partition	fraction	0.11	0.15	0.11	0.1	0.11	0.11	0.11	0.1	0.11	0.1
DNDC	3a	Grain Partition	fraction	0.45	0.35	0.49	0.55	0.49	0.45	0.49	0.5	0.49	0.35
DNDC	3a	Opt Grain C	kg C/ha	3000	3000	3500	3500	3000	4000	3500	3800	3000	3800
DNDC	3a	Leaf C:N	Ratio	65	60	65	60	60	70	85	60	80	60
DNDC	3a	Stem C:N	Ratio	65	60	65	60	60	70	85	60	80	60
DNDC	3a	Root C:N	Ratio	70	40	70	60	65	70	90	60	90	60
DNDC	3a	Grain C:N	Ratio	35	40	35	30	30	35	40	30	40	30
DNDC	3a	Water Req	Scalar	135	90	135	85	140	95	160	95	140	95
DNDC	3a	Crop TDD	Degree Days ($0^{o}C$)	2215	2215	2625	2625	2800	2800	2750	2805	2420	2420
DNDC	3a	N Leaching	Scalar	1.1	1.05	1.22	1.3	1.12	1.19	1	1.02	1	1.19
DNDC	3a	Soil Evaporation	Scalar	1	0.5	1	1	1	1	1	0.85	1	1
DSSAT-CERES-Maize+Century	3a	P1	degree days	220	220	300	300	330	330	365	380	250	230
DSSAT-CERES-Maize+Century	3a	P2	days	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
DSSAT-CERES-Maize+Century	3a	P5	degree days	605	605	640	640	810	810	515	520	725	705
DSSAT-CERES-Maize+Century	3a	G2	#/plant	540	840	600	850	600	700	850	950	600	600
DSSAT-CERES-Maize+Century	3a	G3	mg/day	7.5	9	7.5	8	7.5	8	8	8.4	7.5	7.5
DSSAT-CERES-Maize+Century	3a	PHINT	degree days	50	50	55	55	55	55	55	50	50	55
DSSAT-CERES-Maize+Century	3a	Stable C fraction 0-20 cm	g[stable C]/g[OC]	0.55	0.85								
DSSAT-CERES-Maize+Century	3a	Stable C fraction 20-40 cm	g[stable C]/g[OC]	0.75	0.9								
DSSAT-CERES-Maize+Century	3a	Stable C fraction 40-60 cm	g[stable C]/g[OC]	0.95	0.98								
DSSAT-CERES-Maize+Century	3a	stable C fraction 0-15 cm	g[stable C]/g[OC]			0.850	0.950						
DSSAT-CERES-Maize+Century	3a	stable C fraction 15-25 cm	g[stable C]/g[OC]			0.875	0.950						

DSSAT-CERES-Maize+Century	3a	stable C fraction 25-35 cm	g[stable C]/g[OC]			0.900	0.960						
DSSAT-CERES-Maize+Century	3a	stable C fraction 35-50 cm	g[stable C]/g[OC]			0.953	0.970						
DSSAT-CERES-Maize+Century	3a	stable C fraction 50-80 cm	g[stable C]/g[OC]			0.980	0.980						
DSSAT-CERES-Maize+Century	3a	stable C fraction 80-100 cm	g[stable C]/g[OC]			0.980	0.980						
DSSAT-CERES-Maize+Century	3a	Modify SLPF	--					0.86	0.82			0.9	0.82
DSSAT-CERES-Maize+Century	3a	Added simulation of phosphorus	--										
DSSAT-CERES-Maize+Century	3a	Soil lower limit 0-10 cm	vol fraction									0.148	0.128
DSSAT-CERES-Maize+Century	3a	Soil lower limit 10-20 cm	vol fraction									0.14	0.12
DSSAT-CERES-Maize+Century	3a	Soil lower limit 20-30 cm	vol fraction									0.171	0.131
DSSAT-CERES-Maize+Century	3a	Soil lower limit 30-40 cm	vol fraction									0.114	0.094
DSSAT-CERES-Maize+Century	3a	Soil lower limit 40-60 cm	vol fraction									0.086	0.086
DSSAT-CERES-Maize+Century	3a	Soil lower limit 60-80 cm	vol fraction									0.107	0.107
DSSAT-CERES-Maize+Century	3a	Soil lower limit 80-120 cm	vol fraction									0.107	0.107
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 0-10 cm	vol fraction									0.283	0.233
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 10-20 cm	vol fraction									0.272	0.222
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 20-30 cm	vol fraction									0.304	0.244
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 30-40 cm	vol fraction									0.283	0.233
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 40-60 cm	vol fraction									0.206	0.206
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 60-80 cm	vol fraction									0.25	0.25
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 80-120 cm	vol fraction									0.25	0.25
DSSAT-CERES-Maize+Century	3a	soil saturation water content 0-10 cm	vol fraction									0.317	0.327
DSSAT-CERES-Maize+Century	3a	soil saturation water content 10-20 cm	vol fraction									0.305	0.315
DSSAT-CERES-Maize+Century	3a	soil saturation water content 20-30 cm	vol fraction									0.337	0.347
DSSAT-CERES-Maize+Century	3a	soil saturation water content 30-40 cm	vol fraction									0.331	0.341
DSSAT-CERES-Maize+Century	3a	soil saturation water content 40-60 cm	vol fraction									0.226	0.246
DSSAT-CERES-Maize+Century	3a	soil saturation water content 60-80 cm	vol fraction									0.273	0.293
DSSAT-CERES-Maize+Century	3a	soil saturation water content 80-120 cm	vol fraction									0.273	0.293
DSSAT-CERES-Maize+Century	3a	Soil lower limit 0-15 cm	vol fraction					0.206	0.176				
DSSAT-CERES-Maize+Century	3a	Soil lower limit 15-30 cm	vol fraction					0.243	0.223				
DSSAT-CERES-Maize+Century	3a	Soil lower limit 30-45 cm	vol fraction					0.275	0.255				
DSSAT-CERES-Maize+Century	3a	Soil lower limit 45-60 cm	vol fraction					0.287	0.267				
DSSAT-CERES-Maize+Century	3a	Soil lower limit 60-75 cm	vol fraction					0.297	0.277				
DSSAT-CERES-Maize+Century	3a	Soil lower limit 75-100 cm	vol fraction					0.297	0.277				
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 0-15 cm	vol fraction					0.335	0.305				
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 15-30 cm	vol fraction					0.327	0.317				
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 30-45 cm	vol fraction					0.366	0.356				
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 45-60 cm	vol fraction					0.372	0.362				
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 60-75 cm	vol fraction					0.383	0.373				

DSSAT-CERES-Maize+Century	3a	soil drained upper limit 75-100 cm	vol fraction					0.383	0.373				
DSSAT-CERES-Maize+Century	3a	soil saturation water content 0-15 cm	vol fraction					0.36	0.36				
DSSAT-CERES-Maize+Century	3a	soil saturation water content 15-30 cm	vol fraction					0.408	0.418				
DSSAT-CERES-Maize+Century	3a	soil saturation water content 30-45 cm	vol fraction					0.415	0.425				
DSSAT-CERES-Maize+Century	3a	soil saturation water content 45-60 cm	vol fraction					0.409	0.419				
DSSAT-CERES-Maize+Century	3a	soil saturation water content 60-75 cm	vol fraction					0.416	0.426				
DSSAT-CERES-Maize+Century	3a	soil saturation water content 75-100 cm	vol fraction					0.46	0.47				
DSSAT-CERES-Maize+Century	3a	soil lower limit 35-50 cm								0.3	0.28		
DSSAT-CERES-Maize+Century	3a	soil lower limit 50-80 cm								0.35	0.33		
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 35-50 cm								0.5	0.48		
DSSAT-CERES-Maize+Century	3a	soil drained upper limit 50-80 cm								0.5	0.48		
DSSAT-CERES-Maize+Century	3a	2014 Initial ammonium 0-15 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 Initial ammonium 15-25 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 Initial ammonium 25-35 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 Initial ammonium 35-50 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 Initial ammonium 50-80 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 Initial ammonium 80-100 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 initial nitrate 0-15 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 initial nitrate 15-25 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 initial nitrate 25-35 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 initial nitrate 35-50 cm	ppm			not specified	0.01						

DSSAT-CERES-Maize+Century	3a	2014 initial nitrate 50-80 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2014 initial nitrate 80-100 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Century	3a	2013 Initial ammonium 0-15 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Century	3a	2013 Initial ammonium 15-25 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Century	3a	2013 Initial ammonium 25-35 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Century	3a	2013 Initial ammonium 35-50 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Century	3a	2013 Initial ammonium 50-80 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Century	3a	2013 Initial ammonium 80-100 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Century	3a	2013 initial nitrate 0-15 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Century	3a	2013 initial nitrate 15-25 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Century	3a	2013 initial nitrate 25-35 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Century	3a	2013 initial nitrate 35-50 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Century	3a	2013 initial nitrate 50-80 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Century	3a	2013 initial nitrate 80-100 cm	ppm			not specified	10						

DSSAT-IXIM-Maize+Century	3a	P1	degree days	300	223	300	300	330	338	325	380	230	230
DSSAT-IXIM-Maize+Century	3a	P2	days	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
DSSAT-IXIM-Maize+Century	3a	P5	degree days	530	650	700	600	810	800	515	525	725	750
DSSAT-IXIM-Maize+Century	3a	G2	#/plant	540	950	600	540	600	750	850	900	540	450
DSSAT-IXIM-Maize+Century	3a	G3	mg/day	7.5	9.5	7.5	7.5	7.5	8.5	8	8.5	7.5	5.5
DSSAT-IXIM-Maize+Century	3a	PHINT	degree days	50	50	55	65	50	55	55	50	50	55
DSSAT-IXIM-Maize+Century	3a	AX	cm2/leaf	650	400	800	750	800	850	650	600	650	350
DSSAT-IXIM-Maize+Century	3a	ALL	degree days	800	450	800	800	800	800	800	850	800	600
DSSAT-IXIM-Maize+Century	3a	Stable C fraction 0-20 cm	g[stable C]/g[OC]	0.55	0.85								
DSSAT-IXIM-Maize+Century	3a	Stable C fraction 20-40 cm	g[stable C]/g[OC]	0.75	0.9								
DSSAT-IXIM-Maize+Century	3a	Stable C fraction 40-60 cm	g[stable C]/g[OC]	0.95	0.98								
DSSAT-IXIM-Maize+Century	3a	stable C fraction 0-15 cm	g[stable C]/g[OC]			0.850	0.950						
DSSAT-IXIM-Maize+Century	3a	stable C fraction 15-25 cm	g[stable C]/g[OC]			0.875	0.950						
DSSAT-IXIM-Maize+Century	3a	stable C fraction 25-35 cm	g[stable C]/g[OC]			0.900	0.960						
DSSAT-IXIM-Maize+Century	3a	stable C fraction 35-50 cm	g[stable C]/g[OC]			0.953	0.970						
DSSAT-IXIM-Maize+Century	3a	stable C fraction 50-80 cm	g[stable C]/g[OC]			0.980	0.980						
DSSAT-IXIM-Maize+Century	3a	stable C fraction 80-100 cm	g[stable C]/g[OC]			0.980	0.980						
DSSAT-IXIM-Maize+Century	3a	Modify SLPF	--	0.86	0.95	0.86	0.90	0.86	0.82	0.86	0.90	0.86	0.82
DSSAT-IXIM-Maize+Century	3a	Added simulation of phosphorus	--	--	--	--	--	--	--	--	--	--	--
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 0-10 cm	vol fraction									0.148	0.128
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 10-20 cm	vol fraction									0.14	0.12
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 20-30 cm	vol fraction									0.171	0.131
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 30-40 cm	vol fraction									0.114	0.094
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 40-60 cm	vol fraction									0.086	0.086
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 60-80 cm	vol fraction									0.107	0.107
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 80-120 cm	vol fraction									0.107	0.107
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 0-10 cm	vol fraction									0.283	0.233
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 10-20 cm	vol fraction									0.272	0.222
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 20-30 cm	vol fraction									0.304	0.244

DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 30-40 cm	vol fraction									0.283	0.233
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 40-60 cm	vol fraction									0.206	0.206
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 60-80 cm	vol fraction									0.25	0.25
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 80-120 cm	vol fraction									0.25	0.25
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 0-10 cm	vol fraction									0.317	0.327
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 10-20 cm	vol fraction									0.305	0.315
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 20-30 cm	vol fraction									0.337	0.347
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 30-40 cm	vol fraction									0.331	0.341
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 40-60 cm	vol fraction									0.226	0.246
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 60-80 cm	vol fraction									0.273	0.293
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 80-120 cm	vol fraction									0.273	0.293
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 0-15 cm	vol fraction					0.206	0.176				
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 15-30 cm	vol fraction					0.243	0.223				
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 30-45 cm	vol fraction					0.275	0.255				
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 45-60 cm	vol fraction					0.287	0.267				
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 60-75 cm	vol fraction					0.297	0.277				
DSSAT-IXIM-Maize+Century	3a	Soil lower limit 75-100 cm	vol fraction					0.297	0.277				
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 0-15 cm	vol fraction					0.335	0.305				
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 15-30 cm	vol fraction					0.327	0.317				
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 30-45 cm	vol fraction					0.366	0.356				
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 45-60 cm	vol fraction					0.372	0.362				
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 60-75 cm	vol fraction					0.383	0.373				
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 75-100 cm	vol fraction					0.383	0.373				
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 0-15 cm	vol fraction					0.36	0.36				
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 15-30 cm	vol fraction					0.408	0.418				
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 30-45 cm	vol fraction					0.415	0.425				
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 45-60 cm	vol fraction					0.409	0.419				
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 60-75 cm	vol fraction					0.416	0.426				
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 75-100 cm	vol fraction					0.46	0.47				
DSSAT-IXIM-Maize+Century	3a	soil lower limit 35-50 cm	vol fraction							0.3	0.2		
DSSAT-IXIM-Maize+Century	3a	soil lower limit 50-80 cm	vol fraction							0.35	0.2		
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 35-50 cm	vol fraction							0.5	0.4		
DSSAT-IXIM-Maize+Century	3a	soil drained upper limit 50-80 cm	vol fraction							0.5	0.4		
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 35-50 cm	vol fraction							0.6	0.5		
DSSAT-IXIM-Maize+Century	3a	soil saturation water content 50-80 cm	vol fraction							0.6	0.5		
DSSAT-IXIM-Maize+Century	3a	2014 Initial ammonium 0-15 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 Initial ammonium 15-25 cm	ppm			not available	0.01						

DSSAT-IXIM-Maize+Century	3a	2014 Initial ammonium 25-35 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 Initial ammonium 35-50 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 Initial ammonium 50-80 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 Initial ammonium 80-100 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 initial nitrate 0-15 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 initial nitrate 15-25 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 initial nitrate 25-35 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 initial nitrate 35-50 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 initial nitrate 50-80 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2014 initial nitrate 80-100 cm	ppm			not available	0.01						
DSSAT-IXIM-Maize+Century	3a	2013 Initial ammonium 0-15 cm	ppm			not available	0.9						
DSSAT-IXIM-Maize+Century	3a	2013 Initial ammonium 15-25 cm	ppm			not available	0.9						
DSSAT-IXIM-Maize+Century	3a	2013 Initial ammonium 25-35 cm	ppm			not available	0.9						
DSSAT-IXIM-Maize+Century	3a	2013 Initial ammonium 35-50 cm	ppm			not available	0.9						

DSSAT-IXIM-Maize+Century	3a	2013 Initial ammonium 50-80 cm	ppm			not available	0.9						
DSSAT-IXIM-Maize+Century	3a	2013 Initial ammonium 80-100 cm	ppm			not available	0.9						
DSSAT-IXIM-Maize+Century	3a	2013 initial nitrate 0-15 cm	ppm			not available	10						
DSSAT-IXIM-Maize+Century	3a	2013 initial nitrate 15-25 cm	ppm			not available	10						
DSSAT-IXIM-Maize+Century	3a	2013 initial nitrate 25-35 cm	ppm			not available	10						
DSSAT-IXIM-Maize+Century	3a	2013 initial nitrate 35-50 cm	ppm			not available	10						
DSSAT-IXIM-Maize+Century	3a	2013 initial nitrate 50-80 cm	ppm			not available	10						
DSSAT-IXIM-Maize+Century	3a	2013 initial nitrate 80-100 cm	ppm			not available	10						
DSSAT-IXIM-Maize+Ceres-SOM	3a	P1	degree days	300	223	230	230	325	380	300	300	330	338
DSSAT-IXIM-Maize+Ceres-SOM	3a	P2	days	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
DSSAT-IXIM-Maize+Ceres-SOM	3a	P5	degree days	530	650	725	750	515	525	700	600	810	800
DSSAT-IXIM-Maize+Ceres-SOM	3a	G2	#/plant	540	950	540	450	850	900	600	540	600	750
DSSAT-IXIM-Maize+Ceres-SOM	3a	G3	mg/day	7.5	9.5	7.5	5.5	8	8.5	7.5	7.5	7.5	8.5
DSSAT-IXIM-Maize+Ceres-SOM	3a	PHINT	degree days	50	50	50	55	55	50	55	65	50	55
DSSAT-IXIM-Maize+Ceres-SOM	3a	AX	cm2/leaf	650	400	650	350	650	600	800	750	800	850
DSSAT-IXIM-Maize+Ceres-SOM	3a	ALL	degree days	800	450	800	600	800	850	800	800	800	800
DSSAT-IXIM-Maize+Ceres-SOM	3a	Modify SLPF	--	0.86	0.95	0.86	0.82	0.86	0.90	0.86	0.90	0.86	0.82
DSSAT-IXIM-Maize+Ceres-SOM	3a	Added simulation of phosphorus	--	--	--	--	--	--	--	--	--	--	--
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 0-10 cm	vol fraction	0.148	0.128								
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 10-20 cm	vol fraction	0.14	0.12								
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 20-30 cm	vol fraction	0.171	0.131								
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 30-40 cm	vol fraction	0.114	0.094								
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 40-60 cm	vol fraction	0.086	0.086								

DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 60-80 cm	vol fraction	0.107	0.107								
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 80-120 cm	vol fraction	0.107	0.107								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 0-10 cm	vol fraction	0.283	0.233								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 10-20 cm	vol fraction	0.272	0.222								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 20-30 cm	vol fraction	0.304	0.244								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 30-40 cm	vol fraction	0.283	0.233								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 40-60 cm	vol fraction	0.206	0.206								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 60-80 cm	vol fraction	0.25	0.25								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 80-120 cm	vol fraction	0.25	0.25								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 0-10 cm	vol fraction	0.317	0.327								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 10-20 cm	vol fraction	0.305	0.315								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 20-30 cm	vol fraction	0.337	0.347								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 30-40 cm	vol fraction	0.331	0.341								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 40-60 cm	vol fraction	0.226	0.246								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 60-80 cm	vol fraction	0.273	0.293								
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 80-120 cm	vol fraction	0.273	0.293								
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 0-15 cm	vol fraction									0.206	0.176
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 15-30 cm	vol fraction									0.243	0.223
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 30-45 cm	vol fraction									0.275	0.255
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 45-60 cm	vol fraction									0.287	0.267
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 60-75 cm	vol fraction									0.297	0.277
DSSAT-IXIM-Maize+Ceres-SOM	3a	Soil lower limit 75-100 cm	vol fraction									0.297	0.277
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 0-15 cm	vol fraction									0.335	0.305
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 15-30 cm	vol fraction									0.327	0.317
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 30-45 cm	vol fraction									0.366	0.356
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 45-60 cm	vol fraction									0.372	0.362
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 60-75 cm	vol fraction									0.383	0.373
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 75-100 cm	vol fraction									0.383	0.373
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 0-15 cm	vol fraction									0.36	0.36
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 15-30 cm	vol fraction									0.408	0.418
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 30-45 cm	vol fraction									0.415	0.425
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 45-60 cm	vol fraction									0.409	0.419
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 60-75 cm	vol fraction									0.416	0.426
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 75-100 cm	vol fraction									0.46	0.47
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil lower limit 35-50 cm	vol fraction			0.3	0.2						
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil lower limit 50-80 cm	vol fraction			0.35	0.2						
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 35-50 cm	vol fraction			0.5	0.4						
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil drained upper limit 50-80 cm	vol fraction			0.5	0.4						
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 35-50 cm	vol fraction			0.6	0.5						
DSSAT-IXIM-Maize+Ceres-SOM	3a	soil saturation water content 50-80 cm	vol fraction			0.6	0.5						

DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 Initial ammonium 0-15 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 Initial ammonium 15-25 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 Initial ammonium 25-35 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 Initial ammonium 35-50 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 Initial ammonium 50-80 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 Initial ammonium 80-100 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 initial nitrate 0-15 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 initial nitrate 15-25 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 initial nitrate 25-35 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 initial nitrate 35-50 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 initial nitrate 50-80 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2014 initial nitrate 80-100 cm	ppm					not specified	0.01				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 Initial ammonium 0-15 cm	ppm					not specified	0.9				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 Initial ammonium 15-25 cm	ppm					not specified	0.9				

DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 Initial ammonium 25-35 cm	ppm					not specified	0.9				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 Initial ammonium 35-50 cm	ppm					not specified	0.9				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 Initial ammonium 50-80 cm	ppm					not specified	0.9				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 Initial ammonium 80-100 cm	ppm					not specified	0.9				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 initial nitrate 0-15 cm	ppm					not specified	10				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 initial nitrate 15-25 cm	ppm					not specified	10				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 initial nitrate 25-35 cm	ppm					not specified	10				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 initial nitrate 35-50 cm	ppm					not specified	10				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 initial nitrate 50-80 cm	ppm					not specified	10				
DSSAT-IXIM-Maize+Ceres-SOM	3a	2013 initial nitrate 80-100 cm	ppm					not specified	10				
HERMES	3a	Amax	kg Co2/ha leaf/h	86	80								
HERMES	3a	initial weight roots	kg dm/ha	12	20	12	16	12	14	12	16	12	20
HERMES	3a	initial weight leaves	kg dm/ha	11	20	11	16	11	14	11	16	11	20
HERMES	3a	kc factor (ET) before emergence		0.15	0.65	0.15	0.65	0.15	0.65	0.15	0.65	0.15	0.65
HERMES	3a	kc factor at shooting		0.3	1	0.3	1.1	0.3	1	0.3	1.18	0.3	0.95
HERMES	3a	Kc at tasseling		1	1.1	1	1.2	1	1.15	1	1.2	1	1.15
HERMES	3a	Kc at silking				1.2	1.15			1.2	1.25		
HERMES	3a	Kc grain filling				1.25	1.1-1.0						
HERMES	3a	specific leave area until shooting	$m^2/m^2/kg$ dm	0.0014	0.0016	0.0014	0.0017	0.0014	0.0018	0.0014	0.0016	0.0014	0.002

HERMES	3a	specific leave area shoot to tasseling	m^2/m^2/kg dm							0.0012	0.0013		
HERMES	3a	Tsum1 (sowing to emergence)	°C days			177	60			145	75		
HERMES	3a	Tsum2 (emerg. to shoot)	°C days	400	420	400	365			500	560		
HERMES	3a	TSUM3 (shoot to tassel)	°C days			380	590						
HERMES	3a	Tsum4 (tassel to silk)	°C days							90	110		
HERMES	3a	TSUM5 (grain filling)	°C days			660	705	840	850				
HERMES	3a	fractions at shooting for root/ leaves/stems at shooting				0.4/0.3/0.3	0.3/0.5/0.2			0.3/0.3	0.35/0.25		
HERMES	3a	death rate at mid of grain filling				leaves: 0.001	leaves 0.003			root: 0.1 leaves: 0.001	root: 0.12 leaves: 0.01		
HERMES	3a	death rate at beginning of senescence		0.01	0.05	root: 0.1 leaves: 0.01	root: 0.15 leaves: 0.06	root: 0.1 leaves: 0.01	root: 0.15 leaves: 0.02	root: 0.1 leaves: 0.01	root: 0.18 leaves: 0.06	root: 0.1 leaves: 0.01 stem: 0.006	root: 0.15 leaves: 0.025 stem: 0.01
HERMES	3a	Mineralisable fraction of org. matter		0.13	0.16	0.13	0.1	0.13	0.2	0.13	0.2	0.13	0.16
HERMES	3a	Initial Nmin	kg N/ha	2015-06-24: 23.5/23.5/2	2015-07-22: 10/10/35	2013-10-4: 4/3/2 2014-10-8: 4/3/2	2013-9-23: 15/15/8 2014-10-8: 2/2/1			16/16/2	36/26/2 in 2013 46/36/35 in 2014		
HERMES	3a	Initial water	cm3/cm3	2015-06-24: 0.117/0.12/0.11	2015-07-22: 0.221/0.284/0.284								
HERMES	3a	rooting depth	cm	50	60	8	10	8	10	10	12	8	12
MONICA	3a	StageTemperatureSumStage1	C	300	270	370	380	420	380	430	230	290	284
MONICA	3a	StageTemperatureSumStage2	C	190	180	280	245	320	190	390	300	335	200
MONICA	3a	StageTemperatureSumStage3	C	520	180	330	245	450	180	450	250	390	250

MONICA	3a	StageTemperatureSumStage4	C	250	280	350	300	350	250	320	300	340	380
MONICA	3a	StageTemperatureSumStage5	C	440	430	480	310	580	300	450	450	460	440
MONICA	3a	StageTemperatureSumStage6	C	25	25	25	25	35	25	25	25	25	25
MONICA	3a	yieldDryMatter	%	0.85	0.7	0.85	0.6	0.85	0.85	0.85	0.7	0.85	0.65
MONICA	3a	OrganMaintenanceRespiration_root	%	0.01	0.009	0.01		0.01	0.02	0.01		0.01	0.015
MONICA	3a	OrganMaintenanceRespiration_leaf	%	0.03	0.04	0.03		0.03	0.03	0.03		0.03	0.03
MONICA	3a	OrganMaintenanceRespiration_stem	%	0.01	0.01	0.01		0.01	0.01	0.01		0.01	0.02
MONICA	3a	OrganMaintenanceRespiration_fruit	%	0.007	0.007	0.007		0.007	0.01	0.007		0.007	0.0018
MONICA	3a	OrganGrowthRespiration_root	%	0.28	0.28	0.28	0.31	0.28	0.24	0.28		0.28	0.3
MONICA	3a	OrganGrowthRespiration_leaf	%	0.28	0.28	0.28	0.3	0.28	0.24	0.28		0.28	0.25
MONICA	3a	OrganGrowthRespiration_stem	%	0.31	0.31	0.31	0.31	0.31	0.27	0.31		0.31	0.31
MONICA	3a	OrganGrowthRespiration_fruit	%	0.28	0.25	0.28	0.29	0.28	0.26	0.28		0.28	0.26
MONICA	3a	SpecificLeafArea_stage1	%			0.0028	0.001	0.0028	0.0028	0.0028	0.0028	0.0028	0.0031
MONICA	3a	SpecificLeafArea_stage2	%			0.002	0.004	0.002	0.004	0.002	0.0032	0.002	0.0023
MONICA	3a	SpecificLeafArea_stage3	%			0.002	0.004	0.002	0.003	0.002	0.0032	0.002	0.002
MONICA	3a	SpecificLeafArea_stage4	%			0.0019	0.003	0.0019	0.0016	0.0019	0.0019	0.0019	0.002
MONICA	3a	SpecificLeafArea_stage5	%			0.0018	0.0019	0.0018	0.0019	0.0018	0.0018	0.0018	0.0019
MONICA	3a	SpecificLeafArea_stage6	%			0.0018	0.0019	0.0018	0.0018	0.0018	0.0018	0.0018	0.00199
MONICA	3a	SpecificLeafArea_stage7	%			0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018	0.0018
MONICA	3a	MaxAssimilationRate				96	96	96	90	96	96	96	90
SA	3a	LEJuv:Development time from emergence to the end the juvenile period during which the plant is not photoperiod sensitive (equal to P1 / PHINT in CERES-Maize).-L. E. to end juvenile	Leaf equivalent	2.9841	4.98411	3.0039	3.0039	6.0178	6.0178	6.15883	6.1588	3.387932	3.38793
SA	3a	MnNMlt:Multiplier for the minimum permissible N concentration in plant with respect to the optimum.-Multiplier for min. N conc.	-	0.35	0.5	0.35	0.5	0.35	0.8	0.35	0.8	0.35	0.7

SA	3a	MnPMlt:Multiplier for the minimum permissible P concentration in plant with respect to the optimum.-Multiplier for min. P conc.	-	0.2	0.7	0.2	0.4	0.2	0.7	0.2	0.7	0.2	0.6
SA	3a	MxNKr:Maximum concentration of N in the grain.-Max. N conc. in grain	g g-1	0.04	0.02	0.04	0.02	0.04	0.02	0.04	0.01	0.04	0.02
SA	3a	MxNVg:Maximum concentration of N in the vegetative parts of the plant.-Max N conc. in vegetative part	g g-1	0.03	0.07	0.03	0.05	0.03	0.015	0.03	0.05	0.03	0.05
SA	3a	MxPKr:Maximum concentration of P in the grain.-Max. P conc. in grain	g g-1	0.2	0.005	0.2	0.003	0.2	0.003	0.2	0.005	0.2	0.003
SA	3a	MxPVg:Maximum concentration of P in the vegetative parts of the plant.-Max P conc. in vegetative part	g g-1	0.2	0.005	0.2	0.003	0.2	0.003	0.2	0.005	0.2	0.003
SA	3a	krPGR:Daily rate of kernel fill at optimum temperature (equal to G3 * 10-3 in CERES-Maize).-Daily rate of kernel fill	g kernel^-1 d^-1	0.009	0.009	0.009	0.009	0.009	0.003	0.009	0.009	0.009	0.0015
SA	3a	SLWmax:Maximum specific leaf weight, modified by the specific leaf weight fraction from the species phases table.-Max. specific leaf weight	g cm-2	0.006	0.006	0.006	0.006	0.006	0.005	0.006	0.005	0.006	0.006
SA	3a	LeafF:Leaf partitioning coefficient	g g-1								(until beginning of ear growth), increased by 0.1		
SA	3a	StemF: Stem partitioning coefficient									(until beginning of ear growth), decreased by 0.1		
SA	3a	Soil water conductivity (average all layers)	cm hour-1			0.5	5	~0.3	0.15	~0.1	~0.2		
SA	3a	DUL										~0.25	~0.23
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	tsum1											
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	tsum2											
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	tsumem											

SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	Specific Leaf area as a function of Crop Development stages (DVS)	m2/g										
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	DVS = 0.0		0.0215	0.015	0.0215	0.022	0.0215	0.018	0.03	0.02	0.0215	0.022
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	DVS = 0.78		0.008	0.008	0.008	0.01	0.008	0.008	0.02	0.011	0.008	0.009
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	DVS = 2.0		0.008	0.008	0.008	0.008	0.008	0.008	0.02	0.009	0.008	0.009
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	Radiation use efficiency for biomass production as function of DVS	g/MJ										
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	DVS = 0.00		4.0	4.0	4.0	2	4.0	3.8	3.2	3.2	4.0	3.0
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	DVS = 1.25		4.0	3.7	4.0	1.7	4.0	3.6	2.5	2	4.0	2.0
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	DVS = 1.50		3.6	3.2	3.6	1.4	3.6	3.0	2.2	2	3.6	1.4
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	DVS = 1.75		3.0	3.0	3.0	1.4	3.0	2.0	2	2	3.0	1.2
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	DVS = 2.00		1.4	1.4	1.4	1	1.4	1.0	1.4	1	1.4	1.0
SIMPLACE-Lintul + ET Hargreaves + Heat stress with air temperature	3a	Maximum N concentration in storage organs	g/g	0.016	0.02	na	na	na	na	na	na	na	na
Stics	3a	codetemp	-	1	2	1	2	1	2	1	2	1	2
Stics	3a	coeflevamf	-	-	1.44	-	1.44	-	1.44	-	1.44	-	1.44
Stics	3a	coefamflax	-	-	1.07	-	1.07	-	1.07	-	1.07	-	1.07
Stics	3a	coeflaxsen	-	-	1	-	1	-	1	-	1	-	1
Stics	3a	coefsenlan	-	-	1.1	-	1.1	-	1.1	-	1.1	-	1.1
Stics	3a	coeflevdrp	-	-	1.13	-	1.13	-	1.13	-	1.13	-	1.13
Stics	3a	coefdrpmat	-	-	1.03	-	1.03	-	1.03	-	1.03	-	1.03
Stics	3a	coefflodrp	-	-	1	-	1	-	1	-	1	-	1
Stics	3a	laicomp	m2 m-2	0	0.6	0	0.95	0	0.6	0	0.95	0	0.35
Stics	3a	udlaimax	-	-	-	-	-	-	-	3	2.1	-	-
Stics	3a	tcxstop	degreeC	35	40	35	38	-	-	-	-	-	-
Stics	3a	ratiodurviel	-	1	0.8	1	0.8	-	-	-	-	1	0.8
Stics	3a	innturgmin	-	0.3	0.35	-	-	-	-	-	-	-	-
Stics	3a	dlaimaxbrut	m2 leaf plant-1 degree-d-1	0.0016	0.0019	0.0016	0.00079	0.0016	0.000739	0.0016	0.0087	0.0016	0.0035
Stics	3a	innsen	-	1	1	-	-	-	-	-	-	-	-
Stics	3a	rapsenturg	-	0	1.5	-	-	-	-	-	-	-	-
Stics	3a	efcroijuv	g MJ-1	1.9	3.4	1.9	2.4	-	-	1.9	2.2	1.9	2.6

Stics	3a	efcroiveg	g MJ-1	3.8	4	3.8	3.5	-	-	3.8	3.2	3.8	4
Stics	3a	efcroirepro	g MJ-1	3.8	3.4	3.8	2.8	3.8	2	3.8	2.5	3.8	3.4
Stics	3a	vitircarbT	g grain g-1 d-1	0.0015	0.0007	0.0015	0.0005	0.0015	0.000743	0.0015	0.001	0.0015	0.001051
Stics	3a	vitirazo	g grain g-1 d-1	0.03	0.021	0.03	0.015	0.03	0.02	-	-	0.03	0.035
Stics	3a	vitircarb	g grain g-1 d-1	0.0103	0.012	0.0103	0.012	-	-	-	-	0.0103	0.012
Stics	3a	codtrophrac	-	-	-	1	3	1	3	1	3	1	3
Stics	3a	longsperac	cm g-1	10000	13060	10000	13000	-	-	-	-	10000	13000
Stics	3a	repracpermax	-	0.4	0.3	0.4	0.3	-	-	-	-	0.4	0.3
Stics	3a	repracpermin	-	0.2	0.1	0.2	0.1	-	-	-	-	0.2	0.1
Stics	3a	krepracperm	-	1.27	0.5	1.27	0.5	-	-	-	-	-	-
Stics	3a	repracseumax	-	-	0.3	-	-	-	-	-	-	-	-
Stics	3a	repracseumin	-	-	0.1	-	-	-	-	-	-	-	-
Stics	3a	krepracseu	-	-	0.2	-	-	-	-	-	-	-	-
Stics	3a	psisto	bars	12	15	-	-	-	-	-	-	-	-
Stics	3a	Vmax1	micromole cm-1 h-1	0.0018	0.003	-	-	-	-	-	-	-	-
Stics	3a	Vmax2	micromole cm-1 h-1	0.017	0.0035	0.017	0.0323	-	-	-	-	0.017	0.0323
Stics	3a	Kmabs2	micromole L-1	25000	25000	-	-	-	-	-	-	-	-
Stics	3a	adilmax	% DM	-	5.5	-	-	-	-	-	-	-	-
Stics	3a	stlevamf	degree-d	400	410	300	450	300	520	300	450	400	500
Stics	3a	stamflax	degree-d	670	480	600	400	600	570	600	350	670	350
Stics	3a	stlevdrp	degree-d	1260	1040	-	-	1675	1380	1380	1300	1500	1320
Stics	3a	stflodrp	degree-d	200	165	-	-	350	200	280	170	120	150
Stics	3a	stdrpdes	degree-d	600	530	650	600	650	620	650	460	500	430
Stics	3a	croirac	cm degree-d-1	0.15	0.08	0.15	0.12	-	-	0.15	0.12	0.15	0.12
Stics	3a	durvieF	-	200	140	200	170	200	165	200	165	200	150
Stics	3a	stdrpmat	degree-d	-	-	-	-	440	610	-	-	400	420
Stics	3a	profhum	cm	30	35	-	-	25	20	-	-	-	-
Stics	3a	codemacropor	-	-	-	1	2	-	-	-	-	-	-
Stics	3a	q0	mm	12	5	-	-	-	-	12	5	3	5
Stics	3a	cfes	-	5	2	-	-	5	3	-	-	-	-
Stics	3a	HCCF(1)	% w	14.6	16.6	17.7	15	23.9	20.9	12.1	12	-	-
Stics	3a	HMINF(1)	% w	3.6	5	-	-	14.7	11.7	-	-	-	-
Stics	3a	HCCF(2)	% w	18.1	19.1	17.7	14	22.9	23.9	13.9	12	-	-
Stics	3a	HMINF(2)	% w	6.1	6.5	-	-	-	-	-	-	-	-

Stics	3a	HCCF(3)	% w	20.9	24	14.3	13	-	-	14.3	11.5	34.7	27.8
Stics	3a	HMINF(3)	% w	6.4	8.9	-	-	-	-	-	-	20.8	14.8
Stics	3a	HCCF(4)	% w	20.9	24	-	-	-	-	10	10.5	34.7	27.8
Stics	3a	HMINF(4)	% w	1.4	8.9	-	-	-	-	5	4	24.3	14.3
Stics	3a	HCCF(5)	% w	-	-	-	-	-	-	13.9	10.5	-	-
Stics	3a	HMINF(5)	% w	-	-	-	-	-	-	5.7	4.7	-	-
Stics	3a	tnitmin	degreeC	4	5	4	5	4	5	4	5	4	5
Stics	3a	tnitopt	degreeC	25	30	25	30	25	30	25	30	25	30
Stics	3a	tnitopt2	degreeC	28	35	28	35	28	35	28	35	28	35
Stics	3a	tnitmax	degreeC	38	58	38	58	38	58	38	58	38	58
AGRO-IBIS	3b	nitrogen fertilized	kg m-2 y-1	default in IBIS is at planting, for low I set it to reported date	used date from a single calibration year for each experimental year with unknown date								
AGRO-IBIS	3b	hybgdd: related to cultivar	GDD to maturity	1550	1550	1700	1700	1950	1950	1750	1750	1750	1750
AGRO-IBIS	3b	lfemerg (fraction of time between planting and maturity at which leaf emergence occurs)	fraction	0.055	0.055	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
AGRO-IBIS	3b	grnfill (fraction of time between planting and maturity at which grain fill occurs)	fraction	0.72	0.72	0.68	0.68	0.7	0.7	0.75	0.75	0.8	0.8
APSIM 7.10	3b	Simulation start date		reset date	start of year	reset date	start of year	reset date	start of year	reset date	start of year	reset date	start of year
APSIM 7.10	3b	Crop lower limit at surface		0.11	0.05								
APSIM 7.10	3b	soil water curve					SAT,DUL,LL,AD all decreased slightly						
APSIM 7.10	3b	Initial residue	kg/ha	0	200	0	1000	0	2000	0	1000	0	2000
APSIM 7.10	3b	Add soil layer	cm	n/a	60-100			n/a	100-150	n/a	100-150	n/a	120-150
APSIM 7.10	3b	Summer date		01-févr	01-mars			01-févr	01-mars	01-juil	01-mars	01-oct	01-mai
APSIM 7.10	3b	Summer second stage evaporation (cona)				4	5	4	5	4	5		
APSIM 7.10	3b	Summer first stage evaporation (u)				6	8	6	11	6.6	9	6.5	6.6
APSIM 7.10	3b	Winter date		01-août	01-oct			01-juin	01-nov	01-avr	01-déc	01-juil	01-déc
APSIM 7.10	3b	Winter second stage evaporation (cona)		2	3	3	4	2	4.5	3	3.5	3	3.5

APSIM 7.10	3b	Winter first stage evaporation (u)		2	4	4	6.5	2	6	4.6	6	4.6	4
APSIM 7.10	3b	Carbon fraction as microbial biomass		.04,.02,.02	0.035,.02,.015	0.04(surface)	0.03						
APSIM 7.10	3b	Carbon fraction as inert		.4,.6	.5,.6	0.4(surface)	0.5						
APSIM 7.10	3b	Soil diffusivity constant						40	88	88	250	40	88
APSIM 7.10	3b	Soil diffusivity slope						16	35	35	22	16	35
APSIM 7.10	3b	Runoff curve number				68	73	73	84	73	84		
APSIM 7.10	3b	Soil albedo						0.16	0.12				
APSIM 7.10	3b	pH				6(profile)	4.6						
APSIM 7.10	3b	Thermal time emerg to end juvenile	oC	270	140	240	230	290	240	295	271	350	280
APSIM 7.10	3b	Thermal time end juvenile to initiation	oC	0	110			0	70			0	60
APSIM 7.10	3b	Photoperiod slope	oC/hour	10	23	41	0	41	0	41	0		
APSIM 7.10	3b	Thermal time flower to maturity	oC	650	590	750	800			700	725	560	620
APSIM 7.10	3b	Thermal time to start grain fill	oC									170	120
APSIM 7.10	3b	Potential kernal weight		260	230	350	260	350	220			260	350
APSIM 7.10	3b	Grain number max coefficient		170	120	170	120	170	210				
APSIM 7.10	3b	Leaf number dead slope				0.0002	0.0005	0.0002	0.0004				
APSIM 7.10	3b	Plant growth rate base								1.2	2		
DSSAT-CERES-Maize+Ceres-SOM	3b	P1	degree days	220	220	300	300	330	330	365	380	250	230
DSSAT-CERES-Maize+Ceres-SOM	3b	P2	days	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
DSSAT-CERES-Maize+Ceres-SOM	3b	P5	degree days	605	605	640	640	810	810	515	520	725	705
DSSAT-CERES-Maize+Ceres-SOM	3b	G2	#/plant	540	840	600	850	600	700	850	950	600	600
DSSAT-CERES-Maize+Ceres-SOM	3b	G3	mg/day	7.5	9	7.5	8	7.5	8	8	8.4	7.5	7.5
DSSAT-CERES-Maize+Ceres-SOM	3b	PHINT	degree days	50	50	55	55	55	55	55	50	50	55
DSSAT-CERES-Maize+Ceres-SOM	3b	Modify SLPF	--					0.86	0.82			0.9	0.82
DSSAT-CERES-Maize+Ceres-SOM	3b	Added simulation of phosphorus	--										
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 0-10 cm	vol fraction									0.148	0.128
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 10-20 cm	vol fraction									0.14	0.12
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 20-30 cm	vol fraction									0.171	0.131
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 30-40 cm	vol fraction									0.114	0.094
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 40-60 cm	vol fraction									0.086	0.086
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 60-80 cm	vol fraction									0.107	0.107
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 80-120 cm	vol fraction									0.107	0.107
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 0-10 cm	vol fraction									0.283	0.233
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 10-20 cm	vol fraction									0.272	0.222
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 20-30 cm	vol fraction									0.304	0.244
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 30-40 cm	vol fraction									0.283	0.233

DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 40-60 cm	vol fraction									0.206	0.206
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 60-80 cm	vol fraction									0.25	0.25
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 80-120 cm	vol fraction									0.25	0.25
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 0-10 cm	vol fraction									0.317	0.327
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 10-20 cm	vol fraction									0.305	0.315
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 20-30 cm	vol fraction									0.337	0.347
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 30-40 cm	vol fraction									0.331	0.341
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 40-60 cm	vol fraction									0.226	0.246
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 60-80 cm	vol fraction									0.273	0.293
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 80-120 cm	vol fraction									0.273	0.293
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 0-15 cm	vol fraction					0.206	0.176				
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 15-30 cm	vol fraction					0.243	0.223				
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 30-45 cm	vol fraction					0.275	0.255				
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 45-60 cm	vol fraction					0.287	0.267				
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 60-75 cm	vol fraction					0.297	0.277				
DSSAT-CERES-Maize+Ceres-SOM	3b	Soil lower limit 75-100 cm	vol fraction					0.297	0.277				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 0-15 cm	vol fraction					0.335	0.305				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 15-30 cm	vol fraction					0.327	0.317				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 30-45 cm	vol fraction					0.366	0.356				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 45-60 cm	vol fraction					0.372	0.362				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 60-75 cm	vol fraction					0.383	0.373				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 75-100 cm	vol fraction					0.383	0.373				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 0-15 cm	vol fraction					0.36	0.36				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 15-30 cm	vol fraction					0.408	0.418				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 30-45 cm	vol fraction					0.415	0.425				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 45-60 cm	vol fraction					0.409	0.419				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 60-75 cm	vol fraction					0.416	0.426				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil saturation water content 75-100 cm	vol fraction					0.46	0.47				
DSSAT-CERES-Maize+Ceres-SOM	3b	soil lower limit 35-50 cm								0.3	0.28		
DSSAT-CERES-Maize+Ceres-SOM	3b	soil lower limit 50-80 cm								0.35	0.33		
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 35-50 cm								0.5	0.48		
DSSAT-CERES-Maize+Ceres-SOM	3b	soil drained upper limit 50-80 cm								0.5	0.48		
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 Initial ammonium 0-15 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 Initial ammonium 15-25 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 Initial ammonium 25-35 cm	ppm			not specified	0.01						

DSSAT-CERES-Maize+Ceres-SOM	3b	2014 Initial ammonium 35-50 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 Initial ammonium 50-80 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 Initial ammonium 80-100 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 initial nitrate 0-15 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 initial nitrate 15-25 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 initial nitrate 25-35 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 initial nitrate 35-50 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 initial nitrate 50-80 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2014 initial nitrate 80-100 cm	ppm			not specified	0.01						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 Initial ammonium 0-15 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 Initial ammonium 15-25 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 Initial ammonium 25-35 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 Initial ammonium 35-50 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 Initial ammonium 50-80 cm	ppm			not specified	0.9						

DSSAT-CERES-Maize+Ceres-SOM	3b	2013 Initial ammonium 80-100 cm	ppm			not specified	0.9						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 initial nitrate 0-15 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 initial nitrate 15-25 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 initial nitrate 25-35 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 initial nitrate 35-50 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 initial nitrate 50-80 cm	ppm			not specified	10						
DSSAT-CERES-Maize+Ceres-SOM	3b	2013 initial nitrate 80-100 cm	ppm			not specified	10						
EXPERT-N-Ceres	3b	MaxNuptRate	(kg/ha.d)/(m/m2)	0.006	0.018	0.006	0.008	0.006	0.003	0.006	0.02	0.006	0.004
EXPERT-N-Ceres	3b	Grain Filling Rate (G3)	[mg/grain/d]	9	9	9	7.5	9	7.5	9	12	9	5.8
EXPERT-N-Ceres	3b	Grains/g(stem)	[g]	330	330	330	330	330	330	330	560	330	330
EXPERT-N-Spass	3b	Tiller demand	[g]			330	300	330	400	330	550		
EXPERT-N-Spass	3b	Grains	[g/per stem]			400	450	400	350	400	350		
EXPERT-N-Spass	3b	Max Grain Filling Rate (G3)	[mg(N)/grain/d]	9.0	7.0	9.0	7.0	9.0	8.0			9.0	8.0
EXPERT-N-Spass	3b	Stem optimum N concentration [%] at emergence	[%]	5.0	2.0	5.0	2.0	5.0	2.0	5.0	2.0	5.0	2.0
EXPERT-N-Spass	3b	Stem optimum N concentration [%] at end of flowering	[%]	2.4	1.0	2.4	1.0	2.4	1.0	2.4	1.0	2.4	1.0
EXPERT-N-Spass	3b	Stem optimum N concentration [%] at maturity	[%]	1.5	0.5	1.5	0.5	1.5	0.5	1.5	0.5	1.5	0.5
EXPERT-N-Spass	3b	Leaf optimum N concentration [%] at emergency	[%]	5.5	5.0	5.5	5.0	5.5	5.0	5.5	5.0	5.5	5.0
EXPERT-N-Spass	3b	Leaf optimum N concentration [%] at end of flowering	[%]	4.0	2.5	4.0	2.5	4.0	2.5	4.0	2.5	4.0	2.5
EXPERT-N-Spass	3b	Leaf optimum N concentration [%] at maturity	[%]	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0
EXPERT-N-Spass	3b	Stem minimum N concentration	[%]	0.15	0.05	0.15	0.05	0.15	0.05	0.15	0.05	0.15	0.05
EXPERT-N-Spass	3b	Leaf minimum N concentration	[%]	0.5	0.1	0.5	0.1	0.5	0.1	0.5	0.1	0.5	0.1
EXPERT-N-Spass	3b	Root minimum N concentration	[%]	0.1	0.05	0.1	0.05	0.1	0.05	0.1	0.05	0.1	0.05
EXPERT-N-Spass	3b	Root optimum N concentration [%] at maturity	[%]	0.1	0.05	0.1	0.05	0.1	0.05	0.1	0.05	0.1	0.05

EXPERT-N-Spass	3b	Max. Rooting Depth	[cm]	200	100	200	100	200	100	200	100	200	100
EXPERT-N-Sucros	3b	Temperature sum until flowering	°C d			1192	1210						
EXPERT-N-Sucros	3b	Temperature sum from flowering to maturity	°C d							670	600		
EXPERT-N-Sucros	3b	MaxLvAppRate	Leaves/d	0.12	0.10	0.12	0.10			0.12	0.10		
EXPERT-N-Sucros	3b	Specific leaf weight	kg ha-1	400	425	400	500	400	350	400	500	400	475
EXPERT-N-Sucros	3b	Grain g^{-1}(stem)	mg g-1	330	510	330	300	330	350	330	510		
EXPERT-N-Sucros	3b	Humus turnover rate upper 20 cm	day^{-1}	0.0001	0.0005								
EXPERT-N-Sucros	3b	Humus turnover rate upper 20-40 cm	day^{-1}	0.0001	0.0002								
MAIZSIM	3b	Juvenile Leaf number (genetic number of leaves when plant has tasseled before temp and daylength effects	number	17	17	18	16	19	19	19	19	18	17
MAIZSIM	3b	StayGreen, higher numbers plant senesces more slowely	none	3	2	4	2	4	2	4	2	3	2
MAIZSIM	3b	Rmax_LTAR leaf tip appearance rate at optimal temperature	leaves per day	0.53	0.53	0.46	0.46	0.52	0.52	0.42	0.42	0.53	0.53
MAIZSIM	3b	Rmax_LTIR leaf tip initiation rate at optimal temperature	leaves per day	0.978	0.978	0.81	0.81	0.92	0.92	0.8	0.8	0.978	0.978
MAIZSIM	3b	maximum potential area of the largest leaf	cm2	125	100	125	100	125	100	125	110	125	90
RZQM2	3b	P1 Thermal time from seedling emergence to the end of the juvenile phase	°C days above 8 °C base temperature	250	250	300	300	390	390	425	425	280	280
RZQM2	3b	P2 Delay in development for each hour that daylength is above 12.5 hours (0-1)	days/hr	0.73	0.73	0.8	0.8	0.85	0.85	0.835	0.835	0.8	0.8
RZQM2	3b	P5 Thermal time from silking to physiological maturity	°C days above 8 °C base temperature	560	560	720	720	780	780	525	525	730	730
RZQM2	3b	G2 Maximum possible number of kernels per plant	#	710	720	710	710	710	710	710	720	710	720
RZQM2	3b	G3 Kernel filling rate during the linear grain filling stage and under optimum conditions	mg/day	9.6	17	9.6	9.6	9.6	9.6	9.6	17.6	9.6	16.6
RZQM2	3b	PHINT Phylochron interval; the interval in thermal time between successive leaf tip appearances	°C days	38.9	39.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9
RZQM2	3b	Maximum plant height at maturity	cm	244.6	160.6	244.6	244.6	244.6	250.6	244.6	100.6	244.6	180.6

RZQM2	3b	Plant biomass at HALF of maximum height	g	43.07	90.07	43.07	90.07	43.07	43.07	43.07	90.07	43.07	100.07
SIMPLACE-Lintul + ET FAO-56 + Heat stress with crop temperature	3b	RGRLAI, daily relative rate of initial leaf growth (when LAI < 0.75 or dev stage < 20% progressed to anthesis)	no unit							0.02	0.01		
SWB	3b	Extinction coefficient	fraction	0.8	0.8	0.8	0.2	0.8	0.35	0.8	0.4	0.8	0.38
SWB	3b	Radiation Use efficiency	kg/DM/MJ Rs intercepted	0.0018	0.0017	0.0018	0.0015	0.0018	0.0012	0.0018	0.006	0.0018	0.0010
SWB	3b	Dry matter Water ratio	Pa	5.5	4.7	5.5	5.0	5.5	4.5	5.5	2.0	5.5	6
SWB	3b	Base temp	^{o}C	10	10	10	10	10	10	10	10	10	10
SWB	3b	Temp optimum light	^{o}C	25	25	25	25	25	25	25	25	25	25
SWB	3b	Cut off temp	^{o}C	35	35	35	35	35	35	35	35	35	35
SWB	3b	Emergence	$d^{o}C$	105.5	106	110	110	115	110	110	110	110	110
SWB	3b	Flowering	$d^{o}C$	941	1070	920	1130	1212	1250	1103	800	981	990
SWB	3b	Maturiy	$d^{o}C$	1449	1480	1429	1550	1882.8	1950	1538	1550	1626.1	1670
SWB	3b	Transition	$d^{o}C$	10	10	10	10	10	10	10	10	10	20
SWB	3b	Leaf senescence	$d^{o}C$	250	700	250	750	250	250	250	750	250	250
SWB	3b	Max. Height	m	1.7	1.7	1.5	1.5	1.9	1.5	2.5	2.5	1.9	1.9
SWB	3b	Stem to grain transl	fraction	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.025
SWB	3b	Max. root depth	m	1	1	1	1	1	1	1	1	1	1
SWB	3b	Canopy storage	mm	1	1	1	1	1	1	1	1	1	1
SWB	3b	Minimum leaf water potential	kPa	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500	-1500
SWB	3b	Maximum transpiration	mm/day	8	8	8	8	8	8	8	8	8	8
SWB	3b	Specific leaf area	m^2/kg	13.5	12.0	13.5	28.0	13.5	38	13.5	25	13.5	14.5
SWB	3b	Leaf-Stem partition	m^2/kg	1.8	0.5	1.8	0.7	1.8	0.3	1.8	1.8	1.8	3
SWB	3b	Total dry matter at emergence	kg/m^2	0.0029	0.0029	0.0029	0.003	0.0029	0.0029	0.0029	0.002	0.0029	0.004

SWB	3b	Root fraction		0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SWB	3b	Root growth rate	$m^2kg^{-0.5}$	5	5	5	5	5	5	5	5	5	5
SWB	3b	Stress index	fraction	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
SWB	3b	Depletion allowed	%	40	40	40	40	40	40	40	40	40	40
SWB	3b	Grain N partition coeff	fraction	1	1	1	1	1	1	1	1	1	1
SWB	3b	Root N concentration	kg N /kg DM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
SWB	3b	Max grain N concentration	kg N /kg DM	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
SWB	3b	Slope for C4	fraction	3	3	3	3	3	3	3	3	3	3
SWB	3b	Increased act root biomass	fraction	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SWB	3b	Drainage factor	fraction	0.4	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4
SWB	3b	Drainage rate	mm/day	50	50	50	70	50	40	50	70	50	50

Table S4: Median and Inter Quartile Range of ensemble (24 calibrated maize models that performed the sensitivity analysis) relative grain yield for doubling [CO_2], Temperature +4°C, 150 and 50% of current rainfall for five sites across sub-Saharan Africa and three levels of Nitrogen inputs.

Climate change variable	Site	Ninput (kg/ha)	median of relative grain yield change (%)	Inter Quartile Range of relative grain yield change (%)
Doubling [CO_2]	Ethiopia	0	0	7.4
		80	1	5.4
		160	4	5.2
	Rwanda	0	5	7.8
		80	9	11.1
		160	12	14.1
	Ghana	0	7	16.2
		80	10	14.6
		160	13	12.4
	Mali	0	3	7.9
		80	8	11.8
		160	8	12.6
	Benin	0	3	5.5
		80	4	7.2
		160	4	6.9
	all sites pooled	0	4	9.0
		80	6	14.1
		160	7	14.4
Temperature +4°C	Ethiopia	0	-2	29.6
		80	-14	17.7
		160	-17	14.7
	Rwanda	0	-15	19.6
		80	-16	12.0
		160	-22	11.3
	Ghana	0	-22	18.9
		80	-28	18.2
		160	-32	23.8
	Mali	0	-16	22.2
		80	-34	30.4
		160	-39	29.7
	Benin	0	-8	26.6
		80	-21	18.9
		160	-29	20.8
	all sites pooled	0	-14	24.9
		80	-21	21.9
		160	-26	22.3
150% of current rainfall	Ethiopia	0	-16	48.9
		80	-9	30.6
		160	-4	15.3

	Rwanda	0	1	40.9
		80	13	28.0
		160	20	26.2
	Ghana	0	-2	12.5
		80	4	7.9
		160	6	12.3
	Mali	0	-7	25.8
		80	-3	6.4
		160	0	8.3
	Benin	0	-35	48.6
		80	-7	20.4
		160	-2	10.9
	all sites pooled	0	-8	28.2
		80	0	13.6
		160	0	12.6
50% of current rainfall	Ethiopia	0	4	38.3
		80	-11	35.9
		160	-20	34.4
	Rwanda	0	-45	56.2
		80	-46	22.0
		160	-50	24.9
	Ghana	0	-21	39.5
		80	-36	30.0
		160	-36	29.5
	Mali	0	0	33.7
		80	-13	42.0
		160	-25	43.1
	Benin	0	25	56.7
		80	-2	13.1
		160	-4	13.5
	All sites pooled	0	-2	52.6
		80	-23	45.1
		160	-27	43.3

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