

Table 1. APEX input parameters relevant for this study [25]. Output variables are model outputs that were used to assess model calibration. Integer values in parentheses indicate soil layers that apply to the value shown. Ranges of performance metrics for output variables are root mean square error (first line), r-squared (second line), and bias (third line). Parentheses are used to denote negative values for the performance metrics. WSLT2 = Soil salinity in layer 2 (1–19 cm) (dS/m); LAI = Leaf area index; STL = Standing live biomass (t/ha); SW2 = Soil water content in layer 2 (1–19 cm) (m/m); USLT = Salt in biomass (kg/ha).

	Description	Pre-Calibration Value	Post-Calibration Value	Calibration Range	Performance Metric Ranges for Sensitivity Analysis for Output Variables				
					WSLT2	LAI	STL	SW2	USLT
BD [‡] , BDD [‡]	Moist bulk density, dry bulk density (t/m ³)	1.21 (1, 2), 1.40 (3, 4), 1.55 (5, 6)	no change		2.23–4.55 0.20–0.57 2.25–4.72	0.27–0.30 0.90–0.90 (0.19) – (0.17)	0.60–0.72 0.93–0.93 (0.21) – (0.12)	0.07–0.08 0.00–0.03 0.08–0.11	215.2–240.4 0.41–0.54 (0.36) – (0.34)
DLAI	Fraction of growing season when leaf area declines	0.62	no change						
DLAP1	First point on optimal leaf area development curve	40.23	no change						
DLAP2	Second point on optimal leaf area development curve	57.95	no change						
DMLA [‡]	Maximum potential leaf area index	2	no change		3.33–3.36 0.51–0.53 3.42–3.45	0.24–1.96 0.89–0.90 (0.57) – 1.36	0.58–1.71 0.93–0.95 (0.48) – 0.41	0.07–0.08 0.00–0.01 0.05–0.14	208.0–285.0 0.51–0.57 (0.58) – 0.14
ECND ^{†‡}	Electrical conductivity (soil salinity) (dS/m)	2 (1, 2), 3 (3, 4, 5, 6)	3.25 (1), 1.73 (2), 2.02 (3), 1.26 (4), 3.8 (5), 1.32 (6)	0–4 (1, 2), 1–5 (3, 4, 5, 6)	0.78–6.17 0.51–0.57 0.42–6.51	0.26–0.44 0.89–0.90 (0.33) – (0.15)	0.58–1.69 0.93–0.94 (0.53) – (0.07)	0.07–0.08 0.00–0.01 0.09–0.10	218.4–344.0 0.23–0.59 (0.70) – (0.34)

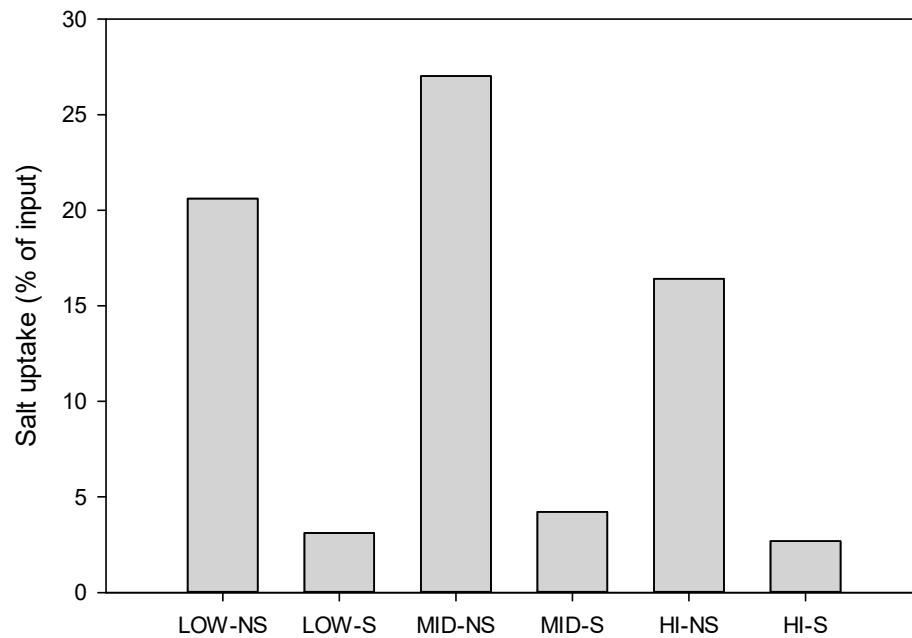
FC [‡]	Soil water content at field capacity (m/m)	0.31 (1), 0.35 (2, 3, 4), 0.29 (5, 6)	no change		3.34–3.34 0.52–0.52 3.44–3.44	0.29–0.29 0.90–0.90 (0.19)–(0.19)	0.67–0.67 0.93–0.93 (0.18)–(0.18)	0.08–0.08 0.00–0.00 0.09–0.09	218.4–218.4 0.51–0.51 (0.34)–(0.34)
HMX	Maximum crop height (m)	1.2	no change						
IDC	Crop category number	12	no change						
Parm38 [‡]	Water stress weighting coefficient		no change		3.34–3.34 0.52–0.52 3.44–3.44	0.29–0.29 0.90–0.90 (0.19)–(0.19)	0.65–0.67 0.93–0.93 (0.18)–(0.17)	0.08–0.08 0.00–0.00 0.09–0.09	216.4–218.4 0.51–0.51 (0.34)–(0.33)
Parm61 [‡]	Soil water upward flow limit		no change		3.22–3.37 0.52–0.52 3.31–3.47	0.29–0.29 0.90–0.90 (0.19)–(0.19)	0.66–0.67 0.93–0.93 (0.18)–(0.18)	0.08–0.08 0.00–0.02 0.08–0.13	218.3–218.9 0.51–0.51 (0.34)–(0.34)
Parm95 [‡]	Exponent of crop stress temperature function		no change		3.34–3.34 0.52–0.52 3.44–3.44	0.29–0.29 0.90–0.90 (0.19)–(0.19)	0.67–0.67 0.93–0.93 (0.18)–(0.18)	0.08–0.08 0.00–0.00 0.09–0.09	218.4–218.4 0.51–0.51 (0.34)–(0.34)
Parm86 ^{†‡}	Nitrogen and salt upward movement by evaporation coefficient	0.001	16.058	0.001–20	2.22–3.34 0.00–0.52 1.16–3.44	0.27–0.29 0.90–0.90 (0.19)–(0.16)	0.57–0.67 0.93–0.94 (0.18)–(0.09)	0.08–0.08 0.00–0.00 0.09–0.09	218.4–251.4 0.37–0.51 (0.35)–(0.33)
PPLP1	Plant population for first point on population curve	25.20	no change						
PPLP2	Plant population for second point on population curve	60.95	no change						
RBMD	Biomass-energy ratio decline rate parameter	1.0	no change						
RDMX	Maximum rooting depth (m)	0.8	no change						

RLAD	Leaf area index decline rate parameter	0.2	no change						
SAN [‡]	Sand content (%)	7.10 (1), 27.10 (2, 3, 4), 33.30 (5, 6)	no change		2.22-4.51 0.50-0.55 2.22-4.67	0.27-0.30 0.90-0.90 (0.20)-(0.17)	0.59-0.73 0.93-0.93 (0.21)-(0.12)	0.07-0.11 0.00-0.01 (0.06)-0.25	214.9-236.2 0.43-0.54 (0.35)-(0.34)
SATC ^{†‡}	Saturated conductivity (mm/h)	0.91 (1), 0.22 (2), 0.3 (3, 4), 0.91 (5, 6)	0.21 (1), 0.57 (2), 0.21 (3), 0.79 (4), 0.39 (5), 0.35 (6)	0.10-1.50	2.17-5.70 0.20-0.65 2.29-6.00	0.27-0.29 0.90-0.90 (0.18)-(0.17)	0.60-0.65 0.93-0.94 (0.17)-(0.13)	0.07-0.08 0.00-0.01 (0.01)-0.07	220.9-233.7 0.44-0.50 (0.35)-(0.34)
SIL [‡]	Silt content (%)	64.40 (1), 41.90 (2, 3, 4), 44.20 (5, 6)	no change		2.22-4.15 0.51-0.56 2.22-4.29	0.28-0.30 0.90-0.90 (0.19)-(0.17)	0.59-0.71 0.93-0.93 (0.20)-(0.13)	0.07-0.10 0.00-0.00 (0.03)-0.21	215.5-232.3 0.45-0.53 (0.35)-(0.34)
STX1 ^{†‡}	Salt stress curve wavelength parameter	12.8	28.5	8-40	3.34-3.39 0.52-0.52 3.44-3.49	0.26-0.69 0.89-0.90 (0.54)-(0.15)	0.58-2.68 0.92-0.94 (0.83)-(0.07)	0.07-0.08 0.00-0.04 (0.10)-(0.11)	285.6-390.3 0.24-0.61 (0.84)-(0.40)
STX2 ^{†‡}	Optimal soil salinity (dS/m)	10.5	9.05	6-20	3.34-3.39 0.52-0.53 3.44-3.49	0.26-0.68 0.89-0.90 (0.53)-(0.15)	0.58-2.63 0.93-0.93 (0.81)-(0.07)	0.07-0.08 0.00-0.04 0.09-0.11	270.0-384.4 0.24-0.60 (0.83)-(0.39)
TBS	Minimum temperature for plant growth (C)	6	no change						
TOP	Optimal temperature for plant growth (C)	23	no change						
UW [‡]	Soil water content at wilting point (m/m)	0.17 (1), 0.20 (2, 3, 4), 0.14 (5, 6)	no change		3.34-3.34 0.52-0.52 3.44-3.44	0.29-0.29 0.90-0.90 (0.19)-(0.19)	0.67-0.67 0.93-0.93 (0.18)-(0.18)	0.08-0.08 0.00-0.00 0.09-0.09	218.4-218.4 0.51-0.51 (0.34)-(0.34)
WA ^{†‡}	Biomass-energy ratio (radiation use efficiency)	30	32.91	22-33	3.33-3.41 0.52-0.53 3.43-3.50	0.29-0.29 0.90-0.90 (0.19)-(0.19)	0.58-2.97 0.89-0.93 (0.91)-(0.12)	0.07-0.08 0.00-0.03 0.06-0.10	210.8-426.7 0.43-0.51 (0.93)-(0.29)
WOC [‡]	Organic carbon concentration (%)	2.80 (1, 2), 2.00 (3, 4), 1.50 (5, 6)	no change		1.34-3.83 0.43-0.53 1.31-3.97	0.27-0.45 0.89-0.90 (0.34)-(0.17)	0.58-2.09 0.93-0.98 (0.64)-(0.14)	0.07-0.10 0.00-0.01 (0.03)-0.24	216.4-322.2 0.48-0.73 (0.68)-(0.34)

6 † indicates parameters adjusted during calibration within the given calibration range; ‡ indicates parameters included in the sensitivity analysis.



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Figure 1. Percentage of salt removed by quinoa relative to salt input via irrigation across 15 years.