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Unraveling ecophysiological mechanisms in potato under different irrigation methods: A preliminary field evaluation – Supplementary Materials

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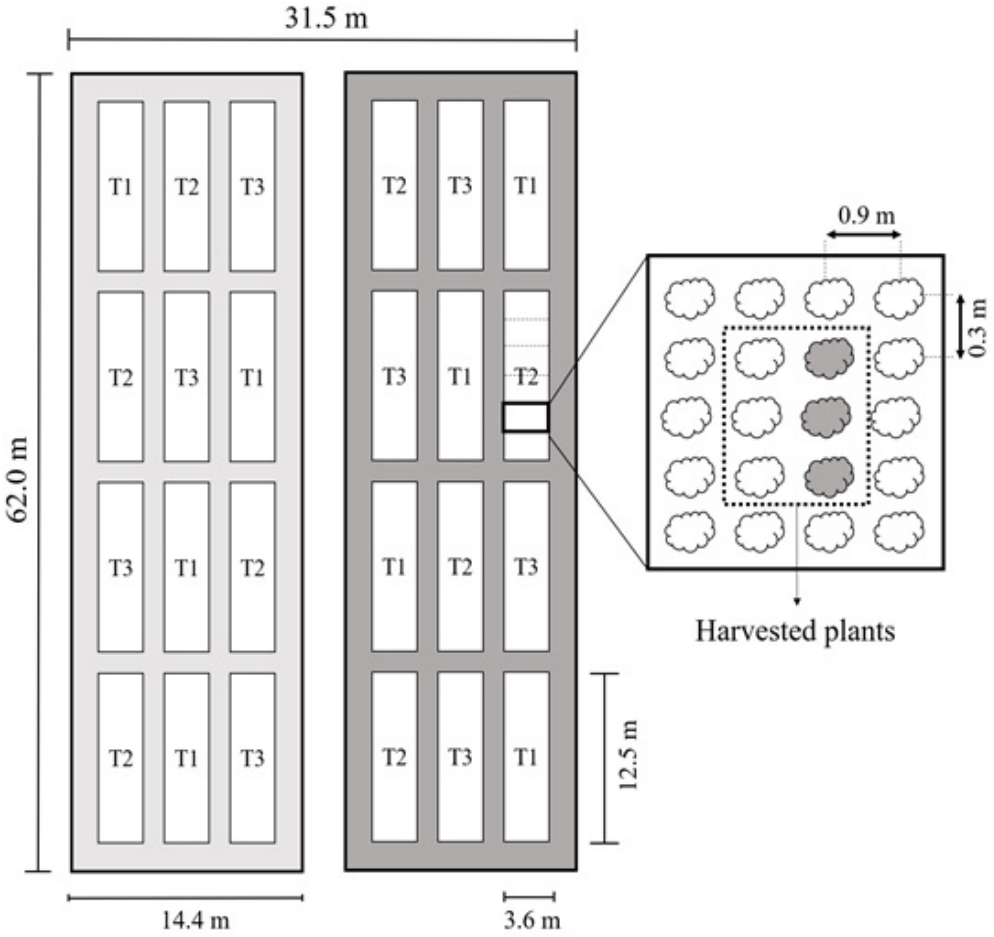

Figure S1. Twin experiment using drip (gray area) and furrow (dark gray area) irrigation methods with a randomized complete block design within each area (plot). A full irrigated control (T1) and 2 water restriction treatments based on maximum light-saturated stomatal conductance (T2: 0.15 and T3: 0.05 mol H_2O m^{-2} s^{-1}) were implemented at each plot. Shaded plants – target plants.

Table S1. One – way ANOVA for comparing dry tuber yield of "sampled" against "nonsampled" plants for carbon isotopic discrimination analysis, in each treatment (T1 – control; T2 – water restriction until g_{s_max} = 0.15 mol H_2O m^{-2} s^{-1}) and T3 – water restriction until g_{s_max} = 0.05 mol H_2O m^{-2} s^{-1}), and irrigation method (DI – drip irrigation and FI – furrow irrigation). n.s. – Non significant difference. $*$ Significant difference at p-value < 0.05.

Treatment	p-value
T1-DI	$0.27^{n.s.}$
T2-DI	$0.29^{n.s.}$
T3-DI	$0.37^{n.s.}$
T1-FI	$0.09^{n.s.}$
T2-FI	0.04^{*}
T3-FI	$0.15^{n.s.}$

Table S2. Canopy cover (CC) and cumulative thermal time (TT) for estimation of Senescence Initiation, for each treatment (T1 – control; T2 – water restriction until g_{s_max} = 0.15 mol H_2O m^{-2} s^{-1}) and T3 – water restriction until g_{s_max} = 0.05 mol H_2O m^{-2} s^{-1}), and irrigation method (DI – drip irrigation and FI – furrow irrigation). DAP – days after planting.

Treatment	CC (%)	TT (°C day)	DAP
at the maximimum canopy cover (MCC)			
T1-DI	95.6 ± 2.10	797.5 ± 19.49	66.8 ± 1.28
T2-DI	92.5 ± 1.31	741.4 ± 46.42	62.9 ± 3.12
T3-DI	81.6 ± 4.13	691.0 ± 12.63	59.6 ± 0.91
T1-FI	100.0 ± 0.00	865.8 ± 23.70	71.2 ± 1.55
T2-FI	79.4 ± 3.88	836.4 ± 46.40	69.2 ± 2.99
T3-FI	70.8 ± 7.88	714.5 ± 39.08	57.1 ± 4.42
at the 50% of MCC			
T1-DI	47.8 ± 1.05	1264.6 ± 18.51	96.8 ± 1.24
T2-DI	46.3 ± 0.65	1100.5 ± 36.79	86.5 ± 2.13
T3-DI	40.8 ± 2.06	1036.1 ± 23.51	82.6 ± 1.51
T1-FI	50.0 ± 0.00	1322.2 ± 28.07	99.5 ± 1.95
T2-FI	39.7 ± 1.94	1311.0 ± 80.36	98.9 ± 4.63
T3-FI	35.4 ± 3.94	1102.0 ± 44.44	86.6 ± 2.86

TT at MCC and 50% of MCC was estimated by nonlinear regression by fitting temporal data of CC to a Beta function, according to Ramírez et al.'s [1] procedure. CC measurements were made according to CIP's Protocol for Designing and Conducting Potato Field [2], by coupling digital photography and the software Image Canopy [4] for processing image.

Table S3. Fv′/Fm′ – Average values of fluorescence parameter (±SE, n = 8) in different water restriction levels reported by [3] at Santa Rita, Arequipa – Peru, in 2016.

Irrigation method	Fv′/Fm′
Control	0.474 ± 0.011
Early low stress	0.434 ± 0.012
Early medium stress	0.414 ± 0.013
Early severe stress	0.381 ± 0.013
Late low stress	0.448 ± 0.015
Late medium stress	0.439 ± 0.014
Late severe stress	0.403 ± 0.021

See [3] for treatments description.

Table S4. ANOVA analysis combined to compare drip (DI) and furrow (FI) irrigation for dry tuber yield. IM – Irrigation method. Block(IM) – Block nested in irrigation method. TWR – Treatment of water restriction. IM*TWR – Interaction between irrigation method and treatment.

	Df	Mean Sq	F value	*p*-value
IM	1	2.66	1.77	0.232
Block(IM)	6	1.51	0.71	0.651
TWR	2	47.67	22.38	< 0.001
IM*TWR	2	1.30	0.61	0.560
Residual	12	2.13		

Prior to this, both DI and FI were analyzed as RCBDs, and then a Bartlett's test was performed to test the homogeneity of variances (Bartlett's K-squared = 0.044, *p*-value = 0.833).

References

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