

Supplementary Materials

Table S1. F values for phosphorus content and accumulation in common bean as a function of P₂O₅ and phosphate solubilizing-bacteria (PSB) doses.

F value	PCL	PCDM	PCG	PADM	Export	AE
	g kg ⁻¹			kg ha ⁻¹		kg kg ⁻¹
P ₂ O ₅ doses (P)	3.52*	5.71**	3.75 *	1.68 ^{ns}	0.98 ^{ns}	1.21 ^{ns}
PSB doses (I)	0.27 ^{ns}	2.93*	0.26 ^{ns}	5.27 **	3.95 *	2.53 ^{ns}
P × I	1.00 ^{ns}	1.68 ^{ns}	0.91 ^{ns}	1.87 ^{ns}	0.56 ^{ns}	1.90 ^{ns}
Mean	2.9	2.9	4.26	4.58	14.3	9.79
CV (%)	10.29	7.54	6.65	19.05	13.03	74.59

**, * and ns: significant at $p < 0.01$, $p < 0.05$ and not significant, respectively. CV: coefficient of variation; PCL: phosphorus content in leaves; PCDM: phosphorus content in dry matter (R₆); PCG: phosphorus content in grains; PADM: phosphorus accumulation in dry matter (R₆); P export at physiological maturity (R₉) and AE: agronomic efficiency.

Table S2. F values for chlorophyll content index (CCI), chlorophyll a (Chl a), chlorophyll b (Chl b), total chlorophyll (Chl total) and carotenoids (Cx + c) as a function of P₂O₅ and phosphate solubilizing-bacteria (PSB) doses in the stages V4, R6 and R8.

F value	Vegetative stage (V4)				
	CCI	Chl a	Chl b	Chl total	Cx + c
	-----mg g ⁻¹ -----				
P ₂ O ₅ doses (P)	1.44 ^{ns}	3.66 **	10.56 **	3.80 *	2.95 **
PSB doses (I)	0.3 ^{ns}	4.48 *	3.50 *	0.39 ^{ns}	0.41 ^{ns}
P × I	1 ^{ns}	8.32 **	6.62 **	1.5 ^{ns}	2.28 *
Mean	19.06	0.21	0.3	0.52	0.46
CV (%)	7.76	8.07	7.19	3.92	14.5
F value	Reproductive stage (R6)				
	CCI	Chl a	Chl b	Chl total	Cx + c
P ₂ O ₅ doses (P)	7.46 **	0.28 ^{ns}	0.40 ^{ns}	0.35 ^{ns}	0.61 ^{ns}
PSB doses (I)	0.64 ^{ns}	0.75 ^{ns}	1.40 ^{ns}	1.12 ^{ns}	1.56 ^{ns}
P × I	0.63 ^{ns}	0.83 ^{ns}	0.90 ^{ns}	0.86 ^{ns}	1.42 ^{ns}
Mean	22.18	0.22	0.33	0.54	0.5
CV (%)	7.28	11.32	11.36	11.28	11.24
F value	Reproductive stage (R8)				
	CCI	Chl a	Chl b	Chl total	Cx + c
P ₂ O ₅ doses (P)	3.79 *	4.21 *	7.03 **	3.70 *	2.22 ^{ns}
PSB doses (I)	0.12 ^{ns}	0.52 ^{ns}	0.78 ^{ns}	0.70 ^{ns}	0.80 ^{ns}
P × I	0.82 ^{ns}	0.96 ^{ns}	1.32 ^{ns}	0.86 ^{ns}	0.80 ^{ns}
Mean	21.6	0.15	0.26	0.41	0.47
CV (%)	10.79	16.35	9.77	11.35	13.93

**, * and ns: significant at $p < 0.01$, $p < 0.05$ and not significant, respectively. CV: coefficient of variation.

Table S3. F values for leaf area (LA), dry mass (DM), number of pods per plant (NPP), number of grains per pod (NGP), hundred-grain weight (HGW), grain yield (YLD) as a function of P₂O₅ and phosphate solubilizing-bacteria (PSB) doses.

F value	LA	DM	NPP	NGP	HGW	YLD
	cm ²	g planta ⁻¹	-----n ^o -----		g	kg ha ⁻¹
P ₂ O ₅ doses (P)	0.55 ^{ns}	6.65 ^{**}	1.49 ^{ns}	1.49 ^{ns}	0.50 ^{ns}	5.54 ^{**}
PSB doses (I)	3.63 [*]	3.57 [*]	7.83 ^{**}	3.78 [*]	0.19 ^{ns}	5.13 ^{**}
P × I	2.73 [*]	0.90 ^{ns}	1.92 ^{ns}	1.01 ^{ns}	1.23 ^{ns}	0.18 ^{ns}
Mean	1065.18	7.29	12.22	4.91	26.27	3295.38
CV (%)	19.11	15.44	15.96	14.43	2.25	10.67

^{**}, ^{*} and ^{ns}: significant at $p < 0.01$, $p < 0.05$ and not significant, respectively. CV: coefficient of variation.

Table S4. F Values for yield of sieves ≥ 12 (YS ≥ 12), crude protein content (CPC), cooking time (CKT), time for maximum hydration (TMH) and hydration ratio (HR) of common bean grains as function of P₂O₅ and phosphate solubilizing-bacteria (PSB) doses.

F value	YS ≥ 12	CPC	CKT	TMH	HR
	----- % -----		min:seg	h:min	-
P ₂ O ₅ doses (P)	0.92 ^{ns}	2.01 ^{ns}	4.20 [*]	0.05 ^{ns}	0.14 ^{ns}
PSB doses (I)	1.36 ^{ns}	1.26 ^{ns}	0.67 ^{ns}	1.30 ^{ns}	0.69 ^{ns}
P × I	1.02 ^{ns}	0.87 ^{ns}	0.78 ^{ns}	1.25 ^{ns}	0.93 ^{ns}
Mean	85.7	17.0	12:23	15:25	2.02
CV (%)	3.14	5.56	7.67	15.05	1.84

^{*} and ^{ns}: significant at $p < 0.05$ and not significant, respectively.

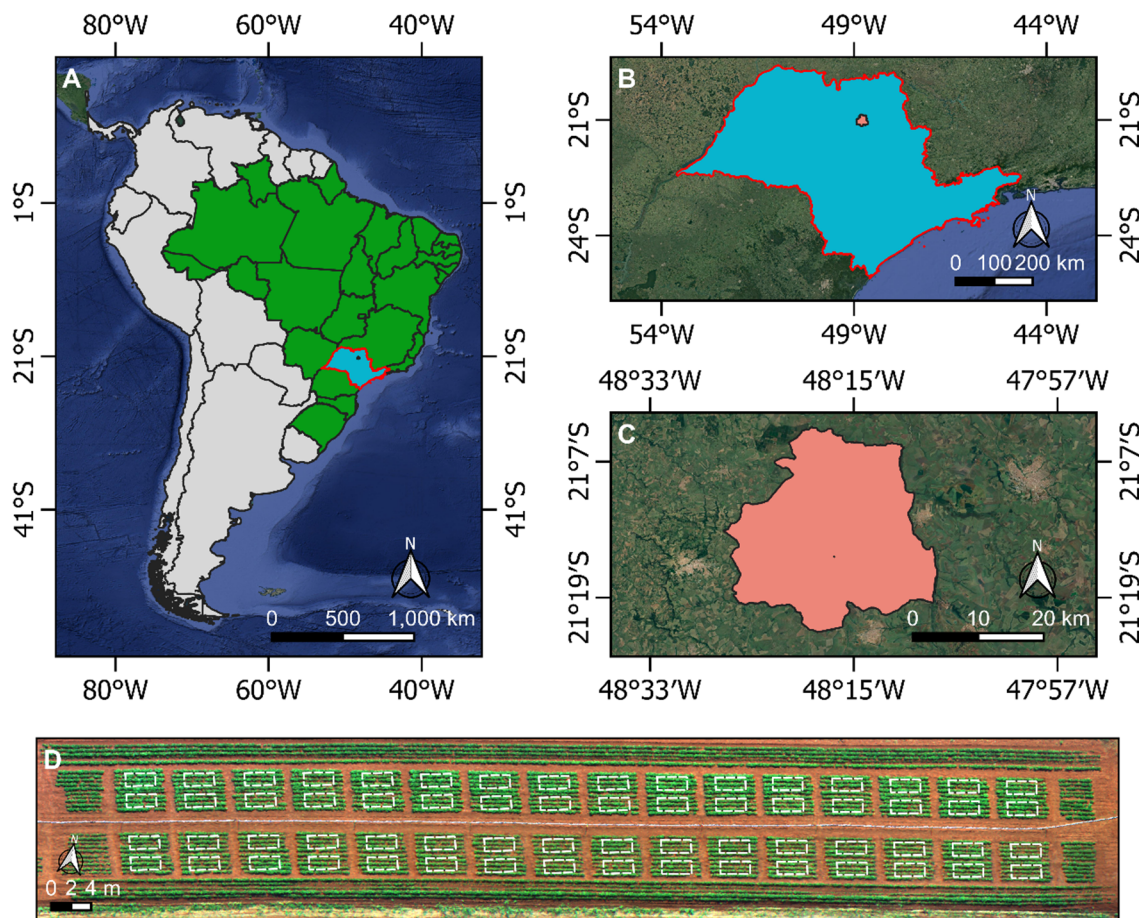


Figure S1. Description of the study area. Map of South America highlighting Brazil (A); State of São Paulo (B); city of Jaboticabal (C) and experimental area (D).

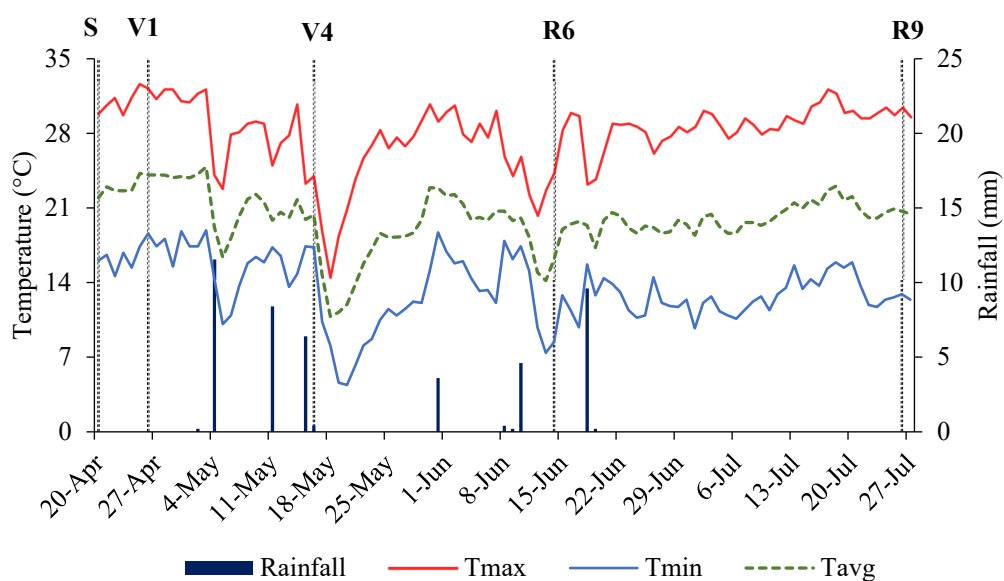


Figure S2. Average rainfall, maximum, average and minimum temperatures recorded during the period in which the experiment was conducted (20 Apr. to 27 Aug. 2022). Jaboticabal, São Paulo,

Brazil. Sowing (S), Emergence (V1), Third fully expanded trifoliate leaf (V4), Full flowering (R6) and Physiological maturity (R9).

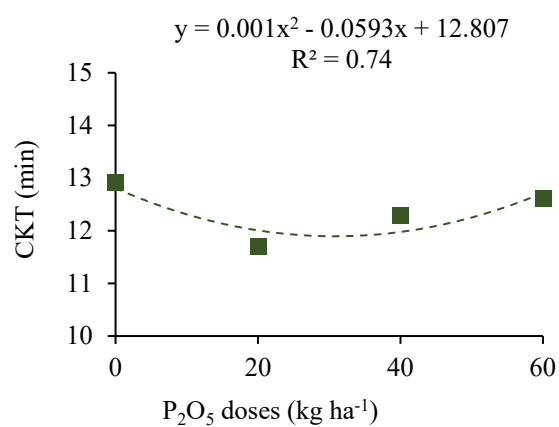


Figure S3. Common bean cooking time (CKT) as a function of P₂O₅ doses.