Table S1. In vitro characterization of PGPR traits for the tested PSB isolate: P solubilization and pH in Pikovskaya and NBRIP media; production of gluconic acid on both media; phytate solubilization; siderophores, HCN (Hydrogen cyanide) and IAA (indole-3-acetic acid) productions, and ACC deaminase activity. Results are expressed as the mean value ± standard deviation. SI : Solubilization Index.

		Pfaba
Pikovskaya medium	SI	2.3
	Solubilized P	152.1 ± 0.9
	Medium pH	6.7 ± 0.1
	Gluconic acid production (µmol mL^{-1})	11 ± 0.7
NBRIP	SI	1.4
	Solubilized P	49.3 ± 2.1
	Medium pH	3.8 ± 0.2
	Gluconic acid production (µmol mL^{-1})	8.3 ± 0.1
	Phytate SI	3.5
	Siderophore production	+
	HCN production	-
	IAA production (ng μL^{-1})	18.8 ± 3.7
	ACC deaminase activity	+

Table S2. Morphometric and elemental NP plants profiles, according to the level of N fertilization (N160 or N80), P added in complexed or labile form; and without of with Pfaba inoculation. Results are expressed as mean ± SD (n=4). Letters indicate significant differences obtained by post-hoc LSD Fischer test from the R package "agricolae" (4.0.2 version) (p-value < 0.05).

		High N fertilization												**Low N fertilization**									
		Complexed P				**Labile P**				**Complexed P**				**Labile P**			
		Control			**Pfaba**			**Control**			**Pfaba**			**Control**			**Pfaba**			**Control**			**Pfaba**		
Shoots	Foliar area (cm²)	405.32 ± 64.14	a	427.70 ± 65.99	a	389.23 ± 146.77	ab	451.29 ± 154.63	a	253.19 ± 54.86	c	263.81 ± 134.86	bc	233.31 ± 67.96	c	265.27 ± 68.73	bc
	Dry biomass (g)	6.06 ± 1.67	ab	8.33 ± 1.70	a	6.27 ± 2.42	ab	6.90 ± 2.25	a	4.33 ± 0.62	b	4.40 ± 2.19	b	3.99 ± 1.05	b	4.43 ± 1.69	b
	P content (%)	0.08 ± 0.01	b	0.16 ± 0.08	b	0.52 ± 0.22	a	0.54 ± 0.19	a	0.16 ± 0.10	b	0.14 ± 0.10	b	0.68 ± 0.22	a	0.69 ± 0.27	a
	P amount (mg)	0.47 ± 0.10	b	1.28 ± 0.71	b	2.88 ± 0.67	a	3.42 ± 0.54	a	0.67 ± 0.32	b	0.63 ± 0.25	b	2.77 ± 1.25	a	2.83 ± 0.89	a
	N content (%)	1.00 ± 0.08	b	0.98 ± 0.12	b	1.31 ± 0.33	a	1.08 ± 0.23	ab	0.86 ± 0.17	b	0.91 ± 0.20	b	0.87 ± 0.24	b	0.84 ± 0.16	b
	N amount (mg)	60.24 ± 14.59	a	81.24 ± 15.01	a	80.04 ± 26.75	a	72.38 ± 18.91	a	37.72 ± 11.73	b	38.11 ± 17.87	b	33.44 ± 8.75	b	37.58 ± 16.40	b
Roots	Dry biomass (g)	2.17 ± 0.47	abc	2.88 ± 0.85	a	2.17 ± 0.39	abc	2.35 ± 0.86	ab	1.38 ± 0.24	c	1.56 ± 0.66	bc	1.42 ± 0.53	c	1.54 ± 0.73	bc
	P content (%)	0.07 ± 0.04	c	0.23 ± 0.10	b	0.24 ± 0.05	ab	0.22 ± 0.05	ab	0.19 ± 0.06	ab	0.21 ± 0.09	ab	0.28 ± 0.06	a	0.23 ± 0.04	ab
	P amount (mg)	0.15 ± 0.09	d	0.70 ± 0.51	a	0.53 ± 0.15	ab	0.51 ± 0.15	abc	0.26 ± 0.08	cd	0.29 ± 0.07	bcd	0.38 ± 0.10	abcd	0.35 ± 0.13	abcd
	N content (%)	1.76 ± 0.40	ab	1.45 ± 0.35	b	2.06 ± 0.54	a	1.48 ± 0.42	b	1.80 ± 0.38	ab	1.66 ± 0.45	ab	1.69 ± 0.30	ab	1.61 ± 0.31	ab
	N amount (mg)	37.90 ± 11.09	ab	41.34 ± 14.16	a	43.45 ± 8.04	a	35.24 ± 15.96	ab	25.22 ± 9.14	b	25.22 ± 11.26	b	24.31 ± 10.56	b	23.61 ± 7.32	b

Table S3. Root traits according to the level of N fertilization (N160 or N80) and P added in complexed or labile form, and without of with Pfaba inoculation. Results are expressed as mean ± SD (n=4). Letters indicate significant differences obtained by post-hoc LSD Fischer test from the R package agricolae (p-value < 0.05).

	High N fertilization												**Low N fertilization**									
	Complexed P				**Labile P**				**Complexed P**				**Labile P**			
	Control			**Pfaba**			**Control**			**Pfaba**			**Control**			**Pfaba**			**Control**			**Pfaba**		
Root length (cm)	4797.00 ± 1134.22	ab	4141.75 ± 789.36	abc	4109.57 ± 323.06	abc	4142.07 ± 872.84	abc	5222.35 ± 342.48	a	3576.18 ± 646.20	c	3830.52 ± 688.11	bc	3551.02 ± 1292.69	c
Roots surface (cm²)	716.90 ± 72.53	a	629.77 ± 101.54	ab	680.37 ± 126.80	a	637.18 ± 169.69	ab	749.73 ± 68.75	a	412.12 ± 94.57	c	512.69 ± 129.50	bc	453.85 ± 105.93	c
Roots average diameter (mm)	0.50 ± 0.12	ab	0.49 ± 0.02	ab	0.53 ± 0.09	a	0.49 ± 0.09	ab	0.46 ± 0.05	abc	0.36 ± 0.02	c	0.42 ± 0.03	bc	0.42 ± 0.07	bc
Length per volume (cm , m-3)	4797.00 ± 1134.22	ab	4141.75 ± 789.36	abc	4109.57 ± 323.06	abc	4142.07 ± 872.84	abc	5222.35 ± 342.48	a	3576.18 ± 646.20	c	3830.52 ± 688.11	bc	3551.02 ± 1292.69	c

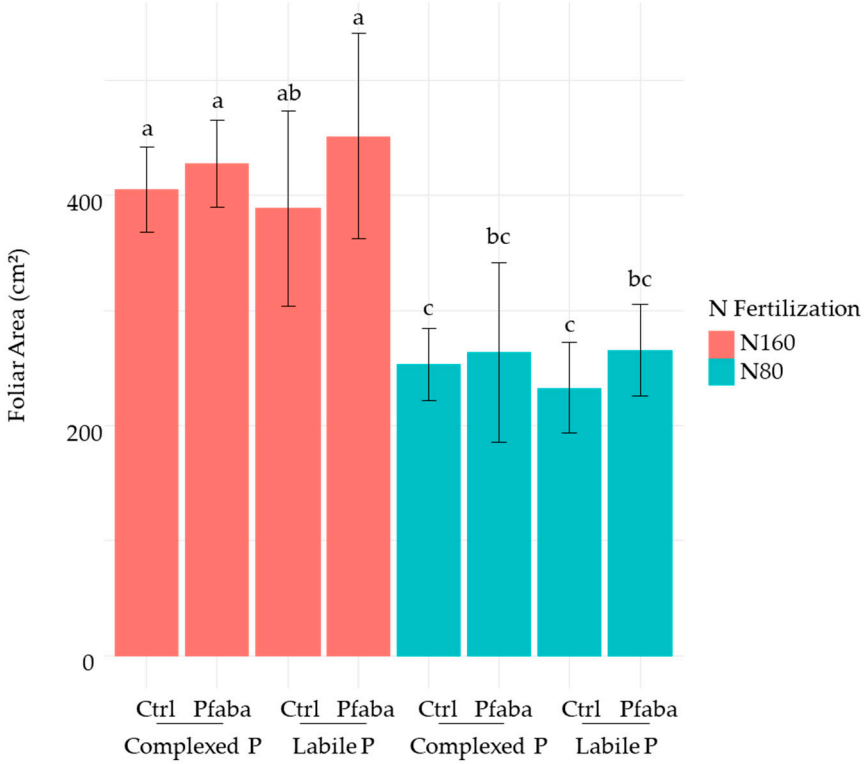


Figure S1. Leaf area of plants subjected to high (N160, red) or low (N80, blue) N fertilization, with P fertilization added in complexed or labile form, and without of with Pfaba inoculation. Letters indicate significant differences obtained by post-hoc LSD Fischer test from the R package « agricolae » (4.0.2 version) ($p.value < 0.05$).