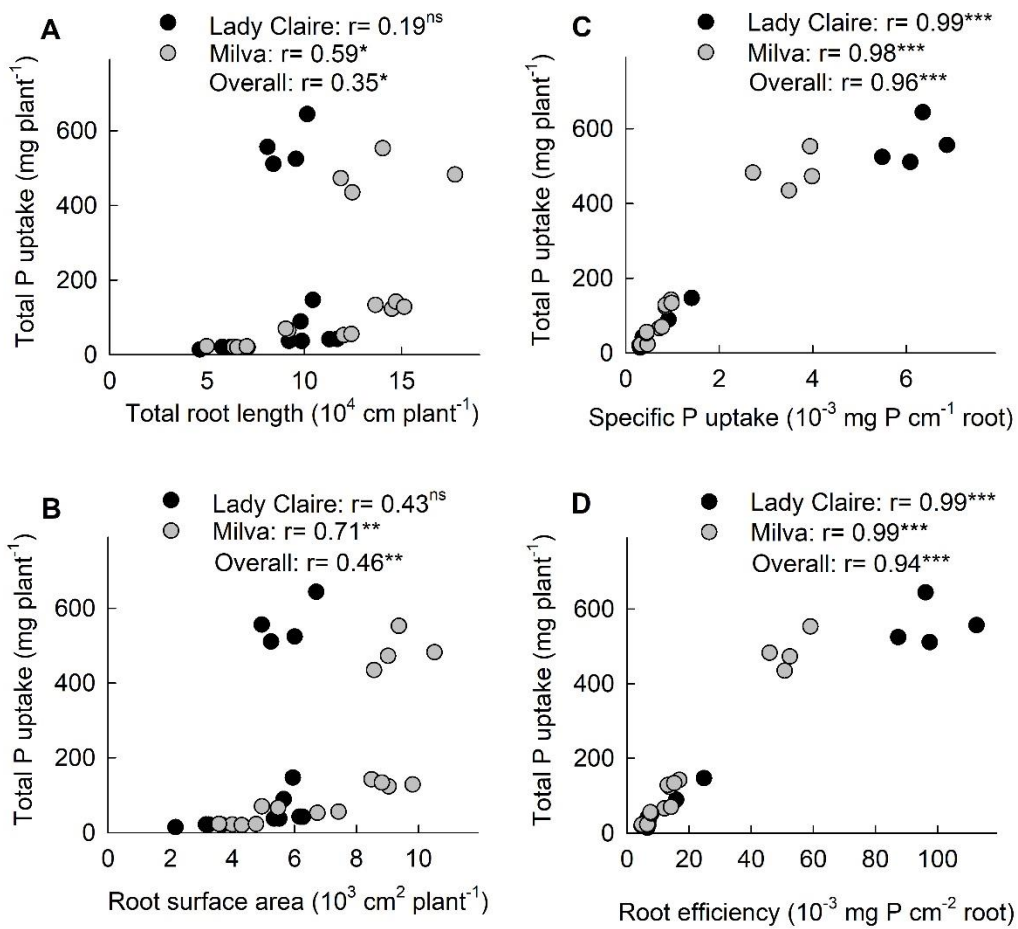


**Additional files****Additional file 1.** Concentration of nutrients applied in the hydroponic system

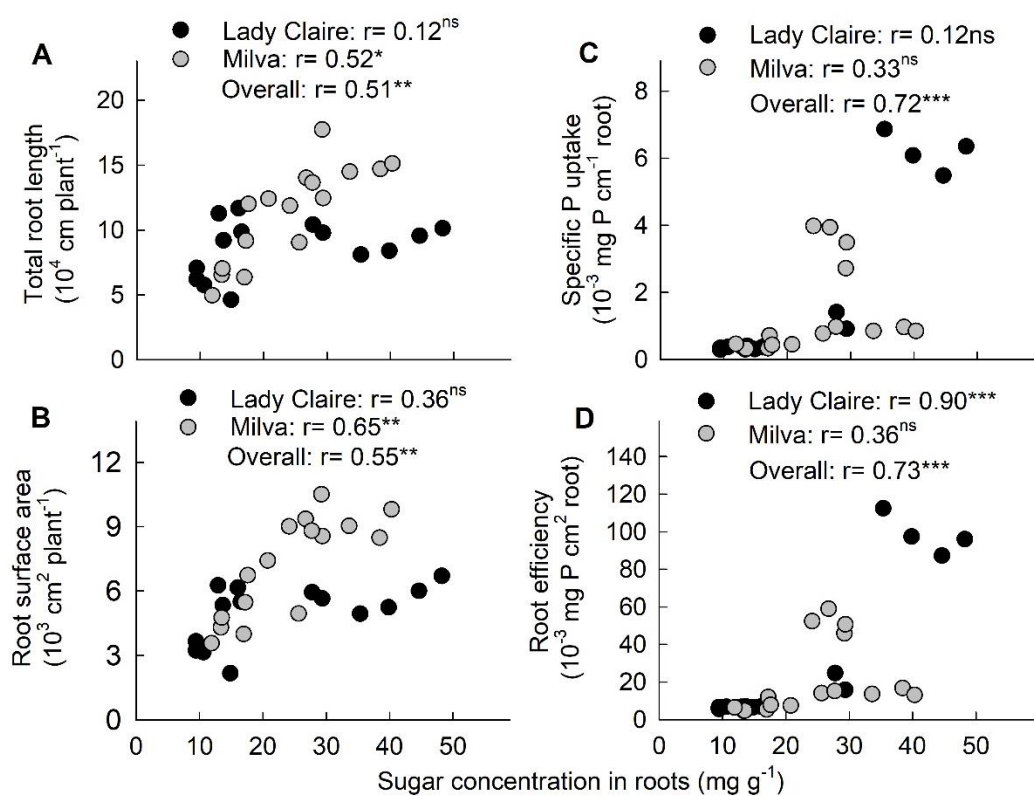
Nutrient	Concentration (mg L <sup>-1</sup> )	Nutrient sources
P	0 - 30	KH <sub>2</sub> PO <sub>4</sub>
N	56.04	NH <sub>4</sub> NO <sub>3</sub> , Ca(NO <sub>3</sub> ) <sub>2</sub> * 4H <sub>2</sub> O
K	104.25	K <sub>2</sub> SO <sub>4</sub>
Ca	69.05	Ca(NO <sub>3</sub> ) <sub>2</sub> * 4H <sub>2</sub> O, CaCl <sub>2</sub> * 2H <sub>2</sub> O
S	45.01	K <sub>2</sub> SO <sub>4</sub> , MgSO <sub>4</sub> * 7H <sub>2</sub> O, CuSO <sub>4</sub> * 5H <sub>2</sub> O, ZnSO <sub>4</sub> * 7H <sub>2</sub> O, MnSO <sub>4</sub> * H <sub>2</sub> O
Mg	1.62	MgSO <sub>4</sub> * 7H <sub>2</sub> O
Cu	0.02	CuSO <sub>4</sub> * 5H <sub>2</sub> O
EDTA-Fe	5.58	C <sub>10</sub> H <sub>12</sub> FeN <sub>2</sub> NaO <sub>8</sub> * 3H <sub>2</sub> O
Zn	0.09	ZnSO <sub>4</sub> * 7H <sub>2</sub> O
B	0.14	H <sub>3</sub> BO <sub>3</sub>
Mo	0.13	H <sub>24</sub> Mo <sub>7</sub> N <sub>6</sub> O <sub>24</sub> * 4H <sub>2</sub> O
Mn	0.07	MnSO <sub>4</sub> * H <sub>2</sub> O
Na	2.32	C <sub>10</sub> H <sub>12</sub> FeN <sub>2</sub> NaO <sub>8</sub> * 3H <sub>2</sub> O
Cl	2.83	CaCl <sub>2</sub> * 2H <sub>2</sub> O

**Additional file 2.** Acquisition parameters for phytohormone analysis.

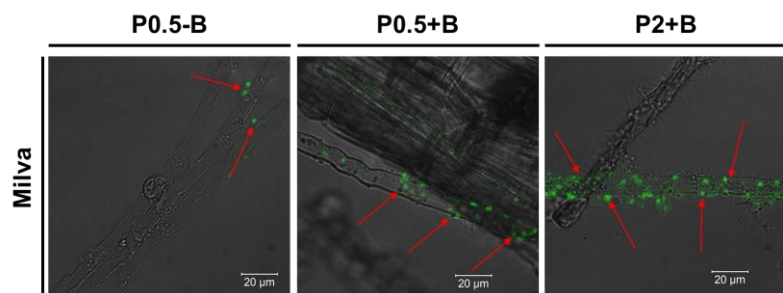
Compound	RT [min]	Polarity	Parent Ion [m/z]	Fragmentor V	Collision Energy V	Product Ion [m/z]
<i>Trans</i> -zeatin	1.93	+	220.1	100	15	136.1
					9	202.1
					22	148.1
<i>Trans</i> -zeatin-d5	1.92	+	225.1	105	16	137.1
					10	207.2
Indoleacetic acid (IAA)	3.88	+	176.1	84	14	130
					38	103.1
					40	77.2
Indoleacetic acid-d4	3.87	+	180.1	84	15	133.2
					38	106.1
					45	79.2
Abscisic acid (ABA)	4.68	-	263.1	85	4	153.1
					5	219.1
					12	204.1
Abscisic acid-d6	4.67	-	269.1	88	4	159.1
					8	225.1
Jasmonic acid (JA)	5.20	+	211.2	85	8	133.1
					8	151.1
					5	193
Jasmonic acid-d5	5.19	+	216.1	85	8	135.1
					9	153.2
					7	198.2



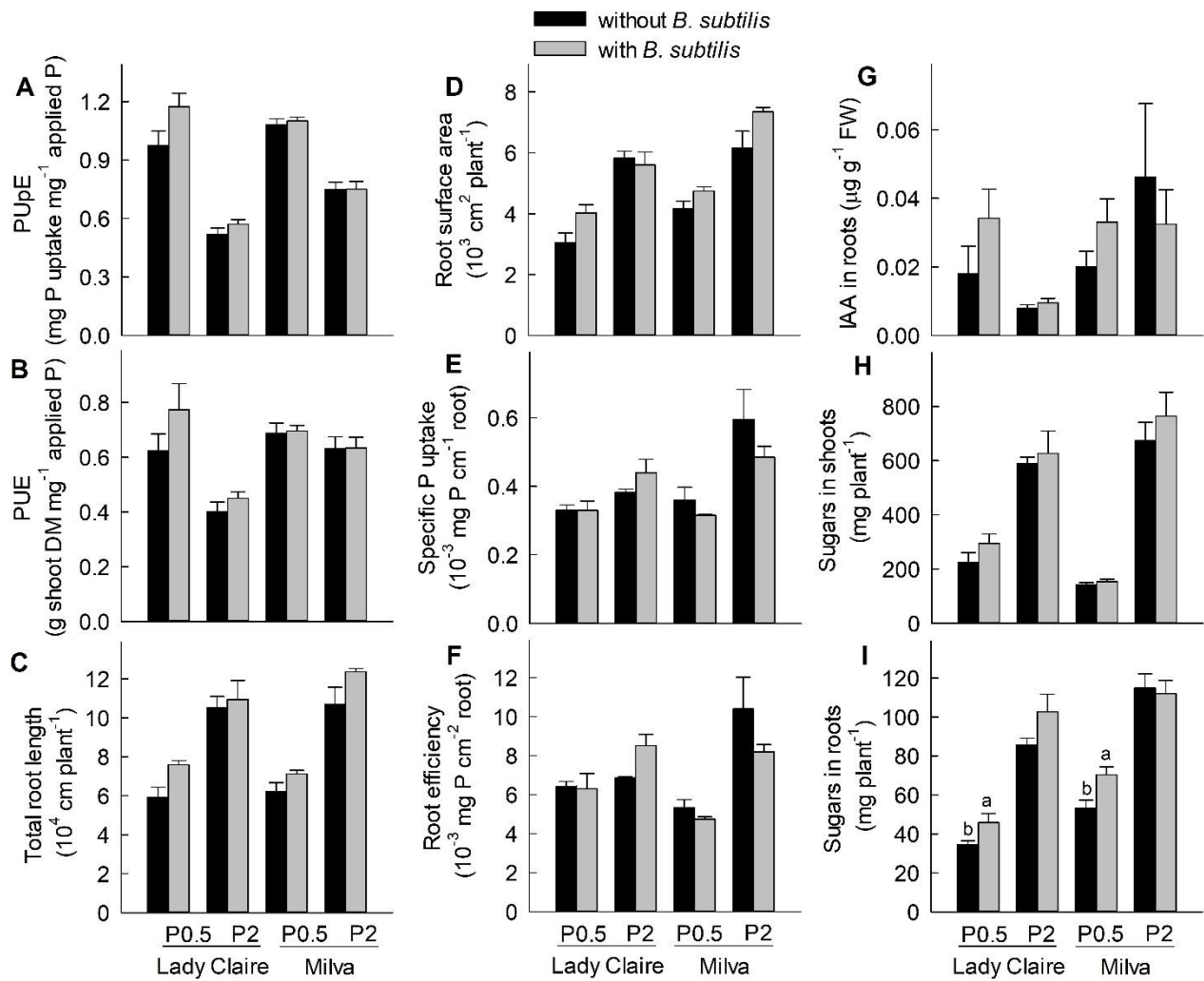
**Additional file 3.** Correlation between root morphological traits and total P uptake. ns, \*, and \*\*\* indicate non-significant and significant differences at  $p < 0.05$  and  $p < 0.001$ , respectively, by Pearson correlation.



**Additional file 4.** Correlation between root sugar concentration and root morphological traits. ns, \*, and \*\*\* indicate non-significant and significant differences at  $p < 0.05$  and  $p < 0.001$ , respectively, by Pearson correlation.



**Additional file 5.** Microscopic images of roots of cultivar Milva with and without *B. subtilis* inoculation using Cellbrite Fix Membrane Stains. Arrows indicate the bacterial colonies attached to the roots. B = *B. subtilis*.



**Additional file 6.** Effect of *B. subtilis* inoculation on (A) PUpE, (B) PUE, (C-F) root traits, (G) root IAA, and (H-I) sugar content in shoots and roots. Mean  $\pm$  SE (n=5) with different lowercase letters are significantly different at the same P level and cultivar. No indication = not significantly different.