Electronic Supplementary Material (ESI) for Environmental Science: Advances.

Supporting Information

Impact of iron oxide nanoparticles on a lead polluted water-soil-plant system under alternating periods of water stress

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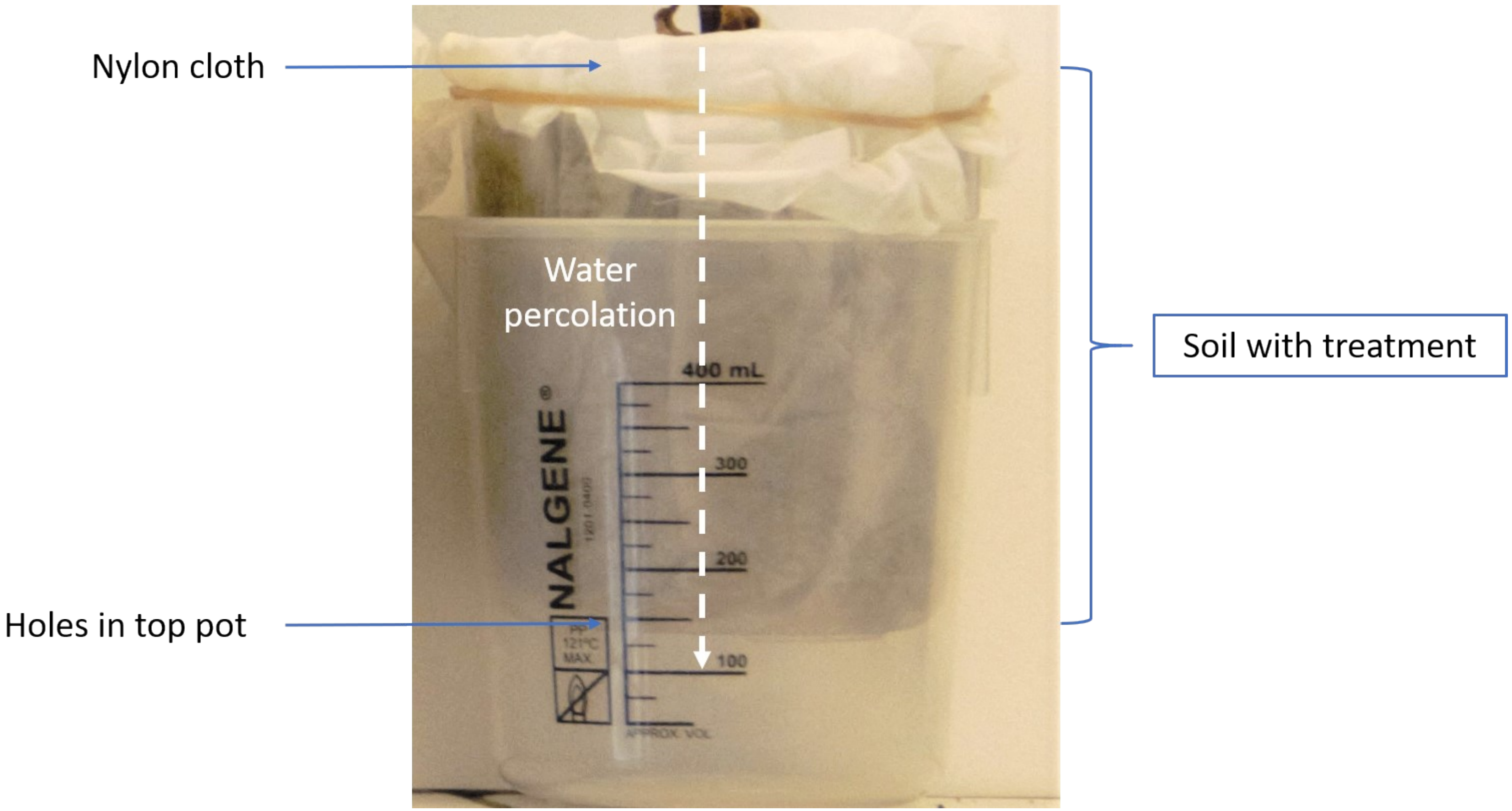

Fig. S1 Experimental set-up of 400 mL polypropylene beaker (Nalgene)

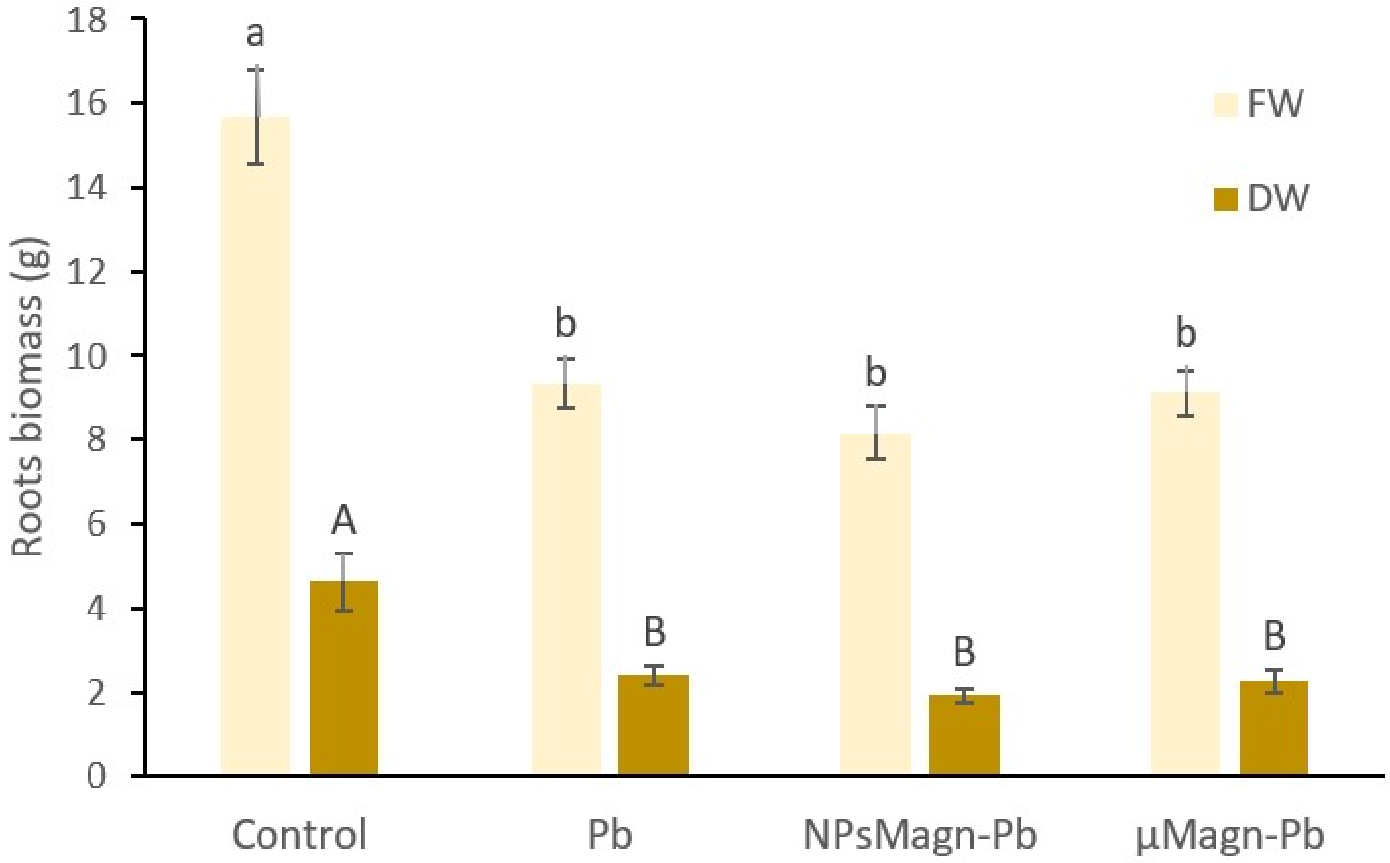

Fig. S2 Fresh weight (FW) and Dry weight (DW) (g) of roots of sunflower plants measured after 90 days of growth on control soil or containing Pb, NPsMagn-Pb or µMagn-Pb. Data represent the mean ± SEM (n= 6). Different letters above indicates significant difference ($p < 0.05$).

Table S1 Soil characterization. The analyses were performed in the SARM, Analytical laboratory (Vandoeuvre-lès-Nancy, France).

As (ppm)	Ba (ppm)	Be (ppm)	Bi (ppm)	Cd (ppm)	Co (ppm)	Cr (ppm)	Cs (ppm)	Cu (ppm)	Ga (ppm)	Ge (ppm)	Hf (ppm)
9.12	357	1.75	0.38	0.31	15.5	79.8	3.07	32.9	15.1	1.25	5.28
In (ppm)	**Mo (ppm)**	**Nb (ppm)**	**Ni (ppm)**	**Pb (ppm)**	**Rb (ppm)**	**Sb (ppm)**	**Sc (ppm)**	**Sn (ppm)**	**Sr (ppm)**	**Ta (ppm)**	**Th (ppm)**
0.06	0.69	8.45	35.2	53.8	70.3	1.70	12.50	4.17	44.6	0.78	6.19
U (ppm)	**V (ppm)**	**W (ppm)**	**Y (ppm)**	**Zn (ppm)**	**Zr (ppm)**	**La (ppm)**	**Ce (ppm)**	**Pr (ppm)**	**Nd (ppm)**	**Sm (ppm)**	**Eu (ppm)**
2.12	90.5	1.84	23.5	144	200	23.1	47.4	5.83	22.9	4.71	1.09
Gd (ppm)	**Tb (ppm)**	**Dy (ppm)**	**Ho (ppm)**	**Er (ppm)**	**Tm (ppm)**	**Yb (ppm)**	**Lu (ppm)**	**SiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**	**MnO (%)**
4.15	0.671	4.21	0.886	2.41	0.358	2.33	0.345	64.24	11.59	5.90	0.076
MgO (%)	**CaO (%)**	**Na_2O (%)**	**K_2O (%)**	**TiO_2 (%)**	**P_2O5 (%)**	**PF (%)**	**Total (%)**				
1.16	0.41	0.53	1.95	0.81	0.21	12.88	99.75				

Table S2 Quantum yield measured on the leaves between day 35 and 87 of the experiment. Data represent the mean ± SEM (n=6). Different letters indicate significant differences ($p < 0.05$).

	Control	**Pb**	**NPsMagn-Pb**	**µMagn**
d35	0,85 ± 0,007 [a]	0,85 ± 0,003 [a]	0,85 ± 0,001 [a]	0,85 ± 0,004 [a]
d41	0,84 ± 0,004 [a]	0,85 ± 0,003 [a]	0,85 ± 0,004 [a]	0,85 ± 0,003 [a]
d48	0,83 ± 0,003 [a]	0,83 ± 0,007 [a]	0,82 ± 0,007 [a]	0,84 ± 0,006 [a]
d63	0,83 ± 0,003 [a]	0,83 ± 0,003 [a]	0,83 ± 0,003 [a]	0,83 ± 0,003 [a]
d66	0,83 ± 0,007 [a]	0,84 ± 0,004 [a]	0,83 ± 0,006 [a]	0,84 ± 0,004 [a]
d70	0,82 ± 0,008 [a]	0,81 ± 0,010 [a]	0,81 ± 0,004 [a]	0,82 ± 0,009 [a]
d77	0,82 ± 0,003 [a]	0,82 ± 0,006 [a]	0,82 ± 0,006 [a]	0,82 ± 0,008 [a]
d84	0,82 ± 0,008 [a]	0,82 ± 0,008 [a]	0,82 ± 0,006 [a]	0,83 ± 0,004 [a]
d87	0,82 ± 0,003 [a]	0,83 ± 0,004 [a]	0,83 ± 0,005 [a]	0,83 ± 0,003 [a]

Materials and methods: Maximum quantum yield of photosynthesis measurement. Pulse-amplitude modulated (PAM) fluorescence was determined using a FluorPen FP100 on two leaves of each plant (n=6) after a dark adaptation for 30 min to oxidize the PSII reaction centers. Measurements were made at different days of growth (from day 35 to 87).