

Table S1. Basic characterization of the soil in the various treatments. The pH was measured in a 1:2.5 soil:deionised water suspension (ISO 10390:2021) using a XS pH-meter model PC8. Available phosphorus by the Olsen method (ISO 11263:1994). Organic carbon was extrapolated from the loss-on-ignition determined according to Nelson and Sommers (Soil Organic Matter – SOM) [1] and multiplied by the Van Bemmelen factor, i.e., 0.58 [2]. Total nitrogen was determined by an elemental analyser (Model Leco CN828 Carbon Nitrogen Determinator, St. Joseph, MO) after pulverizing the sample. Particle-size analysis was carried out using the methodology proposed by Pansu and Gautheyrou [3].

Treatment	pH	P available	SOM	organic C	total N	C/N	Sand	Silt	Clay
			%	%	%	%	%	%	%
B	7.1±0.4	41.9±0.9 b	15.6±4.0 ab	9.1±2.3 ab	0.65±0.24 a	14.6±2.7 a	41	40	19
C	7.1±0.5	27.8±4.5 c	10.2±2.8 b	5.9±1.6 b	0.69±0.22 a	9.1±3.5 ab	38	47	15
CRK	6.7±0.5	31.9±1.9 c	14.3±7.2 ab	8.3±4.2 ab	0.73±0.10 a	11.5±6.6 ab	31	43	26
CRK+CMP	6.9±0.2	54.5±0.7 a	20.1±3.8 a	11.6±2.2 a	1.19±0.44 a	10.3±2.0 ab	36	43	21
CMP	7.0±0.1	30.0±2.7 c	14.2±2.4 ab	8.2±1.4 ab	1.19±0.40 a	7.2±1.4 b	41	39	20

Table S2. Characterisation of the compost used in the study, as provided by the composting company. Heavy metals were determined after concentrated hydrochloric acid attack, so they can be assumed as total concentrations.

Parameter	unit	Measurement	uncertainty	Limit of quantification	Method
pH		6.41	±0.45		UNI EN 13037:2012
Humidity at 105 °C	%	20.5	±1.4	0.1	UNI 10780:1998 App. C
Organic C	% d.m.	37.1	±5.6	0.2	UNI 10780:1998 App. E
Humic acids (as C)	% d.m.	11.62	±0.43	0.1	DM 21/12/2000 SO n° 6 GU n° 21 26/01/2001 Suppl 6 All
Fulvic acids (as C)	% d.m.	2.08	±0.16	0.1	DM 21/12/2000 SO n° 6 GU n° 21 26/01/2001 Suppl 6 All
Total N	% d.m.	3.00	±0.36	0.005	UNI EN 15407:2011
Organic N	% d.m.	2.96	±0.44	0.005	UNI EN 15407:2011 + UNI 10780:1998 App. J
Org N/tot N ratio	%	99	±15	0.1	UNI EN 15407:2011 + UNI 10780:1998 App. J
C/N ratio		12.00	±0.84		UNI 10780:1998 App. E + UNI EN 15407:2011

Salinity	meq 100 g ⁻¹	109.3	±8.7	0.06	UNI 10780:1998 App. D
Copper	mg kg ⁻¹ d.m.	52.3	±7.8	0.5	UNI 10780:1998 App. B
Zinc	mg kg ⁻¹ d.m.	121	±18	0.5	UNI 10780:1998 App. B
Lead	mg kg ⁻¹ d.m.	11.9	±1.8	0.05	UNI 10780:1998 App. B
Cadmium	mg kg ⁻¹ d.m.	0.250	±0.038	0.005	UNI 10780:1998 App. B
Nickel	mg kg ⁻¹ d.m.	13.3	±2.0	0.5	UNI 10780:1998 App. B
Mercury	mg kg ⁻¹ d.m.	< 0.5		0.5	UNI 10780:1998 App. B
Plastic, glass, and metal materials (fraction > 2 mm)	% d.m.	< 0.01		0.01	ANPA 4 Man 3 2001
Inert lithoid materials (fraction > 5 mm)	% d.m.	0.1005	±0.0070	0.01	UNI 10780:1998 App. A
Germination index	%	90	±14	1	UNI 10780:1998 App. K
<i>Salmonella</i> spp.	in 25 g t.q.	absent		0	APAT 3 Man 20 2003
<i>Escherichia coli</i>	UFC/g	< 10		10	CNR IRSA 3.2 Q 64 Vol 1 1983
Polycyclic Aromatic Hydrocarbons [PAH]	mg kg ⁻¹ d.m.	0.220	±0.055	0.01	EPA 3545A 2007 + EPA 8270E 2018
Ash at 600 °C	% d.m.	32.5	±2.3	0.1	CNR IRSA 2 Q 64 Vol 2 1984 /Notiziario IRSA 2 2008
Ammoniacal nitrogen (as N)	mg kg ⁻¹ d.m.	413	±62	1	UNI 10780:1998 App. J

Nitrates	mg kg ⁻¹ d.m.	< 1		1	UNI 10780:1998 App. J
Total phosphorus (as P ₂ O ₅)	% d.m.	1.4	±1.1	0.001	EPA 3050B 1996 + EPA 6010D 2018
Total potassium (as K ₂ O)	% d.m.	1.55	±0.23	0.0005	EPA 3050B 1996 + EPA 6010D 2018

d.m. = dry matter

Figure S1 Maximum daily shrinkage (MDS, μm) of *Quercus ilex* trees growing in uncompacted (B) and compacted urban soil (C), and compacted urban soil previously amended with cork (CRK), cork + compost (CRK+CMF) and only compost (CMP) in July and August. Means were subjected to two-way ANOVA with the treatment and time as source of variation. Means with different letters are significantly different after for $p < 0.05$ after Fisher's least significant difference post-hoc test.

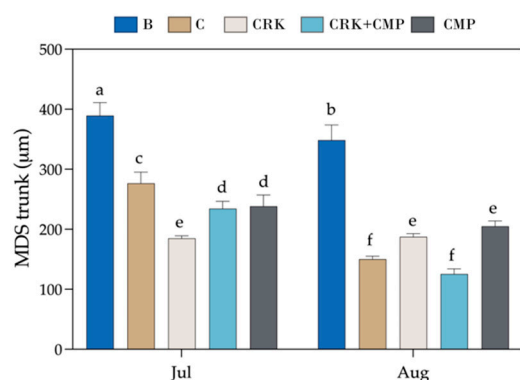
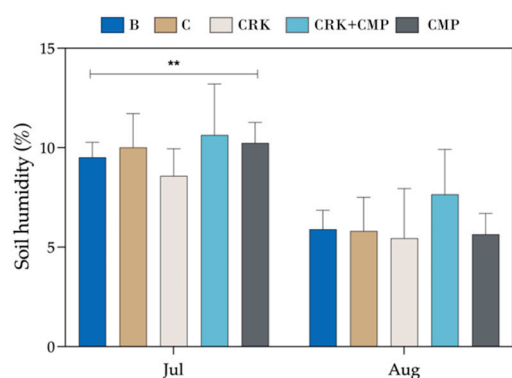


Figure S2 Soil humidity (%) in uncompacted (B) and compacted urban soil (C), and compacted urban soil previously amended with cork (CRK), cork + compost (CRK+CMF) and only compost (CMP). Means \pm SD of July vs August values were compared by Student's t-test, **: $p < 0.01$.



References

1. Nelson, D.W.; Sommers, L.E. Total Carbon, Organic Carbon, and Organic Matter. In *Methods of Soil Analysis. Part 3-Chemical Methods*; Sparks, D.L., Page, A.L., Helmke, P.A., Loeppert, R.H., Soltanpour, P.N., Tabatabai, M.A., Johnston, C.T. and Sumner, M.E. (Eds.); Soil Science Society of America Inc.: Madison, 1996; pp. 961–1010.
2. *Methods of Soil Analysis. 2: Chemical and Microbiological Properties* / A. L. Page, Ed; Page, A.L., Ed.; Agronomy; 2. ed., 6. pr.; Amer. Soc. of Agronomy: Madison, Wisc, 1992; ISBN 978-0-89118-072-2.
3. Pansu, M.; Gautheyrou, J. *Handbook of Soil Analysis: Mineralogical, Organic and Inorganic Methods*; Springer: Berlin New York, 2006; ISBN 978-3-540-31211-6.