

Table S1: Literature used in meta-analysis.

	Year	Title	DOI
1	2017	Short-term effects of biochar on grapevine fine root dynamics and arbuscular mycorrhizae production	10.1016/j.agee.2017.01.025
2	2017	Root traits and nitrogen fertilizer recovery efficiency of corn grown in biochar-amended soil under greenhouse conditions	10.1007/s11104-017-3180-6
3	2014	Biochar Improves Sugarcane Seedling Root and Soil Properties Under a Pot Experiment	10.1007/s12355-014-0335-0
4	2020	Biochar increases maize yield by promoting root growth in the rainfed region	10.1080/03650340.2020.1796981
5	2016	Biochars reduce infection rates of the root-lesion nematode <i>Pratylenchus penetrans</i> and associated biomass loss in carrot	10.1016/j.soilbio.2015.12.003
6	2015	Changes in soil nutrient availability explain biochar's impact on wheat root development	10.1007/s11104-015-2700-5
7	2017	Growth and metabolic responses of maize roots to straw biochar application at different rate	10.1007/s11104-017-3229-6
8	2016	Root development of non-accumulating and hyperaccumulating plants in metal-contaminated soils amended with biochar	10.1016/j.chemosphere.2015.03.068
9	2018	Effects of bamboo biochar on soybean root nodulation in multi-elements contaminated soils	10.1016/j.ecoenv.2017.12.036
10	2020	Impact of biochar on plant growth and uptake of ciprofloxacin, triclocarban and triclosan from biosolids	10.1080/03601234.2020.1807264
11	2020	Growth and elemental uptake of <i>Trifolium repens</i> in response to biochar addition, arbuscular mycorrhizal fungi and phosphorus fertilizer applications in low-Cd-polluted soils	10.1016/j.envpol.2019.113761
12	2020	Enhancing Cadmium Tolerance and Pea Plant Health through <i>Enterobacter</i> sp. MN17 Inoculation Together with Biochar and Gravel Sand	10.3390/plants9040530
13	2020	Biochar Improves the Growth Performance of Maize Seedling in Response to Antimony Stress	10.1007/s11270-020-04521-1
14	2020	Biochar bound urea boosts plant growth and reduces nitrogen leaching	10.1016/j.scitotenv.2019.134424
15	2019	Phosphate Uptake is Correlated with the	10.3390/agronomy9120824

		Root Length of Celery Plants Following the Association between Arbuscular Mycorrhizal Fungi, Pseudomonas sp. and Biochar with Different Phosphate Fertilization Levels	
16	2018	Biochar enhancement of facilitation effects in agroforestry: early growth and physiological responses in a maize-leucaena model system	10.1007/s10457-018-0336-1
17	2019	Application of wood biochar in polluted soils stabilized the toxic metals and enhanced wheat (<i>Triticum aestivum</i>) growth and soil enzymatic activity	10.1016/j.ecoenv.2019.109635
18	2019	Effects of biochar on the growth of apple seedlings, soil enzyme activities and fungal communities in replant disease soil	10.1016/j.scienta.2019.108641
19	2019	Straw and biochar effects on soil properties and tomato seedling growth under different moisture levels	10.1080/03650340.2019.1575510
20	2019	Biochar Effects on Soil Properties and Wheat Biomass vary with Fertility Management	10.3390/agronomy9100623
21	2020	Amending Sandy Soil with Biochar Promotes Plant Growth and Root Colonization by Mycorrhizal Fungi in Highbush Blueberry	10.21273/hortsci14542-19
22	2020	Combined biochar and nitrogen application stimulates enzyme activity and root plasticity	10.1016/j.scitotenv.2020.139393
23	2020	Effect of biochar on yield and quality of tomato grown on a metal-contaminated soil	10.1016/j.scienta.2020.109210
24	2015	Biochar stimulates plant growth but not fruit yield of processing tomato in a fertile soil	10.1016/j.agee.2015.04.015
25	2019	Effects of biochar on growth, and heavy metals accumulation of moso bamboo (<i>Phyllostachy pubescens</i>), soil physical properties, and heavy metals solubility in soil	10.1016/j.chemosphere.2018.11.159
26	2020	Change in composition and function of microbial communities in an acid bamboo (<i>Phyllostachys praecox</i>) plantation soil with the addition of three different biochars	10.1016/j.foreco.2020.118336
27	2020	Application of co-composted farm manure and biochar increased the wheat growth and	10.1016/j.chemosphere.2019.125809

		decreased cadmium accumulation in plants under different water regimes	
28	2019	The effects of biochar and dredged sediments on soil structure and fertility promote the growth, photosynthetic and rhizosphere microbial diversity of <i>Phragmites communis</i> (Cav.) Trin. ex Steud	10.1016/j.scitotenv.2019.134073
29	2020	Incorporation of biochar and nanomaterials to assist remediation of heavy metals in soil using plant species	10.1016/j.eti.2020.101134
30	2020	Biochar-assisted transformation of engineered-cerium oxide nanoparticles: Effect on wheat growth, photosynthetic traits and cerium accumulation	10.1016/j.ecoenv.2019.109845
31	2020	Influences of arbuscular mycorrhizae, phosphorus fertiliser and biochar on alfalfa growth, nutrient status and cadmium uptake	10.1016/j.ecoenv.2020.110537
32	2018	Effects of rice-husk biochar on sand-based rootzone amendment and creeping bentgrass growth	10.1016/j.ufug.2018.09.001
33	2018	Impact of biochar on soil characteristics and temporal greenhouse gas emissions: A field study from southern Canada	10.1016/j.biombioe.2018.08.019
34	2019	Biochar effect associated with compost and iron to promote Pb and As soil stabilization and <i>Salix viminalis</i> L. growth	10.1016/j.chemosphere.2019.01.188
35	2019	Interactive effects of biochar and AMF on plant growth and greenhouse gas emissions from wetland microcosms	10.1016/j.geoderma.2019.03.033
36	2020	Effect of biochar and redmud amendment combinations on <i>Salix triandra</i> growth, metal(loid) accumulation and oxidative stress response	10.1016/j.ecoenv.2020.110466
37	2019	Biochars effects potentially toxic elements and antioxidant enzymes in <i>Lactuca sativa</i> L. grown in multi-metals contaminated soil	10.1016/j.eti.2019.100427
38	2019	Biochar and crushed straw additions affect cadmium absorption in cassava-peanut intercropping system	10.1016/j.ecoenv.2018.10.003
39	2014	Soil application of biochar produced from biomass grown on trace element contaminated land	10.1016/j.jenvman.2014.07.046
40	2016	Effects of gasification biochar on plant-available water capacity and plant growth in	10.1016/j.still.2016.03.002

		two contrasting soil types	
41	2015	Impact of quality and quantity of biochar and hydrochar on soil Collembola and growth of spring wheat	10.1016/j.soilbio.2015.01.014
42	2017	Potential of miscanthus biochar to improve sandy soil health, in situ nickel immobilization in soil and nutritional quality of spinach	10.1016/j.chemosphere.2017.07.097
43	2015	Biochar increases arbuscular mycorrhizal plant growth enhancement and ameliorates salinity stress	10.1016/j.apsoil.2015.07.014
44	2015	Biochar stimulates plant growth but not fruit yield of processing tomato in a fertile soil	10.1016/j.agee.2015.04.015
45	2014	Biochar makes green roof substrates lighter and improves water supply to plants	10.1016/j.ecoleng.2014.06.017
46	2016	Modest amendment of sewage sludge biochar to reduce the accumulation of cadmium into rice(<i>Oryza sativa</i> L.): A field study	10.1016/j.envpol.2016.06.053
47	2014	Biochar and humic acid amendments improve the quality of composted green waste as a growth medium for the ornamental plant <i>Calathea insignis</i>	10.1016/j.scienta.2014.06.021