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Lilian Marchand, Céline Pelosi, Christian Mougin, M. Gonzalez Centeno, Anne Maillard, Alain Ourry, William Galland, Pierre Louis Teissedre, Jean-Jacques Bessoule, Sebastien Mongrand, et al.

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WE017 Modulation of trace element bioavailability, yield and seed quality of rapeseed (*Brassica napus* L.) by biochar addition to a contaminated technosol

L. Marchand, INRA Institut National de la Recherche Agronomique / UMR BIOGECO; C. Pelosi, INRA Institut National de la Recherche Agronomique / UMR ECOSYS; C. Mougin, INRA (Institut National de la Recherche Agronomique / UMR ECOSYS; M. Gonzalez Centeno, Université de Bordeaux / Unité de recherche Oenologie; A. Maillard, A. Ourry, UNICAEN / UMR Ecophysiologie Végétale Agronomie et nutritions; W. Galland, Université de Bordeaux / UMR BIOGECO; P. Teissedre, Université de Bordeaux / Unité de recherche Oenologie; J. Bessoule, CNRS / UMR Laboratoire de Biogenèse Membranaire; S. Mongrand, Université de Bordeaux / UMR Laboratoire de Biogenèse Membranaire; A. Morvand-Bertrand, UNICAEN / UMR Ecophysiologie Végétale Agronomie et nutritions; Q. Zhang, Chinese Academy of Agricultural Sciences / Key Laboratory of Agricultural Environment; C. Grosbellet, Florentaise; V. Bert, INERIS / Technologies and Sustainable and Clean Processes; N. Oustrière, M. Mench, INRA Institut National de la Recherche Agronomique / UMR BIOGECO; S. Brunel-Muguet, UNICAEN / UMR Ecophysiologie Végétale Agronomie et nutritions. Rapeseed (*Brassica napus* L.) is a Cd/Zn-accumulator whereas soil conditioners such as biochars may immobilize trace elements. These potentially complementary soil remediation options were trialed, singly and in combination, in a pot experiment with a metal(loid)-contaminated technosol developed on dredged sediments. The efficiency of these remediation options were assessed using both phenotypic and physiological plant responses. A trace element (Cd, Cu, Pb, Zn) contaminated technosol was either amended (2% w/w) or not with a poultry manure-derived biochar. Rapeseed was cultivated under both soil treatments during 24 weeks up to harvest in greenhouse. Based on the soil pore water, biochar incorporation into the technosol promoted the As, Cd, Cu, Mo, Ni, Pb and Zn solubility. It decreased foliar B, Cu and Mo concentrations, and Mo concentration in stems, pericarps and seeds. Conversely, it did not impact neither the biomass of aerial rapeseed parts (except a decrease for seeds), nor their C content (except a decrease for stems), seed fatty acid content, seed sugar content and antioxidant capacity in both leaves and seeds. Biochar amendment increased the phytoextraction by aerial plant parts for K, P, and S, reduced it for N, Ca, B, Mo, Ni and Se, whereas it remained steady for Mg, Zn, Fe, Mn, Cu, Cd and Co. Zinc and Cd concentrations in the soil pore water were decreased 3 times by rapeseed in the unamended technosol showing the feasibility to strip available soil Zn and Cd in combination with seed production.