XXXIV Convegno Nazionale della Società Italiana di Chimica Agraria

Can phosphorous amendment actually reduce lead pollution threat in contaminated soils?

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Amendments reducing soil Pb bioavailability are attractive alternatives for mitigating health risks from exposure to lead contaminated soil, and adding phosphate-containing compounds is one of the most studied strategies for lowering lead bioavailability. The final goal of this strategy would be the transformation of soil Pb into pyromorphite, a highly insoluble Pb-phosphate mineral. The formation of insoluble compounds does not seem, however, to fully answer the need of environmental protection as the finest particles can be detached from the soil and transferred to other compartments where their reactivity is different.
This study evaluated the effect of P-treatment, at three application rates, on the potential availability and bioaccessibility of lead, assessed with 0.11 M acetic acid, 0.05M EDTA, USEPA Method 1340, and a modified version to estimate the bioaccessibility to humans. Two Pb-contaminated soils (500 mg Pb kg^{-1}), one roadside soil and one spiked and aged (1-year) soil, were incubated in a bench scale experiment for three months.
Soil amendments were effective in reducing plant Pb availability, since the lead extractable with EDTA and acetic acid was lowered from zero to almost 70 % of the pseudo-total pool, depending on soil and application rate. However, they were ineffective in reducing *in vitro* bioaccessible lead. Using the USEPA method the immobilization was negligible in both soils, while with the modified method, in which pH was raised to 2.5, contrasting results were obtained between soils, but nevertheless immobilization effects appeared to be low in both soils. Without an accepted method for screening P-treated soils rigorous conclusions cannot be drawn, but our results indicate a serious limitation of the immobilization procedure for contaminated soils

Parole chiave: immobilization, P, Pb, bioaccessibility