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Book of Abstracts

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GORDON AWARD PLENARY PRESENTATION

FROM PHYTOREMEDIATION TO PHYTOMANAGEMENT

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ABSTRACT

Studies on the behavior of trace elements in the plant-soil systems date back to the 60' at the INRA Bordeaux-Aquitaine Research Centre. Molecular mechanisms in the rhizosphere (notably the pivotal role of root exudates) were explored in the 80-90'. Since 1991, we have been investigating the potential of soil conditioners, native and naturalized colonizer species, annual crops, microorganisms, cultural practices, and post-harvest treatments to build up relevant phytoremediation options. The new paradigm of phytomanagement includes to build tools for assessing initial and residual risk assessments, to deeply investigate the molecular mechanisms driving plant tolerance to excess metal(loid)s (with emphasis here for Cu) for selecting relevant genotypes, to test the effectiveness of plant and endophyte assemblages, to long-term monitor the phytomanagement options implemented at various sites (for effectiveness and life cycle assessment). Milestones where for instance obtained for the use of zerovalent iron grit and Linz-donawitz slags, phytoremediation of Cu-contaminated soils, hydrothermal treatment of phytoremediation-borne biomass, and changes in the soluble proteome of *Agrostis capillaris* exposed to excess Cu. Both terrestrial options and constructed wetlands must be sometime implemented at several sites to address the pollutant linkages. The crop production on metal(loid)-contaminated soils under phytoremediation and its use for notably plant-borne feedstock in local conversion chains (trying to generate financial opportunities) as well as the restoration of ecosystem services are both exciting challenges, which are in particular explored within the EU FP7 Greenland project (<http://www.greenland-project.eu/>).

