



## **TRACE ELEMENT SPECIATION IN SOILS, PHYTOAVAILABILITY AND DISTRIBUTION IN FIELD-GROWN FLAX OILSEEDS AS AFFECTED BY DIFFERENT CONTAMINATED SOILS**

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Flax oilseeds are cultivated mainly to feed animals because of their high content in Omega 3. The trace-elements (TEs) from soil, transferred at various rates to plants, can enter the animal or human food chain, and the total content of TEs is not a sufficient factor for alimentary risks assessment. TEs have to be studied by their speciation in different soil phases to determine their real phytoavailability.

Our study deals with essential micronutrients (Cu, Zn, Ni) and phytotoxics considered little (Pb) or very mobile (Cd). Distribution profiles of each of these elements give information about: their mobility in different soil compartments, their behaviour at the soil/plant interface, and their uptake by plants.

Two flax varieties were tested at four development stages, in two field situations. First plot correspond to a normal agricultural practice in which sewage sludge were brought in an agronomic way (silty soil). The second ones were irrigated with waste water over a long period, which led to high TEs contents (sandy soil).

Several techniques to characterize the TE concentrations were examined. Total extraction and biodisponibility are compared with selective and sequential speciation. This enables to evaluate the role of each compartment of soil in plant uptake, and the influence of soil physicochemical factors. TE concentrations of the different parts of plants show their uptake and their distribution from roots to seeds. Element content was determined by GF-AAS. All these measurements enable to understand the transfers of TEs from soil to flax.

Keywords: soil/plant transfer, trace elements, flax, speciation, phytoavailability

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