Drivers of copper availability in agricultural soils receiving long-term applications of organic fertilizers

**Context**
- Moderate but on-going and long-term contamination of agricultural soils fertilized with organic wastes (OW)
- High Cu toxicity for soil organisms

**Scientific issue**
- Lack of knowledge on effects of availability and bioavailability of Cu in such moderately contaminated soils

**Study’s aim**
→ Long-term consequences of recycling organic wastes on Cu availability under real field conditions

**Material & Methods**
- 4 types of soil: Andosol/ Cambisol/ Nitosol/ Arenosol
- 3 fertilisation types: No fertilizer/ Mineral fertilizer/ Organic fertilizer
- Soil solutions extraction (1:10 ratio)
- \( \text{pCu}^2+ \) measure of Cu availability

**Other measurements**
- pH
- Dissolved organic carbon (DOC)
- \( \text{pCu} = \log_{10}([\text{Cu}]_{\text{total}} \text{ in soil solution}) \)

**Impact of fertilization on soil solution parameters, example of the arenosol**

**Impact of soil solution parameters on \( \text{pCu}^2+ \), example of the arenosol**

**Range of pH, pCu, COD and pCu\(^2+\) in soil solutions (n = 94)**

**Ecotoxicity assays**
- DGT (kinetic method)
- RHIZOtest
- Cu bioaccumulation in earthworms

**Work in progress**
- Ecotoxicity assays
- DGT (kinetic method)
- RHIZOtest
- Cu bioaccumulation in earthworms

**Reference**
Sauvé et al 2000
T.Djae et al 2017
ISO Norm 16198 - RHIZOtest