EU-project applies green technologies to decontaminate soil

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Soil pollution causes severe environmental and economic impacts, as well as risks for the human health and ecosystems. The closure of mining and industrial facilities in many sites across Europe has revealed large amounts of contaminated land with uncertain future uses. Decontaminating and recovering such soil is a long, complex and expensive process, which places a large burden on enterprises or public administrations.

Land in Asturias, Spain, for example, is shown to be contaminated with Arsenic (usually accompanied by heavy metals) which is complicated to remove. The LIFE I+DARTS project, co-financed by LIFE+, aims to address this problem by developing a protocol to enable the recovery of

soils contaminated with Arsenic and heavy metals in former mining and industrial sites.

The team is doing this by applying innovative and sustainable remediation technologies to decontaminate the soil.

The project, which runs until August 2016, is already revealing pertinent results. The LIFE I+DARTS team has found that plants such as the birch, the willow or the yellowhead and leguminous plants such as the melilotus alba can accumulate heavy metals and Arsenic.

Project experts have also detected the presence of certain endophyte bacteria that resist high concentrations of Arsenic and the existence of fungi that favour the processes of decontamination. These advances open the door to using these biological techniques for soils that have been catalogued as contaminated for more than a decade.

The three basic strategies for soil remediation are excavation and disposal in landfills, containment, and removal of the contaminants through physic-chemical or biological technologies. LIFE I+DARTS only considers the last possibility because the others are more expensive and less sustainable options.

The team is engaged in five basic actions over the course of the four-year project: biogeochemical site characterisation, and human health risk assessment; soil remediation at pilot scale and a comparison between green remediation technologies and physic-chemical technologies; the development of the protocol as a tool for the management of Arsenic-polluted soils and the dissemination of information on the project activities and results.

Project coordinator, Professor José Luis Rodríguez Gallego, has been leading the team since 2012. They are testing their results in three

different contaminated sites of Asturias: El Terronal (Mieres), the site of the old factory of Nitrastur (Langreo) and the old mercury mine of Olicio (Cangas de Onís). These sites all have remains of Arsenic in their sub-soil - there is also mercury in two of them and an anomalous concentration of lead in one.

Professor Rodríguez Gallego notes, 'In truth, we have found very heterogeneous sites and this has proved to be a difficulty. There are very different terrain compositions over a short distance, and this complicates our actions, but we have also been surprised by the great capacity of the environment to regenerate.'

Provided by CORDIS