

# Evidence

## Soil screening values for assessing ecological risk

### Project summary ShARE id26

This project has produced guidelines for screening the risks to soils from chemicals released through the landspreading of waste-derived materials.

The project reviewed the available evidence on the direct terrestrial ecotoxicity and potential for secondary poisoning of 38 chemical substances and mixtures, including 23 trace elements and 15 persistent organic pollutants. Although there were insufficient data to derive an assessment criterion in all cases, soil screening values are recommended in the report for 9 trace elements and 10 organic pollutants. A spreadsheet tool allows the screening values to be adjusted for site-specific soil properties.

The soil screening values developed through this project will help the Environment Agency to better review the technical suitability of landspreading proposals submitted by an operator for a wider range of chemicals.

#### **What are the challenges with recycling?**

Recycling waste-derived materials to farmland is an important source of soil improvers through the supply of nutrients, raising pH and adding organic matter. Using them reduces the costs to both industry and farmers, while improving our resource efficiency. However, it is also vital that their recycling does not cause unacceptable harm to human health, crops and livestock, and/or the wider environment.

While recovery of waste-derived materials can improve many beneficial aspects of the soil, they can also introduce and increase existing chemical contamination. Chemicals may harm soil functions by disrupting their complex ecosystems and affecting key organisms such as bacteria, fungi, plants and earthworms. They can also accumulate in soil organisms that form part of the natural food chain for dependent wildlife including birds and small mammals.

The Environment Agency regulates the spreading of waste-derived materials on farmland under the Environmental Permitting Regulations. These regulations ensure that the potential agronomic and economic benefits from waste recovery are balanced against the broader health and environmental risks.

Healthy soils are important to a sustainable environment. They store carbon, produce food and timber, filter water, and support wildlife and natural landscapes. The quality of our soils depends on a number of complex and interacting factors including their structure and texture, mineralogy, pH, organic matter and nutrient content, and the presence of diverse and abundant communities of micro- and macrofauna.

#### **How will the results of this project be used?**

In its regulatory risk assessments, the Environment Agency will compare these 'safe levels' in soil to the amounts of chemical added as a result of landspreading proposals. In this way, it will be possible to screen out low risk activities and focus time and resources on the higher risk ones.

Soil ecotoxicologists study the effects of chemicals on organisms in the soil environment with the aim of protecting the structure and functioning of these complex ecosystems. This is generally achieved by assessing the effects on one or more single species of test organism (such as earthworms and plants) and extrapolating the findings to determine the 'safe levels' for the communities of organisms that make-up the wider soil ecosystem.

The procedures used by the Environment Agency to assess the available evidence on the terrestrial ecotoxicity of chemicals and to define 'safe levels' have been developed by the European Chemicals Agency for use under the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation. The soil screening values developed by this project have also been independently peer reviewed.

This summary relates to information from project ShARE id26, reported in detail in the following output(s):

#### **Report:** ShARE id 26

Title: Derivation and use of soil screening values for assessing ecological risk

**November 2017**

**Project manager:** Ian Martin, Research, Analysis and Evaluation, Environment Agency.

**Research Contractor:** wca Environment Limited,  
Brunel House, Volunteer Way, Faringdon, Oxfordshire  
SN7 7YR

This project was funded by the ShARE programme, a partnership between the Irish Environmental Protection Agency, Natural Resources Wales, the Northern Ireland Environment Agency, the Scottish Environment Protection Agency and the Environment Agency

Enquiries: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk).

© Environment Agency