

# CASE STUDY



Manure spreading

## CUSTOMERS

European Food Safety Authority (EFSA), European Copper Institute (ECI), International Zinc Association (IZA), wca environment ltd

## DELIVERABLE

A tool for predicting long-term metal risks in farmland soils and nearby water bodies

## OUTCOME

Informing policy on the maximum levels of copper and zinc that can be present in feed additives for different types of farm animal



*The model helped us to better understand and predict the concentrations and fluxes of copper in catchments."*

**Dr Stijn Baken**  
European Copper Institute

## Predicting the build-up and runoff of metals in soils

### Copper and zinc in animal manures

## The challenge

Spreading waste materials including animal manures on farmland is an important way of adding nutrients to the soil. Because farm animals may be given feed supplements or medicines containing metals, these can become present in their manure. This can lead to metal build-up in the soil, and runoff into adjacent waterbodies.

Predicting the metal build-up and runoff can help in:

- (i) Making decisions on how to spread manure sustainably;
- (ii) Providing data for environmental impact assessment.

## The research

The Centre for Ecology and Hydrology (CEH) has developed a tool to predict how concentrations of copper and zinc in soils and waters increase due to regular inputs over the long term (decades and greater).

The tool builds on extensive CEH research in modelling the environmental chemistry of metals. Predicting over the long term is needed as the build up of metals to potentially toxic levels is gradual, but once present, they may remain in soils for decades to centuries.

## The outcomes

- Customers have confidence that the tool is built upon extensive research on modelling the environmental chemistry of metals and that the predictions can be used, for example, to inform policy on the maximum levels of copper and zinc that can be present in feed additives for different types of farm animal.





*The IDMM-ag tool was an excellent fit to the EU regulatory requirements to assess the environmental impacts of a nanoparticulate zinc feed additive. From our long association with CEH we are fully aware [...] that the tool uses the most up to date science to make its predictions."*

**Dr Graham Merrington**  
Managing Director  
wca environment ltd

- The European Food Safety Authority has referred to the outcomes of the work in proposing reductions in the copper and zinc content in feed additives for some animal groups.
- The tool has subsequently been improved and re-evaluated for the European Copper Institute (ECI) and International Zinc Association (IZA). It has been recently used to assess the potential impacts of zinc in manure from a nanoparticulate zinc veterinary medicine in order to fulfil the European Union Authorisation requirements.



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*The CEH projects described here have multiple partners across the UK, Europe and worldwide. Please visit our website for partner details.*

