

Location of UK LTSE field sites



- 1 Gleadthorpe (ADAS)
- 2 Woburn (Rothamsted)
- 3 Watlington (Rothamsted)
- 4 Pwllpeiran (ADAS)
- 5 Rosemaund (ADAS)
- 6 Bridgets (ADAS)
- 7 Hartwood (JHI)
- 8 Auchincruive (SAC)
- 9 Shirburn (ADAS)

Partners involved in the UK network of the LTSEs (1994–2006)



The following are thanked for supporting the LTSE partners;



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Acknowledgements

The Hartwood LTSE is supported by the Scottish Government
RESAS under its Underpinning Capacity funding



The James
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The Long Term Sludge Experiment



Studying the long term impact of
wastewater sludge on soil fertility
and grassland productivity

www.hutton.ac.uk/about/facilities/hartwood/LTSE

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Registered in Scotland No SC374831
Registered office: The James Hutton Institute Invergowrie Dundee DD2 5DA
Charity No SC041796

The nature of wastewater sludge

Wastewater sludge is a useful source of nitrogen, phosphorous and organic matter when applied to land.

However it may also contain heavy metals not normally found in soil and so may accumulate in the topsoil.

In 2005 some 1 million tonnes were applied to around 150,000 ha of agricultural land in the UK¹.

While soil fertility may be built up quickly we need to ensure there are no long term adverse effects.

The Experiment

The Long Term Sludge experiment (LTSE) was set up in 1994 and ran until 2006 as part of a network of sites across the UK to examine the long term effect of the application of metal contaminated wastewater sludge to land. The sites reflected the range of soils used in agriculture.

The work continues, under the Underpinning Capacity research undertaken at the James Hutton Institute, to monitor the effect of the application for a further 15 years.

This will provide a rich resource of soil chemical and biological data as well as a comprehensive soil and DNA archive for future research.



The Treatments

The LTSE site at Hartwood consists of a number of replicate plots which are treated with waste water sludge amended either with Cu, Zn or Cd at three levels or treatments aimed at gradually building up the levels of these metals over time.

What is tested?

A range of core biological and chemical properties are measured

Biological –

Microbial activity and substrate utilisation, biomass as well the capacity to fix N (Rhizobial population). Microbial diversity using genetic fingerprinting as well as looking at specific genotypes such as ammonia oxidisers.



Soil Chemical –

Total and extractable levels of Zinc, Copper and Cadmium; metal speciation, total N and organic C and N.

Soil Physical –

Bulk density, Conductivity, Cation Exchange Capacity (CEC) and pH.

Meteorological data – maximum, minimum and daily average air temperature, soil temperature, rainfall, daily PAR and solar radiation and windspeed.

Collaborating

If you would like to collaborate with the project please contact Pat Cooper at pat.cooper@hutton.ac.uk for further information.



¹Water UK (2006) Recycling of Biosolids to Land. Water UK, 1 Queen Anne's Gate, London