



Organic farming: closing nutrient cycles and uptake of recycled fertilisers

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Nutrient cycles in organic farming – what place for recycled fertilising materials?

Why does organic farming need to close nutrient cycles, what are the potentials and limitations of new recycled fertilisers in helping to achieve this?



What is organic farming?

Organic Agriculture is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved

IFOAM Organics International 2005







One of the key principles of organic agriculture is that fertility should be built up through biological cycles, but this is much more difficult for phosphorus (and potassium) than it is for nitrogen.

Nearly all organic farms will need some input of phosphorus from off the farm at some point, and ideally this should involve the return of phosphorous that left the farm in crops, milk and meat by recycling the phosphorous in human excreta.



Historically, phosphorus was returned to agricultural land through the application of animal manure and human excreta. However, from the mid nineteenth century, the use of this local organic matter was replaced by phosphate mined in distant places



"...When water-borne sewage was introduced into our cities, the capital of the soil – its fertility – which is removed from it year by year in the form of crops and livestock, no longer found its way back to the land in the form of the waste products of the community, but was poured into the sea or otherwise destroyed."

The Living Soil, Lady Eve Balfour, 1943



Whilst a change in diets, and a shift to organic farming systems are important in order to reduce our dependence on mined phosphate, to close the phosphorus loop we will need to return not only all animal waste to the soil, but other types of waste as well

Composting food waste from households, food processing plants and food retailers are all ways that phosphorus can be recovered and recycled. However, recycling the majority of human excreta will also be necessary.



Under EU Organic Regulation human sewage sludge is not one of the permitted fertilisers or soil conditioners.

This is because of concern over **contamination** e.g. levels over heavy metals & organic compounds including, pharmaceuticals, antibiotics, endogenous hormones and synthetic steroids, detergent residues, etc.

Thus at the moment it is not permitted for biosolids to be used on organic land in Europe.

Short-term solutions



Develop methods for extracting phosphorus from waste that avoid the problems of contamination

Long-term solutions

Develop Ecological Sanitation Systems which collect and treat wastewater flows separately, optimising their potential for re-use in agriculture, whilst minimising hygienic risk

Amend EU Organic Regulation to permit the use of sewage sludge on organic certified land subject to certain quality criteria.



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