

UK needs to use phosphorus sustainably, say researchers

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Phosphorus use in the U.K. needs to be better managed and used in a much more sustainable way to reduce river pollution and increase resilience over rising fertilizer prices, say researchers.

Despite phosphorus being a key nutrient in the agricultural sector for which there is no alternative, the food and feedstock industries rely on imports from a small number of countries including China, Russia and Morocco.

As a result of market instability, farmers have seen fertilizer prices quadruple over the past two years and although prices have come down, they are still high. Also, the [food industry](#) has experienced disruption to supplies.

In addition, phosphorus use in the U.K. is highly inefficient. It is used excessively and run off from farms and discharges from wastewater treatment works are leading to the pollution of "the majority of the U.K.'s rivers and lakes," which is causing a reduction in biodiversity and habitat loss.

A new report by academics from the University of Leeds, Lancaster University, University of Technology Sydney, the Agri-Food and Biosciences Institute and the Center for Ecology and Hydrology—with input from stakeholders across the U.K. food sector including farmers and regulators—argues that these problems would be avoided if the U.K. becomes less dependent on phosphorus supply.

One way to achieve this, say the researchers, is to recover the phosphorus that has already been leaked into the environment, by using new and [emerging technologies](#). The researchers set out a series of recommendations to enable the U.K. to make that switch to more sustainable phosphorus use with the publication of the first ever U.K. [Phosphorus Transformation Strategy](#).

Professor Julia Martin-Ortega, from the Sustainability Research Institute at Leeds and one of the lead investigators, said, "The aim of the strategy is to give all interested parties the confidence that change is possible.

"Already, there are pockets of innovation in the sector, and if those approaches are scaled up and become part of mainstream operations, then the U.K.'s phosphorus system can become more resilient.

"But for that to happen, we need the commitment of all sectors involved and we need to address the issues in an integrated and collaborative way."

Phosphorus: Used throughout the food sector

Phosphorus and its derivatives are present across the [agricultural sector](#). They are used in fertilizers and in [animal feed](#) and consequently, end up in the [food chain](#) and in animal and human waste.

Animal manure raises phosphorus levels in the soil and phosphorus levels can be high at wastewater sewage treatment plants. Phosphorus can contaminate rivers and watercourses when it is discharged from treatment works or as run off from farms.

The researchers say new processes are being developed which would enable phosphorus to be recovered from soils where it has built up over decades, and they say there is theoretically enough of it circulating in manure, soils and other organic wastes to meet the U.K.'s phosphorus fertilizer demand.

Among the key recommendations, the transformation strategy calls for initiatives to:

- Develop and deploy at scale new technologies and innovations that can recover phosphorus from animal manure, wastewater and food waste, and redistribute as viable, cost-effective and renewable fertilizers.
- Provide incentives that encourage investment in technologies and

lower barriers to create new markets for a renewable phosphorus fertilizer sector.

- Improve, align and make coherent policies and governance that recognize and manage phosphorus as a scarce resource, as well as a pollutant.
- Provide tailored knowledge, research and advice for farmers to recover legacy phosphorus from the soil and using recycled phosphorus.

The authors highlight the need for all of the different actors and sectors involved in food production, across catchment areas and government departments, which are currently operating in a fragmented manner, to work more closely and to adopt innovative solutions to transition towards using [phosphorus](#) more sustainably.

One of the report's lead authors, Associate Professor Brent Jacobs from the University of Technology Sydney, said, "As the U.K. food system is undergoing fundamental policy change, our report provides a timely opportunity to integrate urgently needed actions across all sectors of the food chain into regional and national policy and governance, tapping into huge potential wins for the environment and the economy."

More information: The UK Phosphorus Transformation Strategy is available online: wp.lancs.ac.uk/rephokus/publications/

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