

IMAGE: SPREADING SLURRY IN ROWS REDUCES POLLUTION



# From nitrogen pollution to farming solutions



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One of the less savoury sights of country life is the muck spreader sending a plume of foul-smelling slurry over a field. It is inefficient, as much of the nitrogen intended to be returned to the soil as a valuable nutrient either evaporates as ammonia or runs off into nearby watercourses. But it is cheap.

Research by UK environmental scientists at the NERC Centre for Ecology & Hydrology, including Professor Mark Sutton, shows that more accurate slurry distribution could reduce ammonia emissions by up to 90%, and because all that extra nutrient goes into the ground it means farmers could slash fertiliser bills.

"Eighty-five per cent of ammonia emissions are down to agriculture, the biggest parts being livestock and birds and the use of urea-based fertilisers," Professor Sutton says. "If you look at the ways we could reduce emissions, top of the list is the way manure and fertilisers are spread. It makes a big difference to total emissions and is relatively cheap to do."

## Why invest in better spreaders?

Ammonia emissions from farms are highly damaging. Runoff from fields causes algal blooms in ponds, suffocating aquatic life, and has a huge impact on wildlife. Airborne ammonia contributes to poor air quality, impacting human health, and kills the mosses and lichens that protect and renew peat bogs, which are the UK's most important carbon store. However,

it is only recently that the science of the ammonia threat has become more publicly known.

"Now the problem is more widely recognised, we can make sure farmers and other stakeholders understand what they can do to tackle the issue," says Professor Sutton, adding that a statement in the government's new clean air strategy on regulating ammonia emissions indicates a new political willingness to take control of the problem.

Alternatives to the traditional muck spreader, known as a splash-plate spreader, offer very substantial reductions in losses. Professor Sutton explains: "Alternatives to the splash-plate have been available for decades, such as band spreading systems that put slurry out in nice neat rows, reducing the surface area, which we have found reduces emissions by about 30%.

"If you are a bit more ambitious, you can use a trailing shoe that puts it out under shelter of the leaves and keeps them clean, so emissions are about 60% less. If you are really ambitious, you can cut a slot in the soil and put it in there, which can gain about a 90% reduction."

## The cost of the equipment has deterred adoption, however.

"For many years, the UK government has resisted banning splash-plate spreaders as farmer groups expressed concern about the costs. The Danish and Dutch banned them more than 20 years ago," Professor Sutton says. "But farmers can actually see benefits because the cost of the spreading equipment can be set against the savings in the number of fertiliser bags they need to buy."

Associate Director of Research at the UK's Natural Environment Research Council, Ned Garnett, highlights how expert scientific evidence is vital to find solutions to environmental problems such as nitrogen pollution. He says: "NERC-funded science such as Professor Sutton's world-leading research on the sources and impact of excess nitrogen in the environment enables the UK to make evidence-based actions to tackle this issue; from regulation and Government policy to the decisions made by farmers on the ground every day."

## Tackling a global issue

Progress is also being made internationally, with a resolution on sustainable nitrogen management

adopted by the UN Environment Assembly in Nairobi in March.

It recognises that 80% of agricultural reactive nitrogen is wasted globally, and that, on top of the damaging impacts of ammonia and nitrogen on air quality and climate, greenhouse gas nitrous oxide is the major threat to the ozone layer for the next century.

Professor Sutton points out that the global position is the same as that in British farms: saving the planet will result in economic savings too. "If you halve all the nitrogen emissions in the world, including all forms of wasted nitrogen, there would be a saving of \$100bn a year in equivalent fertiliser value," he says. □

Byline: Chris Partridge

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