

Researchers fly a kite for manure recycling

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Researchers at North Wyke Research, and Lancaster and Exeter universities, have come up with an advice system to help farmers recycle manure safely and avoid polluting watercourses.

Organisms such as E coli may be present in animal manure and can pose a serious threat to human health. Irrigated crops are sometimes contaminated, shellfisheries can be vulnerable and bathing waters may be under threat, with subsequent effects for tourism.

This is particularly true in South West England, with its dairy industry and large numbers of summer visitors, and where some public beaches have failed to meet the requirements of the European Water Framework Directive. These are some of the reasons that led the team to focus on the Taw catchment of North Devon as a study area in this project, which is part of the UK Research Councils' Rural Economy and Land Use Programme.

The interdisciplinary team of natural and social scientists, assessed the risk of water contamination at 77 farms, taking into account factors such as grazing livestock and topography, and surveyed farmers to assess their knowledge about risk and find out how they managed manure on the farm.

They also monitored microbial water quality at fixed locations over several seasons.

The project has identified four factors that affect the level of risk:

- Accumulated microbial burden to land (eg how manure is applied and deposited, stocking density)
- Landscape transfer potential (eg the topography of the land, whether there are slopes, streams and so on)
- Infrastructure (eg how the manure is stored, whether there is hard standing)
- Social and economic obstacles (eg whether the farmer has had training about risk, whether he can afford to invest in infrastructure)

The team then constructed a model framework that shows the levels of risk in these four areas, expressed graphically as a "kite" shape. The colour shows the overall level of risk from green representing "low risk" to red representing "high risk." The shape demonstrates where risk is highest. This provides a useful tool for farm advisers working with farmers, as reducing the risk reduces the shape of the kite.

Dr Dave Chadwick from North Wyke who led the project explained: "The project covered a lot of areas, including public perception of the risks involved, so it was very wide-ranging.

"Our examination of microbial evidence threw up some unexpected results. We found that untreated sewage from the farmhouse was a significant factor in the total microbial load in quite a few cases, and how and when manure is applied also has an effect. Some practices may have unintended consequences.

"Injecting slurry, for example, does reduce ammonia emissions, which is the intention, but also favours survival of organisms.

"So how can an individual farmer reduce the risk of polluting watercourses? The kite model is designed to help. It shows whether the farm is high risk, and how the farmer can apply his efforts most effectively and at least cost. So we expect it to be a particularly useful

tool for farm advisers."

Source: Research Councils UK

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