NEWS

Farmer Andy McElmurray won his court case against the US Department of Agriculture over land poisoned by sludge fertilizer.

R. EHRHARDT/AP

Raking through sludge exposes a stink

A former US Environmental Protection Agency (EPA) scientist is suing the agency's officials and researchers at the University of Georgia in Athens, alleging that they manufactured and published false data to support the use of potentially harmful sewage sludges as fertilizers. The sludges have been linked to health problems in humans and cattle — and even deaths.

The False Claims Act lawsuit brought by microbiologist David Lewis, who says he was forced out of the agency, alleges that EPA officials and University of Georgia researchers fraudulently orchestrated a grant and then fabricated data to ensure that the EPA's 'biosolids' programme would come out smelling pretty. If the charges stick, the scientists and EPA officials could be held personally liable and may be forced to pay back the original grant as well as some US$4.6 million in subsequent grants, plus penalties.

"This is one of the few ways that you can hold people accountable for bad science and indeed for using false information to create that science," says attorney Ed Hallman of Decker, Hallman, Barber & Briggs in Atlanta, who filed the lawsuit on behalf of Lewis and two Georgia dairy farmers.

"Data on sewage sludge were unreliable, incomplete, and in some cases, fudged."

At the heart of the case is a study by agricultural engineer Julia Gaskin of the University of Georgia and her colleagues, which concluded that using sludge as a fertilizer "should not pose a risk to animal health". It was used in a 2002 report by the US National Academy of Sciences (NAS), which brushed aside allegations that livestock had been killed by the toxic biosolids. The report states, with explicit reference to the Gaskin study, that the EPA had investigated these cases and found "no substantiation" to the allegations. Gaskin and her colleagues published their study a year later in the *Journal of Environmental Quality*[1].

The lawsuit alleges that the researchers concealed their own evidence that sewage sludge applications contaminated land and probably contributed to cattle deaths on two dairy farms in Georgia, according to recently unsealed court documents. They then conducted a new study on different land — using sewage-sludge data that were known to be "fudged", in the words of one federal judge — to show that the use of biosolids is safe, according to the lawsuit.

Gaskin would not talk about specifics but says she stands by her work. She also says that the paper was never intended to study problems with biosolids on the dairy farms. "The purpose of this paper was not the focus that has been alleged," she says. "That was not part of this effort." University officials and the EPA declined to comment on the lawsuit or discuss the biosolids programme.

The US biosolids programme, which dates back to the 1970s, relies on residential and industrial wastes routed through thousands of water-treatment plants. Some 60% of the residual sludges from the process — several million dry tonnes annually — are now used as fertilizers rather than being buried or incinerated. But questions remain about the sludges' impact on human and animal health — the programme has been the subject of multiple lawsuits for more than a decade.

Court ruling

In February, a district court in Augusta, Georgia, ruled in favour of the McElmurray family, which had sued the Department of Agriculture for farm subsidies on land they could not plant because of various contaminants from sludge, including cadmium, molybdenum, arsenic and thallium. Judge Anthony Alaimo described a "broad consensus" that data on the city of Augusta's sewage sludge toxicity and its application were "unreliable, incomplete, and in some cases, fudged".

These were the same records that were used in the Gaskin study to calculate application rates on the farms that they analysed, and documents suggest that the researchers knew there were problems with the data. In one draft of the study, University of Georgia soil scientist William Miller scrawled a note with a smiley face saying: "We should fess up here that we don't know exact rates of application or specific characteristics of sludges applied."

Miller did not respond to e-mails or phone calls from *Nature*. In a recent interview with Associated Press, however, he acknowledged

these doubts but maintained that the study "does not include fake data".

"I'm at a total loss to look at anything in the Gaskin paper or its conclusions that are not based on fabricated data or the concealment of their own data," says Lewis, who claims he was forced out of the EPA in retaliation for his research into the health impacts of sewage sludge.

In 2002, Lewis and his colleagues published a study in the journal *BMC Public Health* documenting reported health problems among more than 48 people who lived near fields where 'Class B' sludges — the most common and least sanitized — were applied[2]. Some 25% of those surveyed were infected by *Staphylococcus aureus*, which contributed to two people's deaths. This research was cited in the 2002 NAS report as well, although the report stated that there was no "documented scientific evidence" to substantiate reports of human illnesses or death. The academy said that it was not charged with evaluating human health claims but went on to acknowledge a "persistent uncertainty" about health impacts.

The NAS report recommended that the EPA conduct a new survey of chemicals and pathogens in sewage sludge, begin systematically tracking health complaints, and conduct epidemiological studies to assess the impacts of biosolids. The EPA has yet to implement these recommendations, although officals say a new survey of toxic chemicals found in sludges is due out later this year.

Last year, a team led by epidemiologist Sadik Khuder of the University of Toledo in Ohio published similar findings to those of Lewis's team. Their larger study found that the risk of various health problems correlated with the proximity to farms where Class B sludges had been applied[3].

"We have no idea what's going into the waste-stream," says Murray McBride, director of Cornell Waste Management Institute in Ithaca, New York. He says that there are unknown risks from cleaner 'Class A' sludges as well, because the sterilization process doesn't kill all the pathogens and doesn't affect a host of other chemicals used in modern industry. McBride says that the scientific community and regulatory agencies have been slow to address these questions because of the huge economic and institutional investment in the biosolids programme. "There's a vested interest now in keeping this land application going," he says. ■

Jeff Tollefson

1. Gaskin, J. W., Brobst, R. B., Miller, W. P. & Tollner, E. W. *J. Environ. Qual.* **32,** 146–152 (2003).
2. Lewis, D. L., Gattie, D. K., Novak, M. E., Sanchez, S. & Pumphrey, C. *BMC Public Health* **2**, 11 (2002).
3. Khuder, S. *et al. Arch. Environ. Occup. Health* **62,** 5–11 (2007).

See Editorial, page 258.

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German universities bow to public pressure over GM crops

Scientists have decried the decision by two German universities to pull the plug on field trials of genetically modified (GM) crops, calling it a "disgraceful" interference with scientists' freedom to research.

"I am not happy at all with this decision," says Stefan Hormuth, president of the Justus Liebig University in Giessen, Hesse. "Unfortunately, we were no longer able to deal with the massive opposition from politicians and the general public. The university has a reputation in the region that we cannot risk losing."

Last month, the university announced that it would stop its planned cultivation of insect-resistant GM maize in nearby Gross-Gerau after activists occupied the 1,500-square-metre field. Another local field trial of GM maize, in Rauischholzhausen, was also stopped because of massive protests from the public and local politicians. Both trials had been approved by the national consumer protection and food safety body (BVL) and were to be conducted on behalf of Germany's authority for agriculture variety and seed affairs.

Andreas Schier had to stop his field trials of GM maize.

Earlier in April, the rector and external advisory board of Nürtingen-Geislingen University in Baden-Württemberg "urgently recommended" that a faculty member stop his field trials on insect-resistant and fungal-resistant GM maize. The experiments, which were also approved by the BVL, had been going on since 1996. "We have always been very critical of this kind of research," says economist Werner Ziegler, the university's rector. "Lately things got out of control. There were e-mail attacks, vandalism, intimidation and personal threats. People started calling us 'Monsanto University'."

The final straw, Ziegler says, was when the local population brought food and blankets to activists occupying the university's Oberboihingen test site. Local media and supporters hailed the illegal action as a brave act of civil inconvenience.

The university's experiments were led by Andreas Schier, who studies fungal toxins in maize. Although legally the university could not have forced him to stop the field trials, he says he eventually gave in because the pressure on him had become too great. "Scientifically, there was no reason whatsoever to discontinue the experiments," Schier says. "But scientific arguments don't count in a climate of mass hysteria."

Schier claims that Ziegler and members of the advisory board threatened to publicly distance themselves from him and his research if he were to continue. "I couldn't stand the pressure any more," he says.

The incidents reveal a new level of public hostility to plant genetic engineering in Germany, says Heinz Saedler, a director at the Max Planck Institute for Plant Breeding Research in Cologne, which this year is not cultivating GM crops either. "It is a very sad thing that some universities here haven't got the backbone to withstand illegal activism and public pressure," he says. "I honestly don't have much hope left for the future of academic research on GM crops in Germany."

"If it is indeed true that universities in Germany hinder faculty members from doing field research on GM crops for fear of being vandalized by anti-GM activists, then this is disgraceful," says Vivian Moses, a visiting professor of biotechnology at King's College London.

Vandalism and the destruction of GM crops have been common in Germany and elsewhere in Europe since field trials began 20 years ago. As a result, academic research in the field is becoming scarcer. Germany hosts around a third of the European field trials this year, on an area of just 30 hectares. Europe's GM crop-cultivation research is almost negligible compared with that in the United States, Brazil and Canada.

"Work in the field is no longer appreciated because there is a perception that commercially it doesn't lead anywhere, at least in the short term," says Moses. "We need to face up to reality: is the global food crisis upon us, and must we take action, or will Europe continue to act as an ostrich, doing its best to ignore modern agricultural technology?" ■

Quirin Schiermeier

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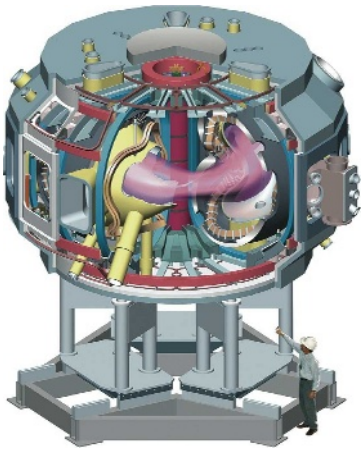

The National Compact Stellarator Experiment never made it out of the design phase.

Plug pulled on stellarator fusion project

The US Department of Energy has cancelled a major fusion experiment.

Based at Princeton Plasma Physics Laboratory in New Jersey, the US$100-million National Compact Stellarator Experiment (NCSX) faced construction delays and cost overruns (see *Nature* 449, 264; 2007) estimated in terms of years and tens of millions of dollars.

On 22 May, Raymond Orbach, the department's undersecretary for science, announced that NCSX would be terminated to free up funds for other fusion experiments, including ITER, an international $12-billion tokamak under construction in Cadarache, France.

Funding boost for B-cell-based HIV vaccine research

In an effort to speed up HIV vaccine research, the US National Institute of Allergy and Infectious Diseases (NIAID) last week awarded US$15.6 million in grants for research on B-cell immunology.

The five-year awards will go to ten research teams. They come two months after NIAID director Anthony Fauci announced his institute's intention to "turn the knob" in the direction of basic research and discovery (see *Nature* 452, 503; 2008) after the highly public failure of a T-cell-based HIV vaccine candidate.

"This is the kind of thing we were talking about when we were talking about discovery," says Fauci, who says that planning for the awards began 14 months ago. B cells make antibodies that neutralize invading viruses, but humans seem unable to mount a response during HIV infection.

Japan to allow limited human embryonic cloning

Last week, an expert committee in Japan's science ministry agreed to lift a 2001 ban on human cloning for research purposes. The amendment, expected to be effective later this year, maps out rigorous ethical regulations under which the research could proceed. Reproductive cloning would still be illegal.

A group in Japan has expressed intentions to clone embryos for research. But serious hurdles remain, including the low availability of human eggs for research due to strict prohibitions on compensation.

Correction

The 2002 biosolids study from the National Academy of Sciences (NAS) did not reference research into health impacts by Environmental Protection Agency (EPA) whistleblower David Lewis, as reported in our News story 'Raking through sludge exposes a stink' (*Nature* **453,** 262–263; 2008). The citation was included in a prepublication draft that is still posted on the EPA's internet site, but the NAS panel voted to remove the reference before final publication. An NAS spokesman said the panel decided the information was not relevant as the panel was not charged with evaluating health impacts.