



New Zealand GMO debacle undermines green lobby

On March 6, an Oregon State University researcher Elaine Ingham and the New Zealand Green Party apologized to the New Zealand government for submitting false claims about the ecological impact of genetically modified organisms (GMOs)—a mistake that seriously undermines the green lobby's call for a moratorium on field trials of all GMOs in New Zealand. The debacle is yet another example of the hijacking of scientific research for political ends, and reminds those in the anti-GM camp that if they choose to pit science against science in the fight against GMOs then they must apply the appropriate intellectual rigor or risk losing credibility.

The apologies in question relate to the erroneous evidence submitted to the New Zealand Royal Commission on Genetic Modification, a group currently deliberating the future of genetic modification in New Zealand. Ingham told the Commission at the beginning of February: "The likely effect of allowing the field trial [with the GMO in question] would have been to destroy terrestrial plants." To illustrate this risk, she referred to an experiment—carried out by a graduate student in her laboratory—showing that GM soil bacterium, *Klebsiella planticola*, killed plants.

The *Klebsiella* had been engineered to convert plant waste into alcohol, eliminating the air pollution created by the "burn off" of fields at the end of the growing season. After the alcohol was removed, a rich plant-bacterial "sludge" would be left that could be used as fertilizer. The US Environmental Protection Agency (EPA) conducted standard toxicology tests of the GMO, revealing no ill effects. Ingham, however, remained concerned about its broader ecological impact.

Ingham told the Commission that wheat plants exposed to the GM *Klebsiella* initially grew healthily, but 7 days later "had turned into slime." The plants, she said, died because the bacteria had produced lethal concentrations of alcohol. Ingham further claimed that her research, allegedly published in *Applied Soil Ecology* (3, 394–399, 1999), had effectively stopped EPA-approved field trials of the bacterium.

Her claims prompted sensational headlines in national papers (for instance, "GM bacteria could kill all life—US Expert," *Evening Post* and *Christchurch Press*, Feb. 2, 2001), spurring an investigation by the New Zealand Life Sciences Network (Wellington,

New Zealand), an organization representing the local biotech community. The Network found that the cited publication did not exist, and that the EPA had never approved the field trials. When questioned further, Ingham cited a second research paper (*Applied Soil Ecology* 11, 67–78, 1999), which was then scrutinized by three independent scientists recruited by the Life Sciences Network. In its rebuttal evidence to the Commission, the Life Sciences Network says that Ingham had made "scientifically unsupported and exaggerated assertions" to the Royal Commission. The experts even suggest that bacterium was "environmentally non viable" and would not survive under normal conditions.

The bedrock of science is that is that you follow the data wherever it leads you—you don't go through the data to pluck out anything that proves your point.

Persistent requests by the New Zealand Life Science Network to the Commission evoked an apology from both Ingham and the Green Party, which had also rested its argument against field trials of GMOs on Ingham's evidence. In a letter to the Commission, Ingham admitted that her doomsday predictions were only "extrapolations from laboratory evidence." Jeanette Fitzsimons of the New Zealand Green Party also admitted that the paper did not support her assertion that a field trial of the GMO would have led to global devastation.

Despite the fact that Ingham admitted her error, Doreen Stabinsky, science advisor for Greenpeace's Genetic Engineering Campaign, says that it was predictable that Ingham's scientific credibility would be attacked. Ingham, she claims, has long been a political "scapegoat" for the agbiotech industry, since speaking out against GMOs at an international meeting on biosafety in Madrid in 1995. "Ingham's scientific evidence [on *Klebsiella*] contradicted the statements being made by the US delegation at the time," says Stabinsky, and she became an embarrassment. Stabinsky continues to stand by Ingham's work—which Greenpeace

also cited as a part of its testimony to the Commission—as evidence that GMOs can have "unanticipated effects" on the environment. She also points out mistakes and overextrapolations made in data presented in part of the Life Science Network's testimony, and argues that "scientists supporting the status quo have [also] not been held to the required high standards in the past."

Nevertheless, the case is a classic example of the lack of scientific rigor applied by the anti-GM lobby group, says Val Giddings, vice president of food and agriculture for the Biotechnology Industry Organization (Washington, DC). "The bedrock of science is that is that you follow the data wherever it leads you...you don't go through the data to pluck out anything that proves your point," says Giddings.

Alex Avery, director of research and education at the Center for Global Food Issues at the Hudson Institute (Indianapolis, IN), agrees that "negative" research findings (such as Ingham's) get overly exhaustive attention from activists. "From a scientific perspective...the sham [of Ingham's research] was bound to come out in the end." However, Avery is pessimistic that it will spur the lobbyists and the media to take a more critical look at the scientific "evidence."

Another recent example was the outcry over Golden Rice, a strain of rice modified to be rich in vitamin A (*Science*, 287, 303–305, 2000). In theory, Golden Rice could help prevent blindness, caused by a deficiency in the vitamin, in children in developing countries. Greenpeace calculated that—at the concentrations produced by current strains of Golden Rice—a child would have had to eat seven kilograms of cooked rice a day to get the recommended daily dose of vitamin A. Gordon Conway, president of the Rockefeller Foundation, which funded the project, wrote to Greenpeace pointing out that vitamin A deficiencies can arise when children lack "10%, 20% or 50% of their daily requirements, not 100%." An average daily rice quota could, therefore, be beneficial.

Doubtless, the debate over genetic modification is highly politically charged. There are important social, religious, political, and economic reasons for care in the application of genetic modification—especially for food and agriculture. Indeed, the New Zealand Royal Commission has taken the unique approach of listening to both facts and feelings on the issue from a broad cross section of the population of New Zealand. However, if groups on both sides choose to use science-based argument then they must get their facts right. Giddings concludes: "This incident was not the hallmark of intellectual rigor."

Liz Fletcher, New York.