Corn Goes Pop, Then Kaboom
Nature regrets publishing a paper on transgene contamination in Mexico
By Barry A. Palevitz

On April 4, *Nature* sent ripples through the scientific community and the popular press by admitting it made a mistake. In an unprecedented action, editor Philip Campbell concluded in the journal’s online version that “evidence available is not sufficient to justify publication” of a paper that appeared in the Nov. 29, 2001 issue. It wasn’t exactly a retraction, but it was close. Along with its statement, *Nature* published two rebuttals to the original paper, plus a response from authors David Quist and Ignacio Chapela of the department of environmental science, policy, and management at the University of California, Berkeley.

The April 4 online announcement, then publication in print April 11, was the latest in a series of skirmishes that started before the Nov. 29 issue appeared. Using PCR to detect a DNA signature diagnostic of genetic engineering, Quist and Chapela claimed that biotech transgenes had invaded so-called land races of maize planted by local farmers in Mexico, probably via cross pollination. The researchers said the promiscuous sequences probably entered the maize genome many times and even fragmented—claims that set off alarm bells in plant molecular biology laboratories.

**FIRST FEATHERS FLY, THEN REBUTTALS**

The Quist and Chapela paper started fax machines and E-mail lists humming. Environmental activists claimed it was smoking-gun evidence of the genetic pollution it feared from biotech crops. Many plant scientists cried foul, however, faulting the paper’s methods and conclusions.

It didn’t take long before the molecular biology community responded officially. By mid-December, *Nature* received at least two letters to the editor in rebuttal; one from a collaboration between groups in UC-Berkeley’s department of plant and microbial biology and the Plant Gene Expression Center in nearby Albany, Calif., and another joint response from British Columbia and the University of Georgia in Athens. A third letter followed closely thereafter from a team led by Matthew Metz, a postdoctoral fellow at the University of Washington in Seattle. *Nature* eventually sent four letters out for review.

Why the rush to counter Quist and Chapela? Angry scientists minced no words. “I saw a very poorly done paper,” says Metz. “It’s important to speak out, so I decided to write a critique.” According to Sarah Hake, who helped with the Berkeley-Albany response, “I was outraged when I saw the Quist and Chapela article.” Adds lead author and graduate student Nicholas Kaplinsky, “We wrote our letter because Quist and Chapela published some of the worst science I have seen in my short scientific career.”

In the end, *Nature* published two of the letters, but reviewers agreed they all made similar points in claiming that Quist and Chapela’s data are PCR artefacts. Editor Campbell says, “We published as few as possible in the interest of page space, ensuring that what we felt to be the essential new points were made.” In response, Quist and Chapela acknowledged mistakes, but stood on their original interpretation based on new results from DNA dot blots. Metz still insists “transgenes fragmenting and scattering through genomes is completely unfounded.”

**MUCH, MUCH MORE**

While *Nature* mulled over the rebuttals, a veritable war of words raged on Web sites and E-mail lists over the Quist and Chapela article. When someone anonymously posted supposedly confidential reviewers’ comments about the rebuttals on the Internet, hostilities grew even hotter. In February, the journal *Transgenic Research* published a lengthy editorial saying Quist and Chapela’s evidence wasn’t credible.

To counter the growing criticism, an international coalition of 144 environmental and antibiotech groups led by Food First issued a joint statement supporting Quist and Chapela (www.foodfirst.org). In response, the probiotech AgBioWorld Foundation circulated its own petition, eventually signed by more than 100 scientists, calling for greater scrutiny of Quist and Chapela’s findings (www.agbioworld.org).
In publishing the rebuttals and admitting it was wrong, *Nature* may have inflamed the infection further. Kaplinsky’s major professor, Michael Feuling, issued biting comments about Quist and Chapela and the way *Nature* handled the matter: “First, bad science must be acknowledged and retracted if it has made it to press, to be accompanied by a sincere apology to all who might have been misled. Second, whichever editor organized the flawed peer review must also acknowledge error, ask for a retraction, and explain how changes in reviewing policy will address the obvious weakness in their journal.”

Scientists who sent rebuttals are also incensed over the time *Nature* took to make a decision—more than three months. They felt hamstrung—as debate over the veracity of Quist and Chapela’s paper raged, and whether the Mexican government should take action, they couldn’t comment because of the journal’s embargo policy preventing release of results ahead of publication. “I was able to acknowledge that I submitted a critique but unable to give details,” says Metz. “That’s a long time for an issue of this magnitude. They took the maximum amount of time at every step,” Wayne Parrott, whose letter wasn’t published, is equally peeved: “I think it was unethical not to lift the embargo until 10 days after they knew they weren’t publishing my paper. It was socially irresponsible.”

Angry researchers have other gripes too. Parrott says he heard from a *Nature* editor on Feb. 15 that the editors were postponing a decision for a month to give Quist and Chapela time to generate more data. He questions the action’s propriety. Campbell told The Scientist, “We agreed with the authors that more data might promptly establish whether or not the original paper’s conclusions could be justified.”

Parrott also argues about the 600-word limit for letters. “It puts greater emphasis on brevity than correcting the damage,” he says. Rebutters also wonder why Quist and Chapela’s published response differed from the one they received in galley proof form.

In another twist, *Nature* published two news reports on the Quist and Chapela study weeks before the original article and rebuttals appeared. Campbell explains that there is a firewall between the news and research divisions of the journal. “Dealings with authors of papers are confidential to the staff in that section,” he says. But, “our subscribers pay for news as well as papers and we cannot hold off news just because we are also a newsworthy journal. We cover the news as it happens, which explains the timings.”

**NOT THE FIRST TIME**

The Quist and Chapela brouhaha didn’t come out of the blue—in a way, *Nature* itself paved the way. As biotech advocates read the Nov. 29 issue, they still winced over a paper *Nature* published in 1999 implicating transgenic corn as a threat to monarch butterflies. While they engendered sensational headlines and dire warnings from environmental activists, the results were roundly criticized by many scientists.

**MONTHS OF FOLLOW-UP STUDIES MINIMIZED THE THREAT**

The year 1999 wasn’t at all good for corn, or *Nature*—the journal published another paper claiming that transgenic *Bacillus thuringiensis* (Bt) toxin seeps from corn roots, thereby contaminating soil. It too was derided by molecular biologists and the biotech industry. To add insult to injury, *Nature* refused to publish an article announcing provitamin A enriched rice. Generally regarded as a biotech tour de force that could save millions of lives, the collaborative effort led by Ingo Potrykus and Peter Beyer eventually appeared in *Nature*’s rival, *Science*, in January 2000. Says Potrykus, “*Nature* preferred to publish about crazy experiments such as feeding Bt pollen to monarch butterflies.”

The imbroglio has left a bad taste in many mouths. Chapela blames biotech advocates for conducting a vendetta against him. At least one prominent scientist thinks *Nature* is in danger of losing its credibility. Hake is considering canceling her subscription. Ironically, most plant biologists believe transgenes will move into maize land races sooner or later—after all, corn is wind pollinated. Says Metz, “I wouldn’t bet against finding it.” In other words, Quist and Chapela may be partly right, but for the wrong reasons. Jane Risler of Union of Concerned Scientists perhaps summed up the situation best in saying, “Regulation of genetic engineering products depends on sound science. In this case, the shortcomings should have been detected before publication.”

In the end, the whole affair may say more about the sociology of science, science publishing, and the debate over transgenic crops than it does about DNA and agriculture. But that’s another story.

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**References**


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