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## A Journalist and a Scientist Break Ground in the G.M.O. Debate

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There was a trace of mischief in Michael Pollan's smile as he took the stage of Wheeler Hall at the University of California, Berkeley, last week to introduce a lecture for a course that he co-teaches, with the activist Raj Patel, called Edible Education 101. The auditorium was crammed with seven hundred students, most looking as you might expect young Berkeley food activists to look: wholesome and bright-eyed, visibly eager to help make the global food system "more equitable, healthful and sustainable," as the course mission states. This group constituted a kind of monoculture, and Pollan was about to introduce an invasive species.

Pamela Ronald, a prominent plant geneticist and a professor at U.C.-Davis, had come, at Pollan's invitation, to present her perspective on the benefits of genetic engineering—even though Pollan himself has been a vocal skeptic of G.M.O. foods. "If anyone can make the case for this technology, it's Pam Ronald," Pollan told the audience.

This was a generous but daunting introduction. It's not easy for anyone, let alone a plant geneticist who spends fifty hours a week directing a large laboratory, to persuade a crowd of young activists to shift their thinking on one of the most contentious environmental debates of our time. Last year, G.M.O. crops—corn, cotton, and soybeans—were planted on more than a hundred and sixty-seven million acres in America. Seventy per



cent of processed foods now have at least one genetically engineered ingredient. But anti-G.M.O. activists have worked to mobilize a backlash: food with the “non-G.M.O.” label is today among the fastest-growing categories of product sales in U.S. markets.

Meanwhile, the major scientific societies, including the National Academy of Sciences and the World Health Organization, have concluded that the G.M.O. crops on the market are safe to eat. And there’s been a shift toward G.M.O.s among editorial boards and science writers—including *The New Yorker*’s Michael Specter, the *Times*’s Amy Harmon, and Nathanael Johnson, of the environmental Web site Grist.org. “I feel pretty lonely among my science-writing colleagues in being critical of this technology, at this point,” Pollan told me.

Pollan, who wrote a feature for *The New Yorker* recently about whether plants can think, remains skeptical of G.M.O.s for several reasons. First, he notes that the vast majority of genetically engineered crops in the U.S. have been designed to enhance the productivity of industrial farming, and are only more firmly establishing practices such as monocropping, which he considers problematic. Monsanto’s “Roundup Ready” crops, which are engineered to be herbicide-tolerant, now account for about three quarters of all the corn and cotton grown in the U.S., and ninety per cent of the soybeans. While many such G.M.O. seeds have promised to reduce the over-all volume of pesticides sprayed on crops, Pollan says that the technology has backfired in some instances: many farms using Roundup Ready seeds, for example, have developed herbicide-resistant weeds, prompting farmers to use more and stronger herbicide sprays. “The major G.M.O. crops are failing, the public is running away from it, and yet the elite opinion is firmly in the camp of: we need this technology to feed the world,” Pollan told me. “It’s really an interesting situation.”

Ronald strongly disagrees with Pollan’s view that G.M.O. crops, broadly, are failing. She cited examples such as Bt cotton that have cut the amount of chemical insecticides applied to crops globally by millions of pounds a year. “The U.S.D.A. just reported a tenfold reduction in the use of insecticides as a result of the engineered Bt trait,” Ronald said. She also cited an example of papayas that were genetically engineered to resist ring-spot virus and helped to save the Hawaiian papaya industry. “It’s a shame to demonize an entire technology because of Roundup Ready,” she told Pollan and Patel when they began a debate after she had given an hourlong PowerPoint presentation.

Ronald’s own experiments in genetic engineering have seen notable success. In 2006, Ronald and her colleagues isolated the gene used by the International Rice Research Institute to produce “scuba rice,” a strain of flood-tolerant rice that can grow in submerged fields; four million subsistence farmers have since grown this rice in Bangladesh and India. Just last month, Ronald and her collaborators published the results of a successful five-year effort to develop genetically engineered bananas resistant to *Xanthomonas* wilt disease, which has decimated millions of acres of banana crops in East Africa. The world is filling with ever more people, Ronald reasons, and we need ever more food from the same amount of land. She argues that genetic engineering will play a critical role in protecting finite soil and water resources, staving off crop diseases, and responding to the pressures of climate change.

As she stood at the Wheeler Hall lectern, wearing clogs, no makeup, and cropped gray-brown hair, it struck me that Ronald might easily be mistaken for a Northern Californian hippie. She’s a strict vegetarian who lives with her family in a modest solar-powered home, she line-dries her clothing, and she backpacks for weeks at a time in the Sierra Nevadas. She’s also married to Raoul Adamchak, a prominent organic farmer. Together they are the Mary Matalin and James Carville of the G.M.O. debate.

“A lot of people wonder if Raoul and I can be friends—if we can even talk to each other,” she told the crowd as she clicked to an image of Adamchak’s bucolic ten-acre farm on the U.C.-Davis campus, where he directs the organic-farming program. “We can because we have the same goal.” Ronald explained that her advocacy of G.M.O.s is deeply tied to her opposition to the use of harmful chemicals in agriculture. With Adamchak, she wrote the book “Tomorrow’s Table,” which advocates a food system that is organic *and* genetically engineered.

While the Berkeley debate was spiked at times with shrill notes and tension, the tone was generally courteous. Given the protest tactics that anti-G.M.O. activists have used in the past, I had expected at least one Flavr Savr tomato to be hurled at the stage. But Pollan, Patel, and Ronald made more of an effort to agree with each other than to disagree. “I’ll

give you the papaya,” Pollan said gamely when Ronald pressed him to name a circumstance in which he felt G.M.O. crops were acceptable.

Despite Ronald’s humanitarian ambitions for G.M.O.s, it was no easy task for Pollan to get her in front of his Berkeley audience. “There were a lot of people on my campus not happy Pam was getting to speak to this group of students; they worried for the students’ education,” Pollan told me. “Pam excites passionate feelings. Then again, so do I.”

Why is it that G.M.O.s, more than any other food issue, have inspired so much angst? “There’s something about genes that just terrifies people, when, in fact, this method is just as safe as the plant breeding we’ve been doing for ten thousand years,” Ronald said. Grist.org’s Johnson told me that people see genetic engineering as “a form of tinkering with the very essence of the life force, so it lends itself to all sorts of ominous metaphors.”

One ominous metaphor was by far the most prevalent among the students with whom I spoke after Ronald’s lecture: “G.M.O.s have come to represent the corporate control of our food system,” Mikel Shybut, a twenty-five-year-old Ph.D. student in plant and microbial biology, told me. Shybut stressed that he and his peers had little concern about the human-health impacts of G.M.O.s. He said that he believed in “the promise and power of genetic engineering,” but only insofar as they are “used for people, not for profit.”

Pollan echoed this sentiment, and agreed that the technology itself may not fundamentally pose a greater health threat than other forms of plant breeding. “I haven’t read anything to convince me that there are *inherent* problems with the technology. I think most of the problems arise from the way we’re choosing to apply it, what we’re using it for, and how we’re framing the problems that it is being used to solve,” he said.

At the end of the event, it wasn’t clear how many people Ronald had managed to win over. It was clear, however, that she and Pollan had set an important precedent: they had convened the two sides of a contentious debate in a respectful dialogue. “It’s the first time I’ve ever seen a discussion on this topic that’s this measured and civil,” said Johnson, whose writing on G.M.O.s has generated scabrous attacks by anti-G.M.O. protestors.

Respect and cooperation from both sides, he added, is “not just novel, but sincerely hopeful.”

*Photograph of Pamela Ronald by Roy Kaltschmidt.*

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