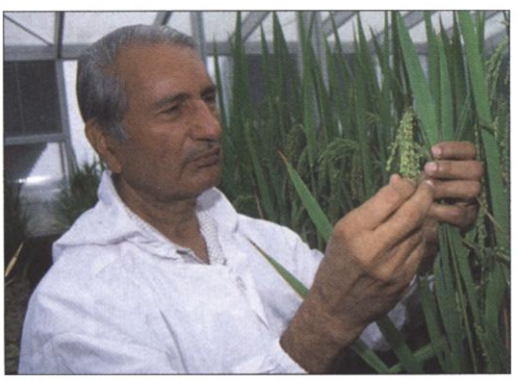
AGROBIOTECHNOLOGY

Asia Gets a Taste of Genetic Food Fights

Despite the need to feed growing populations in Asia, controversy over GM foods is putting a damper on efforts to develop and test new crops

LOS BAÑOS, THE PHILIPPINES—The debate over genetically modified (GM) crops has come to Asia. It hasn't yet reached the intensity of the clash in Europe. But opposition in the Philippines has delayed field trials, Indian farmers have ripped up fields of genetically altered cotton, and Japanese consumers are not buying GM foods, damping the country's interest in the technology. Suddenly, a region that had been banking on GM crops to feed growing populations is facing an uphill battle to implement the technology.



Looking ahead. IRRI's Gurdev Khush worries that Asia will suffer if GMO opponents block new research.

The signs of opposition are scattered and vary from country to country. But they are enough to be worrisome to the region's leaders. "It is very disturbing that here we have a technology and its deployment is being delayed by green groups," says Gurdev Khush, chief plant breeder for the International Rice Research Institute (IRRI) in Los Baños. "The delay will eventually hurt Asia."

If Asia does back away from GM crops, it would be an ironic reversal of the region's history of embracing agricultural advances. Beginning 3 decades ago, Asian farmers rapidly adopted new rice varieties improved through classical breeding techniques, even though this involved altering their traditional farming methods. The result was a near doubling of Asian rice production in the 1970s and 1980s that headed off catastrophic food shortages.

But production gains have leveled off even as populations in developing Asia continue to grow. In the Philippines and Pakistan, for example, the annual growth rate is 2.3% and 2.8%, respectively. The direct manipulation of genes is seen as a key to boosting yields to provide the necessary food. "Asia needs to use every tool available to produce food for these growing populations," Khush says.

Asia has in fact been a fervent believer in GM technology. Virtually every country in the region with any national research program has funded work on GM crops. Take China, which has set up several national labs specifically for the effort. By one count, researchers there have applied GM techniques to 47 plant species, using 103 different genes. Six plants are under commercial production, all but one developed within the country. Although China may have gone farther and faster than any other Asian country, Thailand, India, and the Philippines are following close behind. Still, these same governments are at pains to demonstrate that they are protecting the citizenry. Their vigilance also provides an opportunity to stand up to international companies, a popular target.

Customs officials in China, for example, recently seized a shipment of a GM rapeseed variety not yet approved in the country. And India's biosafety protocol mandates a cost-benefit analysis of GM crops. This was done, says Rameshwar Prasad Sharma, a member of the Department of Biotechnology field trial review committee and a professor emeritus at the National Center on Plant Biotechnology in New Delhi, to hold down seed costs, "so that the interests of small and marginal farmers can be taken care of."

But outright opposition to growing and consuming GM foods has emerged as an unexpected hurdle. In some cases, the opposition comes from outside Asia. For example, the Union of European Community Rice Millers Associations has warned the Thai Rice Exporters Association that Thai rice will not be welcome in the European Union if there are any traces of genetic modification.

Homegrown opponents

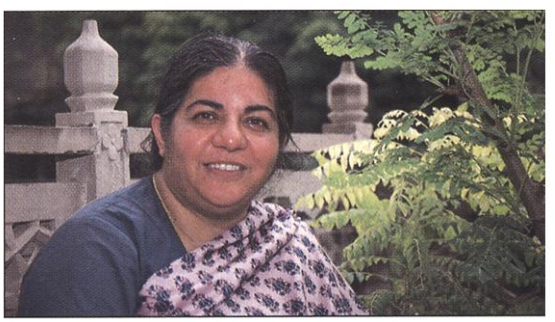
But the bigger impact on the adoption of GM technology is coming from within Asia itself. There has been no organized opposition to GM crops or foodstuffs in China, thanks in part to the country's controlled press, which has paid scant heed to the controversies erupting in other parts of the world. In Indonesia, too, recent trials of so-called Bt corn, which carries a bacterial gene that makes it resistant to insect pests, went off without any significant opposition.

Other countries have not been so lucky. In November 1998, activists and farmers in the southern Indian state of Andhra Pradesh uprooted and burned Bt cotton planted in two small field trials by Maharashtra Hybrid Seed Co. (MAHYCO), a Monsanto affiliate. At the time, farmers' fears were centered on the possible introduction of the terminator gene, which renders second-generation seeds sterile, ensuring that farmers must buy new seed each year. Monsanto later pledged not to use the terminator gene in its products.

Meanwhile, MAHYCO persevered with preliminary trials. In June it won government approval for large-scale field trials of Bt cotton, the first transgenic crop to proceed this far in India. The approval is conditional on obtaining independent Indian laboratory certification that the plant does not contain the terminator gene, but even so, Vandana Shiva, director of the Research Foundation for Science, Technology, and Ecology in New Delhi and an ardent critic of GM technology, filed suit in India's Supreme Court seeking a halt to the trials.

She contends that the first-stage controlled trials and the required clearances were rushed through and that data supporting the safety have been simply "cooked up and fabricated." The Supreme Court is scheduled to hear arguments next month. A ruling could take several months, however, and may come well after MAHYCO harvests the cotton, which is due for planting shortly. Regardless of the court ruling, Shiva vows to keep the debate at the top of the national agenda.

The Philippines has had an even harder time with trials. Last year, Pioneer Hi-Bred Philippines, the local affiliate of DuPont's Pioneer Hi-Bred International, and Agroseed, a Monsanto subsidiary, each won national approval for trials of Bt corn. They



Legal steps. Vandana Shiva's group has sued to stop Indian trials of Bt cotton.

CREDITS: P. BAGLA

were planned for Bay, a town near Manila, and for General Santos City, on the southern island of Mindanao. However, the Bay town council subsequently voted to ban GM field trials.

Paul Teng, Monsanto's Asia-Pacific director of agricultural technology, says that for logistical reasons Agroseed had already decided to do only the General Santos trial anyway. But after it had begun, the General Santos council also adopted a moratorium on GM crop cultivation. A court suit seeking to have the crop destroyed was thrown out on a legal technicality, and Agroseed harvested the crop last spring.

The Pioneer trials never got under way. The company initially delayed them until the rainy season, when the corn borer the Bt resists is more of a problem, and now, a Pioneer spokesperson says, they are on hold because of the local bans. Julieta Estacio, an official with the National Committee on Biosafety, says that such local laws would probably not hold up to court challenges.

Meanwhile, a bigger threat, a bill to ban GM crops nationally that was introduced last year by Philippine Senator Gregorio Honasan, has been staved off. Scientists and officials from both the public and private sectors mounted a lobbying and education effort that has apparently killed any chance of the bill emerging from committee.

A way forward?

Officials are cautiously optimistic that other regions will be more welcoming. Even so, IRRI is treading carefully. Its first planned transgenic trials involve a rice variety with a gene transferred from a different rice variety instead of from a foreign organism. William Padolina, IRRI's director of community relations, says they hope this will prove more acceptable to officials and the public in Los Baños, where the trial will be held.

Monsanto is even more optimistic. Its Agroseed subsidiary is now planning the next step toward approval for commercial use of Bt corn, which involves field trials in 18 locations. Teng agrees on the need for local support. "We don't want to go into an area that doesn't want this trial," he says, adding that they plan "a major effort" in educating officials and citizens. But he believes the tide of public opinion has turned, thanks in part to the General Santos trial, where farmers, citizen groups, and the press could all observe the crop in the field, the harvest, and the postharvest destruction of remaining organic material.

Teng's assessment is not shared by groups opposed to GM organisms, however, who see a hardening of attitudes. "When people become aware of the [GM] issue, they become very concerned," says Roberto Verzola, executive director of Philippine Greens, a Manila-based environmental group.

Indeed, the power of the consumer becomes most evident in Japan, the region's most technologically advanced nation, where early and well-funded research efforts have put a gardenful of transgenic plants into the development pipeline. But only one—a blue carnation—has proceeded to commercial cultivation.

Researchers and industry officials point to a simple reason: "There is extreme consumer resistance" to GM foods, says Go Kawamura, a director of Takano Foods Corp. Takano already uses only certified non-GM soybeans for its products and, like virtually all makers, puts that fact in bold characters on package labels.

That policy is in line with the results of a survey conducted last year by the government-affiliated Agriculture, Forestry, and Fisheries Finance Corp., which found that among 600 respondents, 80% were reluctant to buy GM foods. A labeling law that takes effect next April already has food processors substituting non-GM ingredients in products to avoid the stigma of a GM label.

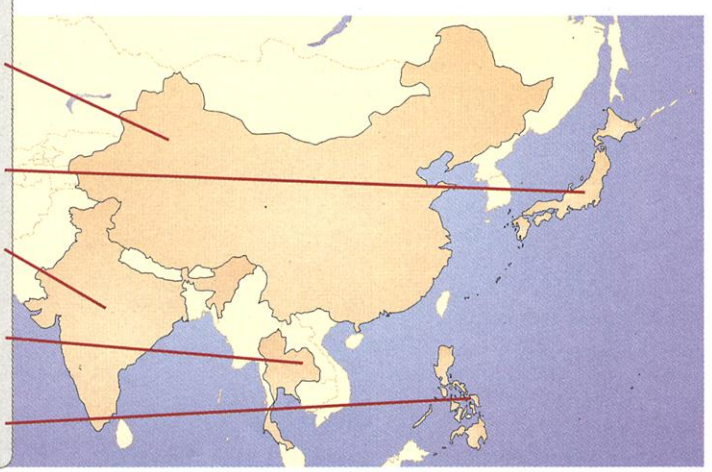
Consumer preferences will inevitably affect the direction of research. "Without consumer acceptance, private companies will lose interest in developing GM plants," says Takeshi Yoshida, director of the Innovative Technology Division of Japan's Ministry of Agriculture, Forestry, and Fisheries. "Eventually, that would influence the national institutes as well."

A decline in research activity in Japan would reverberate through the region, particularly because Japan has been an important source of research collaborations and technical exchanges. Officials hope a new generation of GM plants that are better tasting, more nutritious, and remain fresh longer will have more consumer appeal. "Until now, GM technology only promised benefits for farmers," says Naoki Katsura, director-general of Japan's National Institute of Agrobiological Resources in Tsukuba. "We hope consumers will realize the next generation of GM foods will have benefits for them as well." **–DENNIS NORMILE**

With reporting by Pallava Bagla in New Delhi and Los Baños and Li Hui in Beijing.

A SCORECARD ON GM CROPS IN ASIA

Commercial cultivation	Field trials	In development	Labeling laws
CHINA			
Cotton (two varieties) Tomato (two varieties) Sweet pepper Petunia		Rice, soybeans, potatoes, corn, cotton (other varieties)	None
JAPAN			
Carnation	None	Rice, tomato, melon, broccoli, cucumber	As of 4/2001
INDIA			
None	Bt cotton	Rapeseed, cabbage, cotton (other varieties)	None
THAILAND			
None	Tomato, cotton, corn	Tomato, papaya, chili pepper, cotton	Voluntary
PHILIPPINES			
None	Bt corn	Rice, cotton	None



Unwelcome guests. Protesters who left signs of their opposition to GM crops on IRRI's gates forced the organization to relocate its 40th anniversary celebration in April.

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