

Myth #5

Biotechnology Increases Agricultural Biodiversity

The biotechnology industry maintains that genetically engineered crops actually increase the world's agricultural biodiversity. They claim that growing more food on less land will leave more room for other species to survive and may "play a part in making farms of all sizes more viable." None of the crops that have been commercialized to date, however, have consistently increased yields or biodiversity. Rather, they have presented ongoing threats to centers of diversity in areas around the world.

Centers of diversity are areas that contain populations of relatives of crops, such as corn, rice, soy and wheat. These populations are a reserve of genetic material that traditional crop breeders can use to breed new varieties. The world's agriculture

cannot survive without these centers of diversity which provide the raw genetic material for breeding new characteristics into crops—characteristics such as disease resistance, cold tolerance and drought resistance.

While genetic diversity is already being threatened by loss of small farms and industrialized agriculture, widespread use of genetically engineered crops could intensify this loss. Wild relatives could be displaced by crops or weeds with engineered traits that give them an advantage, such as insect resistance. In addition, farmers may abandon even more traditional varieties as the biotechnology industry aggressively markets genetically engineered crops around the world.

Voices

Bolivia and Genetically Engineered Potatoes

by Maria Luisa Ramos, FOBOMADE, Bolivia

In Bolivia, which is the potato's center of origin, genetic diversity of the crop is so high that up to 70 varieties can be found within one ayllu (a local family farming unit), from sour to semi-sour to sweet. Recent studies have demonstrated that 235 species of wild or cultivated potatoes exist.

Farmers in the High Andean Region guarantee their food requirements through diversified agriculture with the aid of high biodiversity. The potato is one of the most important staples of the country and assures food sovereignty for Bolivian farming families and for the nation.

Because the preservation of native potato varieties is crucial for farmers in that region, several local community initiatives have been launched to revitalise and improve local potato seeds. One such initiative taken by Agruco (Agroecology of the University of Cochabamba) consists of maintaining more than 45 native potato varieties in one ayllu seedbank. The seedbank functions as a source for varieties not actively cultivated, or for seeds, if planting stock quality diminishes. In this way, potato biodiversity is preserved and revitalized.

The introduction of GM potatoes: the risks for Bolivia

In April 2000, the Bolivian Biosafety Committee approved a request for field trials of a GM potato resistant to nematodes, a pest. The field trial was to be conducted by the Proinpa Foundation, with plant material originating from Leeds University, England. In Bolivia, genetic contamination through lateral transfer of GM potato genes poses a high risk to traditional varieties and wild relatives. Serious impacts on biodiversity and cultural diversity are possible, for instance genetic erosion and the disappearance of traditional cultural practices connected to the potato.

People's resistance to the GM potato

When the request to conduct GM potato field trials became known, farmers from different Andean areas rejected the field trials in a letter addressed to the Bolivian Vice-Minister of Natural Resources and Environment.

Bolivia's foremost development NGO (nongovernmental organization) network, the Association of



Agroecology Producers, and the environmental NGO, FOBOMADE, wrote to the Bio-safety Committee to protest. Unfortunately, the committee ignored civil society organizations' wishes on this critical biosafety issue. The plan to introduce the GM potato to its Bolivian centre of origin caused a strong national reaction not foreseen by the project promoters. Andean farmers strongly opposed the project and threatened to destroy the field trials. Meanwhile, statements against the GM potato's introduction came from around the world. Immediately after the Biosafety Committee approved the field trials, the Proinpa Foundation came under heavy criticism at public meetings in La Paz, Cochabamba and Sucre.

Precautionary principle and alternatives to the GM potato

The United Nations Convention on Biological Diversity (CBD) has recognised that the precautionary principle should be used in connection with biotechnology. In the Biosafety Protocol (adopted January 2000) the precautionary principle is recognized as a key element for achieving biosafety. For Bolivia, this means that the critical resource of potato biodiversity should not be risked for a technology that has not proved its worth.

In connection with Bolivian potato case, FOBOMADE delivered a statement both nationally and internationally calling for a moratorium on GM crop releases into

the environment, especially in countries that have traditional varieties or close relatives of the GM crop. The statement also said that Bolivia's problems should be tackled through methods based on the nation's genetic richness, not through methods such as genetic engineering that threaten biodiversity. The use of genetic engineering cannot be justified in Bolivia, when study of the full potential of traditional potato varieties remains incomplete. Furthermore, the study of Bolivian native varieties through traditional hybridization methods is an endeavor that can easily be carried out by the nation's own farmers.

Project withdrawn

On June 5, 2000, the Proinpa Foundation withdrew its project to perform GM potato field trials due to the "debate generated by GM potatoes in the country" and stated that it would "wait for a more appropriate moment."

Resistance continues

In September 2000, the Bolivian Confederation of Farmworkers put the subject of GM food on its agenda, and persuaded the government to sign a decree which stated that, "All production of GM food is stopped during the review period established, and until the final report is issued, with recommendations on amendments to the regulations on access to genetic resources and biosafety" (Decree 25929).



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Then, in January 2001, the agriculture minister adopted Ministerial Resolution 2001, which decided “To ban, for a period of one year, the import of products, sub-products and foodstuffs of agricultural origin derived from genetically modified crops.” The resolution was a provisional and preventive measure to protect the population’s health.

In new negotiations on August 23, 2001, the Bolivian Confederation of Farmworkers persuaded the national government to extend the above resolution until beyond December 2001 and upgrade it to the status of a Supreme Decree.

Corporate influence reverses democratic decree

However, pressures for field trials of GM potatoes and other crops persisted. Permanent lobbying by transnational corporations put pressure on the Bolivian government and its institutions to open the gate to modern biotechnologies. Led by the Argentinean soya sector the lobby strongly attacked the Bolivian decree that banned GMOs.

A leaked Bolivian memo asserted that “the [Argentinean] soya corporate sector is behind the attack, because it exports almost five billion dollars of genetically modified soya.” In the same memo, Bolivian authorities said the “the present situation is very sensitive, because the Bolivian Mission at the WTO considers that the reasons given by the Argentinean Mission are valid, according to WTO rules, and our country does not have any solid justification to back the measure adopted.

Thus, despite widespread opposition from farmers, and environmental and sustainable development leaders, the corporate lobby succeeded in October 2001 in getting the ban on GM product imports lifted until new regulations are made.

The repeal of the above resolution reveals the Bolivian government’s weakness in the face of Argentinean and agribiotech company pressure. It is an outrage that a small nation like Bolivia should be forced to accept GM foods against public sentiment.

Farmer and environment NGOs in Bolivia have vowed to continue urging their country to regulate GMOs in the face of pressure from abroad. Since products in food aid to Bolivia were found by FOBOMADE to contain GM ingredients, concern is even greater. The Association of Agroecology Producers of Bolivia urges that controls be placed on food and seeds imports from countries like Argentina, Canada and the U.S., and that strong sanctions be imposed on any corporation or organization that markets GM products in Bolivia.

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Foro Boliviano Sobre Medio Ambiente y Desarrollo (FOBOMADE) is an organization which brings together the Bolivian social and environmental movement, academic institutions, and individuals who work from their communities to promote the defense of the environment and natural resources.

Based on an article that originally appeared in The World As a Testing Ground: Risks of genetic engineering in agriculture, 2002, Hivos and Friends of the Earth International, <http://www.hivos.nl>.



Myth #5

GE Pollution in Mexico: Native Corn Contaminated

In September 2001, Mexico's Secretary for the Environment and Natural Resources confirmed reports that genetically engineered material had contaminated native corn varieties in Mexico. Out of 22 communities tested by government agencies in the state of Oaxaca, contamination of corn by transgenics was found in 15.¹ It is the first proven case of transgenic contamination affecting a crop at its center of origin—in the region where it evolved, where numerous landrace varieties and wild ancestors still exist.

Mexico placed a moratorium on the planting of genetically engineered corn in 1998 in an attempt to protect the grain's biodiversity base. The government did not, however, eliminate or regulate the import of U.S. corn to be used for human food or animal-feed corn. At least 25% of corn produced in the U.S. is transgenic.² Some of the imported U.S. corn may have been planted by Mexican farmers, who had no way of knowing that the corn they purchased might be genetically engineered. Olga Toro Maldonado, a Oaxacan farmer, commented: "We wanted to try out the seed. No one told us that we should not plant the corn."³

The original discovery of transgenic contamination in Oaxaca was made by a research team led by Ignacio Chapela, a microbial ecologist at the University of California, Berkeley. Chapela informed the Mexican authorities of his findings in early 2001 and the government set about its own studies.

The high rate of contamination (two out of every three communities tested in the government study) led Chapela to conclude that "this contamination may be much more extensive, and—what would be even worse—it may be affecting corn's wild relatives."⁴

No action by Mexican government

The Mexican government agencies responsible for overseeing agriculture, biodiversity, imports and the environment have yet to propose emergency measures to deal with the contamination. The Undersecretary for Agriculture, has described the transgenic contamination as "of low frequency"—even though in 13 of the 22 communities tested, 3–10% of the corn contained transgenic material, and in two other communities the percentage was even higher.⁵

Dozens of civil society groups have called for an immediate moratorium on corn imports from the U.S. until such a system of segregation can be established. Chapela calls "eliminating the source of contamination" the necessary first step in addressing the problem.⁶

A statement of demands signed by 30 Mexican NGOs in September 2001 outlines a plan for assessing the magnitude of the contamination,

determining its sources, informing farmers, establishing mechanisms of oversight and detection for imports, disposing of the corn that has already been contaminated and undertaking legal actions against the corporations responsible for the transgenic corn.⁷

Part of a strategy?

Groups like Greenpeace, the ETC Group (formerly RAFI) and Guerreros Verdes (Green Warriors) argue that support for agri-biotech companies is part of the Mexican government's broader objective of market integration into NAFTA, whereby small farmers in Mexico are being squeezed off the land and forced into underpaid industrial jobs in the cities.⁸ Along with imperiling biodiversity, the introduction of transgenic crops allows a handful of corporations to deepen their control of the seed supply and expand pesticide sales. Farmers who want to grow local varieties or who own only a few acres of land are unable to compete with larger farms that buy seeds and pesticides from the agri-biotech giants—especially now that the genetic material of the small farmers' local corn varieties cannot be protected from contamination by the agri-biotech companies' products.

Notes

- 1 "Transgenic corn found growing in Mexico," *Nature* 413 (September 27, 2001).
- 2 James Clive: "Global Status of Commercialized Transgenic Crops: 2000." International Service for the Acquisition of Agri-Biotech Applications (ISAAA) Briefs No. 21: Preview. ISAAA: Ithaca, NY.
- 3 "Maíz transgénico en Guanajuato y Puebla," *Tendencias*, October 2001.
- 4 "Irresponsable que la SEMARNAT minimice la contaminación transgénica de variedades criollas de maíz: Greenpeace," Greenpeace México, *Boletín* 175, September 20, 2001.
- 5 "Greenpeace tenía razón: hay maíz transgénico en Oaxaca," *Crónica*, September 20, 2001, page 30.
- 6 Op cit. "Irresponsable."
- 7 Open letter to CIBIOGEM (Interdepartmental Commission for Biosafety and Genetically Modified Organisms), September 24, 2001.
- 8 "Corn and NAFTA: An Unhappy Alliance," *Seedling*, June 2000, <http://www.grain.org/publications/jun002-en-p.htm>; "Campesinos demand end to GM imports," Associated Press, October 17, 2001; Open letter to President Fox, Guerreros Verdes, August 30, 2001; World Food Sovereignty Day seminar press release, October 16, 2001; "Continúa México comprando maíz transgénico de Estados Unidos, pese a tener almacenadas 630 mil toneladas de maíz mexicano," Greenpeace México, *Boletín* 183, October 15, 2001.



Rice and Biodiversity

Genetically Engineered Rice: For Whose Gain?

by MASIPAG, The Philippines

Much of the rice diversity, once endowed to farmer communities, has already been lost under the guise of feeding the world during the Green Revolution. Forty years later, the same strategy but under a different name, comes to wreak the same havoc.

A dark cloud of genetic uniformity is already gripping Asian fields today with production being confined to only a few varieties. This is a very dangerous situation for farmers and food security since it increases dependence on toxic chemicals and genetic engineering to help defend crops against inherent weaknesses of biological uniformity.

Diversity in the field is one of the factors to prevent mass infection and traditional rice varieties have an

advantage when planted since they are more adapted to local conditions. Although susceptible to pest attacks, the diverse nature distributes the damages incurred, thus the overall productivity is only slightly affected. There are cultural practices and indigenous knowledge systems being employed to cope with such attacks, which are equally if not more effective without destroying the farm ecology.

Excerpted from "GE Rice: For whose gain?" Masipag News & Views, June 2, 2000.

MASIPAG is a farmer-led, community-managed breeding and conservation program focusing on rice and vegetables throughout the Philippines. It started in 1986 and now involves 50 trial farms maintaining over 500 collections of traditional and improved traditional varieties. Some 534 farmer-bred lines and 75 selections of rice are currently being grown and further improved by well over 10,000 farmers throughout the Philippines.

Voices

Rice 'n Controversy

by Vasana Chinvarakorn, Thailand

What would jasmine rice taste like if it were genetically modified? A street protest against genetically modified rice highlights farmers' fears that there is an ominous threat to the world's most important staples.

Khemporn Songma looked ill-at-ease when asked what he thought about genetically modified rice. But as questions shifted to indigenous species, the 39-year-old Isan farmer suddenly perked up. With just a glimpse at various rice stalks and grains, Khemporn can spot the subtle differences between Khao Dok Mali (jasmine rice), Khao Phama, Khao Por Kaew, and Khao Nang Nual right away. All his life has been spent tending the crop—the first variety for the market, the rest for his family's own consumption.

Now the father of two is worried his days in the fields may be numbered. Last week, Khemporn traveled

almost a 100 kilometers to the town of Roi Et to join 500 other farmers engaged in a peaceful demonstration. The target? To thwart plans to genetically modify the age-old staple food—rice.

"I've heard those genetically modified organisms (GMO) crops have had their innards—what the scientists call 'genes'—tampered with," says Khemporn, his Isan dialect clearly tinged with anxiety. "I don't know how they're doing it technically. But I'm afraid the appearance of such a bizarre crop may end up wiping out many of our local plants."

Khemporn's concern is not totally groundless. Since Thailand embraced the Green Revolution in the 1960s, thousands of rice varieties have noticeably disappeared. Indeed, the actual number of rice varieties currently grown now hovers around a mere 15. And yet, farmers

from remote areas like Khemporn have until recently been mostly spared the swipe of modernization. Unlike those in the Central Plains, Thailand's rice belt, it took Isan villagers much longer to subscribe to the doctrine of intensive chemical use, farm machinery, and high-yielding varieties.

But the second "revolution," heralded by state-of-the-art genetic engineering, promises to deliver a far more universal impact to one and all, as it is directed right at the very fundamental of life—a crop's gene.

Moreover, rice, a staple for more than half of the world's population, has been designated the prime target on which to test the prowess of this high-flying scientific development.

Rising concerns

For social activist Daycha Siriphat, the future of Thailand's indigenous rice strains lies with small-scale farmers and not with the government.

In fact, the director of the Technology for Rural and Ecological Enrichment (Tree) argues that state-endorsed promotion of market-oriented monoculture contributes to a drastic decline in rice varieties. High-yielding varieties together with intensive use of chemicals and farm machinery have effectively turned farmers away from indigenous varieties.

"The state plays a crucial role in the decline of the local varieties," said Daycha.

"For instance, last month, a senior officer at the government-run Bank for Agriculture and Agricultural Cooperatives, urged farmers in the South not to grow indigenous rice. He argued these crops have low market demand.

"Ironically, a lot of farmers have gone bankrupt after they followed the government's advice to switch to high-yield varieties, which turned out to be susceptible to insects and diseases," Daycha noted.

Prayong Khomkaew, an officer at the Ministry of Agriculture, agrees with Daycha's assessment. He said



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the problems of insects and pests that plague farmers nowadays could be solved rather easily if they stop intensive monocropping. Unfortunately, in many instances, attempts by villagers to adopt more ecologically friendly forms of agriculture have been curbed by a governmental lack of understanding. Jorri Odoshao said Karen folks in Chiang Mai have been cultivating up to 60 different varieties for generations, thanks to the practice of rotational cropping—a traditional form of agriculture which allows the land to resume its fertility by nature's own course. Their counterparts in Phetchaburi, however, have been barred from continuing the method. Forced to toil on the same plot of land for many consecutive years, the Karens suffer from degradation of the soil's nutrient value.

"By the end of the fourth year, a large number of indigenous varieties had disappeared," noted Jorri. "What kind of development is this if it takes away biodiversity and disallows pride in traditional cultures?"

Vasana Chinvarakorn is a writer at the Bangkok Post.

BIOTHAI or Biodiversity Action Thailand is a coalition of NGOs, local community organizations, academics, and government officials who realize the importance of biodiversity and its close connections to the livelihood systems of local communities. BIOTHAI began its activities to provide information and raise the awareness of policy-makers and the public in Thai society in 1995.

<http://www.bangkokpost.net/issues/gmo/230900b.html>. Bangkok Post, September 23, 2000.