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The Blood of Agrarian Martyrs (detail), Diego Rivera, 1923-1927, Riveriana Chapel.

Who Should Tell Me What to Eat? The Case of Transgenic Maize

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One of the most controversial issues involved in trade and the environment is U.S. exports of transgenic maize to Mexico. Its impact, both the benefits and the risks to health, the environment, the economy and the culture, is under discussion. Despite at least four bills on bio-safety being before Congress, Mexico still does not have any legislation about

genetically modified organisms (GMOs). Regulation of transgenic foods is a very complex issue involving different bodies. Nationally, it is linked to environmental, agricultural, sanitation, health and security legislation, and internationally, to the World Trade Organization (WTO), the North American Free Trade Agreement (NAFTA) and the Protocol on Biosafety.

From the perspective of science, development and multinational corpo-

rations, linking conserving genetic diversity and traditional agriculture is seen as negative, pegged to underdevelopment and poverty. The idea that traditional varieties are a kind of raw material that can be freely used to create modern crops—in this case transgenic—is directly counterposed to the indigenous, peasant notion of demanding control over their own traditional varieties. This is the key to the conflict behind important indigenous movements in Mexico

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and the Andean region that defend a different vision about the use and value of genetic resources. The UNOSJO peasant union in Oaxaca's Northern Juárez mountains, among others, expressed their resounding rejection of local varieties of maize being contaminated by transgenic corn. On the request of these Mexican peasants, who want to continue to produce the same local varieties of maize that their ancestors selected and improved for 6,000 years, the Commission for Environmental Cooperation (CEC), a trilateral body that came out of the debate about the environment during the NAFTA negotiations, has decided to write a report about transgenic maize in order to discuss its effects and make recommendations to the three countries' governments.

Mexico is a mega-diverse country and the original home of maize and *teocinte*, maize's close wild relative; today between 50 and 60 native corn varieties are planted on a million small plots throughout Mexico for producers' consumption. This only satisfies half the 18-million-ton demand for corn, however; another quarter of the demand is met by maize produced for the market, and the last quarter by imports. The crops are cultivated in two ways: industrial cultivation that uses purchased seed, and subsistence cultivation, that stores, exchanges and selects local seed.

NAFTA'S IMPACT

As everyone knows, international trade in seeds is a multi-billion-dollar business: U.S.\$30 billion to be precise. The United States is the world's main producer and exporter. Ninety-four percent of its exports go to Latin America. Seventy-five percent of Mex-

ico's agricultural imports come from the United States, followed by Canada with around seven percent.

Since NAFTA came into effect, Mexico changed its import rules, establishing a transitory quota for corn imports from the United States and Canada. The initial 2.5 million-ton quota was slated to increase three percent a year over 15 years until 2009, when trade in corn would be completely free. However, in practice, Mexico never demanded that the quotas be respected, which means that they have been far surpassed: by 1996, 7 million tons of corn were being imported a year.

More corn has been imported than quotas dictated because, in the first place, the Mexican government wanted to liberalize its agricultural sector in order to be able to offer cheap foodstuffs to its urban population and satisfy the needs of the flour and cattle industries.¹ This Mexican government policy trend predates NAFTA. Since the late 1970s, administrations were trying to solve the food problem by putting a priority on quantity instead of quality, acquiring cheap foodstuffs, thus supporting the urban consumer instead of production in the countryside.² For this reason, it is important to point out

that from the standpoint of biological diversity, the greatest danger is not transgenic maize, but poverty, a hostile economic and political environment and emigration.³

Approximately one-third of the corn imported from the United States contains some kind of genetically modified organism, particularly Bt and others resistant to blight and pests. According to current U.S. federal regulations, transgenic crops receive the same treatment as traditional crops because they are not considered a risk, which is why they are not separated from traditional grains. Actually, having to identify the genetically modified organisms, separating and labeling them would be an important cost factor in producing corn, which is already subsidized 20 or 30 percent.

Because of Mexican liberalization, which was not a provision of NAFTA but which has increased since the inception of the agreement, the price of maize has dropped 48 percent. As a result, the country's productive structure has changed: forest areas have been cleared to plant more corn, and production and yields have dropped slightly, by 4.7 and 2 percent respectively.⁴ This has brought with it a still

CHANGES IN MEXICAN MAIZE (1990s)		
	1994 vs. 1990	2000 vs. 1994
Consumption	+17%	+8%
Production	+25%	-3%
Area under cultivation	+16%	-8%
Area harvested	+12%	-13%
Yield	+7%	+6%

Source: Secretaría de Agricultura, Ganadería y Recursos Pesqueros (Sagarpa).



"Stop transgenic imports!"

undetermined degree of genetic erosion and the loss of varieties. The real danger is that peasants may lose their traditional knowledge about cultivating the earth because of economic and labor pressures. Migration and farmers simultaneously doing both agricultural and other kinds of work have been going on for decades, undoubtedly favoring deforestation and the risk of the biological diversity loss.⁵

The entry of transgenic corn into Mexico was never authorized but neither was it expressly prohibited. Since 1998, however, the planting of genetically modified maize has been banned. However, in 2000, the Bt gene was discovered in 37 percent of the grain in corn silos in Oaxaca and Puebla. This means that it has spread spontaneously.

A very significant and surprising fact can be observed in Mexico: despite the plummeting price of maize and even though it is unprofitable because production costs are higher than its commercial value, subsistence production continues to advance.

To understand this behavior, inexplicable scientifically since it does not follow the laws of the market, we need the help of anthropologists and sociologists; it must be examined in terms of security, jobs for family members and the cultural issues linked to values, the sacred significance and indigenous preference for corn. In the absence of public subsidies, it is actually the peasants themselves, particularly the poorest ones, who are subsidizing their own production. This is a reflection of indigenous people's desire and choice to

produce maize solely to be able to consume it.

RISK MANAGEMENT: SCIENCE OR CULTURE

Environmentalists talk about serious contamination; the scientific community is divided; and industry and its defenders minimize the consequences. How can we define the risk? Optimizing it, finding a balance between risks and benefits? Applying informed consent, giving those involved the ability to decide whether they accept the risk or not, offering information and, above all, alternatives? Or using the precautionary principle, sustaining the need for caution? Whatever the scientific focus, the need to share negative impacts and distribute the benefits of new technology, as well as labeling the product to ensure a right to choose, seem to be the obvious answers.

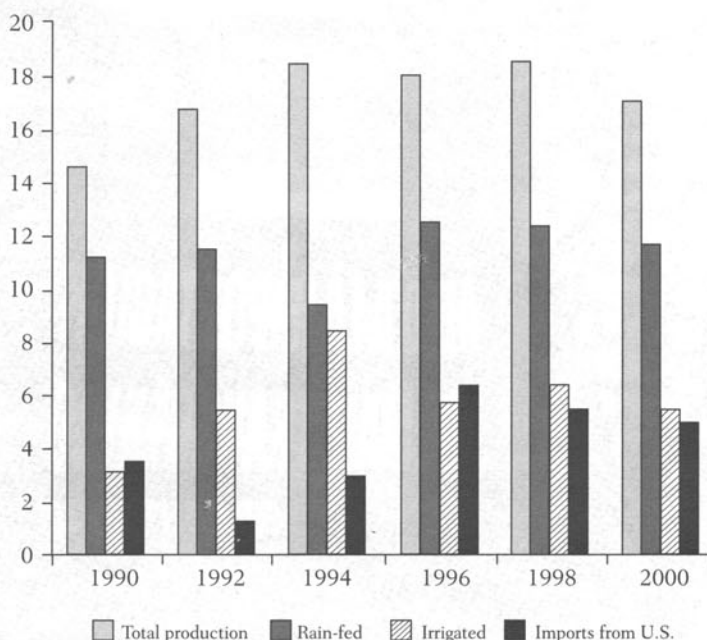
At the public presentation of the CEC's Joint Public Advisory Committee report on the biological, environmental, economic, social and cultural impact of transgenic maize production, we saw a real clash between two historic authorities: institutionalized science and peasant cultural resistance, two opposing worlds that apparently have incompatible values and objectives.⁶ Since not only uncertainty, but actual ignorance still dominates biotechnology, science has not been able to offer clear, understandable proof to peasants about the absence of health and environmental risks. While researchers have maintained that there is no scientifically based evidence to prove these kinds of risks, they have also had to recognize that neither can it be proved that they do not exist since there are no

studies in the context of the region's ecosystem and biodiversity. Much less are there studies that measure the long-term effects of transgenic maize. The effects on the health of animals were not even included in the presentation because there was no information about them or researchers capable of preparing a document on them.

Peasants have interpreted the sophisticated language used by scientists that avoided clear yes or no answers about the details of the controversial genetic flow from Bt genes to *teocinte* and native corn varieties as shameful hesitation by Western science, whose authority for supposedly speaking in the name of "Truth" has thus been brought into question. It has become clear that, based on existing data, the risks are unpredictable. However, the members of affected communities, basically indigenous communities, also made other queries questioning the authority of science. For example, who is paying for the studies being carried out today? The mistrust did not stop there. They also questioned the institutions of experts, like the CIBIOGEM consulting group and the government agencies that have never bothered to listen to peasants.

In fact, as peasant community representatives recognized, despite their speaking in two different languages (the language of science and that of practical experience), this was the first time they had sat down together to discuss the risks that genetically modified organisms imply in Mexico. Ironically, this happened precisely in a trilateral forum that came out of NAFTA. However, the fact of the matter was that the practically inviolable autonomy and public authority of science discussed face to face with peasants who, while ignorant of molecules and DNA sequences, were

GRAPH 1
MEXICAN MAIZE PRODUCTION AND IMPORTS FROM THE U.S. (1989-2000)
(MILLIONS OF METRIC TONS)



Source: FAO, SAGAR, Zahniser y Link 2002.

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culture and survival.

the possessors of ancient knowledge about their means of existence.

The really new thing about the report was that it took into account the social and cultural risks implied in the existence of genetically modified maize in Mexico, putting them on a par with the physical and economic risks. The quality and purity of foodstuffs is not only a health issue, but also involves culture and survival. In the last analysis, the cultural norms and rules about food somehow reflect the distribution of power in a society. Since in a rural society, eating is intimately linked to existential notions like fertility, health and illness, and therefore, birth and

death, when peasant communities do not know what food is made of, it causes cultural confusion and engenders myths with the power to alter people's most basic notions. Some women in the communities expressed their fear that cultivating transgenic corn could make them give birth to children with several heads or other genetic deformations.

The peasants have not only rejected genetically modified maize, but also suspect that it is a new tool for colonization by multinational companies, who are creating a modern weapon to threaten their existence. Peasants say that genetic manipulation goes against their only resource for survival that,

despite everything, has been able to maintain itself down through history: their maize. In the light of this perception, it is clear that the resistance against genetically modified maize, perceived as a killer, is enormously strong.

At the meeting, the manifest risk of peasants' losing their identity contrasted with the notion of risk used in economics consisting of a series of rather bureaucratic procedures for showing how harmless the food is. The notion of quality, like the flavor, color and texture of a tortilla, clashed with risk measured quantitatively and monetarily.

The main lesson we should learn from the CEC meeting is not what the exact gene is that is being crossed with maize in Oaxaca and to what degree, which was never even clarified anyway. The main lesson is a reflection about the capacity of governments to regulate agricultural production in a rational, legitimate way given the people's enormous distrust and anxiety. The lack of credibility and trust in private and public institutions, whether they be universities, research centers or government agencies, was clear. It was shown that the peasantry has not participated in decision making about maize in Mexico, the country with the world's most diverse germ plasm, characterized by the large number of small producers in its agricultural system, by a complex agrarian history and by marked social polarization in which small peasants, who make up two-thirds of the agricultural sector, produce half of all corn output.

THE RIGHT TO CHOOSE

The risks and benefits of biotechnology and specifically the problem of ge-

netically modified foodstuffs creates big divides in all societies and is also one of the most controversial trade issues between Europe and the United States. For European governments, the rejection of transgenic foods is a response to the genuine concerns of their populations, while for the United States, it is simply an unjustified trade barrier. In Mexico, in accordance with the new slogan, "Without corn, there is no country," it is a powerful cultural symbol and, for many, a real means of survival.

Some changes are beginning to come about in the United States and Canada, too. In both countries, consumer demand for labeling is on the rise. In the U.S., 11 states have already presented bills to label transgenic foods,⁷ and Canada has a voluntary labeling process. Without a doubt, food biotechnology offers many benefits. Apart from increasing production, if political conditions permit, it potentially has the capacity to generate economic benefits not only for producers, but also for consumers, and to create better quality foods.

Mexican peasant communities also have the right to choose. Some of them, in 10 states, have already stated their preference for continuing to cultivate maize free of genetically modified organisms and for creating an alternative seed market.⁸

The report of the CEC's Joint Public Advisory Committee, the body that represents society, after stating that the risks and benefits that today seem to favor corporations and damage producers and the environment should be shared, makes several recommendations: correct the current imbalance in the advisory group that is heavily weighted with academics, industrialists and NGOs to establish an egalitarian proportion between scientists and

indigenous; apply the precautionary principle in the three governments' policies and create spaces for public debate; establish a moratorium on Mexican imports of transgenic maize until the risks for human health, for the cultural integrity of Mexican peasants and in general for the environment are understood. We still do not know what the CEC's final report will say, much less how the governments will respond. ■■■

NOTES

¹ Scott Vaughan, "Valoración económica y temas relacionados con el comercio" (Washington, D.C.: Carnegie Endowment for International Peace, 2003).

² Kristen Appendini, Raúl García Barrios and Beatriz de la Tejada, "Seguridad alimentaria y 'calidad' de los alimentos: una estrategia campesina," *European Review of Latin American and Caribbean Studies* 75 (October 2003), pp. 65-83.

³ Stephan B. Brush and Michelle Chauvet, "Evaluación de los efectos sociales y culturales asociados en la producción del maíz transgénico," Chapter 6, *Informe de la CCA sobre el maíz transgénico*, 2004.

⁴ Frank Ackerman et al., "Free Trade, Corn and the Environment: Environmental Impacts of U.S.-Mexico Corn Trade Under NAFTA," (working paper no. 03-06, Tufts University, Medford, Mass., 2003).

⁵ See the positions in this discussion of Gareth Porter, "Agricultural Trade Liberalization and the Environment in North America: Analyzing the Production Effect," CEC document, 2002, and Alejandro Nadal, *Environment and Social Impacts of Liberalization on Corn Production in Mexico* (United Kingdom: WWF/International OXFAM, 2000).

⁶ The public meeting of the CEC's Joint Public Advisory Committee took place March 11, 2004 in Oaxaca, Mexico.

⁷ Thanks to big biotechnology industry interests, only one of these states, Maine, has passed the bill.

⁸ "Exigen productores declarar 10 estados zonas de reserva de maíces criollos," *La Jornada* (Mexico City), 25 April 2004, p. 14.