Seedling

Biodiversity, Rights and Livelihood

April 2004

GRAIN

Girona 25, pral., Barcelona E-08010, Spain.
Tel: +34 933 011 381
Fax: +34 933 011 627
Email: seedling@grain.org
Web: www.grain.org

GRAIN is an international non-profit organisation which promotes the sustainable management and use of agricultural biodiversity based on people's control over genetic resources and local knowledge. To find out more about GRAIN, visit our website at www.grain.org

Seedling

Seedling is GRAIN's quarterly magazine, published in January, April, July and October. It provides background articles, news, interviews and much more on the issues GRAIN is working on. *Seedling* is available free both in paper format and on GRAIN's *Seedling* website (www.grain.org/seedling). To receive *Seedling* in paper format or to inform us of a change of address, please contact GRAIN at the address or email above.

Seedling is published as a collective effort of GRAIN staff. Janet Bell is the editor. If you would like to contribute an article or other information to *Seedling*, please contact us. Outside contributions are attributed to their respective authors.

Printed on recycled paper
Deposito Legal No. B-25.166.92, Spain
ISSN: 1002-5154

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Front cover picture: © Paul Smith/Panos Pictures. Brazil: Members of the Movimento Sem Terra (MST), the movement for landless peasants, shout slogans during an assembly shortly before a land occupation of the Fazenda Santa Rita.

Back cover picture: © Heldur Netocny/Panos Pictures. Eritrea: A man fetches water for his potato and vegetable crops.

It's time for some straight talk on contamination and co-existence. The co-existence of genetically modified (GM) crops and non-GM crops is not possible and policy makers need to stop pretending that it is. Genetic contamination is an inevitable consequence of GM agriculture and a debliberate ploy by the industry to make the global acceptance of GM crops a *fait accompli.* Forget co-existence, we must say no to GM crops altogether.

Confronting Contamination

Five reasons to reject co-existence

GRAIN

People all over the world are looking to Europe, where the hard-fought moratorium on genetically modified organisms (GMOs) is about to be lifted and where the struggle is now on to determine what will take its place. Genetic contamination is at the centre of the debate and much is being said about thresholds, co-existence and preserving *"consumer choice".* But there's a lot that's not being said, particularly when it comes to how Europe's decisions will affect the rest of the world. The larger issues at stake are in danger of disappearing in the minutiae of official negotiations.

Genetic contamination should be seen for what it is: an inevitable consequence of genetically modified (GM) agriculture and the cornerstone of the biotech industry's efforts to make the global acceptance of GM crops a *fait accompli.* The biotech industry wants its opponents to believe that the only option left is to 'manage' the co-existence of GM and non-GM agriculture. They want us to abandon the fight to stop genetic engineering and to turn our efforts to salvaging remnants of non-GM agriculture, in much the same way that they've tried to co-opt the struggle for biodiversity into a non-threatening campaign to protect global 'hot spots'. But such co-existence will inevitably lead to a two-stream system of global food and agriculture – a GM free niche market for the very rich and a GM polluted supply for the rest of us – with the same small number of corporations controlling both streams, from seed to supermarket.

Here are five reasons why the issue of contamination must lead to a complete rejection of GMOs:

1 The only way to prevent contamination is not to grow GMOs

Agriculture does not take place in a laboratory. Pollen travels. Seeds travel. Food travels. And they do not travel in nice, neat predictable ways.

Insects can transport pollen over kilometres.[1] So can the wind.[2] The ability of seeds to stay in the soil for years before germinating can make things even more complicated.[3] And there is no way to guarantee against human error and activity, whether it be scientists mistakenly sending GM seeds around the world to unsuspecting colleagues (like the University of California at Davis), people smuggling seeds across borders (in Paraguay and Brazil), farmers sowing the grains of GM food aid (Mexico and Romania), or biotech companies violating biosafety regulations (US).[4] This is only logical: food and agriculture have always been about exchange, experimentation and trade, and this is no different in the current context of globalisation.

Nobody is denying this basic fact in the European debate around co-existence. Study after study demonstrates the impossibility of practicing GM-free agriculture next to GM agriculture. This is why the co-existence negotiations are actually about thresholds (what are *"acceptable"* levels of contamination) and liability (who is responsible for the inevitable contaminations that will occur).[5]

Of course, the most practical and cost-effective way to prevent GMO contamination is not to grow GM crops at all. Given that the arguments for growing GM crops are pretty weak from a farmer perspective and weaker still from a consumer perspective, there's really no good justification for all the added effort and cost that it takes to bring GMOs into the agricultural system.

2 Damage control measures obstruct normal agricultural practices

The proposed European plans for co-existence make it clear that separating GM and GM-free agriculture requires massive regulatory intervention. Crops have to be segregated by distance and barriers, seeds have to be certified at low levels (0.1%-0.3%), funds need to be established to compensate non-GM farmers for contamination, post-harvest handling systems need to be developed, and so on.[6]

The end result is far more control over farmers. They will be forced to conform to *"co-existence"* practices that have little to do with good farming. There will be more bureaucracy, paperwork, and pressure for certification and far less flexibility in deciding what to grow, when and how to grow it, and how to sell the harvest. Seed saving and exchanges, if they are not prohibited, will be much more complicated. The future of non-GM agriculture will be a tightly regulated system governed by onerous contracts that will leave farmers more vulnerable to the power of agribusiness. Moreover, for those countries without the resources for such regulatory intervention, there simply won't be a future for GM-free agriculture once GMOs are allowed in.

3 Contamination increases corporate control

It's no big secret that the GM industry's interest lies in pushing GM crops as quickly and as widely as possible across the globe. Industry has raced to get its GM crops into the fields before biosafety regulations and public opposition set in. But it would be wrong to assume that the GM industry does not want regulation of its products.

Big business likes regulations. It wants regulations that enable it to control the market, while not preventing it from selling its products. Industry's lax attitude to the 'black market' for GM crops, such as that for Bt cotton in India or Roundup Ready soybeans in Romania, is just a temporary phenomenon.[7] It likes this initial contamination because it puts authorities in an awkward position, and puts pressure on them to approve the crops. In the face of widespread smuggling of Roundup Ready soybeans from Argentina to Paraguay, the Paraguayan Minister of Agriculture and Livestock said he was inclined to free-up transgenic production because he was *"convinced that there is no alternative under the current circumstances."*[8] But once they attain this initial objective, the big companies quickly move in to squash the 'black market' and take control. This is what is happening in Argentina and Brazil (see box).

The division between the biotech seed industry and downstream agribusiness is another temporary phenomenon. Alliances and mergers between the two industries will take off if and when the European and Japanese moratoriums on GM imports come to an end, giving rise to tightly controlled *"identity preservation"* systems, where farmers grow particular varieties under contract to corporations dictating what inputs they must use. These identity preservation systems, whether for non-GM or *"value-added"* GM crops, will be based on certified seed. Meaning, in order to *"guarantee"* the identity of their crops, farmers will have to grow their crops from seeds purchased from the company, leaving no room for seed saving or exchange. Farmers growing farm-saved seed will have to sell their crops outside of the non-GM stream, unless they can find informal local markets.

All of this is going to elevate the seed industry to a much more powerful position in the agribusiness chain, making seed companies, including organic seed companies, take-over and merger targets for

[1] J Sweet (2003), "Pollen dispersal and cross pollination" in Birte Boelt (ed.), *Proceedings of the 1st European Conference on the Co-existence of GM Crops with Conventional and Organic Crops (GMCC-03): GM Crops and Co-existence*, Danish Institute of Agricultural Sciences, Research Centre Flakkebjerg.

[2] Y Brunet *et al* (2003), "Evidence for long-range transport of viable maize pollen", in Birte Boelt (2003), *ibid.*

[3] R Van Acker *et al* (2003), "GM/non-GM wheat co-existence in Canada: Roundup Ready® wheat as a case study" in Birte Boelt (ed.), *ibid.*

[4] "Tomato Seed from Seed Bank Found to be Genetically Modified (2003)," *UC Davis News & Information*, December 18; Indigenous and farming communities in Oaxaca, Puebla, Chihuahua, Veracruz *et al* (2003), "Contamination by GM Maize in Mexico Much Worse than Feared," Mexico City, Mexico, October 9: www.etcgroup.org/article.asp?newsid=407; Iza Kruszewska (2003), *Romania: The Dumping Ground for Genetically Engineered Crops: A Threat to Romania's Agriculture, Biodiversity and EU Accession*, Asociatia Bioterra, ANPED, Friends of the Earth Europe, Ecosens; Philip Brasher (2003), "U.S. team to monitor biotech field trials," *Des Moines Register*, Oct 18:

[5] Birte Boelt (2003), *op cit.*

[6] Birte Boelt (2003), *op cit.*

[7] Iza Kruszewska (2003), *op cit.*

[8] Inter Press Service (2003), "Legalization of GM crops appears imminent", Nov 10.

bigger companies in the food and feed industry.[9] In the end, a small set of corporations or corporate alliances will emerge with complete control over the agriculture and food system, controlling both the GM stream, whether it be bulk commodities like Roundup Ready soy or *"value-added"* GM crops, and the non-GM stream, turning it into an expensive niche market for the rich, much like organic agriculture has become. Just look at Romania, where the only certified non-GM seed available is seed imported by Pioneer Hi-Bred from the US.[10]

4 Contamination is aggression against the cultures that created agriculture

Most discussions of contamination focus on the *"thresholds"* of GM that consumers and industry will accept in non-GM products. But for many people, any GM contamination is an attack on their most sacred, fundamental beliefs. The most glaring example of this is the recent contamination of maize in Mexico.

For the indigenous peoples of Mexico and Guatemala, maize is the basis of life. In the Popol Vuh (creation story of the Maya), maize was the only material into which the gods were able to incorporate the breath of life and the gods used it to make the flesh of the first four people on Earth.[11] For other peoples of Mexico, maize is the food of the gods and different gods are responsible for caring for maize at particular stages of its development. For others, maize itself is a goddess.[12] Maize has also been the fundamental food of Mexicans for centuries and thousands of varieties provide an amazing range of flavours, consistencies, recipes, nutrients and medicinal uses. It has kept indigenous peoples alive in the face of discrimination, poverty and plundering. It has become equally key and often equally sacred for peasant communities in Mexico and in many other parts of the world. The vast majority of Mexicans will not hesitate to tell you "*we are the children of maize*". So when the people of Mexico discovered that their maize was contaminated by GMOs, they saw it as a violation of what is most sacred to them. Alvaro Salgado of the National Center to Support Indigenous Missions (CENAMI) expressed the popular sentiment: *"Contamination isn't just one more problem. It's an aggression against Mexico's identity and its original inhabitants."* [13]

There is no easy way to clean up this contamination while protecting the sacred biodiversity of the people. It is simply a tragedy, which the biotech industry has no interest in accounting for. Contamination, as this case so clearly demonstrates,

Contamination in Argentina and Brazil pays off for Monsanto

Monsanto introduced its GM soybeans into South America through Argentina, where farmers regularly save and exchange seeds. There are no laws that prevent farmers from saving seed and, while there are legal provisions that restrict farmers from exchanging saved seed of certain varieties, it remains a common practice, especially with the recent currency crisis. The US government estimates that 80% of the crop is grown from farm saved seed. In this context, GM soybeans have spread rapidly, accounting for as much as 99% of the present soy crop.[14] The GM soy has also spread to neighbouring countries, where the GM crop was illegal.

Monsanto used the smuggling of GM soybeans to its advantage, working with the illegal GM soy producers to pressure governments to legalise the crop. But now that the GM soy is legal in Paraguay and Brazil, Monsanto wants to put an end to the 'black market'. In Brazil, where the government has offered an amnesty to farmers who register their crops as GM soy, Monsanto worked out an agreement with certain producer organisations and soybean crushers, cooperatives and exporters to force farmers to pay royalties.

Under the agreement, farmers pay a fee of between US$3.45 and US$6.90 a tonne when they drop their harvests off at the elevators. The elevators are responsible for collecting the fees and, in exchange, they keep a percentage. If farmers don't declare their soybeans as GM they'll have their soy crops tested, leaving them liable to thousands of dollars in fines and penalties if the tests prove positive, even if they unknowingly planted GM soybeans.[15]

Monsanto plans to extend the same system to Argentina. But first it is working with other seed industry players to crack down on seed saving. In October 2003, Monsanto announced it was withdrawing its GM soybeans and holding off on a $40 million investment in the country due to a *"lack of adequate intellectual property protection policy."*[16]

This was a cleverly timed contribution to a long-running seed industry push for *"extended royalties"* and it paid off. In early 2004, the government reconstituted its seed police and announced a proposed global royalty fund that forces farmers who can't prove that they grew their crops with purchased certified seeds to pay a tax on their wheat and soybean sales. The government will administer the tax and the seed industry will pocket it.[17]

[9] Richard Lewontin (2000), "The Maturing of Capitalist Agriculture: Farmer as proletarian" in Fred Magdoff *et al* (eds.) *Hungry for Profit: The agribusiness threat to farmers, food, and the environment*, Monthly Review Press: New York.

[10] Presentation by Avram Fitiu of the National Federation of Ecological Agriculture at the workshop *Reconquérir la Biodiversité dans les Fermes* at the European Social Forum, Paris, France, 13 November 2003.

[11] Popol Vuh, Part I of Book III and Part II of Book I.

[12] Alfredo López-Austin (2000), *Tamoanchan y Tlalocan.* Fondo de Cultura Económica, México.

[13] Indigenous and farming communities in Oaxaca, Puebla, Chihuahua, Veracruz *et al*, (2003), *Contamination by GM Maize in Mexico Much Worse than Feared*, Mexico City, Mexico, October 9. See also ETC Group, "Maize Rage in Mexico: GM maize contamination in Mexico - 2 years later," *Genotypes*, 10 October 2003: www.etcgroup.org

[14] USDA Foreign Agricultural Service (2003), "Argentina Planting Seeds Annual 2003" *GAIN Report*, April 29.

[15] Rachel Melcer (2004), "Monsanto sees sales rise 22%; posts loss of $97 million," *St. Louis Post-Dispatch*, USA, Jan 7; Reese Ewing, "Brazil soy trade to pay Monsanto royalties," *Reuters*, January 28; Reese Ewing (2004), "Growers register 12 pct of Brazil soy crop as GMO," *Reuters*, January 15.

[16] Elizabeth Johnson (2003), "Monsanto puts $40m Argentine investment on hold" *CropChoice News*, October 29.

[17] ETC Group (2004), "Argentina Announces Corporate Welfare for Monsanto", *Genotype*, 26 February: www.etcgroup.org; David Dechant (2003), "Monsanto wants extended seed royalties", *CropChoice News*, 22 May: www.cropchoice.com; "Argentina to create royalties fund for soy, wheat" *Reuters*, 20 February 2004; "Monsanto and farmers battle over GM seeds," *Inter Press Service*, 10 February 2004.

is inseparable from real world power relations, where the people closest to biodiversity, the world's indigenous peoples and peasants, are the most affected. GMOs are profoundly disrespectful of these peoples. Unfortunately this is rarely, if ever, considered by those who develop, authorise and produce GM crops.

5 The poor will suffer the most

There is simply no way that poor countries of the South will be able to implement the kind of co-existence measures being put forward in Europe. You only have to look at the situation with pesticides to understand the disparity in regulations and implementation between the North and the South. Whenever GMOs are introduced into Southern countries, contamination is inevitable, even if the GMOs come in as grain for food aid. But it's not just the ease with which contamination can occur that is so problematic for the South; it's also the implications.

The stakes are much higher in the South, since the poor are highly vulnerable to any disruptions in local agriculture, local food supplies, and local customs. Southern countries are also in a weak position vis-à-vis their exports. While they rely on agricultural exports for much of their foreign exchange, the export markets are controlled by Northern companies, who are free to block exports from Southern countries if they fail to meet the thresholds for contamination set by importing countries or even the companies themselves. The push for GM comes from the North, but it is the North that will end up dominating the non-GM market, if GMOs make their way into the South.

The only practical option for Southern countries is to close their borders to all imports of GMOs. But doing this takes a level of political courage that is unfortunately absent from many governments in the South. The unrelenting pressure from the biotech industry, the US government and their allies is often too much. In this context, support for *"co-existence"* in the North is an attack on solidarity with the people of the South. It will only encourage the spread and domination of GMOs over the South's agriculture.

Getting back to basics

There is no acceptable justification for GMOs. There is already more than enough knowledge and technology for farmers to practice agriculture in ways that will feed the world's population, look after the planet, and support the well being of rural communities. Who cares if these practices aren't profitable for big agribusiness? GMOs are obstacles that prevent us from moving in the right direction and we need to treat them as such. For GRAIN, the only possible position in support of pro-farmer ecological agriculture and in solidarity with the world's peoples, is a complete rejection of GMOs.

Between 2001 and 2003, GRAIN commissioned a series of reports from various countries in Latin America to examine the takeover of food and farming by transnational corporations. This is the summary report from the project. What emerges is a picture of lost opportunity – a continent well endowed to be self-sufficient in food that is systematically giving up its food sovereignty to foreign corporate interests. In doing so, it is undermining food security across the continent.

A short history of farming in Latin America

WALTER PENGUE

All human groups modify their environment in order to meet their needs. Of all human activities, farming presents the greatest conflict between satisfying our basic needs and maintaining the sustainability of the natural environment. Some types of farming impact the environment more than others. For several thousands of years in Latin America, highly diversified ecological farming systems evolved that fostered the sustainable use of resources. Different cultural groups developed various complementary cropping methods: maize, beans and squash in Central America; tubers, roots and maize in the Andes; and camote and yucca in the Caribbean. These practices have been progressively undermined by the influence of colonisation, modernisation and globalisation, which have replaced them with systems that encourage extractive processes and the mining of resources.

Latin America's natural and human resources could sustain its own long-term development. Some 23% of its land is suitable for farming and another 23% is tropical rainforest (almost half the world's tropical rainforests are found in Latin America). Some 13% of the surface area is grassland and the region holds 31% of the planet's available fresh water. Furthermore, it is home to rich reserves of renewable and non-renewable energy, and the wealthiest biodiversity on the planet. Of the twelve so-called 'mega-diversity' countries, five are in Central and South America: Mexico, Colombia, Ecuador, Peru and Brazil. Nevertheless, that wealth has not created the quality of life or environment for Latin America's peoples that it should. This is because governments have focused on a defective development model that has excluded the majority of people, especially over the last thirty years.

The origins of poverty in Latin America are complex, but its more recent roots lie in a long history of authoritarian governments insensitive to the need for social change; economic policy decisions based on the need for constant growth; the transfer of capital, human and natural resources from South to North; the exploitation of South America by the rich economies and a growing foreign debt imposed by the super-developed countries and their multilateral financial institutions in the 1970s. The arrival of democratic governments in the 1980s fostered a new debate at the formal level, but the inequities continued to grow. These inequities have been exacerbated by the neo-liberal policies implemented in almost all Latin American countries during the 1990s, and which have opened a much broader road for the export of plundered natural resources that pay for the growing demands of the foreign debt.

Money becomes the logic of farming

During this period, the agricultural sector – one of the most promising productive sectors of the region – changed dramatically. Large-scale, export-oriented production requiring the intensive use of chemical inputs started to dominate the agricultural landscape. This Green Revolution-style approach to farming started to suffocate the diversified local and self-sufficient farming practices of small and medium-sized farmers. Traditional *campesino* culture had demonstrated a high degree of sustainability within its own historical and ecological contexts, and fulfilled the vital needs of the population even under adverse environmental conditions. Farming practices were built on sophisticated social, geographical and cultural frameworks, appropriate processing technologies, and a precise knowledge of resources, consumption and labour habits, all adjusted to the conditions of each locale.

"*Campesinos* comprise up to 80% of the rural producers, and they supply 51% of the most important grain harvested in the region: corn"

These diverse farming systems fed millions of Americans five hundred years ago. Today they are largely relegated to the poorest 10% of agricultural land, yet they still generate 40% of the region's livestock and agricultural produce. In Central and South America, *campesinos* comprise up to 80% of the rural producers, and they supply 51% of the most important grain harvested in the region: maize. In at least seven countries (Brazil, Chile, Colombia, El Salvador, Guatemala, Mexico and Paraguay), *campesinos* are primarily responsible for their own food security. Nevertheless, their farming methods – so successful from a social and environmental point of view – have not received the support or the official backing of the governments.

Green Revolution agriculture has taken humankind's conflict with Nature to unprecedented levels. It promotes a farming model based exclusively on economic logic – maximising profits, increasing yields, and homogenising and concentrating production in ever fewer crops and varieties. The model is highly inefficient in ecological and social terms, and is only productive within an economic framework imposed by global capitalism that forces large areas of the world to transform great tracts of land for the non-diversified production of crops to feed livestock in the most developed countries. The Green Revolution, which has gripped most of the Latin American continent for thirty years, has certainly left its mark. Most of the important impacts have been negative, affecting habitats, landscape and biodiversity, food sovereignty and food security, and the lives of millions of people.

In the 1990s, the continent was confronted with a new twist to the Green Revolution model, with the introduction of genetically modified (GM) crops. The GM Revolution extends the logic of the Green Revolution from controlling the inputs (seeds and chemicals) to controlling the whole chain of agroindustrial activities from seed to supermarket packaging. Not only are farmers and *campesinos* everywhere affected by this ever more dominant force, but so are the consuming public, which is rapidly losing its freedom to choose what it eats. New technology, regulatory measures, patents and commercial agreements were the keys to introducing GM products in Latin America, and success has been varied.

GMOs sneak ahead of regulation

Argentina has allowed the most extensive introduction of transgenic crops and has rushed through oversight mechanisms for genetically modified organisms (GMOs), via its National Advisory Commission for Agricultural Biotechnology (CONABIA). CONABIA's explicit objectives in relation to GMOs include the *"minimisation"* of potential risks to human health, the natural environment and agricultural productivity; *"favouring"* technological development; assessing the safety and quality of the new products; informing public opinion; and following the international markets. Similar agencies have been set up in Ecuador, Mexico, Brazil, Uruguay, Chile, Bolivia and Colombia. Most of them have been more involved in matters regarding the promotion of the new technologies than with their regulation, largely ignoring integrated social-environmental impact studies (see Table 1). There have been no instances of broad-based public participation, nor are the decisions of the agencies submitted to review by independent researchers.

Table 1: The rules of the GMO game in Latin America - and who's playing

Country	Regulatory Body	Seed Industry Representatives	Agricultural Research Institutes	State of Legislation Governing GMOs	Dominant Companies
Argentina	National Advisory Commission for Agricultural Biotechnology (CONABIA)	Argentine Seed Producers' Association	National Institute for Agricultural Technologies (CONICET): www.inta.gov.ar	Decrees emanating from sub-ministerial level. No specific legislation	Monsanto Dekalb Cargill Nidera Don Mario
Bolivia	Biosafety Commission and National Seeds Committee	National Association of Oil Seed Producers and Wheat Growers (ANAPO)	Bolivian Institute of Agricultural Technology (IBTA)	National Biosafety Law with implementation problems	SEMEXA Aventis
Brazil	National Technical Biosafety Commission (CTNBio)	Brazilian Association of Seed Producers	Brazilian Enterprise for Agricultural Research (EMBRAPA) www.embrapa.br	Biosafety Law. Includes a section on environmental impacts	Monsanto Agroceres Cargill Braskalb Novartis Pioneer
Colombia	National Technical Council for Biosafety (CTN)	Colombian Association of Seed Producers	Colombian Corporation of Agricultural Research (CORPOICA) www.corpoica.org.co		
Chile	Advisory Committee for the Release of Transgenic Organisms (CALT)	National Association of Seed Producers	Agricultural Research Institute (INIA) www.inia.cl	Decree	Pioneer Cargill Agrotuniche Novartis ANASAC
Ecuador	National Biosafety Commission	Ecuadorian Association of Seeds (ECUASEM)	Autonomous National Institute of Agricultural Research (INIAP) www.ecuanex.net.ec/iniap/	The highest level: National Constitution, Art. 89, In. 3, regulates according to the precautionary principle	SENACA AGRIPAC and others
Mexico	La Comisión Intersecretarial de Bioseguridad y Organismos Genéticamente Modificados (CIBIOGEM)	Mexican Association of Seed Producers (AMSAC)	National Institute for Forestry, Agricultural and Livestock Research (INIFAP): www.inifap.conacyt.mx/ International Maize and Wheat Improvement Centre (CIMMYT): www.cimmyt.org	None. Only a general law on seeds	Monsanto SVS Mexicana Pioneer Aventis Calgene CIICA
Uruguay	CERV Commission RVGM	National Association of Seed Producers (ANAPROSE)	National Institute for Agricultural Research (INIA)	Decree	Pioneer Monsanto Novartis Nidera Syngenta Don Mario

These agencies' personnel and consulting structures include researchers from biotechnology research centres, industry representatives and other actors from the public sector and the trade associations, but there is very scarce representation and very little real participation by representatives from NGOs or government agencies charged with protecting the natural environment or the consumer. The existence of these risk evaluation committees is largely symbolic, and they tend to focus on establishing legal formalities and acting as guarantors against possible legal actions from the public. These agencies also now usually have a public relations section whose mission is to explain *"the scientific basis for these processes"* (presuming that only the science is in question), but without opening a forum for public participation.

On the other hand, the Ministries of Agriculture in each of these countries are very actively involved with the bodies that certify and promote seeds. These entities were set up to adapt and implement the International Union for the Protection of New Varieties of Plants (UPOV) in order to expand the commercial seed industry and oversee the payments of patents and royalties. These bodies

and mechanisms are well established in Argentina and Brazil, and there is rapid development elsewhere. The strongest proponents of promoting and spreading the new transgenic seeds are the trade associations which defend and represent the interests of the seed sector in each of our nations. These organisations have the resources to carry out constant lobbying and operate with the support of huge transnational corporations, and heavily influence the decisions of the government agencies in charge of overseeing and certifying commercial seed.

Legal frameworks that are strong enough for the effective regulation of GM technologies and the powerful corporations behind them are sorely lacking. Just one nation, Ecuador, has included strict biosafety norms based on the precautionary principle for handling GMOs in the national constitution. Brazil also has specific legislation on biosafety that regulates the use of GMOs, but the other countries only have decrees and norms promulgated by their Ministries of Agriculture, Environment and others.

"Despite the amount of land grown to GM crops in Argentina, the country has no regulatory standards, nor has there been an open debate in Congress about legislation to oversee their introduction"

The case of Argentina is especially noteworthy because despite the amount of land already planted to GM crops, the country has no regulatory standards, nor has there been an open debate in Congress regarding legislation that would contain and oversee the introduction of GM crops. Similarly, few countries have taken concrete steps on consumers' rights. Ecuador has passed a Consumer Protection Law which states the obligation to inform the public of GM ingredients in food products. The Mexican Penal Code recommends (but does not require) the labelling of food products, and Brazil's Consumer Protection Law recommends the labelling of GM products.

Consolidation gathers steam

The transnational agro-industrial corporations have created large conglomerates through buying out or negotiating collaboration agreements with companies in the agricultural and chemical sectors. In addition to buying up national companies, the transnationals are purchasing outright or partially investing in state-owned enterprises, often disguising the presence of the corporations in both areas. This is how the major economic groups in the seed and chemical sectors arrived in the region several decades ago, and have now expanded throughout Latin America.

Monsanto now holds a strong position in Argentina, Brazil and Mexico, and is experiencing dramatic growth elsewhere. The circle is closed with the involvement of the world's major grain traders such as Cargill, Archer Daniels Midland, Bunge, Toepfer and Dreyfus, which operate and are expanding rapidly in the north as well as the south of the region. In Argentina, these five companies export 78% of the wheat, 79% of the maize, 71% of the soy flour, 95% of the soybean oil and 99% of the sunflower seed oil. The same is true all over the continent, showing how thick a slice of the world's exportable foodstuffs are in the hands of these companies, which have tremendous negotiating power.

To deal with public dissent over GMOs, the interested sectors have created their own media to promote the technology. The seed trade associations have established a variety of means for promoting the new techniques or have formed institutes to do so, such as the Argentine Biotechnology Forum and its counterparts in Mexico, Brazil and other countries.[1] Their arguments in favour of GM crops focus on increasing food production *"sustainably"*, ignoring social, economic and other environmental perspectives. Pseudo-scientific principles such as *"substantial equivalency"* are thrown into the pot, with the idea of treating GM production as no different from conventional production.

The international contribution to the debate is growing, with important financial support from UN agencies present in all South American countries through the World Bank's Global Environmental Fund. Nevertheless, illuminated by public debate and the increased activity of social movements, the importance of applying the precautionary principle is becoming clear in each country as we confront the unrestrained incursion of GM products.

In most countries, formal agricultural research has historically been linked with a process of technological modernisation that only benefited large-scale farmers. The research agenda of national agricultural research institutes – many of which have now been privatised – focuses largely on extensive cropping for export markets. Many of these institutes receive the direct benefit of a small percentage of the resulting export sales, which further skews their research priorities. In these agencies, as in the universities and public-private joint ventures, research is done on demand, which is dangerous territory for determining research and development policy. It is a flagrant risk, bordering on irresponsibility, that the scientific agenda of our research institutes be defined by one sector to the exclusion of others, and that debate and public participation are not permitted to influence the policies of our respective countries.

[1] www.porquebiotecnologia.com.ar/

The many ways in which GMOs have made their way into Latin America

Mexico: Cotton and soybeans are being handled at a *"pre-commercial"* level, but about 300,000 hectares have already been planted. Planting GM maize is prohibited because Mexico is the centre of origin of the crop, but trade agreements with the US (particularly the North American Free Trade Agreement) have put the country at serious risk by setting high import quotas for US maize. This imported GM maize is meant for consumption only, but farmers all over the country have planted it.

Colombia: A net importer of (GM) maize and soybeans from Argentina and the US. GM crops being pushed for commercialisation are coffee, sugarcane, yucca, maize and cotton. Large areas of land are treated with glyphosate herbicide. There are nearly three millon refugees from the war, mostly *campesinos* who have lost their land.

Brazil: GM crops were initally prohibited because of inadequate environmental impact assessments. But orporations created a black market for illegal GM soybeans from Argentina (*"Maradona"* variety) to inundate the Brazilian market. They were so successful in flooding the market that 'approving' the release of the soybeans for became a non-issue and the government agreed to allow the sale of the illegally grown Roundup Ready soybeans. GM soy may be used in the Zero Hunger Campaign.

Ecuador: No commercialisation or field trials of GMOs. One means of entry of GM maize and soybeans are imports from the US and Argentina, others are food aid programmes promoted by the US (USAID) and the World Food Programme. The *Mi Papilla* and *Mi Colada* products for children distributed through these programmes have been found to contain GM soybeans.

Bolivia: The commercial introduction of GMOs has not been authorised. But glyphosate-resistant soybean products enter the country from Argentina, particulary via Santa Cruz de la Sierra in eastern Bolivia. Another means of entry is via international food aid programs like the World Food Programme.

Uruguay: The major seed corporations are operating as in most of the other countries of the region. Commercial release of Roundup Ready soybeans has been authorised and there is a debate about the introduction of Bt maize. Uruguay maintains a strategic policy that favours the release and sale of GMOs throughout the region.

Chile: 99% of the GM crops are grown without a biosafety quarantine (maize, soybeans, tomatoes, etc.) GM soybean and maize products are also being imported from Argentina and the US. There is talk of Chile becoming a production centre for GM seed for planting in the Northern hemisphere.

Argentina: This country has gone the farthest in embracing transgenic crops (soybeans, maize and cotton). There is a strong alliance between private institutions and government agencies to facilitate the spread of GMOs. New trade associations (like AAPRESID) are firmly integrated into the intensive production model. Another way of making inroads has been the promotion of national food aid programs, like *Soja Solidaria*, involving the free distribution of GM soy products among the poorest sectors of the population. Pro-GM trade associations promote the programs, together with other institutions such as CARITAS.

Many entry points for GMOs

The existence of loose and short-sighted regulatory frameworks and the establishment of bodies supposedly charged with the institutional oversight of GMOs has made easy passage for transnational corporations to introduce several transgenic crops to Latin America, both commercially as well as in field trials. More have arrived as imported foodstuff for public consumption or as food aid. More than thirteen million hectares of transgenic crops have been planted in Argentina alone (Round Up Ready soybeans[2], Bt maize and Bt cotton in particular), while in other countries there is an on-going process of analysis, field trials or greenhouse production, like the blue carnation which is sold in Ecuador or Colombia, and tomatoes in Mexico. Andean countries are experiencing an intense push to spread cotton and maize. Transgenic soybeans have been available for several years in Uruguay, and Bt maize has also been approved, albeit in the face of increasing public resistance.

"Policy makers must remember that it is the large, rural *campesino* population that is the real source of the food consumed in the region"

The widespread genetic contamination of America's most important food crop – maize – occurred in its centre of origin, Mexico, even in the face of a ban on planting GM seeds. Bolivia could soon suffer a similar fate with respect to potatoes, since one of the institutions involved in promoting the introduction of GM potatoes is also the custodian of potato germplasm. Bolivia, together with Peru, is the centre of origin (original source) of the potato, and its most important centre of diversity.

Food aid has been instrumental in undermining food sovereignty in the region and spreading the GM cancer. The World Food Program has widely distributed GM food in Ecuador without public knowledge or consent. GMOs, especially glyphosate-resistant soybeans, were found in children's food (*"Mi Papilla"* and *"Mi Colada"*). In Argentina, a national programme was initiated to promote the consumption of GM soybeans among the poor, especially children, known as *"Soja Solidaria"* (Solidarity Soybeans). Argentina has historically produced an abundance of food, and the need for a programme of this kind was a direct result of the country's devastating economic crisis, which in turn was generated by strict observance of the neoliberal economic model during the 1990s. The food aid programme was the work of groups committed to the widespread introduction of GM crops in the country, such as the Argentine Association of Farmers for Direct Planting. In response to strong public protest, the government has since reduced its support for these programmes.

[2] Soybean plants that have been engineered to resist the herbicide glyphosate.

Time for some sober reflection

Hard as it is to believe, most countries in the region are worse off in terms of food security than they were 40 years ago. Some that were previously self-sufficient in basic foodstuffs have become net importers of food, including maize – our basic food! In Colombia, Mexico, Uruguay and Bolivia, the rich variety of the foods produced for local consumption has been greatly reduced. In Argentina and Brazil, the focus is on export markets to the detriment of local sustainability. It is disappointing to note how all of Latin America, in accordance with the political decisions taken by the respective national governments, has moved farther and farther from a position of security regarding the management of its food to become dependent exclusively on the commercial decisions of the transnational corporations that dominate agriculture. Now the food sovereignty of the whole region is at risk.

The examples of Argentina and Mexico should prompt us to review the means of evaluating the real impacts of a tremendously powerful technology that influences the natural environment as well as the societies where it is introduced. Argentina permitted the expansion of the GM crops throughout its own territory, while Mexico allowed the full-scale importation of food from the US. Both strategies have resulted in the systematic elimination of jobs for small and medium-sized farmers. The process of introducing GM foods has taken different forms in different countries in Latin America, ranging from advertising by business interests that compete on the international level, to feeding the poor with the surpluses of the agro-industrial process, to importing of GM foods from abroad (see map on p 9). It's no wonder that people who can see what is going on are outraged. Why should a homogeneous system be installed in our countries that is only of interest to certain export sectors and has no real social benefits?

The conclusions of the regional reports make it clear that transnational corporations have weaselled their way into a position of tremendous power with respect to agriculture and food. In every country, this has led to the privatisation of commercial farming in very few hands, most of them foreign. The enormous social costs incurred, the increased poverty and joblessness, food dependency and the lack of opportunities in the traditional rural context should make the political authorities rethink the situation and remember that even today it is the large rural, *campesino* population in Latin America that is the real source of the food consumed in our region. Argentina has lost 30% of its farms in the past few years, in a process of concentration that is being repeated in almost all countries.

The penetration strategies that have effected this change in South America are characterised by a policy of *fait accompli*, with GMOs fed to the poorest sectors of the populations and transgenic seeds placed in the hands of farmers, often for free. Argentina expanded its export-oriented agriculture, favouring the concentration of ownership and the emigration of rural populations, and now feeds part of its own population with the GM soybeans that it produces. Uruguay is encouraging the planting of GM crops, Chile the production of GM seeds, Brazil is struggling to deal with being flooded with Argentine GM soybeans, while Ecuador receives GM food aid from the US.

The objective of the corporations is to extend their business to the extensive, integrated geography shared by Argentina, Brazil, Bolivia, Paraguay and Uruguay (known as the Southern Cone), where the quality of the land and the navigable rivers make export relatively easy and enormously profitable. The Paraguay-Paraná barge route is being designed exclusively with that objective in mind, without any consideration for the serious environmental, social and economic consequences that could result. Poverty is still on the rise.

The agricultural research and extension institutes and national agencies have largely adopted the lines that favour extensive production and export-oriented farming, and the only people raising the alarm are environmental NGOs, some independent research and scientific groups, and the organisations of small farmers and consumers in some countries. In Bolivia, the anti-GM movement, led by farmer/*campesino* organisations, achieved a government moratorium on the entry of GMOs into the country in 2001. Groups opposing GMOs are calling on governments to support sustainable production methods and to rescue local production rooted in agro-ecological systems, which have proven to be sustainable, productive and economic during periods of crisis in the past and which we may face in the future.

These agro-ecological systems return the ways and means of production to the farmers. Their success, proven independently and scientifically, is beginning to be recognised as a viable, productive alternative that is growing in the face of the industrialised agricultural model. In terms of technology and the delivery of information, and with very limited resources, national programs are beginning to show important results. For example, INTA's ProHuerta progamme in Argentina, and EMATER, a regional technical institution in Brazil, have been very successful in promoting and providing support for household gardens and the sale of healthy, inexpensive, organic food grown according to well-proven agro-ecological methods that require very low investment.

The main demands of the millions of small farmers responsible for the majority of agricultural production in Latin America favour the implementation of agricultural policies that are consistent with and adequate for their own needs. Their message is simple: the GM crops developed to date do not provide solutions for the small family farm. The evaluation of a new technology and its risks should necessarily involve providing information about all the possible alternatives, as well as a comparative analysis of the benefits, risks, means of distribution and the variety of possible solutions. The evaluation should involve broad, complex and holistic criteria that our authorities are still unaware of or prefer to ignore.

This report was prepared by Walter Pengue (right), an agricultural engineer at the University of Buenos Aires in Argentina. He can be contacted at wapengue@sinectis.com.ar. The report was written from contributions from the following countries: Argentina (Walter Pengue, GEPAMA, Universidad de Buenos Aires), Bolivia (Tatiana Muñoz y Freddy Delgado Burgoa, AGRUCO, Universidad de Cochabamba), Brazil (Rubéns Nodari, Universidad Federal de Santa Catarina), Chile (María Isabel Manzur, Fundación Sociedades Sustentables), Colombia (Gemán Velez, Grupo Semillas), Ecuador (Ana Lucia Bravo, Acción Ecológica), México (Flor Rivera) y Uruguay (Carmen Améndola, Universidad de la República, Montevideo, Redes). These regional studies were commissioned as part of the project *The Transnationalisation of Farming and Food in Latin America*, which was coordinated by GRAIN from 2001 to 2003.

As the politics around genetically modified (GM) food and crops intensifies, the regulatory scene is also becoming more complicated. One of the instruments that could play a significant role in the future is the UN's Codex Alimentarius. The authors outline Codex's relationship to other relevant treaties, and argue for strong lobbying from civil society to help give Codex the teeth it needs to be an effective instrument for the regulation of GM foods.

To Eat ... or Not to Eat?

An obscure UN agency tries to provide an answer

PHIL BEREANO AND ELIOTT PEACOCK

Concern over genetically engineered foods is now being expressed in farmers' fields, supermarket aisles, commodity exchanges, legislative halls, scientific circles and at dinner tables. The fate of such crops and foods is being determined in many and varied meetings and institutions, some well known and others less so. While many people have learned about the World Trade Organisation's relevance to food, two lesser-known international instruments have recently changed the playing field regarding genetically engineered organisms: the Cartagena Biosafety Protocol and the Codex Alimentarius Commission's Risk Analysis Principles for Foods Derived from Biotechnology. These instruments signal a growing interest among the world community to address the pitfalls of establishing rules and regulations based on trade considerations alone, and the alarming potential consequences for humans and ecosystems of tampering with genes at the molecular level.

These progressive international instruments emphasise the rights of consumers and farmers, and protecting ecosystems. But reaping the benefits offered by these new agreements is contingent upon governments actually implementing them. In attempting to do so, they are bound to meet strong opposition from industry and exporter governments. For this reason, advocacy and lobbying efforts by civil society organisations will be an integral part of making governments use these instruments.

The Cartagena Biosafety Protocol

In September 2003, a new international agreement, the Cartagena Biosafety Protocol, came into force to regulate the international transfer of *"living modified organisms"* (LMOs). Although every sovereign nation has an absolute right to control its borders and bar what it wishes, most have bargained away this aspect of sovereignty by adhering to the World

Trade Organisation and its limitations on any trade restrictions. The Protocol may prove to be useful in order to re-establish that trade considerations need not always be accorded primacy in balancing out national objectives. Under the Cartagena Protocol and its parent agreement, the Convention on Biological Diversity, protecting biodiversity, the environment, and human health are recognised as valid decision-making criteria.

The Protocol establishes a procedure whereby would-be exporters of LMOs intended to be introduced into the environment must notify the country into which they are being sent. The latter may require an Advanced Informed Agreement governing the shipment, based on a risk assessment. The Protocol clearly allows the latter nation to invoke the Precautionary Principle if, in its judgment, sufficient scientific information is lacking to do a proper assessment.

The 82 countries that have joined the Protocol had their first meeting in Kuala Lumpur, Malaysia, in February 2004. Although many of those activists involved in the process of drafting the Protocol are pleased at much of its language, they recognise that this agreement does not itself resolve many of the existing concerns about creating proper oversight for genetic engineering:

- *"Living modified organisms"* is a more restricted category than *"genetically modified organisms"* since it excludes those no longer alive, and the products thereof.
- "*Intentional introduction into the environment"* may not address situations where the exporter knows, but does not necessarily 'intend' that some of the shipped grain will be planted within the country of import.
- Many of the world's most influential countries are *not* members of the Protocol, including the largest growers and exporters of LMOs: the US, Canada, Argentina, and Australia.
- The Protocol's provisions regarding trade in LMOs between a party and a non-party does not require that its procedures actually be followed;
- The Protocol says nothing about any regulatory oversight *within* a country;
- The Protocol is ambiguous about how to resolve any conflict that arises between the regulation of LMOs by an importing country and the obligations it may have not to impede trade if it is also a party to the World Trade Organisation (WTO). In particular, the Protocol's adoption of the Precautionary Principle is claimed by trade interests to run counter to the WTO mandate. The Protocol text reflects the controversial negotiations on this point by including three somewhat inconsistent provisions in its Preamble.
- A system for identifying and tracing LMOs in international trade remains to be developed. What such a system might look like will be the subject of negotiations among the parties until September, 2005.
- The parties still have to produce a system of *"liability and redress"* in order to deal with any damages LMOs cause, such as the genetic contamination of other farmers' fields.

The Codex Alimentarius

Just two months prior to the Protocol's entry into force, a breakthrough regarding the oversight of risks related to genetically modified organisms (GMOs) occurred under the auspices of a little-known United Nations agency charged with setting international guidelines for food regulations, the Codex Alimentarius Commission. The Food and Agricultural Organisation and the World Health Organisation established Codex in 1963 with the mandate of *"protecting the health of the consumers and ensuring fair practices in the food trade"*. Codex drafts voluntary international food guidelines via negotiations that take place in approximately 30 committees and task forces. A handful of civil society organisations and more than 100 industry groups periodically participate as observers with the right to speak at meetings and distribute documents. Most committees are focused on a particular subject (such as fisheries, oils, or food additives) and several are cross-cutting in their agendas (such as labelling, analytic methods, or General Principles).

"Codex has moved from obscurity to playing a potentially significant role in GMO regulation, though few people recognise it"

In July 2003, with the consensus of its 168 member nations, Codex produced the first set of international guidelines for assessing and managing the health risks posed by GM foods. They were prepared by an Ad Hoc Task Force on Foods Derived from Modern Biotechnology that met for 4 years in Japan. Most notably, these risk analysis guidelines call for safety assessments to be conducted for all GM foods prior to market approval. While this may seem like common sense to most people, it has not been the policy in countries such as the US – the largest grower of GM crops and home to the world's largest biotechnology firm, Monsanto.

Codex thus has moved from obscurity to playing a potentially significant regulatory role in defining internationally acceptable modalities for GMO

regulations, although relatively few civil society activists are aware of it. This new importance is due to the status of Codex guidelines in trade disputes. In 1995, the WTO established that Codex norms would be the reference point in evaluating the legitimacy of food regulatory measures that are challenged as restrictions on trade, under the WTO agreements known as Sanitary and Phytosanitary Standards and Technical Barriers to Trade (TBT). This linkage means that Codex guidelines now have legal significance for WTO members.

Codex guidelines are merely recommendations to governments, which may voluntarily adopt them, but are under no obligation to do so. But since the guidelines are shielded from WTO attack, they may have an impact on what governments might require of firms and farmers producing GM foods, and consequently, on the level of risk to which consumers of foods are exposed. These guidelines may be called on in the case the US has taken to the WTO against the EU for its GM food regulations; the US claims that the EU has prevented many GM foods from the US from being sold in Europe without any legitimate basis for the restrictions. In its defence, the EU is likely to cite the new Codex risk analysis guidelines to show that it has been acting in accord with evolving international norms for GM foods.

"Codex guidelines may be called on in the case the US has taken to the WTO against the EU for its GM food regulations"

Although the risk assessment guidelines Codex has adopted for GM foods contain a great deal of language about carrying out a *"scientific"* evaluation of the actual hazards presented by the new foods, they also allow a certain amount of subjective judgment as well. For example, one provision says that *"Risk managers should take into account the uncertainties identified in the risk assessment and implement appropriate measures to manage these uncertainties"* which appears to recognise the validity of a precautionary regulatory regime similar to that provided for international shipments under the Cartagena Protocol. Other provisions call for a "*transparent*" safety assessment, communicated to "*all interested parties*" that have opportunities to participate in "*interactive*" and "*responsive consultative processes*" where their views are "*sought*" by the regulators. Codex also recognises that there are Other Legitimate Factors – non-scientific in nature – that can be valid contexts/bases for regulations. These non-scientific aspects are consistent with the second prong of the Codex mandate, to deter deceptive practices, which might include, for example, selling or distributing GM foods to consumers without labelling these foods as such, even though this information has been shown to be important to consumers on all surveys that have been conducted.

The US, as a top world food exporter, has lobbied other governments and advocated vigorously that only the objective scientific health claims should be the basis for regulation of GM foods, arguing strongly for de-emphasising the second Codex mandate, the Other Legitimate Factors, and precautionary regulations of any kind.

Few citizens know about the Codex, and fewer still are in touch with their country's Codex Contact Point to lobby for positions which would balance the views of industry. But all will be affected by their government's decisions under this international regime.

How the treaties relate

It may seem confusing to understand how these various international agreements – the Protocol, the Codex, and the WTO – mesh together. But that question supposes that some rational, logical process guided the negotiation of these agreements. It didn't. These compacts were produced at different historical times, by delegations from different national ministries with different missions (trade, environment, food, agriculture, health), and without any grand plan, and different configurations of industry and public interest groups. Despite the existence of some language in their texts about *"harmonisation"*, they exist separately, and it is only through their applications that countries will be forced to try to work out some accommodations. For example, the US challenge in the WTO to the EU regulation of GM crops is expected to be defended by Europe by claiming that its approach is justified by either or both the Protocol and the Codex. However, the decision on whether to accept such a defence will be made by a WTO dispute panel. Political power will, of course, be a major determining factor – the power of different governments, their will to pursue certain goals, and the power of civil society organisations to influence governments by building up constituent pressures and gradually altering the consciousness of decision-makers.

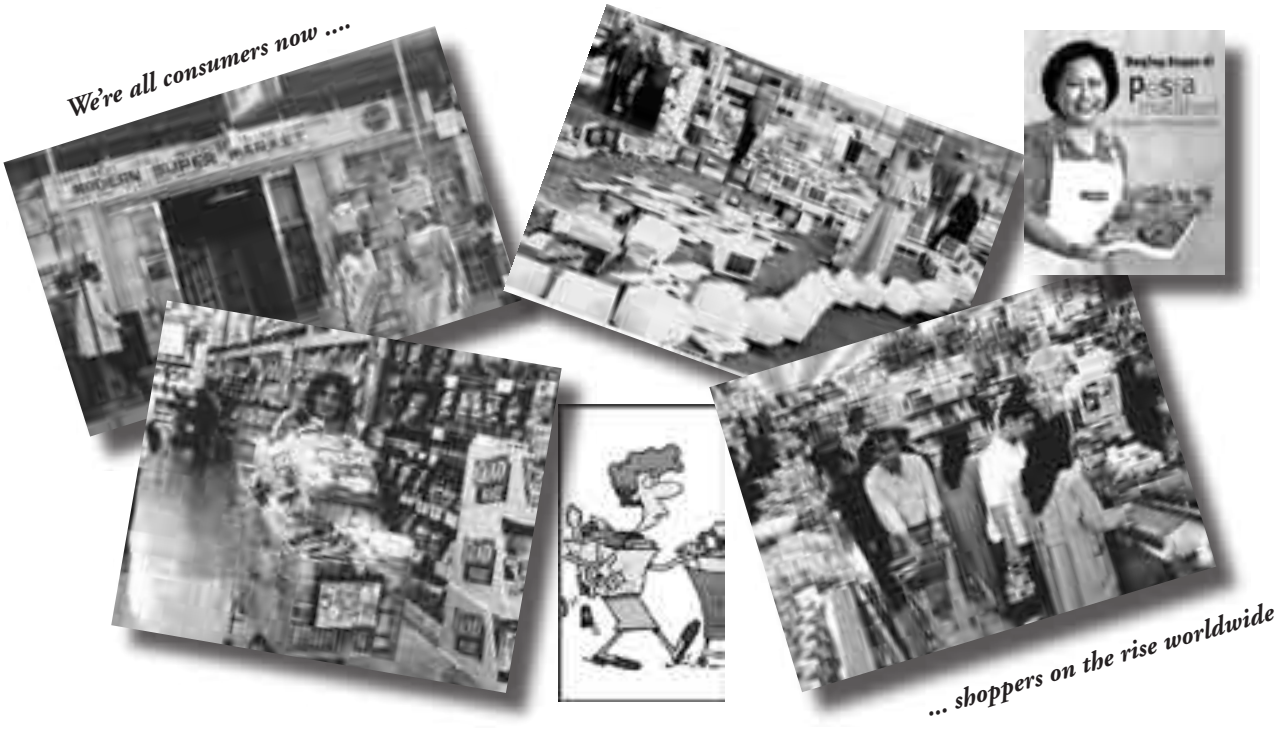
The new Codex international norms for regulating GM foods underscore the deficiencies in practices that allow industry to bring GM foods to market without regulatory oversight, as has happened in the US. This practice has been the object of criticism by many activist organisations, a growing number of scientists, much of the rest of the world, and international authorities on food safety matters. As former US government agriculture policy expert Charles Benbrook has observed: *"The*

[1] Charles Benbrook (2003), *GMOs, Pesticide Use, and Alternatives Lessons from the US Experience.* Paper presented at the Conference on GMOs and Agriculture, Paris, France, June 20, 2003. www.biotech-info.net/lessons_learned.pdf

US agricultural biotechnology regulatory system and policy framework is…difficult to defend as thorough and rigorous relative to contemporary scientific understanding and international food safety norms and testing recommendations."[1] Even international civil servants recognise that while products assessed prior to marketing by the US Food and Drug Administration (FDA) *may* be safe, the FDA has not conducted safety assessments of the foods produced from the roughly 50 genetically modified crops grown in the US. Despite this, the FDA claims that such foods are *"safe"* for human consumption on the basis of a logical construct, the principle of analogy. Under this approach, the FDA assumes that since GM foods are like their parent counterparts in many ways, they must be *"substantially equivalent"* to these conventional foods in other aspects as well, such as safety and nutrition. On this basis, the US government has allowed for GM crops in the US to become common ingredients in 70% to 75% of all processed foods sold in local supermarkets. (Whether this action by the US government might amount to a *"deceptive trade practice"* under the Codex mandate is perhaps an interesting open legal question.) The FDA apparently has no plans to change its policies by adopting the mandatory pre-market safety assessments called for in the Codex guidelines.

A growing number of critics of such non-regulation have called attention to the virtual absence of any peer-reviewed, published scientific research on GM food risks that would allow for safety claims to be tested. As Benbrook has noted, *"I am near certain that no independent scientist or laboratory has received the funding, information, and technical cooperation required to carry out what any team of experts would consider a thorough and independent assessment of GM food safety claims."* Yet no evidence of risk is *not* the same as evidence of no risk, although the industry and compliant governments often try to confuse the two. Apparently, neither the industry nor the governments promoting this technology have any interest in finding out if hazards really might exist. Work by independent scientists, such as Arpad Putzai and Ignacio Chapela has been ridiculed and ignored, and the researchers themselves vilified by colleagues who often are financially beholden to the biotech industry. Nonetheless, even the WTO Appellate Body has recognised that divergent scientific views can be considered in making assessments, such as those evaluating food risks.

Since there are so many concerns raised about the high degree of scientific uncertainty regarding the health and environmental impacts of GM foods, many civil society organisations have insisted that precautionary steps should be taken to avert potential risks. 'Look before you leap,' the folk expression of what has become known as the Precautionary Principle, is the basis for EU biotech regulations and, as previously noted, is enshrined in the new Cartagena Biosafety Protocol. (Although the US now shuns the Precautionary Principle, it is embedded in some 40-odd US laws from the mid 20th century, when the US government saw its role more in protecting consumers rather than stimulating industry profits.)



Using a precautionary approach to assessing and managing risks means taking preventative measures when it is reasonable to believe that potential hazards may become evident (even when no scientific evidence of such hazards may exist). It also puts the burden of proof on the industry that wants to introduce the new technology. The US and other exporters of GM foods have stymied efforts to incorporate the Precautionary Principle into Codex guidelines *explicitly*. But some commentators and activists believe the Precautionary Principle is *implicit* in the risk analysis guidelines established by Codex, despite the absence of the term, since these guidelines call for a safety analysis before there is any commercialisation of a GM food. The governments blocking the inclusion of the Precautionary Principle in Codex have argued that applying it to regulating GM foods could be used to justify protectionist regulations that might be a strategy for insulating domestic industries from foreign competitors (in violation of the WTO agreements). However, it is not the purpose of Codex to stimulate trade, but to protect consumers; the WTO is supposed to follow Codex norms, not vice-versa.

"Some people believe that the Precautionary Principle is implicit in Codex, since it calls for a safety analysis before any commercialisation of a GM food"

Tracking the risks

Another concept under negotiation in Codex and Article 18 of the Protocol is *"traceability"*. The idea behind traceability is to keep track of information about the origins, transformation and fate of foods on their journey to the market. There are several reasons touted in favour of traceability. By keeping clear records and creating a transparent communication system, regulators would be able to respond quickly and effectively in the event of any consequent food-borne health hazards. This would also enable consumers to hold industry liable for any wrongdoing. Another argument for traceability is that if foods are going to be labelled, traceability provides support for the information presented to the consumer and would facilitate the exercise of free choice in the marketplace. Just as some households may want to avoid buying goods made in some particular countries which abuse human rights or have poor labour conditions, they may wish – for reasons scientific or political – to avoid GM foods.

The US has been the major government opposing traceability of GM foods. In the US, traceability measures for food have historically been limited to known hazards (e.g., marking tin cans with a numeric code to make it possible to trace a botulism outbreak), not hazards that are merely plausible but unknown. This latter situation is now being debated within Codex. It is also debating whether all relevant information about a food item will be accessible at a single point or, instead, if only partial information will be available at various points throughout the food system. Interestingly, the new US regulation on protection from *"bioterrorism"*, by requiring the monitoring of imported foods, is at variance with the position of the US in these negotiations, by being both precautionary (there has never been a documented case of food bioterrorism in the US) and using subjective terms (since it addresses *"credible threats of serious adverse health consequences or death")*.

The tail end of a traceability system would be the labelling of foods for consumers. Codex can adopt labelling guidelines that are objective or scientific in nature (like how much acid is the maximum allowable for an olive oil to still be called *"virgin"*) or social (like the definitions of halal or kosher).The question of whether those shopping at the market should be able to identify GM foods has been under negotiation in Codex for ten years. The debate has been about which criteria, if any, should trigger labelling. Consumer organisations, along with the EU, Japan, Brazil and some other governments, are calling for mandatory labelling of GM foods. In these negotiations the US delegation has argued that labels would suggest to purchasers that there is a difference between GM and non-GM foods and that this would be *"misleading."* But most civil society organisations believe that there is a difference and, indeed, the industry itself makes such an argument when it applies for a patent on the GM food. The US government acquiesced in voluntary labelling after the FDA actively tried to discourage it.

At present, two labelling options are being battled out within the Codex Committee on Food Labelling. One calls for labelling to identify all GM foods, while the other (supported by the GM food-exporting countries) proposes labelling GM foods only where the food's nutritional content, composition or intended use are no longer *"substantially equivalent"* to non-GM foods. The strong push from the exporting delegations is indicative of the high degree of industry penetration into government; in contrast, the EU's system of proportional representation has empowered activists working through Green parties to effectively champion consumer demands for labelling. But without Codex labelling guidelines, it is possible that any labelling regulations the EU introduces could be challenged under the WTO agreement. Even if such a challenge were successful, it is likely that the EU would pay financial penalties rather than change its regulations. But the US could

use such a win to terrorise weaker countries into abandoning GM food labelling.

The costs of segregating GMO crops and foods, doing risk assessments, and tracing the products need to be borne by the GMO producers and exporters, not consumers, since they are the ones altering existing practices for their own benefit. The attempts by these industry parties to stimulate concerns – claiming that unreasonable environmental NGOs will be imposing a financial burden on developing countries and poor consumers in the North who are unable to pay – must be resisted.

Where are GMO politics going?

The politics around GMOs is increasingly intense, as the economic stakes become more extreme and scientific debate continues. Within the past year, several new instruments have come into play – the Cartagena Protocol, the guidelines of the Codex Alimentarius, and the WTO challenge by the US to the EU's regulatory approach to GMOs. Is it possible to make any sense out of these configurations, to suggest whether the prospects for safe oversight of the technology exist, whether human health and the environment are likely to be adequately protected?

The four countries that want to export GMOs – the US, Canada, Argentina, and Australia – are all members of Codex, and none of them is (or is soon likely to be, with the possible exception of Argentina) a party to the Biosafety Protocol. Thus, one can argue, they cannot object to countries that use the Codex risk assessments. On the other hand, when the Protocol parties meet to work out the details for risk assessments under that compact and to set rules for tracing and for liability, none of these four nations will be legally able to block action. Because of this, the Protocol is likely to evolve rules that are more protective for biodiversity and health. So it seems that higher levels of environmental and health protection are feasible in the future.

But the actual scenario is also likely to unfold behind the scenes, as the exporters (particularly the US) pressure countries, one by one, to waive the exercise of rights they have under international law. We have seen this happen with the new International Criminal Court, for example. And it has happened in the past regarding GMO regulation, where small nations, such as Croatia and Thailand, have been squeezed by the US. The role of civil society in blunting such attempts will be crucial. Concerned citizens need to figure out ways that the Cartagena Protocol and the new Codex rules can help achieve their valued ends of protecting biodiversity, the environment, and human health.

Going further

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Phil Bereano is Professor of Technology and Public Policy at the University of Washington (Seattle), and a long-time activist. He is on the roster of experts for the Cartegena Protocol, co-founder of the Council for Responsible Genetics (www.gene-watch.org) and currently represents the Washington Biotechnology Action Council (www.washbac.org) and the 49th Parallel Biotechnology Consortium at international meetings.

Eliott Peacock is a Mary Gates Research Scholar and undergraduate thesis candidate at the University of Washington. He has attended international meetings regarding GMOs as a Senior Research Associate of the 49th Parallel Biotechnology Consortium, and is completing an analysis of negotiation dynamics in the Codex Alimentarius Commission.

The world's biggest agrochemical companies and the US government are rushing to introduce genetically modified (GM) crops into West Africa, starting with cotton. Bt cotton has already hit Burkina Faso and Senegal, and Mali is next. Benin and Ivory Coast are also on the list of targets. For many of these countries cotton is the top export crop, and national and community livelihoods are closely tied to cotton revenues. Will Bt cotton fulfil its promises of increased profits for farmers?

Bt Cotton on Mali's Doorstep

GRAIN

Agriculture in Mali, as in most African countries, is characterised by small-scale, family farming. Like several other countries in West Africa, cotton is Mali's number one export, and the success or failure of a cotton crop has a direct and drastic impact on families and communities. Mali's farmers and their unions have fought hard to earn their proper place in decisions to obtain their share of the country's cotton revenues. These gains, however, are in danger of disappearing. Transnational corporations are at the gate, ready to squeeze the country's farmers for everything they can. Researchers with the Institut d'Economie Rurale in Mali are finalising a five-year plan with the US Agency for International Development (USAID), Monsanto, Syngenta and Dow Agrosciences to develop and commercialise GM cotton, starting with field testing in 2004. This will make Mali the third country in West Africa to start field trials with Bt cotton, following in Burkina Faso and Senegal's footsteps.

Other countries on the hit list for Bt cotton are Benin (where a moratorium on GM crops was declared on March 6, 2002) and Ivory Coast. Cotton is just the beginning. In November 2003, USAID with the official support of the International Institute of Tropical Agriculture in Nigeria, declared its intention to 'GMise' Africa. "*Bt cotton is the biotech industry's trojan horse for bringing patented GM crops into West Africa*," says Jeanne Zoundjihékpon of GRAIN in Benin. "*The infrastructure for cotton is well established and they want to take advantage of this. But cotton is a critical crop for the region. It is shameful for public researchers to play with the livelihoods of their people, when the technologies they are bringing in offer nothing to farmers but greater dependence on foreign companies.*"

The letters *"Bt"* stand for *Bacillus thuringiensis*, a toxin-producing bacterium found naturally in the soil. Scientists have isolated certain genes responsible for the production of these toxins and have then used genetic engineering techniques to insert them into cotton. The resulting cotton plants produce the Bt toxins and susceptible pests are supposed to die when they eat them. Almost the entire global acreage of Bt cotton is currently sown to Monsanto's Bollgard variety. This company

has developed a second Bt cotton variety, Bollgard II, which produces two different toxins. In 2004, Dow Agrosciences hopes to introduce Widestrike, another Bt cotton producing two toxins, while Syngenta is trying to introduce its Bt cotton, VIP Cotton.[1] The companies selling Bt cotton offer several reasons for introducing Bt cotton into West Africa, none of which stand up to scrutiny.

The pesticide lie

The first is that Bt cotton will eliminate pesticide use. Bt cotton will not eliminate the use of pesticides; at best it can only reduce it. Experience with Bt cotton in other countries shows that the technology provides only partial control of several important caterpillar pests. In the US in 2002, in spite of the use of supplementary insecticides, approximately 14,152 tonnes of cotton or 7.5% of the total Bt cotton crop was destroyed by bollworms and about 2600 tonnes or 1.4% of the total Bt cotton crop was destroyed by *Spodoptera* and *Pseudoplusia includens* caterpillars.[2] In the Indian state of Andhra Pradesh, where Bt cotton was grown for the first time in 2002, Bt cotton was not able to control the cotton bollworm much better than non-Bt cotton.[3] Moreover, Bt cotton is ineffective against sucking pests, which keeps insecticide use high in Bt cotton fields. In the Indian example above, farmers had to apply more insecticides against aphids in fields of Bt cotton than in those of conventional cotton.[4] In the US, while insecticide use against bollworms and budworms declined significantly with Bt cotton, the total use of insecticides has remained relatively stable due to the increase in secondary pests.[5]

There are more effective and appropriate methods to reduce the use of insecticides, such as targeted application management, where insecticides are only applied when the level of damage from pests surpasses economic thresholds determined by researchers, and Integrated Pest and Production Management (IPPM), which encourages the use of farmers' knowledge and local resources, like neem. During one project's first season in 2002, cotton farmers practising IPPM eliminated pesticides without reducing yields. But, despite the success of such strategies, few Malian farmers use these techniques or even know about them, because of the lack of training programmes and publicity.

Richer pickings?

A second argument for introducing Bt cotton into West Africa is that it will increase yields and thus farmers' profits. In India, a 2003 study showed that conventional varieties produced more and larger bolls (95 per plant) than Bt varieties (50 bolls per plant).[6] Another study showed that farmers' yields fell by 35% when they grew Bt cotton.[7]

When farmers buy Bt cotton seed, they are obliged to pay *"technology fees"* on top of the price of the seed itself. In West Africa, where Monsanto plans to introduce Bollgard II, the technology fees for Bt cotton are likely to be at least $US 50/ha (the existing rate in South Africa), or 30,300 CFA/ha. In Mali, the total price for insecticides is around 37,600 CFA/ha ($US 62/ha). At this price, even if Bt cotton were to reduce insecticide use by half, which is difficult to imagine, the costs of the seeds would still outweigh the savings in expenditures on insecticides.

Criminalising farmer practices

At present, cotton seed is not sold in most West African countries; it is distributed for free. For farmers, the seeds belong to them because they are derived from their previous harvests and because they have paid for the breeding programs that have developed the region's cotton varieties. Moreover, farmers customarily exchange seeds with their neighbours, friends and family members. The introduction of Bt cotton will upset these traditional practices. Farmers will be obliged to pay for seeds and to sign Monsanto's infamous Technology Use Agreement which states that:

- Farmers are prohibited from saving seeds for replanting.
- Farmers are prohibited from supplying seeds to anyone else.
- Farmers must pay 120 times the technology fee, plus Monsanto's legal fees, if they violate the contract.

Monsanto takes these contracts very seriously. The company keeps lists of all farmers who are growing GM varieties and monitors them closely. It goes after farmers in Brazil as aggressively as farmers in the US.[8] In West Africa, where the majority of farmers are illiterate, they may well not even understand the clauses of the contracts. The fact that there will not be any visible difference between Bt cotton and conventional cotton will create even more confusion. In this chaotic situation, farmers risk being prosecuted and judged as criminals.

[1] Jeremy Greene (2003), "How Bollgard II cotton fits," *Delta Farm Press*, June 6.

[2] Leonard Gianessi *et al* (2002), *Plant Biotechnology: Current and Potential Impact For Improving Pest Management In US Agriculture: An Analysis of 40 Case Studies*, National Center for Food and Agricultural Policy.

[3] Abdul Qayam and Kiran Sakkhari (2003), *Did Bt Cotton Save Farmers in Warangal? A season long impact study of Bt Cotton - Kharif 2002 in Warangal District of Andhra Pradesh*, AP Coalition in Defence of Diversity and Deccan Development Society, Hyderabad: www.ddsindia.com

[4] *Ibid*

[5] Charles Benbrook (2003), *GMOs, Pesticide Use, and Alternatives: Lessons from the US Experience.* Delivered at the Conference on GMOs and Agriculture, Paris, France, June 20: www.biotech-info.net/lessons_learned.pdf

[6] Suman Sahai and Shakeelur Rahman (2003), *Performance of Bt cotton in India: Data from the first commercial crop*, Gene Campaign, India: www.genecampaign.org/btcotton.html

[7] Abdul Qayam and Kiran Sakkhari (2003), *op cit.*

[8] International Cotton Advisory Committee (1999), "Technology Protection Systems", *ICAC Recorder*, March 1999.

Bt and contamination

Bt cotton is not visibly different from conventional cotton, and mixing is therefore inevitable. Significant amounts of Bt cotton will be able to easily slip into stocks of conventional cotton. Contamination can also come about through cross pollination of Bt and conventional cotton plants, particularly via insect pollinators. Such contamination has serious consequences:

- Once the transgene (the gene that is transferred from one species to another) is introduced into the environment, it is difficult if not impossible to remove it if harmful effects for human or environmental health are discovered.
- Monsanto holds patents on the transgenes of Bt cotton and claims intellectual property rights on all plants containing these transgenes, even if they arrived in farmers fields through accidental contamination.
- Gene flow could occur between Bt cotton and local varieties or wild species of cotton—important reserves of biodiversity.
- Contamination by Bt cotton could compromise the entire production of organic cotton in the sub-region, since organic certification criteria prohibit GMOs.

Despite these risks, field trials of Bt cotton have already been undertaken in the sub-region, in Senegal and in Burkina Faso, without monitoring by regulatory authorities and without appropriate public information or consultation. The same situation is set to play out in Mali, where the national agricultural research centre (Institut de l'Economie Rurale), USAID, Monsanto, Syngenta, and Dow Agrosciences have just completed a five-year plan for the introduction and development of Bt cotton in that country.

Despite risks of contamination and other unknown effects, field trials of Bt cotton have already been undertaken in the sub-region without monitoring by regulatory authorities and without appropriate public information or consultation. "*The Expert Group of the African Union's Scientific, Technical and Research Commission has expressly recommended the need for its member states to consider a moratorium on GMO introduction,*" says Mariam Mayet of the African Centre for Biosafety in South Africa. "*But GM continues to be pushed into Africa through the back door, putting the whole continent at risk".*

Since farmers will be the people most affected by the technology, they need to be at the centre of decisions on Bt cotton. But it is unlikely that governments or Monsanto will engage in the major effort required for serious consultations with farmers, who, for the most part, lack even minimal knowledge of genetic engineering. So it is up to farmers, and especially the farmer organisations, to insist that they be fully informed and consulted before a decision is taken to introduce GM cotton, even for field trials.

As François Traoré, President of the National Union of Cotton Producers of Burkina Faso, says: *"If we already have the means to reduce pesticide use, why look for things that are going to complicate life?"*[9] The IPPM project in Mali clearly shows that farmers can minimize – if not totally eliminate – the use of insecticides in a sustainable way, without having to rely on costly foreign technologies like Bt cotton. Instead of introducing GM cotton, why aren't the national cotton companies and the state authorities promoting practices that are less costly and have fewer risks?

GRAIN will be publishing a full report in French and English on Bt cotton in West Africa in April 2004.

[9] Personal communication with Francois Traoré, President of the Union Nationale des Producteurs de Coton du Burkina Faso, Ouagadougou, Burkina Faso, June 27, 2003.

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Cotton is an important export crop for more than 20 countries in Africa

Sprouting Up...

A new partnership for Africa?

GRAIN

Recently it has been impossible to talk about development in Africa without mentioning NEPAD (New Partnership for African Development). But what is NEPAD?

NEPAD is a development program for Africa, launched by the presidents of South Africa, Algeria, Nigeria, Egypt and Senegal. It takes the form of a document drawn up by experts commissioned by these political authorities without any popular consultation, and without any involvement of the different social actors, in their respective countries. NEPAD was adopted by the African heads of state at Abuja (Nigeria) in October 2001. NEPAD's point of departure is that since independence, Africa's development has not been effective. New approaches are needed to resolve the problem of poverty. NEPAD's answer is a new programme for development, giving a greater role to private investment, and founded on a new form of partnership with developed nations.

The text of NEPAD starts by saying, *"This New Partnership for African Development is a promise, made by African leaders, founded on a common vision, as well as a firm and shared conviction that it is their urgent duty to eradicate poverty and to place their countries, both individually and collectively, on the path of sustainable growth and development, while actively participating in the world economy and international politics..."*. As we can see from NEPAD's title, its focus and the approaches it has made, it is clear that the development of Africa will be based on a partnership with the developed countries and the principles of the World Trade Organisation (WTO), which currently dominate the global economy and international politics.

In the field of genetic resources, we have seen over the last few years that the principles of the WTO, which promote intellectual property rights over biological resources, oppose the sustainable use of biological diversity. Sustainable development, meaning development that does not undermine the social and environmental resource base nor benefit only a minority, cannot be fuelled by the international economic and political system as NEPAD would have us believe. Sustainable development must be based on the recognition of each country's traditional practices, on the sustainable use of African genetic resources, according to the African peoples' ways of life. NEPAD now looks more like a promise to the North that African countries will adopt the WTO framework of intellectual property rights, or laws that will promote the monopolistic commercial exploitation of traditional resources and knowledge, while allowing the consumption and production of genetically modified organisms (GMOs), rejected in the North.

Genetic resources (agriculture, forests, medicinal plants and so on) and the protection of traditional knowledge and values do occupy an important position in the NEPAD document. But if we are not sufficiently wary, we may end up mortgaging the future of generations to come to ensure the implementation of this initiative. Under the heading *"Action Plan: Strategy to Ensure Sustainable Development in Africa in the 21st Century"*, the following is written about agriculture and culture:

"140. Culture is an integral part of efforts to develop the continent. That is why it is essential to protect and correctly use the indigenous knowledge that represents an important dimension of the continent's culture, and to ensure that it benefits all humanity. NEPAD will pay particular attention to the protection and development of traditional knowledge. Namely literary and artistic production based on tradition, as well as scientific endeavours, performances, inventions, discoveries, concepts, brands, trademarks and logos, information yet to be revealed, and all other innovation or creation founded on tradition or intellectual activity in the industrial, scientific, literary or artistic domain. This concept also includes our genetic patrimony and the traditional medical knowledge that is associated with it..."

"141. NEPAD leaders will take urgent measures to ensure that Africa's indigenous knowledge is protected by appropriate legislation. They are also in favour of its protection at an international level, working to achieve this in close collaboration with the World Intellectual Property Organisation (WIPO)"

In the light of these extracts, we can congratulate the authors of NEPAD for the pride of place granted to genetic resources and the protection of traditional knowledge linked to these resources. But what is really worrying is that, in order to protect genetic resources, NEPAD recommends working in close collaboration with WIPO. In effect, this organisation, and its subsidiary in Francophone Africa, OAPI (Organisation Africaine de Propriété Intellectuelle) have demonstrated time and time again that they have no interest in African development. For example, they recently undertook (1996-2002) a revision of a supranational law of the 16 nations of Francophone West and Central Africa (Bangui Accords) on the orders of the WTO, without any consultation of the farmers and local communities whose interests are trampled on by this law. The protection of Africa's genetic resources cannot be achieved in a sustainable manner unless all the social actors at a national level, headed by farmers and local communities in each country, propose, in their own interest and not that of the multinationals, the ways and means to effectively protect their genetic resources and traditional knowledge.

NEPAD's official website is at www.nepad.org

Hope Shand

Why are you saying that 'no patents on life' campaigns don't go far enough these days?

The *"No Patents on Life"* campaigns have been extremely important – and continue to be important – no question. But we think that campaigns to challenge intellectual monopolies have to keep pace with new trends in science and technology and the concentration of corporate power.

Since the 1980s, a growing number of civil society organisations (CSOs) and some governments have denounced life patenting as technically invalid and fundamentally inequitable. We have been arguing that monopoly control over plants, animals and other life forms jeopardises world food security, undermines conservation and use of biological diversity and threatens to increase the economic insecurity of farming communities. Instead of promoting innovation, patents are stifling research, limiting competition and thwarting new discoveries.

What we're seeing now is that industrial corporations are also becoming disenchanted with intellectual property – but for different reasons. The complexity and costs of patents are becoming problematic. The transaction costs are enormous. The legal costs of obtaining a patent are approximately $10,000 in the US, and it typically costs $1.5 million per side to litigate a patent. Start-up biotech companies are budgeting as much for patent litigation as they are for research expenditures. In addition, intellectual property laws are also perceived by corporations as politically unpredictable, because life patenting has become politically contentious. Industry is worried that mounting political opposition to patents could lead to legislative changes that threaten its intellectual property.

Because of this, industry is seeking alternative mechanisms, or *"New Enclosures"*, to secure corporate control over biotechnology and other emerging technologies. After two decades of consolidation, five multinational corporations dominate the field of agricultural biotechnology. Patents become less relevant in oligopolistic markets and when other tools of monopoly are potentially cheaper and more far-reaching. It is these New Enclosures that we need to tackle now.

What do these New Enclosures look like?

We have identified three categories that relate to agriculture. The first is biological monopolies on genetic material. The best-known examples of New Enclosure mechanisms are the controversial genetic use restriction technologies (GURTs), better known as Terminator and Traitor technologies. GURTs involve the use of genetic switches, triggered by the application of external chemicals, to control a plant's genetic traits. Terminator plants are genetically modified to switch on or off the trait for seed sterility. Seeds harvested from Terminator crops will not germinate if re-planted the following season. The technology aims to prevent farmers from saving seed from their harvest, thus forcing them to return to the commercial seed market every year. The difference here is that patents are a legal mechanism to prevent farmers from saving and re-planting proprietary seed. If they reach the market, Terminator seeds would offer a biological mechanism to eliminate farmer seed-saving. For corporations, seed sterilisation offers a stronger and more far-reaching monopoly than intellectual property because, unlike patents, Terminator technology would not be time-limited, it would

Hope Shand is Research Director for the Action Group on Erosion, Technology and Concentration (ETC Group). She has has written extensively on the topic of agricultural biodiversity, and on the social and economic impacts of new biotechnologies.

Among the myriad publications she has produced, Hope is the author of *Human Nature: Agricultural Biodiversity and Farm-Based Food Security (1998)* and co-author of *The Ownership of Life: When Patents and Values Clash (1997).*

Hope holds a master's degree in Regional Planning (population and development). She lives in North Carolina, USA, and can be contacted at hope@etcgroup.org

offer no exemption for researchers, no provision for compulsory licensing and no need for lawyers.

What other types of New Enclosures are there?

Remote sensing and surveillance is another area. Earth observation satellites are already being used by governments, civil society and industry to collect images and information about human activities and the natural environment. While these technologies have the potential to promote transparency and benefit agriculture, they also threaten to diminish the rights of farmers and farm communities. Remote sensing and biodetectors are already being used by corporations and governments to enforce proprietary rights and regulatory compliance; and to identify, monitor and control germplasm, territory and labour.

So it's like Big Brother literally watching you?

There are various ways of monitoring – one is looking at images of what is going on. This technology is now very precise and the images have better than 1-metre resolution. The Argentine government has talked of plans to use this kind of satellite imagery to monitor farmers' crops in an effort to halt tax evasion. The idea is to figure out how many hectares a farmer has sown and check to see if his declared crop yields are consistent with the average for the region. The National Seed Institute (INASE) has also proposed using satellite surveillance to stop illegal seed trading.

Another way is using sensors that monitor all kinds of information from climatic conditions to a farmer's business transactions. The Tasmanian government has set up a Global Positioning Satellite System (GPS) to establish a comprehensive mapping and numbering system for all Tasmanian farms. This system began as an *"identity preservation"* system to regulate legally-licensed opium poppy fields produced by Tasmanian Alkaloids, and was so successful that they decided to expand it state-wide. The idea is that seed, fertiliser and spray regimes are recorded for future reference, and the downstream buyer can scrutinise a detailed history of the farmers' suppliers. There are obvious benefits for buyers in verifying and tracking production practices from seedling to supermarket. The same technology offers unprecedented opportunities for industrial food processors and retailers to determine who will farm, how, and under what conditions.

The third class of New Enclosures you refer to are legal contracts. Why are these more threatening to farmers than patents?

Increasingly, the seed industry provides proprietary seed to farmers under contractual agreements that prohibit the farmer from saving, re-using or selling any of the harvested crop as seed. Seed industry giants routinely use technology user agreements when they sell genetically modified (GM) seed. The contracts not only restrict the use of harvested seed, they go far beyond intellectual property by dictating conditions for using seed and related inputs, establishing limits for liability and legal recourse, and even conditions for post-harvest marketing (see box).

How does nanotechnology fit into the picture?

Genetic engineering enabled scientists to break the species barrier. Nanotechnology takes it a step further – shattering the boundary between living and non-living matter. *"Nanotechnology"* refers to the manipulation of atoms and molecules to make new products. At the nano-scale, where objects are measured in billionths of meters, the distinction between living and non-living blurs. The raw materials for nanotechnology are the chemical elements of the Periodic Table, the building blocks of all matter – both living and non-living. Nanotech companies are already engineering novel materials that may have entirely new properties never before identified in nature. And there is huge investment in it. Worldwide, public and private sector nanotechnology funding is already between $5-$6 billion a year.

Atomic-level manufacturing provides new opportunities for sweeping monopoly control over both animate and inanimate matter. Patenting at the nano-scale offers the potential to monopolise the basic elements that make life possible. Again, that's why we think it's important to expand efforts to resist intellectual monopolies beyond 'no patents on life.'

Nanotech concerns seem far removed from most farmers' realities, particularly in the South. Why should they worry?

Both present and future applications of nanotechnology pose profound implications for trade, labour requirements and industrial production processes – including agriculture. Some materials and manufacturing processes will no longer be dependent on geography, labour or raw materials. Nanotechnology could render some natural resources obsolete – with especially serious disruptions for economies in the South. The world's major tyre producers, for example, are experimenting with the use of nanoparticles as additives in automobile tyres to make them stronger and more wear-resistant. Researchers are also designing new nanomaterials that are stronger and lighter and could be substituted for natural rubber. If nano-designed tyres require little or no rubber in the future, it could have devastating impacts

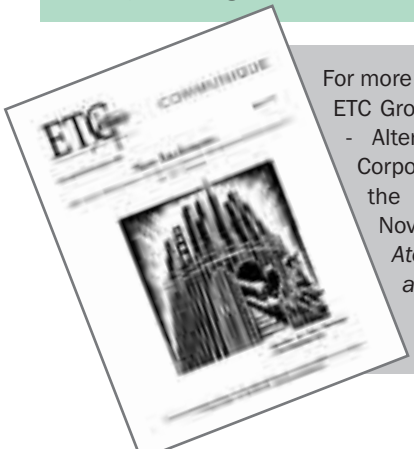
Legal contracts – worse than patents

Technology use agreements force farmers to shoulder a huge burden of responsibility in return for the privilege of growing GM crops:

- ***Liability Limits:*** Farmers who sign Monsanto's 2001 technology agreement must accept the company's Exclusive Limited Warranty, which severely limits Monsanto's liability for any and all losses, injury or damages that result from the use or handling of a product containing Monsanto's gene technology.
- ***Right of Venue:*** Right of venue clauses allow the seed company to force breach of contract disputes arising from technology agreements to be settled exclusively in court jurisdictions that are generally more favorable to the corporation, and typically make defense against infringement charges more costly to the farmer.
- ***Dictate Farming Conditions:*** Monsanto's 2001 technology agreement for Roundup Ready GM crops states that the producer has responsibility for ensuring that pollen from his or her GM crop does not trespass on a neighbour's crop. This means that growers of GM crops are exposing themselves to potentially huge financial risks by signing gene technology agreements.
- ***Post-Harvest Liability:*** A farmer who signs Pioneer's contract for both YieldGard and LibertyLink gene technology *"agrees to keep the harvested grain from these hybrids out of European grain export channels."* Monsanto's 2001 agreement on RoundUp Ready crops has similar provisions. Dwight Aakre, North Dakota State University economist, warns farmers, *"Signing that agreement means you accept a risk that you have very little control over. If a ship load of grain arrives at one of these export markets, is tested and found to contain unapproved genetics and the source can be traced back to your farm, what is your responsibility?"*

In North America, Monsanto has aggressively monitored and prosecuted seed-saving farmers with the help of private investigators. The company has filed more than 475 lawsuits against farmers for patent infringement and violation of technology user agreements – (the exact number is not known). Monsanto's GM seed technology accounted for more than 90% of the total world area planted in GM seed in 2002, and the company is showing its determination to hold all farmers to the terms of its technology user agreement, whether or not they signed it.

Recently we've been seeing a new and dangerous model emerging in Argentina where the government has proposed to levy taxes on soybean farmers to collect royalty payments for Monsanto (see p 3). Argentina is offering to police the patent system for Monsanto! This is corporate welfare, and another example of New Enclosures. Monsanto won't even need patents if governments are willing to collect royalties for them.



For more information on New Enclosures, see ETC Group's publications: "New Enclosures - Alternative Mechanisms to Enhance Corporate Monopoly and BioSerfdom in the 21st Century", *ETC Communiqué*, November 2001; *The Big Down: Atomtech – Technologies Converging at the Nano-scale*," January, 2003; "Oligopoly, Inc.," *ETC Communiqué*, November/December 2003.

for rubber producers and plantation workers worldwide. Malaysia and Thailand are currently the world's top producers of natural rubber.

In Chiang Mai, Thailand, researchers at the Fast Neutron Research Facility are using nanotechnology to modify rice. These are nuclear physicists who are blasting nitrogen atoms into rice cells to stimulate re-arrangement of the rice DNA. Their goal is to modify genetic characteristics and produce a fragrant rice with short stems that is not light sensitive. Ironically, the physicists who are doing the work say that they are hoping to avoid the controversy surrounding GMOs!

Where is the battleground to fight New Enclosures? What can people do?

New Enclosures threaten to erode the rights of farmers and workers, undermine national sovereignty, and promote corporate consolidation. Efforts to resist and reform intellectual property must not be limited to campaigns against the patenting of life, because nanotechnology is positioning the world's largest companies to seek patent claims on the building blocks of the entire natural world.

New Enclosures must be carefully monitored, analysed and independently regulated. Action is needed at all levels – from local communities and national governments to intergovernmental bodies. We're already seeing farmers' and civil society organisations resisting and challenging corporate contracts and bioserfdom. We've seen that civil society partners around the world and farmers' organisations can quickly grasp the issues and threats posed by nanotechnology once they're informed – they've seen it all before. The UN also needs to be involved because we must regain the capacity to monitor and regulate the activities of transnational enterprises, and these operate beyond the boundaries of any single country. We have also proposed setting up a new body with the mandate to evaluate, accept or reject new technologies and their products through an International Convention on the Evaluation of New Technologies.

Sprouting Up...

Biodiversity Convention to develop *"regime"* on benefit sharing

GRAIN

After a decade of delaying tactics from developed countries, the Parties to the Convention on Biological Diversity (CBD) will now attempt to implement the CBD's nearly forgotten objective of benefit sharing. Until now, the CBD has done little to bring about a *"fair and equitable sharing of the benefits arising out of the utilisation of genetic resources"*. A set of non-binding recommendations, called the Bonn Guidelines, was adopted by the Parties two years ago. Strongly focused on best practices for bilateral contracts between bioprospectors and developing countries, these guidelines carefully avoid the political underpinnings of benefit sharing.

This is where the issue would probably have remained for quite some time, had it not been for the World Summit on Sustainable Development held in Johannesburg in 2002. One outcome of the Summit was an outright order to the CBD to get back to work and negotiate *"an international regime"* on benefit sharing. At the recent CBD Conference of Parties (COP7) in Kuala Lumpur, this process was formally set in motion. A negotiating mandate was adopted and two negotiating meetings are now scheduled to take place before COP8 in 2006. The work will mainly be done by the CBD's Working Group on Access and Benefit Sharing, but in *"collaboration"* with the Working Group on Article 8(j) and Related Provisions, which is the CBD body dealing with *"indigenous and local communities embodying traditional lifestyles"*.

So what will be the content of this *"regime"*? Most observers expect it establish some kind of legally binding obligation on those who benefit from commercialisation of biodiversity to share the wealth created. But not even this is certain, much less what the criteria would be or who would be entitled to benefits, or indeed what *"an international regime"* is supposed to mean. The terms of refer ence (ToR) are extremely vague, saying it *"could be composed of one or more instruments within a set of principles, norms, rules and decision-making procedures, legally-binding and/or non-binding"*. On content, the ToR are even more hazy. It only provides a long non-exhaustive list of things that could be covered by the negotiation.

Developing country governments that have been fighting for concrete returns on access to genetic resources in their territories see simply starting the initiation of this negotiating process as an important victory. The inclusion of the benefit sharing objective in the Convention itself was the main reason that they accepted to join it and take on considerable responsibility for conservation and sustainable use, the two other CBD objectives. The attitude of the rich countries, that benefit sharing is sufficiently taken care of by commercial contracts with their biotech companies, has been a growing source of tension in CBD meetings.

Much of the regime negotiation is therefore bound to develop into another North-South fight. A major point of contention is likely to be on rules for *disclosure of origin* in patent applications involving biological materials, something developing countries have been demanding for years in many international fora. One of the reasons why the North has so fiercely resisted this idea – aside from the obvious one: that it would limit the freedom of their companies to profit from biopiracy – has been that it would introduce a foreign issue into patent law, which patent offices are not equipped to handle. This objection might be eliminated by a technical solution which has gradually grown more popular among governments North and South. Many developing countries are now advocating a *"Certificate of Legal Provenance"*, which would certify not only origin but also compliance with any relevant access and benefit-sharing legislation, including prior informed consent. This would be a self-standing document, not something built into patent legislation, meaning that all patent examiners would need to do is check whether there is a valid certificate or not.

Will this regime deliver anything of value for farmers, indigenous peoples and all other real world custodians of biodiversity? This depends on whether governments can be forced to address one of the major shortcomings of the CBD: that it does not create any rights for those who manage and develop biological resources in fields and forests, only for the governments who hold *"national sovereignty"* over them. The regime could improve on the CBD by clarifying that benefit-sharing also involves obligations to respect and reward the actual custodians. But it could just as well make things worse by strengthening governments' rights to expropriate the value created by their citizens and sell it to the highest bidding transnational company.

Numerous indigenous peoples' organisations present in Kuala Lumpur stressed that any benefit sharing regime must recognise their right to self-determination and to their territories, their right to free and prior informed consent and the collective custodianship, governed by customary law, that they have over biodiversity today. Others were so wary that they argued for not supporting the negotiation process at all.

Unless the regime can help strengthen local – rather than national – control over biodiversity and traditional knowledge it will be a failure also in terms of the CBD's two other objectives. Neither conservation nor sustainable use will happen in a world where biological resources are managed to satisfy the combined greed of governments and corporations.

GRAIN is preparing an in-depth briefing on the current politics of access and benefit sharing, to be published shortly. The CBD's document outlining the proposal for the international regime, is available at: www.biodiv.org/doc/meetings/cop/cop-07/official/cop-07-l-28-en.pdf