Seedling

Biodiversity, Rights and Livelihood

April 2003

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Genetic Resources Action International (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

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Sprouting Up

Front cover picture: © Rhodri Jones / Panos Pictures Ciudad el Alto, La Paz, Bolivia. Sacks which once contained food aid from the USA recycled to make straw mattresses.
Back cover picture: © Jeremy Horner / Panos Pictures, Chimborazo, Ecuador. Quechua women harvesting barley.

The Free Trade Area of the Americas (FTAA) is a free trade agreement being negotiated by all the governments of the American hemisphere except Cuba. Its objective is to impose common rules for the entire continent to open up national activities to the free flow of global capital. This agreement will be even more wide-reaching than the World Trade Organisation. The FTAA will result in many restrictions on the rights of all citizens, but especially wage earners, small farmers and indigenous peoples. In contrast, transnational investors will receive a level of protection never before experienced.

No Free Trade FTAA At All

GRAIN

Although it is called a *"free trade"* agreement, the Free Trade Area of the America (FTAA) is all about restricting and controlling trade in favour of the major global enterprises. The FTAA, if approved, will not only affect trade, but also production, services and property rights over land, water and natural resources. Many economic activities, especially small farmer economies, will be put under immense stress. Civil rights and human rights, the rights of local communities, the rights of indigenous peoples, labour rights, the right to knowledge and culture and basic forms of sovereignty will be even more restricted than they are today. We will see the privatisation of remaining public spaces and activities, and we may be confronted with new forms of repression that do not exist today. If the FTAA is approved, it will have a profound impact on the economic, social and political life of American peoples.

The FTAA was first proposed by US president George Bush senior in 1994. It includes 34 countries: all of the Americas except for Cuba. From the beginning, the agreement was presented as something more than an economic agreement. Participating countries would also take on a series of political commitments, in terms of their domestic policies (such as those aimed at promoting privatisation and decentralisation) and also for international actions (with a greater commitment to expanding free trade agreements). Meanwhile, each of the summits has been used by the US to achieve support for its attacks on

Cuba and for the militarisation of the Americas (such as the imposition of Plan Colombia). From 1994 to 1998, negotiations focused on defining structure and organisation. Substantial discussions began in 1998, and are scheduled to conclude on December 31, 2004. The agreement should come into effect a year later, pending approval from all the participating countries.

So far, negotiations have been very secretive. Although the negotiating texts are publicly available,[1] the positions of each country are kept secret. Even some government officials feel they are in the dark – the Chilean Minister of Agriculture said that he was unaware of what Chile had bargained for on agriculture in the FTAA. Meanwhile, the only governments that have expressed any explicit opposition to the agreement have been Brazil and Venezuela. Brazil is worried that the FTAA might make the Mercosur (a common market being established between Argentina, Brazil, Uruguay and Paraguay) totally irrelevant. The President of Venezuela has indicated he will not sign until the agreement is approved by a national referendum. Nonetheless, negotiations on the FTAA are proceeding.

Water is one of the basic services that will be up for grabs for the private sector. *FAO/E.Bizarri*

The negotiations have progressed through three Presidential Summits (or Summits of the Americas – in Miami in 1994, Santiago in 1998 and Québec in 2001), seven ministerial meetings (once every 18 months since 1995) and a long series of meetings of negotiating groups and committees. The Presidential Summits are the final decision-making fora, while ministerial meetings review the agreements achieved by negotiating groups and provide instructions for the following rounds.

Nine negotiating areas have been defined: market access, agriculture, services, governmental purchases, subsidies and anti-dumping, competition, intellectual property, dispute resolution and investments. Officially, the negotiations are strictly governmental. But business representatives have participated from the outset. The Business Forum of the Americas is the only non-party (only governments are parties) to have presented formal proposals for negotiation. Business participation in the negotiations has become so 'official' that documents produced by the Business Forum of the Americas are published on one of the sites alongside official information on the FTAA.[2] The participation of other social sectors has been very restricted. The Committee of Governmental Representatives on the Participation of Civil Society only accepts opinions by e-mail, using a rigid format. There is no mechanism to assure that such opinions will be heard.

The ideological framework

To fully appreciate the possible impact of the FTAA, it is helpful to remember three premises. First, the FTAA is part of a broader privatising offensive being pushed through international mechanisms and agencies, including the World Trade Organisation (WTO). This means the agreement not only creates new formats for trade and private property, but also imposes a new ideological, legal and political context to define relations between transnational capital, national states and the peoples of Latin America. The FTAA will impose laws, concepts and definitions that will soon affect all aspects of national activity and experience, in order to assure that transnational capital will have no limits and guarantee its profits. The final objective is for every aspect of the lives of a country's people to be controlled by the market, with rules assuring that the entire population will submit to these conditions.

The second premise is that the final text of FTAA will be interpreted every time it is applied. While some of its provisions are extremely detailed, most of them cannot be applied directly or literally, but rather set boundaries for making legal, legislative, economic and political decisions. Interpretation will be put in the hands of individuals or agencies who accept privatisation as the supreme dogma. This will be done in a setting in which states and transnational corporations have been put on virtually equal footing in terms of authority and empowerment. Because of this, it would be foolish to expect that any FTAA 'overkill' will be worked out once its provisions have been set in

[1] Available at www.sice.org or www/ftaa-alca.org/alca_s.asp

[2] www.sice.org

place. The current negotiating text already has extremely dangerous provisions, and their future interpretations may be even worse.

Finally, the FTAA creates, transforms or re-writes – explicitly or implicitly – a series of economic, legal and political concepts. For example, a number of government functions, including *"activities that are part of a national security system or to establish or maintain public order"*, are reworked into "*services*" and then opened up for "*delegation*", meaning the privatisation of public power. Many examples of this are found throughout the text.

It is extremely difficult to foresee fully all of the FTAA's impacts. What we do see is an attempt to launch a powerful apparatus to guarantee the rule of transnational capital over the entire continent. It goes unimaginably far beyond the privatisation and concentration already achieved in the Americas, and must be urgently understood – and rejected.

Political context

It was no accident that the FTAA was first pushed by the US government, whose key objective is to achieve the unfettered expansion of transnational capital in the Americas, and most particularly US capital, which already controls about 80% of the region's production. The US has always used regional imbalances to impose its will, and since the beginning, the FTAA negotiations have forced all countries involved to act as a bloc in the WTO.

Then it started breaking the process down into bilateral negotiations between the US and several countries in the region (none of them having advanced far to date). This was a deliberate strategic move on behalf of the US to avoid any chance of a Latin American and Caribbean negotiating bloc emerging, and to be able to pressure any country that might show some degree of independence. With the active complicity of Chile and Costa Rica in particular, this strategy is likely to work. What is more, the US continues to use other negotiating processes, such as the World Intellectual Property Organisation (WIPO) and the WTO, to pursue its own objectives, since whatever is agreed in those fora will automatically be incorporated into the FTAA.

As an economic strategy, the FTAA is the revival of the Multilateral Agreement on Investments, an agreement once proposed by the Organisation of Economic Cooperation and Development but later abandoned after strong social opposition, particularly in Europe. It also adds teeth to the North American Free Trade Agreement (NAFTA). For example, the investment chapter of the FTAA is a close copy of the corresponding NAFTA chapter, but with an even more dangerous definition of *"investment"*. The ongoing destruction of peasant farming in Mexico through the exacerbation of poverty and intensification of migration is a clear indication of what the FTAA may bring to the rest of the hemisphere.

FAO/R.Jones

Supermarkets, which are already expanding rapidly in Latin America, will replace local markets like this one in Ecuador

Meanwhile, although the FTAA is now the most important multilateral negotiating process underway in the Americas, it is not the only free trade treaty being negotiated. There are more than a dozen other bilateral and multilateral negotiations going on involving countries of the Americas, and even more agreements that have already been signed. Most important are the agreements with the EU and the above-mentioned attempts by some Latin American countries to gain special agreements with the US, with even worse strings attached than the FTAA.

The problem is not just the FTAA but the advance of privatisation and the power of transnational capital. But while any reaction to the FTAA cannot ignore the other negotiations, the FTAA is one of the most aggressive and ambitious of all the processes now underway.

Under the FTAA, nutritious local foods, like the maize tortillas this woman is making, may be replaced by imported

Nuts and bolts of the FTAA

Latin American rulers recognised from the outset that the FTAA is a political agreement aimed at creating new environment for economic activity and the expansion of big capital. This new setting will be founded on at least the following six pillars:

a) Expansion of the domain of markets to all activities, including services and goods that are now public, collective or free.

All public services are to be privatised either directly (through sale) or indirectly (through public bidding). Conditions will be created to privatise entirely education, health, drinking water, electric power, communications, prisons, ports and natural areas. In its strictest interpretation, even the police, inspection services and the administration of justice could be privatised through the *"delegation"* of tasks. Also up for privatisation, making them eligible for sale, will be communal and community land, and all indigenous territories.

b) Access for transnational capital to the entire economy and all national activities.

No economic sector and no part of a country's territory, nor any property in a country will lie beyond the reach of transnational capital. This also includes health, education, urban and inter-city transportation, port and highway administration, public services, and all natural resources including water. Whenever the state privatises one of its functions, the activity will become available to transnational capital.

c) Investors protected and profits guaranteed.

International investors will not just be given a favourable environment but will be protected and will receive special, explicit guarantees. States will have to assure that the profits of transnational capital will not be affected by national regulations or laws, or by social demands. In addition, international investors must automatically receive treatment that is as favourable as, or better than, national businesses. If states do not implement all these assurances, international companies may sue to recover their foregone earnings. Not only is private property guaranteed, but the profits of transnational capital are also assured.

d) International investors on the same legal and sovereign footing as governments.

In case of a dispute, governments will have to accept secret, private arbitration. International companies may decide, if they wish, that national courts of justice have no jurisdiction over these disputes.

e) Elimination or reformation of many measures aimed at preventing abuses by big companies.

Gone will be the barriers against concentration, speculation and market control measures. The defences left standing will be those that defend business, particularly transnational corporations. The rest of the population must simply submit.

f) Aggressive expansion of intellectual property

Property rights will be granted for longer periods, and all living beings and peoples' knowledge and artistic and cultural creations will become commodities. Penalties against those who do not respect intellectual property will be more severe while the reversed burden of proof will be maintained (meaning that presumed violators are now presumed *guilty* until proved innocent).

What this all means is that states and governments will not only lay down their duty to defend the well being of their populations, but renounce whatever limited sovereignty they still enjoy today. Through many different points in the agreement, it is made clear that the central role for states and governments will be to repress their citizens in order to protect capital interests.

Impact on local communities

Because peasant sectors and indigenous peoples have held out the longest against the advance of transnational capital and globalisation, they will be amongst the sectors most violently attacked by the FTAA. This aggression will be effected through three major tools designed especially for the rural world, along with the agreement's more general measures. The three specific measures are:

* The elimination of protection for farmers, and the corporate takeover of farms, particularly small farms

* The forced privatisation of natural resources and of large territories, including water and indigenous land

* The privatisation of biodiversity in general, and the privatisation and/or destruction of cultivated biodiversity in particular

The first two of these measures are discussed in detail in the longer briefing (see details at the end of the article), but here we will focus on the privatisation of biodiversity.

The privatisation of biodiversity

Control over and privatisation of territory necessarily implies the control over and privatisation of biodiversity. Transnationals have many reasons to want to control both, some of which are:

a) Biodiversity is the fuel for industrial products

Biodiversity (plants, animals, micro-organisms) is the original source of chemicals and raw materials that will probably be the basis for all future industrial development. Biological sources are expected to provide and to produce pharmaceuticals, agrochemicals, medical material, organs for transplants, building material, energy, raw materials for all kinds of industry and almost any element that can be manufactured.

b) Biodiversity sustains the balance of life

Biodiversity is also a fundamental factor that keeps our planet operating within appropriate limits for human life. Yet this balance is becoming more precarious. Factors such as the stability of climate, availability of fresh water, regulation of river flows, the existence of ecological niches that allow species to survive, etc. are gifts from the planet that today cannot be taken for granted. Today, controlling biodiversity and all the ecosystems that nurture it means controlling who gets these gifts and being able to charge for them.

c) Biodiversity = mineral resources

The Latin American ecosystems richest in biodiversity are also the richest in oil and minerals. Yet biodiversity is life and as such easily escapes from any control. While someone may claim a plant, animal or micro organism as their exclusive property, it will continue to reproduce without permission and sooner or later will come into the hands of someone else who will continue to use, change and multiply it. This 'danger' is all the more certain when the plant, animal or even micro organism falls into indigenous or peasant hands, because it is they who have used, cared for and nurtured the planet's biodiversity for thousands of years and they will find a thousand ways to continue to do so in the future. Transnational corporations have realised that they need to monopolise both biodiversity and the knowledge associated with it, most of which is currently held by local and indigenous communities. To that end, the FTAA sets out an intellectual property system that goes far beyond the provisions of the WTO or the World Intellectual Property Organisation (WIPO). Some of the characteristics of intellectual property under the FTAA are:

1. Everything is patentable, whether as a product or a process. Exceptions allowed by the WTO are eliminated. Countries retain only the vague possibility of denying a patent if it endangers morals or *ordre public*, people's health or the existence of plants and animals. If denied, the patent applicant can appeal via the private dispute resolution mechanisms described above.

2. A patent allows its holder to control or prohibit the manufacture, reproduction, use, sale, distribution, export and import of a product. If the patent covers a process, it allows for the control over the use of the process itself and also of all activities involving the product obtained through the process.

3. In its most extreme interpretation, prohibitions or forms of control may extend as far as personal use, totally unrelated to commercial activity.

4. If the patent refers to a biological trait (such as resistance to cold), property rights extend to all organisms or biological material that have that characteristic.

5. Cultivated plants may also be appropriated through so-called *"breeders' rights",* which give basically the same rights as patents.

6. Traditional knowledge, cultural expressions and folklore are also the object of this form of property, with the specific objective of marketing and transferring them as property to third parties.

7. All information associated with a patented organism, even that provided by local populations, can be declared confidential and its dissemination sanctioned by fines or other penalties.

8. Each country must assure that it will establish rapid procedures and effective mechanisms to punish any violation of intellectual property laws.

9. All countries are obliged to join all intellectual property treaties now in force, including those recently approved or others that may be approved in the future, such as the Patent Law Treaty.[3] This has serious implications. For example, the Patent Law Treaty imposes legal texts and procedures that the parliaments of each country will not be able to adjust to their own national conditions.

[3] GRAIN, "WIPO moves towards a world patent system", July 2002, www.grain.org/docs/wipo-patent-2002-en.pdf

We can only imagine various scenarios at this point, but bioprospecting practices to date, along with control mechanisms now in place around privatised maritime and natural zones, give some insight into the mechanisms most likely to be used. The first is that access to areas with biodiversity and to the plants, animals and micro organisms that live there will be under the absolute control of those who have appropriated those areas. If anyone removes plants or animals from such areas, the material would be confiscated and the people would be fined, the same applying to unauthorised reproduction of such organisms. If a company authorised the extraction and use of living material, this could be done under very specific and restricted conditions.

A second situation is that the knowledge of entire peoples and communities will be transferred to companies upon payment to an individual or group of individuals. Once declared the property of a corporation, all the peoples and communities that used and developed the knowledge will be obliged to refrain from disseminating or even using it. Those who do could be fined or even imprisoned. Any new variety of cultivated plant will have to be grown according to the instructions given by the seed companies. In no case can the plants be reproduced. If plants are patented, the companies could even control use of the harvest. If traditional varieties are cross-bred with patented varieties, their use may be prohibited by the patent holders, or they may demand payment for the right to continue planting the offspring. The same rule would apply if a traditional variety has traits that a company has patented, even if the trait was in the local variety long before the company got it.

The FTAA will totally disregard indigenous peoples' territorial and cultural rights

All of this paints a picture in which the planting of local varieties will be progressively stamped out, even for family use, and those farmers who remain on the land will be obliged to use varieties that are patented or otherwise protected by intellectual property. Such crops will have to be grown under the conditions and for the purposes determined by industry. Industry will have total control over what is planted, consumed and marketed.

Meanwhile, biodiversity-rich zones owned by transnational companies will be exploited to extract mainly oil and biological material, under privately-set rules. As the concept of *"environmental services"* develops and expands, we may see the imposition of fees by companies that local communities will have to pay for assurance that the company will not destroy the plant cover on territories they have taken over. Communities will not only have to pay for the water but to maintain the sources of water. They may have to pay for every year without natural disasters or extreme temperatures, or for each harvest that was not wiped out by a flood or ruined by a drought. As absurd as all this may sound, the FTAA negotiating text makes it possible. What is more, a government could be accused of *expropriation* if it does not impose such payments.

The first thing we will see is the ruin and probable expulsion from the countryside of huge numbers of peasants and indigenous people, along with the total disregard for indigenous peoples' territorial and cultural rights. We will see the physical appropriation of territories by transnational corporations, which will be protected by special rules and authorities defined by private agencies. Biodiversity in wild areas will be controlled by big companies and agricultural diversity will be pushed aside for lack of markets or simply declared illegal. Local and indigenous knowledge will become business property and the peoples who created it will have to refrain from sharing or using it. Those who remain or who are allowed to remain in rural areas will have to obey the rules set by transnational companies, possibly as cheap, unprotected labour. Finally, both rural and urban populations will have to pay the companies to maintain the land which they inhabit and for all the resources they need to live.

This is an absurd aberration, made possible by the FTAA.

This article is shortened from a longer report which can be found on the GRAIN website at www.grain.org or on request from GRAIN. The longer report examines in more detail the provisions of the FTAA with respect to agriculture and how the FTAA will lead to the privatisation of natural resources and territories, including indigenous lands.

In Canada, the privatisation of farmer's seeds continues to advance at a breathtaking pace. Canadian farmers have fewer and fewer varieties of seed to choose from, fewer places to buy it from and fewer rights to produce their own seed. Now they face another threat: the contamination of the entire seed supply with genetically modified seed.

Contaminating Canada's Seed Supply

GRAIN

Plant breeding in Canada is in the midst of a radical and rapid transformation. The previous framework of plant breeding, based on a collective process of information and seed exchange, farmer participation and seed saving, and a mandate to maximise the public good, is being replaced by a framework of exclusive property rights and private profit. Public breeding programmes have been gutted. Farmer seed saving and plant breeding practices have been criminalised. The Canadian seed supply, built on generations of farmer and public sector plant breeding, is being taken over by a handful of transnational seed and pesticide corporations.

The same processes are underway in other countries, but they are particularly advanced in Canada, where the government has pursued a national biotechnology strategy since the early 1980s and where genetically modified (GM) crops already occupy a considerable portion of agricultural land. Sixty-five percent of Canada's oilseed rape (canola) crop was genetically engineered for herbicide resistance in 2002.[1] In the same year, GM crops were grown on 3.5 million hectares in Canada, up 9% from the previous year. A close look at the situation in Canada provides a chilling example of the implications of the transnational seed industry's agenda for farmers in the rest of the world. What is new to the picture is industry's role in deliberately contaminating the seed supply.

Breeding for the common good

There are two characteristics of Canadian agriculture that define plant breeding in the country. First, few of Canada's major crops are native to North America. Indigenous peoples in certain areas of Canada had highly developed agricultural systems before the Europeans arrived, growing crops such

[1] Clive James, "Preview: Global Status of Commercialised Transgenic Crops, 2002," *ISAAA Briefs No. 27*, ISAAA : Ithaca, NY, 2002.

as squash, sunflower, beans, and maize. Some of these indigenous varieties were grown on the farms of European settlers into the 20th century.[2] But, by and large, Canada's current agricultural biodiversity is relatively new and based on varieties from abroad. Canada's short-season soybean crop is based on farmers' varieties from the Sakhalin Islands of northern Japan.[3,4] Nearly every variety of wheat grown in Canada is a descendant of Marquis wheat – a cross of a farmer's variety from the Ukraine with a farmer's variety from India. Canola (a kind of oilseed rape with a particular oil quality) was developed by Canadian public breeders working with descendants of a rapeseed variety brought by a farmer from Poland in 1927.[5]

Second, few varieties grown in other parts of the world are adaptable to Canada's unique ecological conditions. The big breakthrough with wheat occurred when a Canadian farmer introduced a variety that he received from a friend in Glasgow, who collected the seeds from a ship sailing from Poland carrying wheat from the Ukraine. The Canadian government undertook extensive collection missions to find a better variety, but found none. So public breeders turned to difficult and time-consuming crosses to try and improve Canadian wheat.[6]

Canada does not have ideal seed markets for the transnational seed industry. It takes a lot of breeding work to develop varieties for Canada's relatively small markets. From a seed industry standpoint, the returns on investment for most crops are inadequate. This is not the case for the public sector, where returns are measured according to the public good the investment creates. Farmers, consumers, and the downstream food and feed industry in particular all benefit from plant breeding and it has always been carried out with the larger objective of national economic development.

Traditionally, crop development has been an informal partnership between public breeders, farmers and government. In the early 1980s, the public sector still accounted for 100% of formal plant breeding for cereals and oilseeds.[7] The government provided the financial support and farmers were responsible for the multiplication and diffusion of public varieties and seed saving. Public breeders distributed their seeds to certain farmers to carry out the first two generations of multiplication. The seed was then distributed to more farmers, who multiplied it into registered and then certified seed. The certified seed was then sold to farmers, who continued to take care of the seed by saving it for themselves, or selling it to, or sharing it with their neighbours.

Farm-saved seed has traditionally provided the bulk of Canada's seed supply. In 1978, there was only enough certified seed available for 14% of the seeded area for wheat, 31% for barley, and 30% for oats.[8] With most crops, farmers only bought seed when they felt that the quality of their seed was deteriorating. Farmers might save their seeds for upwards of six generations without any need for new certified seed, since they did an excellent job of maintaining the quality of their seed from year to year. One study in the province of Alberta in 1980 found that 60% of the farmer-saved seed surveyed was equal to the highest quality seed on the market.[9] The public good of farm-saved seed is rarely considered, but when farmers save seed they take the cost of producing, distributing and marketing new seed out of the production process. This translates into a saving of millions of dollars every year.

In this traditional partnership the returns on plant breeding were not measured by seed sales but by the overall contribution that these made to agriculture and the food system. This breeding framework has always made sense for Canadian agriculture. But in the 1970s and 1980s, the Canadian government, caught up in the hype of biotechnology and the transnational chemical industry's decision to invest in the seed market, decided to reorient policy. Establishing a private seed and agricultural biotechnology industry became its new priority, and conflicts with the traditional plant breeding framework became inevitable.

[2] Bruce Trigger, *The Huron: Farmers of the North*, Harcourt Brace Jovanovich College Publishers: Fort Worth, Texas, 1990, p 1; and, Dorrine Macnab, "Jerusalem Artichokes", *Heritage Seed Program*, Toronto, Vol.2, No.2, August 1989.

[3] HD Voldeng, "Working with breeding short-season soybean in Canada (Interview). *SoyaScan Notes*. March 2, 1993; TH Antsey, "One hundred harvests: Research Branch, Agriculture Canada 1886-1986" in *Research Branch, Agriculture Canada, Historical Series*, No. 27, 1986, pp 228-230; and, Ontario Soybean Growers Marketing Board, *Fifty Years of Progress: A history of the Ontario soybean industry*, June 1996.

[4] Gordon Ward, *A History of the Research Station Harrow, Ontario 1901-1974*, AAFC Historical Titles Series, 1978, http://collections.ic.gc.ca/agrican/pubweb/titles_e.asp

[5] Brewster Kneen, *The Rape of Canola*, NC Press: Toronto, 1992, p 27.

[6] Stephan Symko, "From a single seed: Tracing the Marquis wheat success story in Canada to its roots in the Ukraine", A web publication of Research Branch, AAFC, 1999.

[7] RMA Lyons and AJ Begleiter, "An examination of the potential economic effects of plant breeders' rights on Canada, *Working Paper for Consumer and Corporate Affairs Canada*, 1984, p 109.

Jargon Buster

Breeder Seed: Seed from a variety (cultivar) that has been produced by a recognised plant breeder or a plant breeder responsible for growing the variety under conditions which ensure that the specific traits of the variety are maintained. Breeder seed is the source of all Pedigreed seed.

Foundation Seed: The approved progeny (offspring) of Breeder Seed produced by seed growers authorised to produce this class of seed, and which is managed so as to maintain its specific genetic identity and purity. Foundation is the highest class of commercial seed

Certified Seed: The approved progeny of Breeder, Select, Foundation or Registered Seed produced by seed growers and managed so as to maintain genetic identity and purity at a high level. It is the class of seed recommended to be used for commercial crop production.

Pedigreed crop: A crop for which the Canadian Seed Growers' Association has issued a Crop Certificate which indicates that the crop has been granted Breeder, Select, Foundation, Registered or Certified crop status.

Source: The Canadian Seed Growers' Association's "Circular No.6: Regulations & Procedures for Pedigreed Seed Crop Inspection", www.seedgrowers.ca/regulations/

A sharp change in direction

The private seed industry could not make a profit in Canada on its own. The Canadian government provided hundreds of millions of dollars to the seed industry in direct subsidies, tax credits and matching public-private partnership grants.[10] It also introduced or modified laws and regulations to give the seed industry more control over the seed supply and to curtail or eliminate the participation of farmers and public breeders. These interventions were designed to eliminate public goods, like seed saving, for the sake of private profit.

In just twenty years, the seed industry and the government have reduced the old partnership to tatters. The foundations of the old system – the free exchange of germplasm and the active participation of farmers in the seed supply – are on the verge of disappearing. The transformation was deliberate, but the ways through which it took place and continues to operate are not easy to decipher. The transnational seed industry cleverly disguised its agenda to avoid opposition. This article aims to demystify one of the transnational seed industry's efforts to advance its interests: the deliberate genetic contamination of the seed supply.

Cashing in on contamination

Most major food crops in Canada are self-pollinating and highly stable. Farmers can save seeds from year to year without any serious impact on quality or performance. Until recently, seed *"purity"* was simply a technical matter of making sure that seeds were properly selected, cleaned, and stored. Genetic *"contamination"* was a meaningless concept.

With the introduction of GM crops, genetic contamination has become a major concern. Consumers in Europe and Japan, Canada's most important agricultural export markets, refuse to eat GM foods and Canadian farmers growing GM crops have lost markets. So have conventional farmers because the seed industry has deliberately contaminated conventional and organic grain supplies. It has done this by introducing GM varieties into a system where contamination is bound to occur, either by mixing during grain handling, cross-pollination, or the persistence of GM crops in fields. This is particularly the case with oilseed rape, which has the largest area planted to GM plants in Canada. Unwanted GM oilseed rape is turning up all over the place in western Canada. According to Robert Stevenson, a Saskatchewan farmer who has never planted GM oilseed rape: *"It's close to being as thick as a crop. Crop insurance considers nine plants per square metre to be a viable canola crop. Without even trying I have four [GM canola] plants per square metre. This for me is a new weed, and it's here in very significant numbers".*[11] The widespread contamination creates indirect problems for farmers as well. Monsanto, the leading GM oilseed rape company in Canada, claims that all oilseed rape plants in farmer's fields containing their patented Roundup Ready gene belong to them, even if plants arrived in the fields accidentally or the gene was transferred through cross-pollination. The Federal Court of Canada recently upheld Monsanto's interpretation in a case between the company and Percy Schmeiser, an oilseed rape farmer from Saskatchewan (see box on p 10).[12]

Contamination is not only happening in farmers' fields. A number of studies show that the pedigreed oilseed rape seed supply is deeply contaminated. Researchers at the University of Manitoba conducted a survey of 27 pedigree seed lots of oilseed rape in 2002.[13] Of the 27 seed lots, 14 had contamination levels above 0.25% and three seed lots had glyphosate resistance contamination levels in excess of 2.0%. Oilseed rape breeder Keith Downey suspects that, *"There are varieties of certified seed out there, in which part of the level of contamination is coming right from the breeders' seed."*[14] Walter Fehr, an agronomist and director of the Office of Biotechnology at Iowa State University says the same is true of other crops, such as soybeans and maize.[15] If the breeder seed supply is contaminated then the whole system is contaminated and it will be hard to find any fields that can be considered GM free. A recent report suggests that even Canadian wheat (the GM version of which has not yet been approved) may be contaminated, since researchers were testing Roundup Ready wheat at a national experimental station alongside plots of wheat destined for commercial seed growers.[16] The extent of the penetration of contaminated seed into the seed supply is now so deep that segregating GM from non-GM seed will not help at this point.

Only upstream mechanisms, such as regulation, can now prevent contamination. One tool that should be able to help is Canada's varietal registration system, which was set up to protect farmers from the introduction of varieties with negative impacts. All new agricultural plant varieties are tested for agronomic performance, disease resistance and end-use quality and only those varieties that are at least equal to the best varieties available are allowed on the market. But the varietal registration system has its limitations. Committees of *"experts"* - composed primarily of formal plant breeders and scientists, commercial seed growers and commodity group representatives – make the final decisions. The committees are not democratic and the varietal registration system is biased towards industrial agricultural systems (as opposed to ecological

[8] Pamela Cooper, "Plant Breeders Rights: Some economic considerations, A preliminary report", *Economic Working Paper,* Agriculture Canada, Ottawa, March 1984, p 23.

[9] Pamela Cooper, *ibid.*

[10] Devlin Kuyek, *The Real Board of Directors: The Construction of Biotechnology Policy in Canada, 1980-2002*, The Ram's Horn: Sorrento, BC, Canada, 2002.

[11] Reg Sherren, "The controversy over genetically modified oilseed rape", CBC News and Current Affairs, March 21, 2002.

[12] Judge J MacKay, Judgement in the case of Monsanto Canada Inc and Monsanto Inc versus Percy Schmeiser and Schmeiser Enterprises Ltd., Federal Court of Canada, March 29, 2001.

[13] Lyle Friesen *et al*, "Evidence of contamination of pedigreed canola (*B. napus*) seedlots in Western Canada with genetically engineered herbicide resistance traits", Draft Manuscript under review, Department of Plant Science, University of Manitoba.

[14] A study commissioned by the AAFC, which the government refused to release, confirmed the severity of the contamination of canola. The study found that the "... large number of canola seeds normally planted per acre plus the high probability that a small percentage of herbicide tolerant seeds will be present in most Certified Seed lots has and will continue to result in significant herbicide tolerant plant populations in most commercial canola fields". ("Organic farmers gain key piece of evidence in class action", Media Release, Organic Agriculture Protection Fund, June 26, 2002.)

[15] Karen Charman, "Seeds of Domination: Don't want GMOs in your food? It may already be too late." *In These Times,* February 10, 2003

[16] Dan Zakreski, "Secret GM wheat test raises contamination fears", *CBC Saskatchewan*, March 24, 2002: http://sask.cbc.ca/template/servlet/View?filename=gmwheat030324

Percy Schmeiser: pawn in a dangerous game

In 1982, the Commissioner of Patents recognised patents on single cell life forms and gene sequences. The Canadian Intellectual Property Office did not understand that in doing so they were opening the door to patent rights over plant varieties.[1] Nearly 20 years later, in the case of Monsanto versus Percy Schmeiser, Judge MacKay of the Federal Court of Canada ruled that Monsanto's patent on a gene gives the company rights over plants containing that gene.

Percy Schmeiser, a farmer from Bruno, Saskatchewan, had grown oilseed rape since the 1950s. The last time he claims to have purchased seed was in 1993. Since then he says he saved seed and, through selection, was able to develop his own strain of oilseed rape that was relatively resistant to various diseases. In 1996, Monsanto introduced its Roundup Ready (RR) oilseed rape, genetically engineered for resistance to the herbicide glyphosate, in the area.

Two years later, Monsanto's private inspectors took samples from Schmeiser's fields. Tests showed that Schmeiser's fields were glyphosate-resistant and the company took him to court for patent infringement. Monsanto's patent is for a gene construct inserted into plants to make them resistant to glyphosate. Monsanto argued that its patent rights extend to all plants containing the gene construct, including the oilseed rape growing in Schmeiser's fields. Schmeiser argued that he did not deliberately sow his fields with RR oilseed rape and that, if his fields were Roundup Ready, it must have occurred by way of an accidental roadside spill of RR seed or contamination from cross-pollination with neighbouring fields.

Schmeiser was found guilty of a) having Monsanto genes on his land, and b) not advising Monsanto to come and fetch it. Allegations of obtaining the seed fraudulently were dropped at the hearing, due to lack of evidence. It didn't matter whether or not Schmeiser was responsible for the RR plants being in his fields. Nor did it matter that Schmeiser did not benefit in any way from the RR seed. But Schmeiser was guilty nonetheless, and fined $15/acre x 1030 acres ($37/ha x 421 ha), plus the value of his crop ($105,000), plus $25,000 for punitive and exemplary damages. He also lost the improved genetics resulting from his lifelong practice of saving his own seed to produce his own tailor-made variety of canola, as the crop was confiscated.

According to Judge MacKay: *"The defendants grew canola in 1998 in nine fields, from seed saved from their 1997 crop, which seed Mr. Schmeiser knew or can be taken to have known was Roundup tolerant. That seed was grown and ultimately the crop was harvested and sold. In my opinion, whether or not that crop was sprayed with Roundup during its growing period is not important.* ***Growth of the seed, reproducing the patented gene and cell, and sale of the harvested crop constitutes taking the essence of the plaintiffs' invention, using it, without permission. In so doing the defendants infringed upon the patent interests of the plaintiffs. . .*** [2] (emphasis added)

"I never had anything to do with Monsanto, outside of buying chemicals. I never signed a contract. If I would go to St. Louis (Monsanto Headquarters) and contaminate their plots – destroy what they have worked on for 40 years – I think I would be put in jail and the key thrown away" *Percy Schmeiser, June 19, 2000*

Judge MacKay's decision puts the onus on farmers to identify the presence of Monsanto's Roundup Ready genes in their crops and, if found, to take steps to remove the plant or seek permission from Monsanto. Schmeiser appealled to the Supreme court to overrule the lower court decision, and on 8 May, 2003, the Court confirmed that it will hear the case. The issue of patent rights over seeds and liability for genetic contamination will now go before Canada's highest legal authority.

Schmeiser is also proceeding with a lawsuit of his own against Monsanto for causing environmental harm in western Canada and contaminating his seed supply. He recognises that "*we are up against a multi-billion dollar corporation that has deep pockets*" and that he can not do it without help. A fund has been set up to help defray the enormous costs of litigation. Schmeiser has made the following plea to the world community: "*If you want me to fight this, I can. But I need help*". For more information, go to www.percyschmeiser.com

[1] In 1998, the OECD asked the Canadian Intellectual Property Organisation whether any judicial decisions in Canada have addressed an action by a patent holder in response to the use or sale of products harvested from a specific plant variety that has been produced using a patented plant or plant that has incorporated a patented gene. CIPO's response was: *"There are no judicial decisions which have addressed this issue. Plants and plant varieties are not patentable."* (CIPO Response to OECD Questionnaire on IP Practices in the field of Biotechnology, March 2, 1998.)

[2] www/fct-cf.gc.ca; click on decisions

agriculture). Nor is the system designed to assess GM varieties.

When the first GM varieties came through the registration system, the evaluation committee took the unprecedented step of awarding bonus points for herbicide resistance (the varieties probably would not have been approved otherwise).[17] Now that the negative implications of GM crops are apparent, the committees should be able to deduct points from GM varieties where there are negative consequences for farmers. But instead the Canadian government, in close collaboration with the seed industry, is moving rapidly in the opposite direction. It is using the introduction of GM crops and the privatisation of plant breeding as a pretext to strip the varietal registration system of its capacity to fulfil its mandate.

Agriculture and Agri-food Canada (AAFC), Canada's department of agriculture, has put forward a proposal to overhaul the varietal registration system. The number of recommending committees will be cut from 20 to six.[18] Certain crops – wheat, oilseed rape, barley, rye, triticale, oat, mustard, pea and sunflower – will continue to be tested for agronomic merit, but the criteria will include only quality and/or disease resistance. Only one year of performance information will be required, instead of three.[19] This appears to be a token gesture to appease critics because, as Rob Graf, a research scientist with AAFC, suggests: *"For yield and some other agronomic traits, environment has tremendous influence, which means that one year of data cannot provide a reliable prediction of long-term performance".*[20] Kevin Falk, another AAFC breeder, says that, *"You need four years, maybe more"* to measure yield.[21]

The government and the seed industry have no interest in strengthening the current regulatory system to deal with genetic contamination. They have a very different system in mind for segregation and regulation. Once undressed, what this *"identity-preservation"* system really is is a way to shift the responsibility for genetic contamination on to farmers, while boosting seed sales.

The term *"Identity Preservation"* is everywhere in Canadian government circles these days. It's one of those catchy labels that fits in well with the current discourse of globalisation: where the future of agriculture is seen as an integrated *'field-to-fork'* system responding to an increasing number of *'value-added'* niche markets. The claim is that an Identity Preservation system will *"preserve the identity of specific lots of grain from farm to market"* and give Canada a *"significant competitive advantage".*[22] Ironically, the system is actually set up to do the opposite, since instead of preserving the identity of Canadian seed, it will occlude it, thereby stripping Canadian farmers of their competitive advantage.

There is a larger story behind the rhetoric. The Canadian prairies already has a system to protect Canada's competitive advantage. The current Kernel Visual Distinguishability[23] and variety registration systems are designed to work together to maintain the quality of Canadian exports and guarantee farmers premium prices on the world market. These systems are the cornerstones of the Canadian Wheat Board, a farmer-controlled organisation that markets wheat and barley grown by western Canadian farmers. The actual problem for farmers is not with securing competitive advantage but with preventing the competitive *disadvantages* caused by the introduction of GM varieties and low-quality varieties, which the proposed system will exacerbate. The Identity Preservation scheme is really a way to allow more varieties on the market – varieties that are rejected by export markets or do not live up to the standards of the current system. It is a way to break apart the Canadian Wheat Board to let big players like Cargill and Archer Daniels Midland Company take over the grain trade and Monsanto and Syngenta take over the seed supply. It is also a way to shift the costs and responsibility of contamination onto farmers growing non-GM crops. As pointed out by Bill Toews, a wheat farmer from southern Manitoba: *"What [the Identity Preservation system is] trying to do is introduce a lower-value variety [the GM variety] into a stream that has a relatively higher value".* This, says Toews, will *"add a segregation cost which will be shifted from the GM crop to the non-GM crop, because it is a higher-value crop that we are trying to protect. Why [as farmers] do we want to do that?"*[24]

Holding farmers to ransom

There is another important element in the larger *"Identity Preservation"* agenda, which revolves around the seed industry's scheme for an *"Affidavit System".* This proposed system requires farmers to sign a written guarantee testifying to the variety of their crop when they drop their harvests off at grain elevators. The assumption here is that grain can be segregated by maintaining the *"identity"* of the variety through the grain handling system. But let's be clear. This is not an effective system for preventing genetic contamination. The seed supply is contaminated, so knowing the variety is no indication of genetic purity. This is a trap to prevent farmers from saving seed.

The seed industry is well aware that, under the Canada Seeds Act, farmers can only declare the

[17] Laura Rance, "Annual variety exams pose difficult questions," *The Manitoba co-operator*, March 13, 1997, p.16.

[18] PRRCG Report: From the 2002 Prairies Registration Recommending Committee for Grain Annual Meeting, Meristem Land and Science, Spring 2002: www.meristem.com

[19] "The future of variety registration", *Meristem Land and Science*, May 3, 2002: www.meristem.com/prrcg/prrcg02.html

[20] *Germination*, July 2002, p 34.

[21] Laura Rance, "Canola Industry wrestles with too much of a good thing," *The Manitoba Co-operator*, March 13, 1997, p18

[22] Canadian Grains Commission, "Identity Preserved Systems in the Canadian grain Industry: A discussion paper," Government of Canada, December 1998.

[23] This system relies on grain operators looking at batches of grain and deciding which class they fall into

[24] Laura Rance, "Farmers want protection from Roundup Ready wheat," *Manitoba Co-operator*, March 1, 2001.

variety name of their crops if the crops are grown with pedigreed seed. According to a January 2003 position paper by the Canadian Seed Trade Association (CSTA) on the Affidavit System: *"A legal opinion obtained by the CSTA confirms the reality that only crops planted with pedigreed seed can be identified by a variety name in the grain handling and processing system . . . We recognise the concerns of industry stakeholders with mandating the use of certified seed. Where products are to be sold by "class", the CSTA supports a middle ground position of not requiring the crop to have been planted with certified seed. However, the grower must be able to prove the purchase of certified seed of that variety in recent years. In cases where the grain handler or processor is claiming the grain is identity-preserved the requirement for the use of pedigreed seed must be complete."*

It's hard to overstate the arrogance in this statement. First, grain handlers have been sorting farmer-saved seed by class without a problem since the classification system began in Canada. Why should farmers all of a sudden have to prove the use of certified seed in recent years? Second, as every farmer or decent plant scientist knows, you do not need to use certified seed to preserve the genetic *"identity"* of a variety. Farm-saved seed can cause agronomic problems if the seed is not properly handled, but this will not affect its quality for the end-user – unless, of course, the crop is at risk of contamination from GM crops. But, the seed industry, not the farmer is responsible for this. It is mighty unfair to penalise farmers by making them buy seed every year for a problem created by those selling seed. This is especially true when the pedigreed seed supply is as seriously contaminated as farmer's fields, a problem that the seed industry itself admits to.[25]

The CSTA's suggestions would be laughable if it were not for the fact that they are in the process of being implemented. AAFC supports the creation of an identity-preservation system and it has turned responsibility for setting it up over to the Canadian Seed Institute, a *"not-for-profit, industry-led organisation"* founded by the CSTA and the Canadian Seed Growers Association and managed by a board of industry representatives.[26] In November 2001, AAFC Minister Lyle Vanclief announced the allocation of $1.2 million to the Canadian Seed Institute to help develop its Market Delivery Value Assurance Program. According to the AAFC announcement, the program will *"help develop standards and audit procedures, as well as launch a research program to verify grain purity, develop an internet-based tracking system requiring key information during each step of the handling process, and create a national third-party certification body."* This is yet another instance of public money being used for private profit.

These developments are really bad news for farmers. They are under attack from all sides. The combination of patents, plant breeders' rights, grower's contracts, and the looming changes to the registration and classification system leaves them with no room to do plant breeding, save seeds or exercise influence over formal plant breeding programs. More and more, the new varieties that come to market will reflect a set of interests that has nothing to do with them. *"Choice"* will be an empty word for farmers. All the benefits from this transformation will go to a small number of transnational corporations, even as the new varieties they produce will continue to be based on the accumulated agricultural biodiversity of farmers, in Canada and abroad, and the preceding investment in plant breeding by the public sector. The interests of the Canadian public, not just the interests of farmers, are being sold down the river by its very own government.

People take back the seed supply

The seed industry and the Canadian government have cornered the public. Some people have tried to take refuge in the organic option, but the combination of laws and regulations that support the seed industry, the deliberate GM contamination, and the dismantling of public sector research programs are quickly turning this option into a dead end. The only possibility left is to fight back.

Farmers are leading the charge. Organic farmers in Saskatchewan, spurred by the GM contamination of virtually all oilseed rape and the looming introduction of Roundup Ready wheat, formed the Organic Agriculture Protection Fund in June 2001. The Fund is pursuing a class-action lawsuit against Monsanto and Aventis for making it impossible to grow organic oilseed rape and has initiated a nationwide campaign, with the National Farmers Union (NFU) and several other farmers' organisations and NGOs, to stop the introduction of GM wheat.[27] Various farmer-led initiatives to prevent genetic contamination are popping up elsewhere in Canada.

There are also signs of unrest in the public sector breeding community. Several breeders have spoken out publicly against intellectual property rights and the dismantling of the varietal registration system and public breeding programs. Others are proposing alternative directions for public...

...continued on page 19

[25] Mark Condon, Vice-President of the American Seed Trade Association, "Seed Genetic Purity in the Pre and Post Biotechnology Eras", Presentation Presented at the Conference *"Knowing Where It's Going: Bringing Food to Market in the Age of Genetically Modified Crops"*, Pew Initiative and the Economic Research Service of the USDA Minneapolis, September 11, 2002.

[26] Canadian Seed Industry website : www.csi-ics.com/en/

[27] Saskatchewan Organic Agriculture Protection Fund: www.saskorganic.com/oapf/ Press release on GM wheat coalition: www.nfu.ca/oppose-gmo.htm

Sprouting Up...

French farmers get organised over seeds

GRAIN

There is a ray of hope for farmers in Europe who wish to save and exchange their seeds. Over the last couple of decades, farmers and gardeners have become ever more dependent on an ever-smaller number of companies for their seeds. These seeds are homogenous and non-adaptive. They are sold regardless of the variable environments where they will be planted and regardless of the kinds of farming methods used. The introduction of genetically modified seeds is simply an extension of this *"homogenising"* of our seeds.

But organic farmers, and other farmers who used methods which do not rely heavily on fertilisers and pesticides, need small amounts of seeds from a wide range of varieties, each variety selected for their specific growing conditions. In this way, these farmers can reduce their dependence on chemical inputs and by keeping many varieties, their seeds can evolve over time, adapting to their unique environment. At the First Toulouse Seed Conference in February 2003, 400 delegates met in Toulouse, France, to discuss ways to get out of this dilemma. Many were farmers who collected and used their own seeds, but also present were activists, union representatives, academics and government researchers.

For decades, each European country has had a *National List* of seed varieties. In the 1970s, the national lists were collated into a *European Community Common Catalogue*. To sell seeds in Europe, your variety must be registered on a National List. To be on the list, the variety needs to meet certain criteria, known as DUS: Distinctiveness, Uniformity and Stability. In addition, you need to show that your plant is an improvement over similar ones (a criterion known as VCU: Value for Cultivation and Use). Farmers' seeds to do not meet these criteria - in particular, they are almost never uniform or stable. And every year the registration of a variety must be renewed on the list for a high fee. Small farmers, their seeds and their systems to maintain and develop varieties just have no place here. As a result, there has been tremendous erosion of genetic diversity in European agriculture through the legal marginalisation of diversity and small farmers.

Yet in 1998 a new directive (98/95/EC) was introduced, amending several other directives on the marketing of specific crops and the 1970 directive on the *Common Catalogue* of seeds. This directive was an important victory for farmers. After many decades of DUS, corporate concentration and genetic erosion, this directive allows local varieties to be marketed as *"varieties for in situ conservation"* or for organic agriculture. *"Conservation"* varieties are traditional or farmer-bred materials, also known as amateur varieties. But the mechanics of this alternate seed system have yet to be determined. Many at the conference felt that this is an excellent opportunity for farmers to take back control of their seeds. This legislation may also prove useful to organic farmers for another reason.

The new "Semences Paysanne" Association

- FNAB (National Federation of Organic Farming)
- Confédération Paysanne
- Nature et Progès
- Mouvement Culture Bio-Dynamique
- National Coordination for the Defence of Farm Seeds
- Other organisations working on specific crops and many involved locally or regionally

Since 1992, under directive 2091/92/EC, organic producers in the European Union are obliged to use organically produced seed and propagating material. A derogation within this regulation that allows for conventionally produced seed to be used if organically produced seed cannot be found is due to expire on 31 December, 2003. In its place, the European Commission has proposed to draw up an annex to 2091/92/EC with a list of all the organic seed varieties available – and which organic farmers would have to use. Since such a list would remove the incentive for seed producers to breed different varieties, there would be an inevitable decline in the biodiversity of organic varieties. An alternative solution may be to use the 98/95/EC legislation to register local varieties of organic seeds. This would not only be a plus for biodiversity, but would bring down the exorbitantly high cost of organic seed in Europe, which exists because there is not enough organic seed to meet demand.

To move forward on keeping farmers' seed in farmers' hands and away from the big agrochemical companies that now control the seed industry, a number of organisations involved in the Toulouse conference have formed a network called *Semences Paysanne* (Farmers' seeds). One objective of this network is to start providing some answers to how 98/95/EC can support the use of farmers' seeds.

The conference was an important meeting point for many groups to get a common understanding of the action that is needed in Europe right now. Ultimately, the new European law offers an important opportunity for farmers to regain control of their seed systems – and with that, turn around the decline of biodiversity and farmers' autonomy.

Thanks to Guy Kastler and Hélène Zaharia for the information provided in this article. For more information about the conference, the European seed legislation or Semences Paysanne, contact Guy or Hélène at guy.kastler@wanadoo.fr Tel: +33 1 43 62 04 04.

Article

In the last year, the UN's World Food Programme has twice launched what it has described as the *"largest humanitarian operation in history"* – first in Southern Africa, and in recent weeks in Iraq. But how helpful have these interventions been and are they really reaching the people who need them? More than ever, the food aid agenda is being driven by the interests of donors rather than recipients. The issue of genetically modified food aid is now also being used by the US, the world's largest food aid donor, to manipulate the agenda.

FOOD AID: Who is getting fed?

MATTHEW MELLEN

These days, famine is not generally caused by shortfalls in food. The real reasons are historical and political, and explain why many farmers in the South lack the capacity to withstand bad harvests. The inequality that exists between North and South – the legacy of colonial intrusion – has led to a spiralling decline for agriculture in the South, and the subsequent ineffectiveness of conventional aid and its ability to prevent future famines. By focusing on alleviating the symptoms of famine, without paying due attention to the causes, the dominant food aid strategies are perpetuating a system of dependence and agricultural subservience that reinforces the inequalities of the world.

The dominance of the Western countries over the majority of the world's population is greater now then ever before. But today's brand of colonialism differs in some ways from the historical model. Social control is not always executed through direct state oppression and violence, but increasingly by management and economic measures. Had Africa continued on its developmental trajectory without the influence of the Europeans, it might well not face the hunger crisis it does today. Western Europe established a relationship which ensured the transfer of wealth from Africa to Europe, which has endured ever since. Trade tariffs and agricultural subsidies are modern manifestations of the inequalities that started with colonialism. This outflow from the South to the North was $619.2 billion in 1992.[1] In terms of agriculture, *"colonialism destroyed the cultural patterns of production by which traditional societies previously met the needs of the people"*.[2]

European colonisers viewed local people, culture and agriculture as backward. Using an ideology of superiority and subordination, they replaced complex, sustainable agricultural systems with monocultures of cash crops. The introduction of the plantation signalled the divorce of agriculture from food production and the erosion of local cultural knowledge of biodiversity essential for effective

[1] Martin Khor, "South-North resource flows and their implication for sustainable development". *Third World Resurgence*, No. 46, pp 4-25, 1994.

[2] Frances Lappé and Joseph Collins, "Why People Can't Feed Themselves" in *Food First: Beyond the myth of food scarcity*, 1977, Boston.

husbandry. *"The plantation colonies became regular factories, whose only purpose was the production of sugar, coffee, and other high-priced merchandise".*[3] This commodification of agriculture introduced by the colonising forces has seriously compromised subsistence agriculture and forces African farmers to sell their produce and buy food instead. As markets are increasingly globalised these farmers cannot compete with the massively subsidised farms in the North. Having being forced to substitute their food production systems for capital generating systems, they are now caught without either food or cash. Because of these changes, famines today are primarily caused by lack of *access* to food caused by food insecurity and poverty.

That said, natural disasters and climatic fluctuations still impact food security. Food shortages as a result of natural processes cannot be avoided in certain parts of the world. The consequences of such shortages can be minimised through improved infrastructure and good food storage capacity. Sound government and regional economy is also required to enable food purchases and imports, should these be required. Tewolde Egziabher of Ethiopia's Environmental Protection Agency says that the most effective form of help for Ethiopia is *"ensuring that the food produced goes for food security by investing in infrastructural development and in the diversification of the rural economy".*[4] The UN Environment Program and the Intergovernmental Panel on Climate Change (IPCC) have warned that it is quite possible Africa's droughts are now being exacerbated or triggered by global warming and that Africa suffers disproportionately from global warming.[5] This is a cruel twist of fate considering that Africa is the least to blame of all the continents for global warming. With 14% of the world's population, it is responsible for only 3% of global CO_2 emissions.

An elderly farmer from Dere Kiltu in Ethiopia describes how thousands of cattle have died because of the lack of water and pasture. 2003©WFP/B.Barton

Ethiopia is one country that seems to be feeling these effects acutely at the moment. Varying rain patterns as a result of the consequences of *el niño* and *la niña* years mean either the north or the south of the country will struggle to produce enough food to feed the local population. These cyclical patterns were typically separated by five or six years, but recently the droughts have become more frequent, most probably as a result of climate destabilisation caused by global warming. In 2002 these weather occurrences were back to back. This freak situation will lead to crop shortfalls that could lead to as many as 20 million people being without adequate food supplies over the next year.[6] The peak time of need will be just before harvest during the months of August to October 2003.[7]

Food aid as a tool of colonialism

These days, the world has considerable capacity to respond to large-scale famines and avert widespread starvation. But the machinery that provides food for the hungry is not as effective as it should be because it is not always driven by the needs of the hungry, but by motives that tie in with the history of colonialism. The World Food Programme (WFP) is the biggest cog in the world's food aid machinery. The US is by far the biggest single donor to the WFP, providing more than 60% of aid. But it insists on either donating foodstuffs or tying cash contributions to the purchase of US produce. This policy is part of a deliberate strategy to subsidise US agriculture and undermine its agricultural competitors.[8,9] Giving aid in kind alleviates the symptoms of famine but perpetuates the causes.

It is in the interests of the US economy and agricultural sector to develop the South only so much that it opens new markets and can purchase off the US. As Lawrence Goodwin of The Africa Faith and Justice Network has observed, *"The US wants to see its corporations control life's most basic resources, including seeds, food crops and water. Unfortunately for Southern Africa, the drought plays right into this unprincipled strategy".*[10] Until recently, the US agrochemical industry focused little attention on Africa in its worldwide promotion of chemical farming. But it seems to be recognising the lost opportunities and is making greater efforts in the region, particularly in relation to GM crops (see box on p 16). David King, the UK's chief scientific advisor has echoed the thoughts of many in denouncing the US attempts to force GM technology into Africa via food aid as a *"massive human experiment"*[11] (see box on p 17). There are even indications that the world's rejection of GM crops is an important factor driving US aid practice at present. With the current global upwelling of resistance to GM crops, much of the maize that

[3] Josué de Castro, "The Geopolitics of Hunger", *Monthly Review Press*, 1973.

[4] EPA, *Ethiopia: Full of Food or Full of the Hungry?* A Brief Prepared by the Environmental Protection Authority. 2002.

[5] IPCC 2002, *Climate Change 2001: Impacts, Adaptation and Vulnerability*. IPCC/UNEP, Geneva, Switzerland, 2001, http://www.ipcc.ch/

[6] John Vidal, "Ethiopia's worst famine in 20 years", *The Guardian* (UK), 18 April, 2003

[7] Statement by Dr Tewolde Egziabher on Ethiopia's predicated food crisis and his article on Ethiopia's capacity to feed itself, 9 December, 2002.

[8] USAID procurement information www.usaid.gov/procurement_bus_opp/osdbu/book-information.htm

[9] See GRAIN, "Better Dead than GM Fed", *Seedling*, October 2002

[10] "AFJN denounces imposing GM food aid on Africa", *Norfolk Genetic Information Network* http://ngin.tripod.com/100902c.htm

[11] Mark Townsend (2002), "Blair urges crackdown on Third World profiteering", *The Observer* (UK), September 1, 2002, www.observer.co.uk/uk_news/story/0,6903,784262,00.html

A new start or a bad re-run?

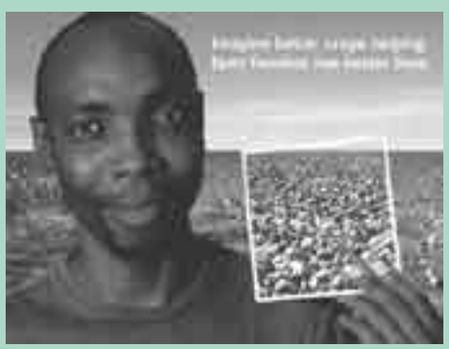
A new organisation, the African Agricultural Technology Foundation (AATF), is being set up in Nairobi, Kenya, to *"to remove many of the barriers that have prevented smallholder farmers in Africa from gaining access to existing agricultural technologies that could help relieve food insecurity"*. The AATF is the brainchild of the US' Rockefeller Foundation that was behind the so-called 'Green Revolution', which focused on industrialising farming, particularly in Asia, in the 1970s. Rockefeller and USAID are funding the start-up costs. Pre-empting criticism that the Green Revolution was bad for the environment and for small farmers, Rockefeller president Gordon Conway talks of a *"doubly green revolution"* in Africa that will be more sensitive to environmental concerns.

Four of the world's largest seed/agrochemical companies are also tied into the venture. Their motivation is said to be philanthropic, but they do acknowledge that they hope to open new markets in the long run. They have said they will donate patent rights, seed varieties, laboratory know-how and other aid. The foundation's aims are to identify crop problems in Africa that might be amenable to technological solutions. It then plans to negotiate with the corporations involved for assistance and patent licenses and seek support from African governments to help put new resources – mainly new seeds – into the hands of small subsistence farmers across the continent. The initiative is being hailed as *"the most comprehensive attempt yet to bring the expertise of the major Western companies to bear on the problems [African farmers face]"*. The foundation will be run by Eugene Terry, a plant pathologist from Sierra Leone known for his work with cassava, a tropical plant whose starchy roots are used to make bread and tapioca.

Getting involved with AATF *"has been fantastic for us,"* said Gerard Barry, director of research in a Monsanto unit that spearheads technology-sharing projects. DuPont's William Niebur declared, *"We have a real opportunity to bring not only our technology but our experience and commitment to world agriculture."* The new foundation will focus on staple crops important to Africans, including cowpea, chickpea, cassava, sweet potatoes, banana and maize. Of these crops, only maize currently represents a meaningful market in Africa for agrochemical companies.

Tewolde Egziabher, head of Ethiopia's environmental protection authority, warns that if the foundation comes to be seen as just a vehicle for pushing genetic engineering in Africa, it will fail. He expressed particular concern that the project would create seed varieties that entirely supplant traditional ones. Eventually, he said, the companies will want to be paid for their seed, instead of giving the technology away, and if old varieties are lost, African farmers may have nothing to fall back on.

Sources: Justin Gillis "To Feed Hungry Africans, Firms Plant Seeds of Science", *Washington Post*, Tuesday, 11 March 2003, www.washingtonpost.com/wp-dyn/articles/A7970-2003Mar10.htm; AATF website: www.aftechfound.org



Taken from Monsanto's website, this is the image the company hopes will appeal to Africa's farmers. Monsanto's new website centres around the word "im**ag**ine" - perhaps because such a vivid imagination is needed to envisage a positive future for Africa with corporate agriculture in control of African farmers' seeds and livelihoods.

the US is currently offering as aid to Africa could not be sold anyway. As the London Independent points out, *"Aid is the last unregulated export market open to US farmers as worried European and Asian consumers shun GM grain and introduce strict import and labelling rules"*.[12]

If we look at what is going on in Africa and the Middle East at the moment, it certainly seems that something other than human need is driving the aid machinery. We are told by the WFP that the Iraq operation *"may become the largest single humanitarian operation in history – a massive intervention totalling $1.3 billion over six months"*. It is planning to provide food aid for the entire population of 27 million people.[13] Last year, we were told by the WFP that Southern Africa was facing its worst famine in a decade and that 20 million may starve. This scenario led to massive aid mobilisation from the world community, and the US in particular, but the crisis has not played out (see below).[14] At the same time, we hear from other sources that the situation in Ethiopia has been drastically underplayed and under-reacted to, with potentially catastrophic results for 20 million people in one country alone.

These imbalances support the idea that countries receive aid not according to their need but according to the benefits that will be reaped by the donor. The benefits include opening new markets, undermining agricultural competitors and unloading surpluses. Perhaps the Southern African nations pose a greater threat as agricultural competitors, especially given their export connections with Europe and the GM-free status of their crops? Perhaps Ethiopia is less of a priority because its cultural preference for wheat deems it unacceptable for the offloading of unsellable GM maize? In the case of Iraq, it is clear that one of the outcomes of the recent invasion will be the opening of Iraqi markets preferentially to US corporations. Iraqi agriculture has declined badly in the last decade because of sanctions and the loss of US markets for export.[15] Like the other sectors of the Iraqi economy, there is a great opportunity for the US to rebuild Iraq's agriculture according to the blueprints of the corporate giants. The man who has been put in charge of the agricultural reconstruction programme is Dan Amstutz, a former senior executive of Cargill, the biggest grain exporter in the world (see p 31), who also served in the Reagan administration as a trade negotiator in the Uruguay round of world trade talks.[16]

Southern Africa – the crisis that wasn't?

Southern Africa is in the midst of what official aid organisations have been describing as the most serious food security crisis since the severe drought

of 1992.[17] The number of people judged to be in need of food aid was estimated to be more than 15 million in late 2002, and by the end of December, 270,000 tons of food aid had been distributed to the region.[18] The WFP estimated that 1.2 million tons of food would be needed to feed everyone.[19] The six hardest-hit countries were predicted to be Zambia, Zimbabwe, Mozambique, Malawi, Lesotho and Swaziland. But it seems that the scale of the famine has been seriously exaggerated. The WFP says that famine was averted because it did its job well, intervening before the crisis mushroomed. Others argue that the problem was never as big as the WFP and other agencies warned (see box, p18).

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A boy walks back from a WFP distribution centre in Atiak, Northern Uganda.

Yes – people are hungry, but they always are in the region. In Zambia and Malawi at least, this year was not any worse or any better than the average year. The UN has coined a new term for the kind of hunger Southern Africa faces – *"new variant famine"*.[20] This is famine set off by the traditional causes of bad weather or political instability, but exacerbated and made more complex by AIDS. The ongoing food crisis is also partly caused by an overdependence on maize. Maize was introduced in colonial times and replaced more diverse and drought-resistant production systems that utilised the qualities of cassava, sorghum and millets. A diversity of crops provided a diversity of benefits. These included improved micro-nutrient uptake and therefore nutritional health, greater ecosystem services (such as soil formation and water retention), better resistance to pests and diseases, and less impact should an epidemic wipe out one crop. Traditional production systems increased livelihood options.

Zambia's rejection of GM food aid stimulated much debate internationally and domestically about the nature and impact of food aid. In Zambia, one outcome of this has been a call to re-establish traditional cropping systems. Chief Sinazongwe (one of the traditional leaders in Southern Province) has called for intensified reintroduction of cassava, sorghum and bulrush millet in the valley. Dr Drinah of the Program Against Malnutrition noted that: *"Recently, the Government has realised*

Why GM crops are particularly dangerous for Africa

In addition to the general risks that GM crops carry (contamination of local varieties, lost markets for higher-value GM-free crops, high investment risk, unknown effects on ecosystems, etc), the African context presents some unique challenges. When Bt maize passed through the regulatory channels for approval in the US and Europe in the early 1990s, it was understood that 98% of it would be used as animal feed. The situation in Africa is completely different. As Charles Benbrook points out, *"If [US] regulatory authorities had felt that a sizable portion of the populations of people consuming this corn would eat it directly (largely unprocessed) and that moreover, the corn might make up as much as half or two-thirds of daily caloric intake, they would NEVER have approved it based on the human safety data presented at the time"*. Also, it is known that Bt corn may have adverse impacts on the stomach lining and that some potential food safety/allergenicity impacts are a function of gut bacteria and the overall health status of the gastrointestinal tract. No one has thought to consider how people suffering acute or chronic malnutrition may react to the consumption of Bt corn, especially when minimally cooked and processed, and present as a major share of their diet.

There are also big implications for the environment and the future food supply for African farmers. There is now no doubt that GM maize being imported into Africa will contaminate local varieties of maize in the same way that local maize varieties have been contaminated in Mexico (see p 20). Since African farmers rely on many locally developed varieties, this could have serious consequences for maize farmers throughout the continent. David Quist, the scientist responsible for discovering the contamination of local varieties of maize in Mexico, says that the best management strategy in this instance would be to encourage local seed swapping as an attempt to dilute out the transgenic plants.

Sources: Charles Benbrook (2002), "Comments to the Zambian delegation", September 13, 2002, www.biotech-info.net/zambian_statement.htm; See "Better Dead than GM Fed", *Seedling*, October 2002, p15

[12] Declan Walsh, "America finds ready market for GM food - the hungry", *The Independent*, 30 March 2000

[13] WFP, Iraq Crisis: WFP's Food Aid Operation Explained, www.wfp.org

[14] Nicole Itano, "The famine that wasn't", *The Christian Science Monitor*, 9 April, 2003, www/csmonitor.com/2003/0409/p07s02-woaf.html

[15] Randy Fabi, Iraq's farm output cut in half since 1990 – USDA, *Reuters*, January 22, 2003

[16] Heather Stewart, Fury at agriculture post for US businessman, *The Guardian* (UK), April 28, 2003

[17] See GRAIN, "Better Dead than GM Fed", *Seedling*, October 2002, p14

[18] WFP press release, "Hunger crisis set to worsen in 2003 despite fresh donations", December 30, 2002

[19] WFP, *Southern Africa Crisis Response*, July 2002, www.wfp.org/

[20] Nicole Itano, *op cit*.

the importance of crop diversification, the appropriate use of indigenous foods, and the importance of integrated systems that include livestock for income and draft power. This year the government has put a lot of money in programmes such as the fertiliser and seed support programme for small-scale farmers ($30 million) and the Food Security Pack for vulnerable but viable farmers ($6 million). The programmes promote traditional crops and diversity, with emphasis on cassava as a reserve, and food security crop, preservation and storage. In general the agricultural policy is being changed to promote growth and sustainability".[21] This is a significant development of policy and illustrates how certain African governments are starting to recognise the threat that industrialisation and genetic engineering pose to African agriculture.

Responding to the crisis

Politics apart, there is no doubt that there remain a great number of hungry people in Africa. In a recent statement in New York, WFP head James Morris urged the Security Council not to forget the 40 million Africans in danger of starvation as heads turn towards the humanitarian crisis in Iraq. But, he argues, many African families would *"find it an immeasurable blessing"* to be in the shoes of most Iraqis when it comes to the amount of food available to them. Morris' statement does not make for easy reading as he catalogues the problems that African countries face.[22] The scale of the problem – in Southern Africa, Ethiopia, Eritrea and the Sahel – is mind-boggling and underlines just how ineffective current food aid strategies are. Morris lists a number of steps that need to be taken to address the situation, some of which do emphasise the importance of long-term thinking to stimulate agriculture in the region and curtail global trade policies that suffocate local production. Clearly conventional aid must be forthcoming to prevent a monumental tragedy but the emphasis must shift to poverty prevention not just alleviation.

Morris makes light of the issue of GM food aid, which he claims *"has faded and is no longer delaying and disrupting deliveries. Five of the six countries needing aid in Southern Africa are accepting processed and milled GM foods".* Given the enormous pressure that weighed in on the government of Zambia for standing its ground in rejecting GM food aid, it is perhaps not surprising that the others did not follow suit. But to claim that the GM food aid issue has faded is somewhat laughable, given the slanging match that continues to rage between the US and the EU on the matter.[23] Despite the US' persistent insistence that there weren't enough non-GM food reserves to make providing non-GM food aid viable, the US did follow in the footsteps of the EU and several other donor countries and ended up

Zambia's famine

In Zambia early last year, the government began encouraging imports to plug a 630,000-tonne maize deficit, which prompted the WFP to declare that a quarter of the population was in need of food aid. Guy Scott, a former minister of agriculture in Zambia and now an agricultural consultant, says that the WFP exaggerated the number of people in need in Zambia by a factor of at least two. He doesn't claim that the exaggeration was intentional, but says the WFP's assessment of the situation was based on flawed data and influenced by the government which had a political interest in seeing as much free food distributed as possible.

When the Zambian government banned GM imports from the US in June, the WFP made no move to bring in alternative food supplies and remove the GM food aid that had already been delivered. There was even a surplus of 300,000 tons of cassava nationally, which could have been bought to benefit Zambia's agronomy and economy. The UN confirmed there was enough non-GM food in Southern Africa and on world markets to deal with the famine, but the US was recalcitrant. The reason for delaying the procurement of GM-free food aid was simply to put the Zambian government under pressure to accept GM food aid. It seems that the United States Agency for International Development (USAID) was manipulating the WFP not just to subsidise its farmers and shifting unsellable surpluses, but also as a way of *"integrating GM crops into local food systems".* This is one of the goals USAID broadcasts on its website.

According to Scott, for three months after the government's GM food aid ban, the WFP distributed less than one-third of the food they said was needed. For the two months after that, it was less than half. If things were so bad, he argues, there should have been some visible negative effects from these five months. Not only is there no evidence of increased deaths, he says, but there is also little evidence that malnutrition reached a crisis level among children, who usually suffer the quickest in times of food crises. Bernadette Lubozhya of Zambia's Agricultural Training Centre and the Jesuit Centre for Theological Reflection confirms that no one in Zambia has died of hunger this year. She adds that the Vulnerability Assessment Committee (VAC) in its January report found that malnutrition levels are still the same as at their August 2002 reports, and in some cases the levels had actually improved.

Sources: Nicole Itano, "The famine that wasn't", *The Christian Science Monitor,* 9 April 2003, www.csmonitor.com/2003/0409/p07s02-woaf.html;"Continued pressure against Zambia on GM food", *Afrol News,* 30 October 2002; www/usaid.gov/press/releases/2002/fs020612.html; Personal communication with Bernadette Lubozhya, 2 May, 2003.

[21] Cassava mobilisation project proposal, *Cassava an Alternative to Maize, for Relief Food in Zambia*, Programme Against Malnutrition, Catholic Commission for Development (CCD) and Christian Council of Zambia (CCZ), November 2002

[22] James Morris, *Africa's Food Crisis as a Threat to Peace and Security,* Statement to the UN Security Council, New York, April 7, 2003.

[23] "Immoral Europe", *Wall Street Journal,* 13 January 2003, and Pacal Lamy, "EU doesn't tell Africa GM goods are unsafe", *Wall Street Journal,* 17 January 2003. www.mindfully.org/GE/2003/Lamy-EU-Foods-Unsafe17jan03.htm

giving a 30,000 tonne GM-free maize donation to Zambia, which suggests that international pressure may be having some effect. But at the same time, it seems that the US is using food aid as a way to deliberately contaminate seed and grain sources all over the world as part of its strategy to make segregation of GM and non-GM crops impossible. Other African and Middle Eastern countries are now facing the same dilemma as Zambia: accepting GM foodstuffs from the US or rejecting them and hoping the international community will rally round and provide cash instead. There is a great deal of anger about having to make such a lousy choice. As an editorial in the Gambia's *Independent* says, *"The continent of famine and drought is living up to her nickname as the world's dumping ground".*[24]

But aside from the GM debate, Zambia is experiencing other problems related to food aid. Farmers bringing in the winter maize harvest are having trouble selling it because the market is flooded with imported maize. In March, former president of the Zambia National Farmers Union (ZNFU) Ajay Vashee told Reuters that Zambia expected to harvest about one million tonnes of maize for the 2002/03 season, a harvest he said would exceed domestic needs by about 100,000 tonnes. *"The food crisis is over",* says ZNFU executive director Songowayo Zyambo. *"The situation on the ground is that there is enough maize, both imported and local maize. The unfortunate development is that early (winter) maize farmers have found themselves with no good market because millers are claiming to have enough stocks".*[25] The same situation is presenting itself in South Africa, which is having trouble finding markets for this year's above average maize harvest, owing to the large-scale imports of imported maize.[26]

The aims of development and international aid programmes must be to increase local peoples' control of their own livelihoods. This cannot be achieved whilst people regularly suffer from a lack of food. The key to maintaining food levels is through local food security. The International Fund for Agricultural Development says that securing local food security requires putting in place (a) measures to enhance and stabilise household access to, and availability of, food across seasons and shortages; (b) activities to sustain food supply in the long term; and (c) constant attention to the adequacy of food while complying with nutrient and safety requirements and cultural preferences.

The adoption of industrial agriculture in the south will do nothing to put these pieces in place. GM technology will lead to a loss of diversity in third world agriculture and a loss of control and food sovereignty. The current food crisis in Africa is not an inescapable reality of life on Earth but a continuation of a trajectory of exploitation that began in the late 15th century when Africa and Europe where drawn into common relations. By restructuring the global economy and applying appropriate technologies logically to our problems we can build equitable, sustainable societies in which hunger is experienced by all, but only as a prelude to eating.

[24] Editorial in *The Independent*, Gambia, 24 March, 2003, http://allafrica.com/stories/200303240169.html

[25] Shapi Shacinda, "Higher Zambian winter maize crop finds few buyers", *Reuters*, April 23, 2003

[26] Toby Reynold, "S. Africa maize surplus falls, still pressures price", *Reuters*, April 30 2003.

Matthew Mellen is an activist and researcher working for The Gaia Foundation in London. For the last six months he has been focussing on the GE Food Aid campaign.

...Taking back the seed supply (from page 12)

programmes. Frustrated by the increasing scope of intellectual property rights, Tom Michaels, the Associate Dean of the Ontario Agricultural College, is working on a proposal for a General Public Licensing system for plant varieties that would keep plant varieties and their descendants freely available for use in any breeding program.[28]

These various voices need to come together. There is no reason to believe that the current trend cannot be stopped. The industry lobby is much weaker than its appearance suggests. It is essentially a small elite of scientists and business people, heavily tied to the transnational biotech industry, who have managed to co-opt government for their own purposes. They are deeply dependent on government support and intervention, but do not have the confidence of a sceptical Canadian public.[29] In order to stop the seed industry's reckless and deliberate contamination of Canadian agriculture and its take-over of the seed supply, people have to take government back into their own hands. This is no small task since the window of opportunity is growing smaller by the day, but it is by no means unachievable.

[28] Personal communication from TE Michaels, Department of Plant Agriculture, University of Guelph, Guelph, Ontario, Canada N1G 2W1.

[29] National Science Foundation, *Science and Engineering Indicators, 2002,* National Science Board: Arlington, VA, USA, April 2002: www.nsf.gov/sbe/sts/sein02/toc.htm

David Quist

David Quist was one of the authors of the first study to report the contamination of one of the centres of genetic diversity with genetically modified (GM) crops. The paper erupted into what has become known as the 'Mexican maize scandal'. Here GRAIN talks to Quist about the aftermath of the volcano and the implications for farmers, scientists and consumers.

GRAIN: What is the story behind the study that ignited such controversy around the world?

David Quist: The story began in a small laboratory in Oaxaca in the highlands of Mexico. My professor Ignacio Chapela had been serving as a scientific director for four indigenous communities which had banded together to manage their natural resources. I had been working with them on another project, but would also help them with technical workshops. These were all indigenous-run projects with the ideas and initiatives coming from the communities themselves. One question that came up for them was whether GM crops were an issue they should be concerned about. We said that Mexico had a moratorium on planting transgenic crops at the time, so it should not be something they needed to worry about immediately, but it might be something they would want to consider down the line as the situation might change.

The groups wanted to learn more, so on one of my trips there, I brought some transgenic corn with me and we ran a workshop on testing for transgenic DNA. We needed a transgenic-negative control, and what better place than the highlands of Oaxaca, the birthplace of maize? We worked out a sampling protocol, did the DNA extraction and ran the analysis. The day before the workshop I ran a test sample and couldn't believe the results - some of the native corn tested positive. We had also taken a sample from the local food agency, which also tested highly positive. These food agencies distribute food in every village throughout the country, and while the maize is supposed to be used only for consumption, there is no label on it saying, *"Do not plant this"*. This means that in every village in Mexico has these point sources of potential contamination.

We went back to the lab, did some new sampling, and more widespread and stringent analysis, the results of which became the *Nature* paper.[1] But first we felt we had to go to the Mexican government to let them know what we had found, even if it might compromise our ability to publish the work. In the *Nature* paper, we made two main statements. The first was simply that genes from the transgenic corn had migrated into native populations. For this we used a technique called PCR, which is widely used to amplify the DNA of interest into sufficient quantities to identify and analyse it. It is the standard tool for GMO identification used by regulatory agencies throughout the world for accepting or rejecting shipments of GM-free grain. The second statement was more exploratory and used a new technique called inverse PCR that allows us to look more specifically at where in the plant's genome the transgenic DNA is located. To our surprise we found it in a diversity of places within the native maize genome. There could be various explanations of why this might be, one of which is that the transgenes had become reinserted through recombination.[2] We felt there was sufficient evidence to suggest that this explanation might be true, so we published it. And that is part of what science is: proposing novel explanations from observed patterns in data, from which further work is done to substantiate or refute the initial findings.

Ignacio Chapela

Since 1998, **David Quist** has been a graduate student in the PhD Programme in Environmental Science, Policy and Management at the University of California, Berkeley, California. A mycologist by training (someone who studies fungus), he made the discovery about the contamination of maize varieties in Mexico quite by chance. Since the study that was published in *Nature*, his work has become more focused on transgene ecology - ie how genes move about in the environment. David Quist can be contacted by email at dquist@nature.berkeley.edu

We knew this was a bit novel, a bit *"out there"*, because there was no previous science behind it and no-one was doing it. At least there was nothing in the peer-reviewed literature, but it wouldn't surprise me if companies have done this kind of work without publishing it, if they did not like what they saw. People responded by saying that there is no evidence that this kind of gene shuffling is what is going on, but no-one has looked, no-one has asked these questions before. We wanted, and expected, a strong reaction, but not in the way it came.

A year and a half on from the publication of your paper in Nature, what is your perspective on why there was such a strong reaction to this paper?[3]

The first wave of response was to trivialise the first statement that we made, which simply said that the transgenes were present in the native landraces. The proponents of biotech were saying 'we know that commercial varieties cross with local varieties all the time - no big deal.' What created a bigger response was what we were exploring in looking at what those genes were doing once they got there. We were going against the propaganda of the industry which says that this technology is precise, this technology is stable. We were suggesting that it is unstable, which infuriated the pro-biotech community. Another reason was that the timing of these findings was really bad for the industry - our findings were biting up against the debates on the moratoria in Europe, Mexico and Brazil. It was a huge PR disaster. In addition, the industry was in a downturn economically. When you look at where the strongest reaction was coming from, there were very significant links to Berkeley and the Berkeley-Novartis deal that was signed five years ago.[4] At that time a number of groups were raising concerns about what it meant for academic freedom, student education, and so on. Dr Chapela was a leading opponent of the signing of the agreement within the college and I was also involved in a vocal group opposing the deal called Students for Responsible Research. I don't think it is insignificant that the most vocal detractors of our paper came from the camp that supported the Novartis deal back in 1998.

What has been the effect of all this on the work you are doing, and has there been follow-up work?

The contamination of local maize varieties was a completely unexpected discovery. I wasn't working on maize when it happened, and I wasn't looking for this when it happened. My training is in mycology. However, since this study I have switched to asking questions about gene flow and how genes move in the environment, both horizontally and vertically[5] and I am doing some follow up work in that area. Transgene ecology is a fledgling field. There are a couple of other institute, such as the Norwegian Institute of Gene Ecology[6] and the New Zealand Institute of Gene Ecology,[7] which are doing some great work, but I don't think they are working on agricultural issues to any great extent. And unfortunately, when a particular branch of science becomes politicised, it becomes a hot potato that scares others away from working in the field. In the case of maize, who is asking the questions about the implications for farmers, human health, and global food systems? In Mexico, those questions have still to be answered. To its credit, the government is doing follow up work to look at the scale of transgene contamination around the country, but it has yet to employ any kind of strategy to try and manage it or ascertain its significance.

On a different tack, a number of civil society groups, spearheaded by Greenpeace,[8] applied in April 2002 to the North American Free Trade Agreement's Commission for Environmental Cooperation (CEC) to investigate the issue. CEC's mandate is to look at the environmental impacts of the NAFTA agreement or environmental issues that will impact the NAFTA agreement, and accepted the challenge. But I'm very sceptical that, given the composition of the committee appointed to investigate the issue and also the nature of the CEC's mandate, that the investigation will have the political fortitude to state anything other than 'there is no evidence that this poses any harm, therefore we should continue importing maize from the US'. However, there is no way they could make a statement like that from a scientific, ecological point of view without conducting rigorous science, which I do not think they are not doing, at least at this point. They are just going to come up with the usual fallback position that absence of evidence is evidence of absence, which is scientifically fallacious.

[1] David Quist and Ignacio Chapela, "Transgenic DNA introgressed into traditional maize landraces in Oaxaca, Mexico", *Nature* Vol. 414, pp541 - 543 (2001) www.cnr.berkeley.edu/chapelalab/Research/Chapela_Research.htm

[2] ie the transgenic material had become fragmented and scattered throughout the genome

[3] For a fuller insight into what became publicly known as 'the maize scandal', go to www.biotech-info.net/mexican_bt_flow.html

[4] Under this agreement, Novartis provided $25 million to the Department of Plant and Microbial Biology (a third of the department's income) in return for first right to negotiate licenses on roughly a third of the department's discoveries (including research funded by public money) and 2 out of 5 votes on the committee that determines how the department's money is spent.

[5] Vertical gene flow is the way in which genes are passed on from parent to offspring through cross-pollination. Horizontal gene flow is the direct uptake and incorporation of foreign DNA into cells

[6] www.genok.org

[7] www.nzige.canterbury.ac.nz/

[8] Greenpeace press release, "Mexican Groups, Greenpeace Launch NAFTA Appeal To Force Action Against Genetic Contamination", April 24, 2002,www.greenpeaceusa.org/media/press_releases/2002/04242002text

David Quist

Where it all began - maize growing around the village where the study was done in the highlands of Oaxaca, Mexico.

The Mexican government did a follow-up study in response to your findings. What kind of research did they do and how was their research received?

In the first round, samples were taken from 22 communities in Pueblo in Mexico, 15 of which tested positive using the same PCR technique that we used. Since then, they have done a much more expansive study in terms of sampling and techniques. The government submitted its results to *Nature*, but its paper was rejected in October 2002.[9] Two reviewers rejected the paper for opposite reasons. One said that the findings were *"obvious"* (having already been reported before in *Nature*), while the other said they were *"so unexpected as to not be believable."* To have two reviewers making such drastically different interpretations of the same data is interesting - there is obviously a story behind that.

From Iowa to Oaxaca: Easy passage for the Bt gene

Maize is the most important crop in Mexico. About 1.5 million hectares of the maize grown consists of hybrid varieties (developed mainly by transnational companies), 0.9 million hectares are open pollinated varieties (developed by the public sector and small companies) and the remaining 5.5 million hectares are planted to local land races. Some 68% of the maize grown in Mexico is used directly for human consumption. Maize is also an extremely important crop to the US, the world's largest maize producer and exporter. In 2000, Mexico was second only to Japan as a market for US maize, absorbing 11% of US exports. Some 24% of total corn consumption in Mexico now comes from the US. Since 1996, US maize exports to Mexico have increased as exports to Europe have decreased, owing to Europe's rejection of GM maize. Of the 5-6 million tons of maize that were imported to Mexico in 2000, 30%-40% was transgenic, but was not segregated or labelled. That same year Mexico had exactly the same amount of domestic maize rotting away, unused.

The maize that comes into Mexico gets distributed through welfare food systems around the country. It is subsidised from beginning to end by US taxpayer dollars. Incredible amounts of money go into the production of this grain that receives subsidised water, soil, machinery and oil; is subsidised in international markets; and subsidised again in Mexico through distribution. It just floods the country. When you talk to a farmer in Oaxaca, they say, *"It costs six pesos to grow seed; I can buy it for four."* The farmer is paying out of his or her pocket to plant his or her own seed. Small wonder that transgenic maize is so widespread in the fields of Mexico...

Sources: "Dr Ignacio Chapela on Controversy, Corn and What's Really at Stake in Mexico", *Global Pesticide Campaigner,* August 2002; Chantal Carpentier and Hans Herrmann, *Maize and Biodiversity: The Effects of Transgenic Maize in Mexico: Issues Summary,* CEC, www.cec.org/programs_projects/other_initiatives

The Mexican Government established a moratorium on planting GM corn in 1998, so how did the transgenic maize get there?

In our local setting, we suggested two possible sources of contamination - very local sources (such as the food agency maize) or that it was wind blown from the industrial maize planted in the valley about 60 miles away in Puerta Vallerta. The first explanation seems the most likely: farmers have admitted that they have planted food agency maize. The food agency maize we tested was highly transgenic - its positive signal was as strong as our transgenic positive. There are also a number of agricultural research stations that have been doing field tests of GM corn in open field plots before and after the moratorium came into effect.

What are the implications of your work for farmers in Mexico, and small farmers in particular? What are the biggest threats to them?

One is all the unknowns - the ecological significance, the effects on human health and genetic diversity, for instance. Those kinds of studies should have been done already, but weren't. We just don't know. The second is the unresolved questions related to liability and intellectual property issues. If Monsanto goes into the highlands of Oaxaca and finds its genes in a farmer's field, who shoulders the liability – the farmer or the corporation? In the case of Percy Schmeiser, the liability fell with the farmer (see p 10). But according to the 'polluter pays' principle, if the company has compromised the farmer's ability to produce for certain markets, then the company should be liable. The third major threat to farmers is the loss of markets owing to the pollution of their maize crops.

What about the wider implications?

I am concerned about the impact on science. It is unfortunate that the debate became so politicised and the real issue was discredited because of some disagreements over the interpretation of the I-PCR data. While there was a lot of noise made about the paper, there has been what I call *"scientific silence"* over it: no-one is doing the follow up work to refute or support our findings and no-one is asking what the implications of them are. People have reacted defensively: because they don't

[9] Food First Press Release, "Nature Refuses to Publish Mexican Government Report Confirming Contamination of the Mexican Maize Genome by GMOs", October 24, 2002, www.foodfirst.org/media/press/2002/naturerefuses.html

see what they expect to see, they call our results *"erroneous"*. This kind of approach is a disservice to science. What we are seeing more and more is that the science of substantiating facts is overriding science as a process, which is all about questioning and re-examining our assumptions, in order to lead us to a better understanding of reality. The way that the debates are framed and the inability of corporate science to re-examine its paradigms are compromising good science. What message does this send to other scientists who make the 'wrong' findings or ask the 'wrong questions', ie those that go against the science of the corporate agenda?

The events that have occurred also raise a lot of questions about the true objectivity of the peer-review process in scientific reporting. *Science* recently published a fairy tale story about the success of Bt cotton in India,[10] despite the fact that Bt cotton is failing miserably all over India. *Nature*'s handling of our paper suggests that it was under pressure from the industry camp. As the heat built up, the journal did not handle things very well and made a lot of people angry, on both sides. Two of the three referees said that they did not challenge the main conclusions of our paper, but suggested writing a correction to part of it. Why didn't the editor make this clear, point out that there were some issues of contention over certain aspects of our findings, and put out calls for more work on the subject? Why the need for a disavowal? And why were most people left with the impression that the paper had been retracted, when it was not? A hallmark of good science is in asking exploratory questions - just as we were doing. We weren't out of step with that, but the response we received was out of step with the way that normal scientific discourse should happen to advance scientific knowledge. Situations like this call into question whether these journals can continue to be looked to as a reliable source of objective science.

Maize, as pictured in Kopokelli's new book (see p 30)

[10] Matin Qaim and David Zilberman, "Yield Effects of Genetically Modified Crops in Developing Countries", *Science* Vol. 299: 900

Sprouting Up...

Cupuaçu – a case of Amazonian self-assertion

The immense biological wealth of the Amazon rainforest has been the subject of plunder for centuries. Through the globalisation of intellectual property rights, it is now being subjected to a new round of colonialisation. Patents have already been granted on literally all well-known Amazonian and Andean medicinal plants, incuding Andiroba *(Carapa guianensis Aubl.)*, Copaiba (*Copaifera sp*), Cat's Claw (*Uncaria tomentosa)*, Maca (*Lepidium meyenii*), Sangre de Drago (*Croton lechleri*), Quebra Pedras (*Phyllanthus niruri*), and Wormseed (*Chenopodium ambrosioides*). Almost all of these patents were registered by companies or people from the North.

Cupuaçu (Theobroma grandiflorum) is a small to medium tree in the rainforest canopy that belongs to the cocoa family. Cupuacu fruit has been a primary food source for both indigenous peoples and animals alike. It is is known for its creamy, exotic-tasting pulp, which is used throughout Brazil and Peru to make fresh juice, ice cream, jam and tarts. Because of its close relationship to the cocoa-tree (Theobroma cacao L.), Cupuaçu seeds can also be used for manufacturing chocolate-like foodstuffs. Cupuaçu-chocolate has been produced in Brazil since 1983 and is known as 'Cupulate'. Cupuaçu has certain nutritional properties that distinguish it from cocoa. Cocoa contains the stimulant theobromine, a close structural relative of caffeine. Cupuaçu does not contain theobromine, which makes it an appealing, healthy alternative to chocolate. *Photo: J.Diaz*

Recently, a new campaign has been launched by a group of Brazilian NGOs in relation to the Cupuaçu fruit. The campaign began in December 2002, when the NGO Amazonlink.org discovered the existence of several worldwide patent applications on cupuaçu oils and chocolate. It also found that the name of the fruit had been registered as a trademark in the EU, US and Japan by Japan's Asahi Foods and its allied US company, Cupuacu International. Amazonlink's sensitivity to the issue of biopiracy had been aroused when it participated in the international *"Growing Diversity"* Workshop in Rio Branco, Brazil in May 2002 (see *Seedling*, July 2002, p 16), and this laid the groundwork for the campaign.

The Cupuaçu campaign addresses a variety of forms of piracy of biological resources and cultural elements – not just patents. Many of the pirated plants have also been trademarked (such as Açai™, Sangre de Drago™, and Cupuaçu™). Many names of plant and indigenous peoples have also been registered as internet domains for commercial purposes, such as www.cupuacu.com, www.cupuacu-int.com, www.sangrededrago.com, www.yanomami.com and www.ashaninka.com. The campaign is being coordinated by the Brazilian network Amazonian Work Group (GTA) in collaboration with Amazonlink.org, other NGOs and groups of small producers. A challenge has been submitted against the Japanese trademark number 4126269 CUPUAÇU at the Japanese Patent Office. In Germany, a group of NGOs is preparing an objection against patent request EP1219698A1 on Cupuaçu oils and chocolate at the European Patent Office.

The campaign has many plans including workshops, websites and awareness-raising activities amongst local communities. The Cupuaçu case is attracting a great deal of attention in Brazil and first meetings with government members have been very positive. The campaigners believe that the Lula government, especially via Environment Minister Marina Silva, will contribute to civil societies' fight against biopiracy and take a determined approach against biopiracy via the World Intellectual Property Organisation. There is a sense of a new era dawning in Brazil and the Cupuaçu case could become a landmark in the formation of Amazonian and Brazilian civil society's self-assertion and capacity to act.

At a first glance, the biopiracy issue appears to unify different social and political groups. It is common sense in Brazil to be concerned when a Japanese company to register trademarks and patents on an Amazonian fruit. But at the deeper level, it becomes clear that there are many different ideas about what it means to fight biopiracy. On one hand there are efforts to preserve biological and cultural diversity by strengthening indigenous groups as autonomous partners in this process. On the other hand there is a quite opposite approach. For many years conservative groups in Brazil have been arbitrarily accusing NGOs and indigenous organisations of facilitating biopiracy and causing what they call the *"internatonalisation"* of the Amazon. In order to prevent this,

they propose large-scale military projects and the reshaping of environmental and indigenous policies in the interests of 'national security'. There is a need for factual information and an open discussion, so people can make up their minds and will not be seduced by oversimplistic xenophobic argumentation.

Another important issue which must be considered is that the Western concept of 'property' is not necessarily inherent in indigenous cultures. Their non-conformity in this realm has always led to prejudice and discrimination against these cultures and caused their disadvantage. They are condemned to be permanent losers in a game whose rules are established and constantly reinvented by the other side. Filing requests for the revoking of patents and trademarks can only be a small part of the strategy to realise the autonomy of indigenous peoples. Even efforts to create legal mechanisms to protect traditional knowledge will not resolve the problem in the long run. If we are interested in sustainable development and fair relations with traditional cultures, the discussion must go to the roots of the problem. Patents on life forms must be rejected and the concept of intellectual property itself needs to be reassessed.

For information about the campaign and on-line protest, visit www.amazonlink.org/biopirataria or email gtanacional@gta.org.br

19 April, 2003: *The campaign organised a demonstration against the patents and trademarks on Cupuaçu at the traditional Cupuaçu Festival near Manaus. The act was supported by Greenpeace and the banner below made will be presented at a special session in the Brazilian National Congress and at the WTO meeting in Mexico in September.*

Hundreds of visitors sign a huge banner saying: "O Cupuaçu é nosso!" (Cupuaçu is ours).

Action!

What? **Philippine Hunger Strike**
When? April 22, 2003
Where? Manila, Philippines
Who? NGO activists/farmers leaders

As *Seedling* went to press, several activists were on day 19 of an indefinite hunger strike in front of the Department of Agriculture, to demand that the government stop the distribution of genetically modified Bt corn, which is scheduled for commercial distribution nationwide by Monsanto starting in May or June this year. According to hunger striker Roberto Verzola, who is secretary of the Philippine Greens, *"We have tried everything legally possible in the past five years to stop this corn variety from being distributed, in vain. Once widespread distribution and planting starts sometime May or June, the irreversible spread of this poison-bearing maize will begin, and there's very little we can do about it".*

Contact Ping Peria by email at searice@searice.org.ph

What? **Letter campaign to save Jasmine rice**
When? Immediately
Where? Everywhere
Who? US Department of Agriculture

Jasmine rice is a fragrant rice bred by generations of Thai farmers. The livelihood of 5 million Thai jasmine rice farmers is threatened by a research project, currently being carried out in the USA. The research, supported by the US Department of Agriculture under the *"Stepwise Program for Improvement of Jasmine Rice for US"*, attempts to develop new strains that can be easily grown in the US. The research could lead to jasmine rice patented and produced in the US, destroying the markets of the Thai farmers. As smallholders are exclusively dependent upon cultivating jasmine rice for their livelihoods, this could turn into a violation of their right to feed themselves. An international action is necessary to support the rice farmers in their struggle for sustaining their right to food. Jasmine rice farmers have protested several times against the US plans, but to no avail. FIAN is asking people around the world to write letters to the US Department of Agriculture, requesting a guarantee that the current research would not affect the right to food of these farmers. FIAN also requests that copies be sent to International Rice Research Institute.

Contact: FIAN (For the Right to Feed Oneself) International Secretariat, PO Box 10 22 43, D-69012 Heidelberg, Germany. Tel: + 49 6221 653 0030, Fax: + 49 6221 830 545, Email: fian@fian.org, www.fian.org

What? **Conference on *"GMOs - Co-existence or Contamination?"***
When? 28 May, 2003
Where? European Parliament, Brussels
Who? Friends of the Earth Europe/ European Greens, EURO COOP and The Heinrich Boell Foundation

The conference aims to discuss the co-existence of organic and conventional farming with genetically modified (GM) crops in Europe. EU policy on Genetically Modified Organisms (GMOs) has reached a crossroads. This year important decisions are expected to be taken, most notably the question of whether to allow new GM crops for cultivation. To date, the EU has followed an ambivalent approach: on the one hand, it wants to facilitate the further commercialisation of GM crops in Europe, while on the other hand it wants to set strict conditions, including consumer choice for GM food and protection of the environment against the risks of GMOs. This policy has so far resulted in the adoption of a Directive for the Deliberate Release of GMOs and legislative proposals for the labelling and traceability of GMOs used in food and feed products. It has often been suggested that these two pieces of legislation will pave the way for

What? **The battle over GM wheat**
Where? US and Canada
When? Now
Who? Farmers' and consumer groups

The biggest battle yet in the history of genetically engineered foods in North America is rapidly developing. The crop of controversy is wheat. Late last year, Monsanto applied for approval to grow and sell genetically engineered wheat in both the US and Canada. If approved, the first commercial crops of genetically engineered wheat may be planted as soon as 2004. Monsanto, the world's largest producer of genetically engineered crops, has been losing money dramatically over the last few years. If the company can begin selling genetically engineered wheat in the US and Canada, it may be able to start earning profits again. For several years, the US and Canadian wheat industries have opposed the introduction of genetically engineered wheat.

For several years, the US and Canadian wheat industries have opposed the introduction of genetically engineered wheat. But that changed dramatically in January of this year at a meeting of wheat industry officials in Albuquerque, New Mexico. At that meeting, US wheat industry officials decided to form a partnership with Monsanto and push for the introduction of genetically engineered wheat. The Canadian Wheat Board continues to oppose GM wheat. With annual sales of between $Can 4 billion and $6Can billion, the Canadian Wheat Board is one of Canada's biggest exporters. It sells more than 20 million tonnes of wheat and barley to over 70 countries each year. *"Being shut out of premium wheat markets around the world could cost farmers hundreds of millions of dollars per year,"* says Board Chairman Ken Ritter. The Campaign to Label Genetically Engineered Foods has started the Save Organic Wheat! Coalition (see the website below).

Contact: The Campaign, PO Box 55699 Seattle, WA 98155, Tel: +1 425 771 4049, Fax: +1 603 825 5841, E-mail: label@thecampaign.org, Web: www.saveorganicwheat.org.

large-scale cultivation of GMOs in Europe. But a communication from Agriculture Commissioner Franz Fischler published in March 2003 has added the issue of co-existence of genetically modified, organic and conventional crops in European agriculture to the political agenda. The conference aims to bring together a wide range of opinions and expertise to help guide the next legislative steps. Translation in English, French, Dutch, Italian, German and Spanish will be available.

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What? India rejects Bt cotton for Northern India
When? April 2003
Where? India
Who? Genetic Engineering Approval Committee (GEAC)

The Indian government's regulatory authority unanimously rejected the proposal for commercial cultivation in north India of a new variety of Bt cotton developed by Mahyco Seed Company in collaboration with Monsanto. GEAC called for more field trials for genetically modified (GM) mustard seeds developed by ProAgro in collaboration with Aventis and Plant Genetic Systems. The GEAC came to the conclusion that *"cultivation of the new Bt cotton, Mech 915 in Punjab, Haryana, Rajasthan and western Uttar Pradesh should not be allowed as this variety is highly sensitive to the leaf curl virus. Leaf curl virus is common in the regions bordering Pakistan. It affects the yield of cotton and can affect other crops in the region as it is easily carried by white flies".* Local varieties of cotton grown in region are much more resistant to leaf curl virus than Bt cotton. GEAC chairperson Sushma Choudhary said that the Committee had also discussed reports from state governments and agencies that Bt cotton had not performed well in some areas in 2002. The Governments of Andhra Pradesh, Karnataka, Maharashtra and Gujarat – the four States where the transgenic crop was mainly cultivated – have publicly accepted that Mahyco-Monsanto's Bt cotton has failed to perform and asked GEAC to recall the seed. When questioned as to whether the GEAC would do this, Choudary said, *"More time should be given to assess the performance of Bt cotton in the regions where it has been approved. One season's performance is not enough".*

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What? UNIDO diploma in biosafety
When? Sept 2003 - April 2004
Where? University of Concepcíon, Chile
Who? Students holding degrees

The United Nations Industrial Development Organisation (UNIDO), in conjuction with Chile's University of Concepcíon, is offering the first academically accredited biosafety course in the world. The Diploma in Biosafety assists industry and national authorities in applying regulatory standards and augments international capacity building efforts aimed at facilitating the implementation of the Cartegena Protocol of the Convention on Biological Diversity through *"the provision of state-of-the-art knowledge in biological risk assessment and management".* According to

What? Support Brazil's anti-GM position
Where? Brazil
When? Now
Who? Lobby Brazil's government

Genetically engineered crops are not legally permitted to be grown in Brazil. But an estimated 30% of Brazil's soybean crop consists of genetically modified (GM) soybeans grown from seed smuggled across the border from Argentina. For several years, the Brazilian government turned a blind eye toward the black market in soybeans. But this year, President Lula's new administration officially recognised for the first time that illegal GM soy planting was taking place on a wide scale. Rather than face the daunting task of destroying up to a third of the national crop, the government in March issued a decree decriminalising the sale of GM soybeans until January 2004, after which it will again become illegal.

The Brazilian government is split on the GM issue and the controversial proposal (which upset both GM supporters and opponents) unleashed a storm of 70 amendments, which will be processed before a final vote in May. In early May, Monsanto threw another iron in the already blazing fire of debate in Brazil by announcing that it plans to seek royalty payments on the black market soybeans.

The Institute of Agriculture and Trade Policy (IATP) speculates that the government is leaning towards legalising GM soybeans because it needs the hard cash from soybean exports to be able to avoid defaulting on its loans. Without this cash, their social security program is likely to crash, which would create chaos and threaten the viability of the government. Brazil, the world's No. 2 soybean producer after the US, is expected to finish harvesting a record 49.6-million-tonne crop in May. Brazil's soybean exports have increased significantly in recent years because many countries have not wanted to buy GM soybeans from the US. But neither the Japanese nor the Europeans are now willing to pay a premium for GM-free soybeans, because they have started getting them from other sources. On the other hand, because of anger towards the US over the war on Iraq, there are opportunities to expand Brazil's GM soybean exports at the expense of US exports.

Contact: AS-PTA Nacional, Rua da Candelária, 9, 6º andar, Rio de Janeiro 20091-020, Brazil, Email:aspta@ax.apc.org; or Kristin Dawkins, IATP, Tel: +1 612 870 3410; Fax: +1 612 870 4846, Email: kdawkins@iatp.org

UNIDO, compliance with national and international regulation of GMOs requires multi-disciplinary expertise and the ability to deal with a rapidly growing body of relevant information. At present, there is a lack of a critical mass of professionals to deal effectively with the complexity of issues related to the assessment and management of biological risks. The Diploma is tailored towards individuals interested in being engaged as biosafety professionals in government agencies or industry, and individuals with an interest in public policy, legal and ethical aspects of biotechnology. Applicants need to have a university and access to a computer and the internet, since the course is based on distance learning.

Contact: University of Concepción, Faculty of Forest Sciences, University District, P.O. Box 160-C, Concepción, Chile. Tel: +56 41 204906, Fax: +56 41 255164, Email: sofvalen@udec.cl, Web: http://binas.unido.org/UDEC_biosafety/about.html

What? International Year of Rice
When? 2004
Where? Everywhere
Who? FAO, CGIAR, UNDP

The UN Food and Agriculture Organisation (FAO) has launched this initiative to *"promote efficient and sustainable rice development through combined and mutually beneficial action by the entire community of interests addressing the challenges and opportunities facing production, consumption, marketing and trade of this highly strategic food"*. FAO says that *"new approaches for meeting challenges are being introduced which can enhance development efforts"*. Could it mean genetic engineering? It also says that *"recent improvements in global communications offer new methods and means for promoting technology transfer and adapting it to local situations"*. It almost certainly does mean genetic engineering. A concept paper, which will include the operational framework for preparatory and observance activities of all stakeholders, will be finalised and distributed in June. Maybe FAO can be encouraged to look at more diverse ways of celebrating the year of rice?

For more information, go to www.fao.org/DOCREP/MEETING/006/y8620e or contact FAO at FAO Regional Office for Asia and the Pacific, Maliwan Masion, Phra Atit Road, Bangkok 10200, Thailand. Tel: +66 2 697 4000, Fax: +66 2 697 4445, Email: FAO-RAP@fao.org

What? Promoting human rights at the WTO Ministerial
When? 10-14 September 2003
Where? Cancún, Mexico
Who? Groups addressing human rights issues

The World Trade Organisation Ministerial will offer an important opportunity for the promotion of human rights. Many organisations working on human rights issues will be present in Cancun, organising events and advocating positions on issues such as the right to health, the right to food and the Agreement on Agriculture, the right to water and the General Agreement on Trade and Services. Many others will be active on these issues in their respective countries, during the Ministerial as well as in the months leading up to it. An ad hoc group of NGOs (Rights & Democracy, Institute for Agriculture and Trade Policy, 3D Associates, INCHRITI, Center for International Environmental Law, Research Unit on the Right to Food) has created a *"human rights caucus"* to be active in the months leading to Cancun and also during the Ministerial itself. This caucus will essentially be an information exchange network. To join the listserve which will act as the communications medium for the caucus, email ESCR-TRADE-subscribe@yahoogroups.com.

For more information about the listserv, visit www.escr-net.org/EngGeneral/discussiongroup.asp. Or contact Kristin Dawkins, Institute for Agriculture and Trade Policy, 2105 First Avenue South, Minneapolis, MN 55404 USA, Tel: +1 612 870 3410, Fax: +1 612 870 4846, Email: kdawkins@iatp.org

What? Call to Action against the USDA Ministerial
When? June 23-25, 2003
Where? Sacramento, California
Who? 60+ organisations from Asia and the Pacific

At the recent PAN Asia and the Pacific Congress in the Philippines, more than 60 organisations created a call to action against this meeting, to which the USDA has invited Ministers of Trade, Agriculture and Environment from 180 nations. An *"Expo on Agricultural Science and Technology"* hosting multinational agribusiness and biotechnology corporations will run alongside. According to the call organisers, *"This summit will promote industrial models of agriculture that enrich transnational and large-scale agribusiness interests while undermining the food security, food sovereignty, participation and welfare of the impoverished and disenfranchised peoples of the global South. It will push for a consensus on the review of the Agreement on Agriculture of the WTO in time for the 5th Ministerial Meeting in Cancun, Mexico"*. The Call for Action asks concerned individuals and organisations to join in the global popular protests against the Sacramento Ministerial meeting.

Contact: Skip Spitzer, Pesticide Action Network North America (PANNA), 49 Powell St, Suite 500, San Francisco, CA 94102, USA. Tel: +1 415 981 6205 ext. 322, Fax: +1 415 981 1991, Email: spitzer@panna.org, Web: www.panna.org.

Sprouting Up...

Trouble in the Rice Bowl

GRAIN

The multinational Syngenta Corporation has been in the news on several counts recently. First, there was outcry over its membership to the Consultative Group on International Research announced in the Philippines in October 2002 (see *Seedling*, January 2003, p 25). The second was over its negotiation of a Memorandum of Understanding with the Indira Gandhi Agricultural University, Raipur, in the central Indian State of Chhatisgarh. If the deal had gone through the resulting collaborative *"research"* agreement between the two would have entailed the transfer of all the rice germplasm collections from the university to the company laboratories. Syngenta would have marketed new rice varieties developed under the collaboration upon payment of royalties to the university. The official collection of the university comprises about 24,000 accessions (rice samples), out of which 19,000 comprise traditional varieties, which was collected together in the 1970s by the efforts of the famed rice scientist Dr RH Richharia while he was director of the Madhya Pradesh Rice Research Institute. The rice was originally collected with farmers' consent as part of Richharia's *"adaptive rice research"* endeavour, to improve the varieties as per local requirements and redistribute them amongst farmers.

News of the deal, leaked through a local daily in Raipur in November 2002, sparked off peoples' protests in Chhatisgarh. Local groups were quick to respond and were able to mobilise public opinion against the deal. The local protests got the immediate support from others around the globe fighting biopiracy and the corporate takeover of agricultural research. The voice of dissent within the University walls was muffled at first, but soon became too loud to ignore. The Indian Council of Agricultural Research pressured the university to pull out and Syngenta had to drop the deal.

Nevertheless, farmers in the region feel violated. Their cry is: hands off, rice is not private property! Enraged by the betrayal of the state, some are campaigning for the repatriation of farmer varieties from all public sector research centres. Meanwhile others think that overhauling the present system can be achieved through Richharia's vision of decentralized, farmer-centred research. Their demand to the government is the reorientation of agricultural research to keep it *"alive"* and in the fields, not distanced from farmers. They emphasise that conservation of knowledge and diversity of the local agroecology cannot be achieved with the exclusion of the local people and that transnational corporations cannot be allowed to misappropriate people's wisdom and resources. Many have called for a ban on Syngenta being allowed into the State.

In the light of this episode, an important question being asked is whether a new Indian law would have safeguarded against the attempted biopiracy. The Indian Biological Diversity Act was cleared by both Houses of the Indian Parliament in December 2002. At a closer look, it seems that the law would have been unlikely to be able to help in this instance. The law mandates that *"collaborative research projects"* especially those involving transfer or exchange of biological resources or information must have *"clearance by the Secretary of the concerned Ministry/Department or a High Level Committee of the Government of India"*. In the proposed agreement with Syngenta no such approval was obtained. If the deal had gone through the approval procedure, at least information about the deal would be made public and open up channels for it to be challenged.

But had the transfer of germplasm already been executed, its recovery would still be very tricky, because the legislation says nothing about what course of action should be taken to repatriate germplasm. More significantly, approval from the National Biodiversity Authority (which was set up under the Biodiversity Act) would not be applicable for intellectual property right issues in relation to plant varieties. For that the legislation points to India's Plant Variety Protection & Farmers' Rights Act instead.

This Act, passed in 2001, allows foreign corporate breeders to register their plant varieties in India. Despite an entire Chapter on Farmers Rights, the rights of farmers described are no more than a 'new variety' of farmer's privilege and a derogation of corporate breeding rights. The Act does not have provisions to safeguard against situations in which traditional crop varieties are taken out of the country. Because of these shortfalls in legislation, there is growing opinion that domestic law and policy on plant genetic resources is inadequate. It remains to be seen whether or not the implementing rules to be drafted under these laws can plug some of the loopholes.

Farmer Dadaji Ramaji Khobragade displays his HMT rice at a meeting on farmer's rights organised in the aftermath of the Syngenta scandal. HMT is one of six varieties of rice he has developed on his three-acre farm in the Chandrapur district of Maharashtra. HMT was taken from him by university researchers, who then supposedly "purified" it and released it as a public variety. HMT is now grown over extensive areas in a number of Indian states, but Khobragade has received no rewards from his work. HMT fetches a high price because of its short grain, and good culinary qualities.

The Seeds of Kokopelli – A manual for the production of seeds in the family garden.

By Dominique Guillet.

The 3rd edition of *"The Seeds of Kokopelli"* is larger than ever with 500 pages of information containing 700 photos, of which 545 are in full colour. This extraordinary book explores in detail more than 2,500 varieties of vegetables, including 600 tomatoes, 400 peppers, 200 marrows (squash), 130 lettuces, 80 melons, 50 aubergines (eggplants) and many more. Each family is described historically and the book provides guidelines on how to grow in the garden, how to pollinate and how to gather seeds. Descriptions are meticulous and the large number of varieties is extraordinary. But most of all, what really brings this book together are the bright photos of just some of the varieties, a few of which we have included here (though we cannot do justice to). The varieties listed in the book are also for sale, which are all for sale at 2.50 Euros per packet ($2.50). Professional producers who are endorsed by organic organisations produce these seeds.

The *Kokopelli Association* was set up in 1999 to replace an organisation called *Terre de Semences*, which was forcibly closed down by the French authorities for breaching impossible-to-implement French seed legislation. The *"Decree of 1997"* established a National Catalogue of "*old varieties for amateur gardeners*". But for a variety to be listed it had to be proved that the variety was more than 15 years old and shown to be distinctive, uniform and stable through field experiments. Furthermore, a registration fee of about 230 Euros (US$ 230) was required for each variety. Despite the closure of *Terre de Semences*, *Kokopelli* continues to promote and distribute old varieties of seeds. Much of its work is illegal and it does not receive subsidies from governments, yet this latest book shows that the saving and distribution of organic varieties of vegetable will continue in Europe. *Kokopelli* also provides seeds from these varieties throughout the South free of charge. In 2002, Kokopelli distributed seeds to Afghanistan, Brazil, Morocco and Senegal. *Kokopelli* also help set up the Annadana Project for the production and exchange of seeds in southern Asia, and is also working with the organisation *Terre et Humanisme* in Niger and Burkina Faso.

To find out more about Kokopelli or to buy the book, visit the Kokopelli website (www.kokopelli.assoc.fr) or the *Terre de Semences* website which is still running (www.terredesemences.org). Both websites are in English. The websites also contain a lot of the information in this book and an online catalogue to purchase these numerous varieties. Or write to Association Kokopelli, Oasis, 131 impasse des Palmiers, 30100 Alès, Tel +33 4 66 30 64 91, Fax: +33 4 66 30 61 21, Email : kokopelli.semences@wanadoo.fr.

Kokopelli, the hunch-backed flute player, has been a symbol of fertility throughout North, South and Central America for millenia. While he sows the seeds hidden in the hump of his back, Kokopelli sings and plays the flute. In this way, he instills in the seed the breath of life.

Invisible Giant – Cargill and it's Transnational Strategies

By Brewster Kneen

Heard of Cargill? Do you know what the company does? Do you know how big it is or anything about its turnover? No? Well, that's not surprising. Cargill is the largest private company in the world, with over 80,000 employees in more than 70 countries and its fingers in food, agriculture, finances and industrial production. But real figures are not really known, and little can be found out about Cargill, as there is no legal requirement for a private company to publish audited accounts. Yet this book tries to see through the fog and draw a detailed picture this invisible giant. Although it is obvious that Brewster Kneen is not a big fan of transnational companies, this book is written with a balanced approach, even giving credit to Cargill where astute business decisions were taken. But overall the picture that emerges is of a secretive business playing an important role – up front and behind the scenes – in the continued globalisation of industrial agriculture. As its vice-president said in 1993: *"Breaking the poverty cycle means shifting from subsistence agriculture to commercialised agriculture. Subsistence agriculture locks peasants out of income growth; it leaves populations outside food-trading systems and therefore more vulnerable to crop disasters, and it harms the environment through overuse of fragile land resources".* Kneen puts it a different way, "*The arch enemy of Cargill is subsistence agriculture, self-provisioning, self reliance, or whatever you want to call the alternative to being incorporated into its growing global system of dependency*".

But what does Cargill actually do? The book goes into great detail of what Cargill does and where, providing examples and stories where relevant. Kneen has obviously researched this book thoroughly, not only through library and internet searches, but also through visiting individuals, from Cargill employees to their chief executives, and their sites around the world. The book covers the wide range of commodities that Cargill is involved with: livestock, cotton, peanut, malting, oilseeds, soybeans, maize, wheat, fertilisers, fruit juices, seeds and salt. It also covers 'invisible' commodities like 'speculation' and 'risk management' of its financial activities and commodities, transport and storage. In addition, Kneen has chapters on the different regions where Cargill works, including North America, Latin America, and Asia.

Invisible Giant was first published in 1995 and this is the second edition. The seriousness with which Kneen has approached updating the book is reflected in the fact that about half the references are new. Between these editions, Cargill has been evolving, fitting into new markets, withdrawing from others and taking public subsidies wherever possible. But what hasn't changed is its ideology. As Kneen says, *"Its structure and business are contradictory to decentralisation and self-provisioning. Cargill deals in volume, and to get sufficient volume in both buying and selling it has to do business transnationally and industrially. In other words, it is a matter of both scale and mode of operation, and there is a definite threshold beneath which a company like Cargill cannot function even if it wanted to. Therein lies the key to resistance and the pursuit of alternatives*".

Invisible Giant is available from most bookshops, including those on the Internet. Also available from the Ram's Horn: Canadian $30 includes postage from:
Mail: The Ram's Horn, S-6, C-27, RR #1, Sorrento, BC V0E 2W0, Canada.
Email: ramshorn@ramshorn.bc.ca.
Tel. and fax: +1 250 675 4866,

You can also obtain details here about the *Ram's Horn*, a useful monthly journal with an analysis of global food systems written in a personal and easy-to-read manner.

Ecoagriculture: Strategies to feed the world and save wild biodiversity

By Jeffrey McNeely and Sara Scherr, Island Press, 323pp

In *Ecoagriculture*, the authors examine the idea that agricultural landscapes can be designed more creatively to take the needs of human populations into account while also protecting, or even enhancing, biodiversity. The book examines the global impact of agriculture on wild biodiversity, describes the challenge of reconciling biodiversity conservation and agricultural goals, presents numerous case studies

of how ecoagriculture works, and explores how policies, markets, and institutions can be re-shaped to support agriculture. This thorough and well researched book makes a compelling case for a win-win approach to food production and biodiversity conservation.

Price: $55 (cloth), $27.50 (paperback)
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FAO BioDeC: Biotechnologies in Developing Countries

The UN Food and Agriculture Organisation (FAO) has launched FAO-BioDeC, a *"searchable database meant to gather, store, organise, and disseminate updated baseline information on the state-of-the-art of crop biotechnology products and techniques which are in use, or in the pipeline, in developing countries."* As of April 2003, the database contained about 2,000 entries from 70 developing countries, including countries with economies in transition. The database is easy to use and useful for getting a quick snapshot of what technologies are being developed and tested in different countries. Most entries are in English, but some information is also provided in Arabic, Chinese, French, and Spanish. The database is currently in its initial stage, but FAO promises that information will be updated and verified regularly. During a second phase, the database will be expanded to include entries related to animal, fisheries, and forestry biotechnology.

The database can be accessed online at: www.fao.org/biotech/inventory_admin/dep/

Gene Wars: The Politics of Biotechnology

By Kristin Dawkins, Seven Stories Press, 84pp

This second edition of *Gene Wars,* according to Dawkins, required so much updating that – six years later – it is almost new. This slim little pocket book is an introduction to the policies that are shaping the future of plants, food and food systems. Written largely for the North American audience, the book clearly outlines the nuts and bolts of the policies and practices that have already drastically changed the way in which food is produced and those who control it. It contains a number of anecdotes to illustrate how fast the world is changing, such as when Jonas Salk, inventor of the polio vaccine, was asked decades ago who would control the new product, he replied, *"Well, the people I would say. There is no patent. Could you patent the sun?"* Now there's an idea …

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Knocking on the EU's door

The terrain is getting rockier in the fight against patents on life at the intergovernmental level. Talk of a new protocol on access to genetic resources under the Convention on Biological Diversity look set to entrench intellectual property rights (IPR) as the prime benefit sharing mechanism; the push to establish IPR on traditional knowledge under new and special *(sui generis)* laws is gaining ground at the World Intellectual Property Organisation (WIPO); and challenges to the World Trade Organisation's (WTO) rules on IPR applied to life forms seem to fall on deaf ears. While multilateral fora serve as a prime tool to spread and entrench IPR regimes, bilateral deals between rich and poor countries can be a lot more effective.

Last September, the EU sent a concept paper to the WTO's TRIPS Council on its review of bio-patenting rules.[1] While we didn't see much new in it back then, recently it has been making the news.[2] In early February, the BBC published a front page news story saying the European Union would protect the rights of Third World farmers to save patented seed. UN agencies started publishing similar reports. The message was that the EU was moving to arrest the problem of biopiracy, curb the power of the biotechnology industry, and safeguard the interests of developing countries against those of their own seed companies. GRAIN wrote an open letter to Pascal Lamy, the European Trade Commissioner, to challenge this message.[3]

In the letter, GRAIN points out that the EU claims to be supporting developing countries proposal for the creation of a *"disclosure"* mechanism under TRIPS. The idea is to require disclosure of the source of genetic materials and traditional knowledge used in a invention, so that illegitimate patents will not be granted. At a closer look, however, the EU proposal clearly states that such 'disclosure' should never be a condition for the grant of patents. This falls far short of what developing countries have been requesting.

The other part of the EU paper which has been misconstrued for the public is the question of whether or not farmers should be allowed to save, reuse and sell seeds if they are patented or subject to *sui generis* plant variety protection schemes. The message getting across is that the EU wants poor farmers spared of any restrictions on seed saving that come with the implementation of TRIPS. In fact, the EU paper does no more than suggest that the impact of seed patents on certain farmers in developing countries could be minimised through limited *"exemptions"*. In essence, the developing countries would have to enforce the patents in order to apply the exemptions.

While the EU may be doing a good public relations job for itself, behind the scenes, and on its own, the EU is aggressively forcing developing countries to adopt the strictest intellectual property rules possible on seeds. Through so-called free trade agreements, partnership agreements, bilateral investment treaties and other means, it is putting direct pressure on developing countries to adopt and enforce higher standards of intellectual property protection than the WTO prescribes. A preliminary survey that GRAIN coordinated in 2001 identified more than 20 such *"TRIPS-plus"* agreements affecting or potentially affecting biological diversity.[4] Almost half of these were initiated by the EU.

In early March, the EU quietly announced that a bilateral agreement between the EU and Lebanon, obliging Lebanon to join the Union for the Protection of New Plant Varieties,[5] had just come into effect. This is the worst kind of politics pushing IPRs on life: quid pro quos for bilateral trade concessions, investment commitments or development assistance. Because it goes on quietly, behind the public eye, and takes countries well beyond their obligations to multilateral agreements. At least the public is starting to take more notice now. The Greens in the European Parliament called an urgency measure on the European Commission to explain its TRIPS-plus politics. People wrote to their parliamentarians about the matter. GRAIN issued an update on TRIPS-plus deals. And the media start picking it up. But civil society has to work a lot harder to stop the TRIPs-plus bulldozer. Beyond WTO, WIPO, CBD and other fora, the push for patents on life is gaining ground very fast through direct bilateral and regional deals.

References

[1] In 1999, the WTO launched a review of Article 27.3(b) of its Trade Related Intellectual Property Rights agreement – the rules on plant patenting. It has yet to come to any conclusions.

[2] Alex Kirby, "EU backs poor farmers' seed use", *BBC News Online,* Nairobi/London, 3 February 2003 http://news.bbc.co.uk/1/hi/sci/tech/2719129.stm; Pascal Lamy, "As precious as gold", *Our Planet,* UNEP, Nairobi, January 2003, www.ourplanet.com/imgversn/134/lamy.html.

[3] www.grain.org/publications/lamy-openletter-en.cfm

[4] "TRIPS-plus through the back door: How bilateral treaties impose much stronger rules for IPRs on life than WTO", GRAIN in cooperation with SANFEC, July 2001, www.grain.org/publications/trips-plus-en.cfm

[5] The Union for the Protection of Plant Varieties is a patent-like system for plants to protect plant breeders.