

SHORT summary (8 pages)

Followed by a **LONGER summary** (about 30 pages)
Followed by notes, and an **(educational) project** about the book.

'Hungry Corporations', By Helena Paul and Ricarda Steinbrecher, Zed books. 2003
(summary in 2005 by Greet Goverde), *h.goverde@chello.nl*)

Ch 1: Paving the Road: the Green Revolution

There are two very different basic responses to world hunger:

- 1 technical solutions, focusing on the seed and its genes – seeking to develop a few varieties that will provide high yields under monoculture conditions over vast areas. The new varieties are often called HRVs: (High -Response Varieties). In order to prosper they require inputs of pesticide, fertiliser, and often irrigation.
- 2 The other approach considers that that food insecurity is highly complex and requires political solutions. It also sees the farm as a complex ecological system.

The Green Revolution of the 60s and 70s advocated the first approach. The HRVs (see above) were developed by researchers funded by mainly the Ford and Rockefeller foundations and they were implemented by governments, extension workers and aid agencies.

From the outset however planters who used the new varieties were unable to achieve the promised yields. They peaked in the 80s but are still falling steadily. Diseases and pests began to break out, some overcoming resistance within two years, so there is a constant race between pests and breeders. Negative consequences are:

- soil depletion because of increased intake of micronutrients as a consequence of the increased use of fertilisers;
- increases in the use of water leading to lower water tables but sometimes to floods;
- herbicides and pesticides have damaged the healthy food web.

After the oil crisis of the 80s many countries were offered cheap loans, which led to heavy debts. The World Bank and IMF then imposed stringent conditions on these countries (Structural Adjustment Programmes) . Countries were encouraged to grow cash crops instead of food for their own markets, and the holding of food stocks was discouraged.

The Green Revolution opened up the world's agriculture to agrochemical corporations. Its successor, the gene revolution that we are witnessing now, is merely a means to perpetuate an agricultural model that does not really contribute to food security.

Neoliberalism dismantles community networks. Its impact has been enormous. Fewer than 5 companies now control 90% of the most important crops.

2 Corporations: from Royal Charters to Biotech gold Rush.

Corporations started out as charitable institutions for the funding of e.g. hospitals in the Middle Ages, but they have over the years been granted more and more rights, and now they are powerful bodies that enjoy total freedom. Since World War I they have further globalised their reach and extended their rights through the World Trade organisation. Corporate control over Research and Development is extending.

Patents give inventors exclusive rights to their inventions for a limited period of time. However, they are not appropriate in an agricultural context, where farmers have developed 'new' plant breeds over generations. What can be covered by a patent is much disputed, and many patent offices just decided that this provision included genes and DNA sequences. In Canada e.g. Monsanto 'owns' the gene construct that has been engineered into canola (oilseed rape) to give it resistance to the herbicide glyphosate. Monsanto claims that this patent gives it rights to any plant containing this gene construct. It sued a farmer in whose fields such a plant was found, even though it arrived there by cross-pollination. (March 2001). Such patents have created an atmosphere of fear among farmers. Private detectives have been employed by at least one company. Plant breeders' rights, patents, and growers' contracts are forcing farmers to abandon their age-old practices of seed-saving, sharing and selling.

13 Leading US companies effectively developed the TRIPS agreement (Trade-related Intellectual Property Rights) that was finally adopted in the Uruguay round of the GATT. Thus intellectual property was moved out of the public and into the trade arena.

In 2002 6 corporations controlled 75% of all agricultural biotechnology patents. Patents and genetic engineering provide the instruments for the TNCs to gain control over agriculture and the food chain. Areas of research that cannot be controlled through patents are neglected by the corporations because they cannot make a profit on them.

Patent protection worldwide remains a mosaic, with different rules and wide differences between the levels of protection in North and South. Industry would prefer a simplified system, set at the highest level of property rights protection, namely the US level. Increasingly, countries are being pushed to adopt stricter patent laws. Now southern countries have become mere observers rather than players. Rapid development in genomics led to a race between public and private domains to sequence the human genome and those of other organisms. Through patenting genes, these corporations are privatising information which many believe should be in the public domain. Corporations justify the patenting of genes on the grounds of the costs involved in research and development (R&D). Investors believed that exciting new drugs were only a few years away, though they had been warned that potential drugs would take a long time to develop. They were disappointed that the completion of the genome research did not immediately lead to high proceeds and new medicines. This is because the assumed correlation between single genes and traits appears to be erratic. In the biotech shares rose by 15%, but in 2001 when there were no quick results the biotech index began the year by losing 25%.

3 Image control: Manipulation and Public Relations.

Whatever trade corporations are involved in, they make increasing use of PR companies to put over their message. Many companies have an ugly record, but PR companies rely on our short memories and their sales tactics to present rosy pictures and meet any public challenge.

So skeletons in the TNC's cupboards are soon forgotten. Examples:

- DDT, PCBs and agent Orange etc. made by Monsanto;
- the gas used for genocide at Auschwitz, Zyklon B, made by an IG Farben subsidiary;
- the Bhopal disaster caused by Union Carbide, etc

A new skeleton in the biotech industry's cupboard is 'multiple resistance'. At present 3 classes of herbicide tolerant oilseed rape are grown in Canada, each made tolerant to a different herbicide by genetic modification. Crosses among them have resulted in the unintended creation of new plants with multiple resistance to two or three classes of herbicides. Such 'accidental gene stacking' could have been foreseen. Canadian farmers are now saying that any advantages that GM technology might have conferred are already being outweighed by the problems caused, and it is getting worse. Farmers are turning to old pesticides which are highly toxic to get rid of such volunteer crops or 'superweeds'.

This chapter gives examples of the tactics that big Public Relations firms use to drive home the message that biotechnology can save the lives of millions and end poverty.

Such tactics include:

- PR as education: firms pay for student magazines, exhibitions, educational centres etc.
- stakeholder dialogues: dialogues with NGOs in which they try to split NGO alliances and meanwhile learn the language of the 'opposition'.
- masquerading as grassroots: pay organisations and churches to go on 'trips' (demonstrations), pretending to speak for farmers, etc.
- industry lobby groups: organising conferences and conventions and lobby groups.
- think tanks: supportive sources of opinion that seem to be completely independent but are paid by the industry (Bush's cabinet ministers are closely linked to such think tanks).
- documentaries and tv programmes (e.g. about the 'health risks' of organic food)
- 'independent' scientists: a key strategy. They actively promote their views in the public domain. Some are paid by the industries – some do not really exist, they are only virtual reality.

One example: Dennis Avery of the H.I. is the author of 'Saving the World with Pesticides and Plastics', and 'How Poverty won't save the Planet'. He claims that people who eat organic food are eight times as likely to be attacked by a deadly new strain of E.coli.bacteria, 0157. He greatly favours 'Golden Rice'. (see below, at the end of ch. 5). At the World Food and Farming Congress (2002) in

London he spoke on 'The Conflict between the Affluent Consumers and the Need of the Majority', and he is quoted as saying 'the activist stance on agricultural biotech is inhumane.'

4 Consolidation, contamination, and loss of diversity: the biotech dream takes hold.

After World War I there were enormous stocks and production capacities for nitrogen that had been used for explosives and poison gas, and industry decided in the twenties to promote nitrogen fertilisers in agriculture. In World War II Bayer had done a lot of research into potential chemical weapons during the war, and this gave a big push to a small pesticide industry in the forties. 'What kills people should also kill insects': the stuff was unloaded on farms. (*The above his passage is in the book and longer summary in ch 1*) Now we are in the third stage. In the last decade of the 20th century the agro-biotech industries that used to produce pesticides and herbicides moved into the seed business. They started to call themselves 'life science' industries: a positive image. Now we are in the third stage: after having used chemistry they opened up a new area of science: biology. TNC's could use biotechnology to engineer plants for dependence on their 'old' pesticides. This explains why almost all of the early GM crops were engineered for herbicide tolerance.

A lot of mergers took place in the seed business around 2000.

Now e.g. the top 5 vegetable seed companies control 75 % of the global vegetable market, and DuPont and Monsanto together control 73% of the US corn seed market.

Most of the largest seed companies are also the largest pesticide companies and agrobiotech companies. To date, most of their research has concentrated on integrating their pesticide and seed businesses. Big firms like Monsanto have bought up small firms, and access to germplasm (*5) of diverse domestic agricultural varieties is increasingly restricted: many varieties are no longer grown or sold, often because it is no longer legal to do so because of patents and national seed lists. Many old varieties are thus disappearing forever.

GMO crops are contaminating other crops in various ways.

Is that a deliberate plot or just blunder? A Canadian farmer, Percy Schmeiser, was sued because GMO seeds appeared in his crops, though he didn't plant them; the seed may have been blown into his field. He was forced to destroy the seed he had saved himself and which had been in the family for generations.

Seed smuggling: farmers hear rumours about wonderful new seeds and naturally wish to obtain them. Seeds have been smuggled from Argentina into Brazil, even though Brazil has resisted legalising GM crops for some years. The contamination is now quite serious in some regions of Brazil and in other countries.

Insufficient segregation: Over three quarters of all GM seeds in 2000 were sown in North America. Aventis' GM *maize StarLink* was only meant for *animal* feed, because the particular Bt toxin (*4) (a protein called Cry9C) could trigger allergic reactions in humans. This maize showed up in corn chips and taco shells. People fell sick, and 300 products were pulled from grocery stores in the US in September 2000, and also in the UK, but it had already contaminated other stocks. There are reports from different parts of the world of people handling crops of GM products and falling sick, but they have not been scientifically investigated. Scientists have unexpectedly been taken off research they were doing.

In the autumn of 2001 researchers called Chapela and Quist found that the native maize varieties (criollo) in the Oaxaca region of Mexico are contaminated with GM material. The closest region where transgenic corn was ever known to have been planted was 60 km away from the Oaxaca fields. Yet the contamination proved to be widespread. This region is the cradle of maize, and it is crucial to preserve the old varieties and landraces. Chapela noted that these genetically diverse crops are less vulnerable to disease, pests and climate change and must not be lost.

On the day the Chapela and Quist article about the contamination appeared in Nature there were many messages on the internet discrediting the researchers, some by people who didn't exist, and most by people linked to the industry.

Contamination through food aid: In 2000 5-6 million tons of corn entered Mexico from the US as food aid and was distributed through the country. Though it was only meant for consumption, Mexicans planted it to see if it was better than their own corn.

The EU now demands that animal feed should be labelled but not the products, so milk and meat from animals are not labelled, although animal feed is the largest use of GM products and consumers would like to have this information. In this way GM products have already entered the food chain.

Is coexistence between GM crops and other crops possible? Industry spokespersons insist that coexistence is possible, while organisations opposing them point to the rapid appearance of contamination even in countries where only trials have taken place.

In the EU there has been a long battle over the regulation of GMO food in the food chain, over labelling and the liability for contamination, This battle between the USA and the EU is not quite resolved yet.

5 The main international players and corporate influence.

Biotech corporations have carefully cultivated strong relations with governments and the public research sector. They have an increasingly strong grip on research because *public* funding for research has dwindled.

TNCs obviously target their research where they believe profits can be maximised. They can often gain influence by merely topping up funds for universities with a small proportion of the total. The universities then provide cheap research, and also apparently 'independent' advocates for corporate interests.

The corporations hold that biotechnology represents the next industrial revolution and is essential for development. Corporate lobbying has led to:

- legislation favourable to industry and the testing of GM products
- downgrading of the 'precautionary principle' (let's NOT do this, because we're not sure of the consequences). (see ch. 6 on *Cartagena Protocol*)
- insufficient sanctions for corporate misdeeds
- massive channelling of public money to the biotech industry
- research diverted to the most potentially profitable applications of GM technology
- GM crops being dumped on the south as food and humanitarian aid.

The World Bank and the IMF are 'one dollar one vote' institutions and operate very secretly. In practice the Bank's agenda is set by the US, the UK and Japan, Germany and France.

In the 60s and 70s the World Bank was a major promoter of the green revolution.

In April 1999 the World Bank started its 'gene revolution' programme.

Bilateral development agencies such as those of the US, the UK and the Netherlands, and private foundations such as Rockefeller, have through the World Bank invested around 200m dollars in biotechnology Research and Development over the past decade.

The World Bank has funded the FAO and public scientific research institutes such as the CGIAR (Consultative Group for International Agricultural Research). *CGIAR is instrumental in the erosion of humanity's agricultural heritage.* They collect samples of germplasm from all over the world and 'conserve' them for humanity. 91 % of the samples come from Asia, Latin America and Africa.

Mexican wheat and maize are now found in 51% of the American crops and rice germplasm from IRRI (International Rice Institute, the Philippines) now accounts for 75% of the American rice harvest.

Several other institutes in different countries are mentioned in this chapter, as well as universities and research institutes (partly funded by the industries), each contributing to spreading the gene revolution in its own way.

One example: The CNFA e.g. (Citizens' network for Foreign Affairs, founded by Henry Kissinger) is an alliance of some 250 US organisations in agribusiness and banking. It has been working in the food and agriculture sector of the new independent states of the USSR and in southern Africa. It has been very active in promoting Monsanto's GM potatoes and creating a hospitable political and legal climate for US business. It is also involved in international lobbying. It was awarded 44.5 million dollars by USAID (!) to implement a three-year Food Systems Restructuring Programme in the former Soviet Union. RAISE is a similar programme. In Zimbabwe, RAISE is designed to develop a 'web of input wholesalers and retailers who can expand their markets and sell inputs to smallholder farmers...' , and in Malawi it trains shopkeepers and provides credit. One of the other CNFA

programmes is the Agribusiness Volunteer Program (sending agribusiness professionals and farmers overseas), etc.

Another example: s an important producer of agricultural commodities, Australia has committed itself to the search for technical solutions to its problems. (Its problems include its climate, the nature of its soils and unsuitable colonial agricultural practices.) It was one of the first countries where glyphosate resistance was reported in ryegrass and it has been accused of being involved in bio-piracy (*3) cases. Australia was a member of the US-led Miami Group that sought to prevent the development of a meaningful Biosafety Protocol (ch 6).

Case-study: Golden Rice

GMO Golden Rice, with its promise to combat VAD (Vitamin A Deficiency) was quickly adopted as the saviour for the beleaguered biotech industry; it became their symbol for the promise of genetic engineering. However, it symbolises the top-down approach, like the green revolution (ch.1): it substitutes technical solutions for necessary political and social change.

In January 2000 an article in science announced the creation of a GM rice containing beta-carotene. As this colours the grain orange, the rice was named Golden Rice. In May 2000 Astra Zeneca (now Syngenta) and German-based Greenovation acquired the exclusive rights to commercialise Golden Rice, arousing protests from the Philippines and India.

However, no tests have been conducted to find out whether the beta-carotene present in Golden Rice can be absorbed when eaten, and converted into Vitamin A. Recent data suggest that the conversion rate is not 6:1, as previously thought, but 12:1 or even 21:1. Vandana Shiva pointed out that a small child would have to eat 1.2 to 4.2 kg of uncooked rice per day, which swells to *3.6 to 12.6 kg* when cooked, which no child between 1 and 3 could eat! In comparison, one carrot, whether eaten cooked or raw, will cover the daily requirement, and 100-200 grams of several other vegetables will suffice, especially when a few drops of red palm oil are added. So Golden Rice can be called a fraud, or at least an intentional diversion from relatively low-cost but effective alternatives.

The problem is not a lack of foods containing vitamin A but a lack of access to these foods. The most effective strategies to tackle the problem are dietary diversification, schooling for girls, improved sanitation, breast feeding, infection control, etc.

Food-based projects in progress across Africa and South-East Asia have shown that small plots of land planted with a variety of fruits and vegetables were enough to provide sufficient Vitamin A and that health conditions improved. Most palm oil has a red colour which is removed from it for marketing purposes, but this also removes the pro-vitamin A. Leaving palm oil with its original red colour might be a far more useful action than trying to persuade people to accept Golden Rice.

Furthermore, the experience of Southern farmers is that intensive rice production with high chemical outputs put and end to their integrated farming systems that included food sources such as fish, snails, water fowl and green leafy vegetables which provided a wide range of essential nutrients, including vitamin A.

6 Corporate influence on International Regulatory Bodies

The World Trade Organisation

WTO rules give large transnationals a similar status to that of nations, which is hardly surprising since several of them are larger in financial terms than many countries. Over 500 corporate delegates attend the biennial WTO ministerial conferences as 'trade advisers', whilst some poor countries might have only a single delegate trying to cover all the issues. The World Bank and the WTO are promoting the drive towards the 'harmonisation' (simplification) of laws such as intellectual property provisions (patents), investment and biosafety regimes.

The Transatlantic business dialogue (TABD)

The TABD was established in 1995 between big businesses in the EU and the USA. Some 150 corporate leaders develop common strategies that are then communicated directly to high-level officials. They seek to harmonise regulation in the EU and the USA (the goal of '*approved once, accepted everywhere*'), which would speed up the development of TNC-friendly regulation.

The Food and Agriculture Organisation (FAO, a UN organisation)

It displays a rather schizophrenic approach to genetic engineering. Parts of FAO have an in-depth understanding of the problems farmers face, and other parts take an uncritical approach to genetic engineering. It can't seem to make up its mind.

Codex Alimentarius. This body is responsible for setting internationally harmonised minimum standards on food safety and quality. It was established in the 1960s and has some 170 member countries. The CA Commission is based in Rome and jointly administered by the FAO and WHO. It is powerful in that it is widely recognised, even by the WTO.

Codex plays a major role in defining and harmonising certain standards, e.g. about labelling. Northern *government* delegations have included representatives of the largest *corporate* interests (Nestle, Coca-Cola, Cargill etc). Lisa Lefferts of Consumers International: *'30 participants at the 1998 meeting represent the pesticide industry.....Three of the four members of the Swiss delegation represented industry (Novartis and Nestec / Nestle)...*

The Convention on Biological Diversity (CBD)

This was signed at the largest-ever meeting of world leaders: the Earth Summit - the UN conference on environment and development - at Rio in 1992. It calls for the conservation of biodiversity and the protection of the interests of indigenous peoples, yet refers to patents and biotechnology as a means for exploiting biodiversity. At the Seattle ministerial in 1999 the US, Canada and Japan hoped to move the regulation of GMOs out of the convention on Biological Diversity and place it under WTO jurisdiction. This attempt was foiled however, and the Biosafety Protocol (= the Cartagena Protocol, see below) was finally agreed in January 2000. It marks the first time that the north failed to dominate, in spite of heavy lobbying. Many areas of the protocol are weak and whole groups of GMOs have been excluded from risk assessment, but it was a victory that the '*precautionary approach*' (PA) became the *guiding principle* for the import of GMOs. However, it is not easy to trigger the precautionary principle, and the protocol has other serious shortcomings. Attempts continue to be made by the US and industry to undermine, misrepresent and downgrade the Cartagena Protocol. There are also struggles over its implementation, and industry seeks to ensure that weak levels of protection are implemented through entire regions with projects such as the Program for Biosafety Systems funded by USAID for 14.5 million dollars.

7 Government legislation and corporate influence.

Well-informed and active citizens and reasonably independent media are vital to balance the pressures of corporations. In 2002 the US grew 66% of the world's GM crops but in the US the public has been slow to respond because they were not informed. In Europe resistance was quick to appear.

In eastern Europe neither the government nor the people were informed before GMOs were introduced. Thus Rumania had 15.000 hectares of GM crops growing before any law was passed, while countries of the former Soviet Union were for some years the "Wild East" where there were neither controls nor information. Yugoslavia had some of the strongest laws in the region, but under cover of field trials the companies have got a foothold there, as they have in the UK. In fact, field trials are the Trojan horse of the industry, part of a process to get people used to GM crops. They give the impression that research is being carried out and maintain the idea that they can flourish alongside conventional and organic agriculture. When Croatia decided to advertise itself as GMO-free it suddenly found itself the object of threats from the US administration. However, resistance has grown steadily in eastern Europe, in both the new EU member countries and those that hope to join. Threatening to use the WTO is common. Croatia is one example (see above), there are many more.

US legislation

In the US, industry has been able (partly through using *substantial equivalence*) to introduce GM crops without labelling or segregation and with a minimum of regulation, which gave the industry a massive advantage. Furthermore the US *deliberately generates surplus production*, including GM food, to donate or dump on foreign markets.

USDA (US Department of Agriculture)

The USDA's strategic viewpoint is that 96% of American agriculture's potential customers reside outside US borders; it strongly propagates exports.

The FDA (Food and Drug Administration)

Its stated aim is '*to reduce the burden of regulation*'. It does not require human safety testing for GM plants, instead there are 'voluntary safety consultations'. Companies themselves are allowed to declare a new substance GRAS (Generally Regarded As Safe), as if they were cosmetics, not food additives. Under this provision the FDA cannot require safety testing: cosmetics don't need testing.. It means that no one actually knows how many GM products are on the market in the US.

However, the FDA began to change and by the end of 2003 they were planning to require data from companies on every aspect of a new GM product.

European Union legislation

The influence of industry was also obvious in 1997 at the negotiations on the European 'Directive on the Protection of Biotechnological Inventions (nicknamed the Life Patent Directive). The 'Genetic Interest Group' encouraged the use of children in wheelchairs to call for the right to patent genes claiming that this would encourage new drugs to be developed. The Directive was accepted in July 1998, although the Dutch and other governments challenged it at the International Court of Justice. Their challenge was dismissed, but by mid-2003 eight EU states had still not implemented the directive.

Tensions between Europe and the US.

There is a constant menace of trade wars and sanctions if Europe fails to open up its markets to GMOs. Zoellick (US representative at the WTO) called the European view immoral '*because Africans need food*'. The final judgement was pronounced in 2006: refusing GMOs is 'unfair competition' – but still states are resisting. The US also dislikes the EU legislation on traceability and labelling but has not to date challenged it. The EU public is still against GM crops.

(For more data on Central and Eastern Europe etc. see the longer summary or the book.)

8 Opening up the South

The push for GM in the south is accelerating.

60% of Indian farmers, 80% of farmers in the Philippines and 90% of African farmers still save their own seed. Most of the smallest farmers are women. The green revolution never really reached them and their use of inputs has remained small. Corporations realise that they have to adapt their presentations to reach this massive market. The large firms have 'non-profit' foundations to fund projects with universities and extension services in North and South, see below.

Microcredit schemes help to link the farmers to industrial agriculture networks. Monsanto's proposed partnership with the Grameen Bank was prevented but the intention is clear. The overseas development agencies of the Northern governments, especially the US government, provide plenty of support.

Disasters, meanwhile, provide the opportunity to unload subsidised US agricultural produce on stricken countries, which destroys local markets and undermines self-reliance.

The importance of reaching women is a concern among the biotech promoters. Companies claim that women will need to do less weeding and spraying, which will benefit the family. It is difficult for people in the north who lack experience of the lives of women in the Third World to respond critically to such arguments. Women are also reliable payers of their debts, even though interest is often set at high levels.

Binding the farmer to the corporation: In the US, Canada, and more recently South Africa, Monsanto uses growers' contracts with its RoundUp Ready seeds. They have to buy new seeds from Monsanto every year. Monsanto has even hired detectives.

In the south surveillance is more difficult and many countries do not yet have patent laws in place. Companies may have to be content to use growers' agreements, or charge a technology fee, but another means of protecting the companies' technology is the Terminator technology. (*4)

The US patent for this was acquired in March 1998. It is designed so that if the farmer replants harvested seed, the seed will not germinate. Such seeds quickly acquired the nicknames Terminator seed or suicide seed, because the seeds produce a toxin when the germination process begins and thus kill themselves. There was a tremendous public outcry and Monsanto and (Astra)Zeneca publicly vowed in 1999 not to commercialise Terminator seeds. But companies have continued to acquire Terminator patents, even though the consequences of contamination simply cannot be predicted from the current knowledge base. Traitor technology is a variation on Terminator. It is designed to produce seeds that require the application of certain chemicals to 'switch on' desirable characteristics such as drought resistance, salt tolerance, toxin production etc, or to 'switch off' undesirable ones such as the production of allergens. The official name for all these technologies is '*genetic use restriction technologies (GURTs)*'. 'Traitor coffee', designed to make all the berries on the bush ripen simultaneously after being sprayed with ethylene - to enable mechanical harvesting - is already being developed. It would lead to even lower market prices, out-competing those who could not afford the technology. The spread of certain traits with compromised immune systems to staple crops could cause a major disaster. Syngenta holds three such patents, DuPont one.

Argentina has for a long time been the second largest GM crop producer in the world. It was profitable: the production of soybean in rotation with wheat, maize or sunflower allowed three harvests every two years. But it led to more large-scale farming. Some 7.000 farming families left the land each year. Now in the region north-west of Buenos Aires half of the cultivated area is managed by contractor holdings. Soil fertility soon began to decline. Glyphosate was used to clear weeds instead of ploughing. Then it was a short step to introducing Monsanto's RoundUp Ready soy. Monsanto also benefited from the increased sale of glyphosate. Use went up 250% in two years, much of it sprayed from the air, causing health problems. By 2000 roughly 90% of Argentina's soybeans were genetically engineered. GM maize and BT cotton were also increasing and RoundUp Ready cotton was expected soon. But yields were not as good as had been promised, , up to 10-15 % lower than conventional yields, while the use of glyphosate had to be intensified because of the rise of herbicide-resistant weeds. In Argentina there are few civil society organisations that protest, and consumers are not being informed. (p.s note GG in Paraguay people's settlements are burnt down, people suffer from infections and burns, and the cancer rate has shot up).

Promoting technology to farmers

Rural extension work was developed in developing countries as a service offered by governments on aspects of farming. Its beginnings can be traced to colonialism. It was instrumental in the spread of the green revolution. Often it involves people from the North trained in colleges teaching farmers in the south with far more experience of the local situation than themselves. Increasingly the rural extension networks are being privatised, which is promoted by northern donors such as USAID and the World Bank. Trial seeds or pesticides may be offered free to farmers at first, plus credit. Slick presentation, often with videos, help to convince farmers of the superior knowledge of the companies. Presenting just herbicides at first (glyphosate or glufosinate, for example) lays the ground for promoting GM herbicide-resistant seed later, ensuring sales of both seed and herbicide. Monsanto has reported: *'the primary classroom is the demonstration plots....Farm families in the area are invited to field days...show that the yield increased....During the last 14 years SG 2000 has helped small-scale farmers to establish 600.000 demonstration plots in more than a dozen African countries.'*

(See the longer summary or the book for examples of public-private partnerships, and for a description of the situation in several southern countries, and for the use of food aid to introduce GMO food and crops.)

USAID is the official development aid organisation of the USAU. USAID's Agricultural Initiative to Cut Hunger in Africa (AICHA) aims to accelerate smallholder-based agricultural growth in Africa. It points out the ...'greater African economic growth means expanding markets for US exports and even more American jobs'. The USAID report 'Assessment of Biotechnology in Uganda' shows how USAID is working with Monsanto and a number of other players, including Makerere University, etc. to facilitate the development of biotechnology in that country. It notes that *'While Monsanto has an interest in the development of the company's own transgenic crops, the other crops of importance to Uganda do not provide sufficient commercial benefit for Monsanto to develop on its own'*. The transgenic crop of interest to Monsanto nearest to commercial production in Uganda in 2003 was Bt cotton. – not really an essential food product.

When one combines these developments with the World Bank's initiative on seeds in Africa (ch. 5) and with efforts to promote the development of IPR (= patents etc) and biosafety law as quickly as possible (see ch 5), the breadth of the US initiative becomes apparent.

Resistance in the South

(See the longer summary for examples of resistance in India, Brazil., and other countries)

As a case-study: Thailand:

In September 1999 BIOTHAI – an NGO based in Bangkok – sent out an open letter accusing Monsanto of illegally releasing GM cotton for cultivation in Thailand even though Bt cotton was on Thailand's quarantine list. (Tests from fields leased by a local company had proved the presence of GM cotton) Meanwhile Monsanto placed adverts in Thai papers about *'GM miracle crops'*, and ISAAA research institute (see ch. 5) set up an office in Bangkok and began to try to counter NGO opposition.

The Thai senate set up a committee to investigate if Thai NGOs had been hired by *'foreign organisations opposed to the development of Thailand'*. The struggle continues.

chapter 9 Conclusion: Summing Up and Moving On.

The biotech companies are not among the largest in the world but their ability to change our lives places them among the most powerful. They are subverting a wide range of institutions and they have colonised much of indigenous agriculture through the green revolution. The loss of germplasm and knowledge is irreplaceable. Farmers are being displaced to expanding cities. All this has intensified dependence and struck at the roots of self-reliance. It requires an unquestioning mass-consumer culture.

Governments of the rich countries have become increasingly complicit (see e.g. the book on 'revolving doors', where employees of industry move into political appointments and back again).

The extension of patents to cover living organisms in 1980 was vital to the biotechnology industry, enabling it to raise capital and gain monopoly control. Now they seek a harmonised global patent regime. The level of control delivered by the technology, especially the Terminator and Traitor technologies, is formidable; it reveals the naked intent of the biotech industry for profit maximalisation.

Research is being affected by a creeping corporate takeover. Genetic engineering as presented by the industry has a deep psychological appeal: people have always longed for miracles. The PR industry is full of clever ideas about how to present GM biotechnology as a dream picture.

Where is all this leading? History may provide clues. The British East India Company began as a group of traders and ended up ruling India. Today, we run the risk of finding ourselves ruled by the corporations far more completely than that: our bodies, our brains, the products of human experience and creativity. Therefore we need to question not just the technology but the bid for power that it represents.

The corporations always promise new products, e.g. crops designed to tolerate salt and drought. What they do not mention is that there are already farmer varieties of crops worldwide that do the same thing, and that all over the world people are producing food that thrives on diversity instead of monoculture, people who work *with* the soil, climate and ecology instead of treating them as obstacles. (See the longer summary for examples).

The message is increasingly clear: we have to choose which path to take. The choices are stark, but people in the *colonised** North are gradually beginning to wake up to them

* (see the subtitle of this book: *Transnational Biotech companies Colonise the Food Chain*)

for (explanatory) NOTES : see after the longer summary!

Hungry Corporations

Transnational Biotech Companies Colonise the Food Chain

By Helena Paul and Ricarda Steinbrecher, Zed Books, UK, 2003

Summary by Greet Goverde, updated and authorised by Helena Paul, April 2006, (g.goverde-lips@chello.nl)

Note that there is more detailed information in the book itself, including elaborate notes providing proof for the statements below.

See the end for a list of abbreviations and for (explanatory) * notes

Contents

1 Paving the Road: the Green Revolution	page	1
2 from Royal Charters to Biotech Gold Rush.		3
3 Image Control: Manipulation and Public Relations.		6
4 Consolidation, Contamination and Loss of diversity: the Biotech Dream Takes hold.		8
5 The main international players and corporate influence.		10
6 Corporate influence on International Regulatory bodies		17
7 Government legislation and corporate influence.		19
8 Opening up the South		24
9 Conclusion: Summing Up and Moving On.		30 followed by notes, abbreviations, films

Followed by (educational) PROJECT.

1 Paving the Road: the Green Revolution

At World Food Summits in 1996 and 2002 it appeared that

- world hunger was not decreasing,
- there was a growing bias towards solutions involving genetic engineering,
- the biotech industry was turning towards advertising and public relations to promote itself.

'Our hungry world cannot afford to go without it' (it = genetic engineering), was the general attitude.

The first chapter is about how the way was paved for this attitude by the Green Revolution of the 60s.

There are two very different basic responses to world hunger:

- 3 technical solutions, focusing on the seed and its genes – seeking to develop a few varieties that will provide high yields under monoculture conditions over vast areas. The new varieties are often called HRVs: (High -Response Varieties). In order to prosper they require inputs of pesticide, fertiliser, and often irrigation.
- 4 The other approach considers that that food insecurity is highly complex and requires political solutions. It also sees the farm as a complex ecological system. Needed are a careful analysis of local problems and possible solutions. Some of the fundamental issues to be addressed are: poverty, lack of access to land, water and seed, poor infrastructure and distribution, unsustainable farming practices, national debt, and wild fluctuations and inequalities in the world market.

There are shades of grey between these two attitudes, e.g. it would help if genetic engineering was made more accountable to the public through public control of science and patenting.

The green revolution of the 60s and 70s took the first approach. It depended on applications of fertilisers, pesticides and irrigation to create conditions in which HRVs could thrive.

The first research institutions were established in the Philippines and Mexico in the 60s with the help of the Ford and Rockefeller Foundations. These institutions are called IARCs (International Agricultural Research Centres). (See also ch. 5, especially on 'Golden Rice' developed at IRRI in the Philippines) Once the HRVs had been developed, a plethora of governments, extension workers, aid agencies and corporations specialising in chemicals and machinery gave incentives for their adoption to small businesses and farmers. Governments designed their own measures, e.g. loans only to farmers who planted approved HRVs, (Philippines), outreach workers being forbidden to teach

farmers how to compost: fertilisers had to be used (Kenya), landowners who mechanised being exempt from land reform (Iran).

The Green Revolution was also seen as a way to stem communism.

The FAO said the gains in production were dramatic, though the use of fertilisers, pesticides and irrigation also shot up..('Towards a New Green Revolutions', produced for the 1996 World Food summit). From the outset however planters using the new varieties have been unable to achieve the promised yields. Instead of 10 metric tonnes per hectare they get 3-6, depending on the region. Moreover others hold that in a traditional mixed crop the yield is much higher (counting all the products, not just the crop itself, but including by-products such as fodder).

There were many negative impacts:

loss of 'farmer varieties'. In Andhra Pradesh (India) it led to a loss of 95 % of the traditional rice varieties without their documentation.

Diseases and pests began to break out, for pesticides also kill so-called 'friendly insects'. Some diseases and pests overcome resistance to pesticides within two years, so there is a constant race between pests and breeders. The WHO estimated in 1989 that 3 million people a year suffer acute pesticide poisoning, and that there are many unreported cases of e.g. pesticide-related dermatitis.

Soil depletion: When fertilisers are added a plant absorbs not only the extra nitrogen, phosphorus and potassium from the fertiliser, but also takes proportionately increased levels of micronutrients from the soil, including zinc, iron and copper. Over time the soil becomes deficient in these micronutrients. If these are absent, it also inhibits the plant's capacity to absorb the fertiliser's elements.

Herbicides and pesticides have damaged the healthy soil food web, esp. mycorrhizae (root fungi, which link plants with the soil), but also worms and the 1-600 million micro-organisms present in one teaspoonful of soil. Breeders have selected for bulk rather than nutritional value, and diets now are less diverse than 30 years ago. These crops are now blamed for causing intellectual deficits because they do not take up essential micronutrients due to soil depletion. Research for the UK government revealed that, across all vegetables measured, mineral content in 1946 was 45% higher in magnesium than in 1991, 46% in calcium, 49% in sodium and 75% in copper: on average almost 60%. (Mass produced fertiliser added to the soil contains only 3 minerals, but there are more than 36 minerals known to be important to plants. These have been depleted in the soil due to fertilizers, acid rain and intensive farming.) Furthermore, minerals improve health more effectively in interactive groups than singly.

Increases in the use of water has lowered water tables. Other areas have become waterlogged with saline and polluted water.

The cost of farming increased because of the high inputs required: fertiliser, pesticides, petroleum and machinery. Consequently smaller farmers were driven off their land into the cities and land was concentrated in the hands of fewer and fewer farmers.. Agriculture was transformed into agribusiness, paving the way for the entry of the corporations and their products

The figures:

- Yields peaked in the 80s, then levelled off and are now falling steadily.

- If China is included, world hunger *reduced* by 16% during the green revolution (1970-90). *Without* China however the number of hungry people *increased* by 11%. Explanation: in the mid-80s China introduced what it called its third land revolution: the 'household responsibility system', which gave farmers decision-making powers about land-use that they had not been allowed under collectivisation. The increase in production in China corresponds with the introduction of this new system.

The Green Revolution did not change existing power structures but rather exacerbated them. Moreover it opened up the world's agriculture to agrochemical corporations This impact may be extremely hard to reverse.

From War chemicals to agrochemicals:

After WW I (1914-1918) there were enormous stocks and production capacities for nitrogen (explosives and poison gas), and industry decided to promote nitrogen fertilisers in agriculture. World War II (1940-1945) gave a big push to a small pesticide industry. Bayer had done a lot of research into potential chemical weapons during the war.: '*What kills people should also kill insects*' – the stuff was reformulated as 'insecticide' and unloaded on the farmers along with potent herbicides.

Although it increased the production levels for a few key crops the green revolution did not actually tackle the problem of food insecurity. That problem is one of maldistribution and ultimately lack of power and opportunity amongst the hungry. The major weakness of the green revolution was its narrow focus on the seed. It failed to see the farm as a complex system. Studies show that other types of innovation, such as intercropping or variety mixes, water management, improved soil fertility and other sustainable practices can produce much better results without the use of costly synthetic inputs (p.103). In an article in Nature 2000 it was shown that variety mixes can give high yields, restrict diseases, pests and weeds, and provide near-complete nutrition for humans and animals alike. Seen like this, genetic engineering is merely a means to perpetuate an agricultural model that is long overdue for a profound transformation (M.S.. Wolfe, 'Crop strength through diversity').

Finance

Since the green revolution, corporate globalisation and the application of neo-liberal policies have speeded up the process of change in agriculture. After the oil crisis of 1973 interest rates were low and an orgy of loans followed in developing countries. These were partly invested in transforming their agricultural sectors and consuming imported goods rather than in public services. Increased production and export of natural resources led to falling commodity prices and reduced income, necessitating further loans. At this point the World Bank and the IMF began to impose stringent conditions : Structural Adjustment Programmes were used to dictate changes in developing country economies and public services. Indebtedness among low-income countries increased three times, and imports increased ten times. Many countries have now paid their debts many times over. The financial institutions have used their stranglehold to dictate terms favourable for the entry of transnationals. Countries were encouraged to stick to cash crops, and holding of food stocks is discouraged by the financial institutions, who advocate selling them off to repay debts. For a country to seek self-sufficiency in food is now ridiculed as old-fashioned. State intervention in the economy is discouraged.

Free trade is supposed to encourage competition but in fact TNCs operate virtual monopolies. Fewer than 5 companies control 90% of the most important crops. In genetic engineering just five companies controlled 100% of GM seeds by 2000. The top 10 agrochemical companies control 91% of the market, in 'vertical integration'. (patents on the technology, seed production, sales process, farmer contracts, and distribution to the markets.)

Neo-liberalism breaks links to particular localities and seeks to remove regulation. It dismantles community networks. Its impact has been enormous.

2 Corporations: from Royal Charters to Biotech Gold Rush.

Corporations were first created in Europe in the Middle Ages for charitable activities such as establishing hospitals. Towards the end of the 16th century certain trade associations were granted royal 'charters of incorporation' by the British crown to act as not-for-profit organisations with a monopoly over a certain area of business. Incorporation (= making a body), gives a business a separate identity to that of the people involved in it. Groups of traders shared the risks of an enterprise, but later members put their assets together and sold their stock to the company, receiving a share in return. The company traded their stock in its name and distributed the profits, thus changing a not-for-profit organisation into a for-profit one. This action was illegal but it was not challenged at the time. In the 18th century many new corporations sprang up, but one of them, the South Sea company, sold shares on the basis of unfounded speculation and collapsed: this was the South Sea Bubble. In 1720 the British government passed the 'Bubble Act', designed to prevent the speculative buying and selling of shares. However, the government itself continued borrowing at interest from the companies, and in 1825 the Bubble Act was repealed. The powers of corporations were gradually extended until the board of directors acquired almost total freedom. The creation of subsidiary companies shields corporations from the consequences of their actions. Risky activities are carried out by the subsidiary and the 'parent' is not liable for its acts. The *consequences* of granting freedoms to fictitious persons who existed only to make profits were never discussed. Finally, the Companies Act of 1989 abolished the right of anyone to challenge the right of the corporation to take various courses of action. A similar path was followed in the US, with judges steadily increasing corporate powers through landmark decisions in the courts.

Since WW I corporations have used events in the international political arena to further globalise their reach. The WTO(*1) (created out of the GATT (*1)) is a perfect vehicle for extending corporate rights, for, unlike other international instruments it has legislative and judicial powers that can be enforced against states through its complaints mechanism. Besides the WTO, other free trade agreements are strongly promoted by the corporations, such as NAFTA (North American Free Trade Agreement), linking Mexico, Canada and the US. 34 Countries have been working to expand NAFTA to FTAA (Free Trade Agreement of the Americas), linking NAFTA to Central America, the Caribbean and South America. (Some have called this a smaller and new version of the MAI - Multilateral Agreement on Investment - , which was defeated but nevertheless it worded an important principle for the corporations: complete freedom to invest and repatriate their profits.)

The marketplace can respond without the impediment of ethics. This is worrying: as biotechnology meets with nano-technology, informatics and the cognitive sciences, the development of biotechnology itself will be profoundly influenced. The accelerating emergence of new technologies means that human society is less and less able to internalise the implications and respond appropriately.

Factors in the growth of the biotech industry

Corporations have the following requirements, all of which they are working for simultaneously:

- compliant financial markets,
- access to cheap raw materials,
- methods of protecting intellectual capital from competition through intellectual property rights, especially patents;
- access to research, infrastructure and public funding, and favourable regulations.

Finance:

At the moment the biotech industry is largely based on a futures market. Investment goes into R&D (Research and Development), public relations and advertising, and spectacular results are promised ... in the future. Currently there are more promises than products, and that makes the market extremely volatile. (see the British Biotech collapse in 1999: p. 27). Of the global biotech companies, mostly involved in research, 20% are public companies, of which 72% are based in the US. The UK has also developed a strong biotech research base due to a greater availability of risk capital in the City of London than in the rest of Europe. The largest shareholders in big companies are always other companies. This means that investment is increasingly removed from local knowledge and local control.

Neo-liberalism dismantles community networks. Its impact has been enormous. There are increasing calls for the localisation of production and investment, for a tax on speculation (Tobin Tax) and for regulation to prevent global TNC monopolies, but none of these demands have yet been enacted. (TNC = Transnational Companies)

Patents give inventors exclusive rights to their inventions for a limited period of time (usually 20 years) and, in exchange, patent holders must disclose their inventions to the public. In 1980 patents were extended to cover living organisms in the US and since then, thousands of "patents on life" have been granted around the world, in spite of much public opposition. Patents are based on a narrow, romantic interpretation of innovators like Thomas Edison, working in isolation. In reality invention is often a collective process, where people build on the knowledge, insights and work of others. This is particularly true for crop development. 'New' plant varieties were typically developed through careful selection by generations of farmers. Patents are inappropriate in this context.

For some crops hybrid seeds have been developed. To produce them two distinct parental lines are needed and thus hybrids can only be reproduced by the breeder. Replanting saved seeds is of little use as they will not grow into a crop resembling the previous hybrid plant. Hybrids thus force farmers to buy seeds every year. However, developing hybrids for most major crops is too expensive, so a system of legal protection has been developed. A PBR (Plant Breeder's Right) entitles the breeder only to prevent unauthorised commercial *propagation* of plant varieties. Patents however prevent *all* unauthorised commercial use. The seed industry has never given up its objective of full patent rights and is not satisfied with PBRs. In the US new plant varieties developed by breeding can now be patented.

Under the TRIPS agreement of the WTO (Trade-related Intellectual Property Rights, see next section), member countries must implement laws to allow patents on micro-organisms, but are allowed to exclude animals and plants from being patented. What can be covered by a patent is much disputed, and many patent offices just decided that this provision included genes and DNA sequences. In Canada e.g. Monsanto 'owns' the gene construct that has been engineered into canola (oilseed rape) to give it resistance to the herbicide glyphosate. Monsanto claims that this patent gives it rights to any plant containing this gene construct. It sued a farmer in whose fields such a plant was found, even though it arrived there by cross-pollination. (March 2001). Such patents have created an atmosphere of fear among farmers. Private detectives have been employed by at least one company. Plant breeders' rights, patents, and growers' contracts are forcing farmers to abandon their age-old practices of seed-saving, sharing and selling. Public breeders have difficulties obtaining genetic stocks from private companies, and researchers seeking to develop new applications of technology may encounter labyrinths of interconnected patents blocking their way. Most breeding programmes now routinely use molecular markers to speed up the breeding process, but these also are often patented as well. This means corporate control over R&D is extending and it signals a breakdown in open communication in the scientific community. Scientists warn each other: *'Don't show your notebook, don't give that talk, so as not to jeopardise the planned patent submission'*. (i.e. Don't endanger the plan to submit this new development for a patent.) Few public researchers are raising objections, deciding instead to jump aboard the corporate bandwagon.

Areas of research that cannot be controlled through patents are neglected by the private sector. Many southern countries do not have facilities of high technology research, investors, or an efficient patent office. Meanwhile they will experience a huge outflow of resources in the form of royalty payments and the patenting of their natural and intellectual resources and knowledge by the corporations from developed countries.

The TRIPS agreement

13 leading US companies effectively developed the TRIPS agreement that was finally adopted in the Uruguay round of the GATT. Thus intellectual property was moved out of the public and into the trade arena.

In 2002 6 corporations controlled 75% of all agricultural biotechnology patents. Patents and genetic engineering provide the instruments for the TNCs to gain control over agriculture and the food chain. Patent protection worldwide remains a mosaic, with different rules and frameworks in each country and wide differences between the levels of protection in North and South. Industry would prefer a simplified system, set at the highest level of property rights protection, namely the US level. Increasingly, countries are being pushed to adopt stricter patent laws. If the proposed SPLT (Substantive Patent Law Treaty) were to be adopted it could perhaps supersede TRIPS itself, e.g. countries would no longer be allowed to exempt plants and animals from patenting. It would reduce many of the southern countries to mere observers rather than players.

In 1999 African countries opposed the review of Article 27.3b of the TRIPS agreement, a review that was mandated during the original negotiations. They called for micro-organisms to be excluded from patenting as well as plants and animals and also called for food sovereignty.(*2) The relevant articles have still not been revised, nor has the whole agreement. In the meantime the US has led the push for bilateral agreements that even go beyond TRIPS

Biotech companies increased from only a few in 1970 to 1.800 worldwide in 1997. It suited the big corporations for initial research to be carried out by universities, research institutes and independent companies. If they liked what they saw, they could always take over once the groundwork had been done. Because of funding difficulties, the universities have been more and more willing to underwrite contracts that allow corporations ownership of IPRs/patents, or make them sole licence holders. Universities have also become pursuers of patents in the hope of increasing their incomes. In order to survive, many small companies have focused on specific areas of genetic research, such as bio-prospecting (*3), vaccine-producing crops etc. Investor interest is highest in pharmaceuticals.

The run on genes and genomes (p. 38) (genome = all the genes of one organism)

Rapid development in genomics led to a race between public and private domains to sequence the human genome and those of other organisms. Through patenting genes, these corporations are privatising information which many believe should be in the public domain. Corporations justify the patenting of genes on the grounds of the costs involved in research and development (R&D)

Syngenta announced in February 2001 that it had mapped the rice genome. The FAO was jubilant and did not question the fact that the map was in private hands. In Dec 2002 the publicly funded International Rice Sequencing Groups (IRGSP) announced that they had completed the draft of a Japanese rice species. The genome sequence was completed in 2005. Chinese researchers announced in early 2002 that they had sequenced the 'indica' strain, and would make it completely available with no strings attached.

Monsanto gave up its rice research in 2002 claiming that much of its data could be found in public databases. The genomes of fruitfly, humans, the mouse, and then proteomics followed. (Proteomics = protein-protein interactions.) The study of proteomes, an organism's total set of proteins, is now overtaking the race to acquire and sequence genomes. (Comment by H. Paul in April 2006: *There are a lot of races being run in different ways. I think companies have seen that maybe there is more to be gained from assisting an international effort to sequence genomes than trying to privately dominate a whole genome. Then they can claim patents on any applications they develop, which would probably be more watertight.. CraigVenter who attempted to claim the human genome as private property and later gave it up is now surveying the oceans for patentable materials.*)

Investors believed that exciting new drugs were only a few years away, though they had been warned that potential drugs would take a long time to develop. They were disappointed that the completion of the genome research did not immediately lead to high proceeds and new medicines. The human genome appeared to consist of only 30.000 genes instead of the 100.000 that had been predicted. The assumed correlation between single genes and traits appears to be spurious, casting doubt on the foundations of genetic engineering and the biotech industry. In the biotech shares rose by 15%, but in 2001 the biotech index began the year by losing 25%.

3 Image Control: Manipulation and Public Relations.

Edward Bernays, a nephew of Sigmund Freud, invented the concept of public relations and wrote books such as 'The Engineering of Consent'. His early campaigns included the promotion of smoking by women and projecting Guatemala's struggles as dominated by communists.

Whatever trade corporations are involved in, they make increasing use of PR companies to put over their message. Words like 'democracy', 'respect', 'transparency', 'sharing' are all freely used but lose their original meaning in the hands of PR companies.

Many companies have an ugly record, but PR companies rely on our short memories and their sales tactics to present rosy pictures and meet any public challenge.

Skeletons in the TNC's cupboards are soon forgotten:

- DDT, PCBs and agent Orange etc. made by Monsanto;
- the gas used for genocide at Auschwitz, Zyklon B, made by an IG Farben subsidiary;
- the Bhopal disaster caused by Union Carbide;
- the vitamin conspiracy (inflated prices) by Rhone-Poulenc (now Aventis).
- Both Novartis merger partners, Sandoz and Ciba-Geigy are remembered for past scandals: in Japan Ciba faced over 5.000 lawsuits over a drug for dysentery which caused eye problems and paralysis. Over 10,000 people were affected and 490 m dollars were paid out in compensation. The other firm, Sandoz, poisoned the Rhine in 1989

A new skeleton in the biotech industry's cupboard is 'multiple resistance'. (p. 51). At present 3 classes of herbicide tolerant oilseed rape are grown in Canada, each made tolerant to a different herbicide by genetic modification. Crosses among them have resulted in the unintended creation of new plants with multiple resistance to two or three classes of herbicides. Such 'accidental gene stacking' could have been foreseen. Canadian farmers are now saying that any advantages that GM technology might have conferred are already being outweighed by the problems caused, and it is getting worse. Farmers are turning to old pesticides which are highly toxic to get rid of such volunteer crops or superweeds.

Strategies for corporate mind control:

PR as education: e.g. the student magazine 'Your World: Biotechnology & You, heavily sponsored by Novartis: *'It gives teachers up-to-date, real-life examples that aren't available from most textbooks'*. Monsanto also founded the 'Beautiful Science' exhibit at Walt Disney World, 1999.

Novartis: Biotechnology Education Centre in Iowa, and an exhibit at the Museum of Science in Chicago, 'From Farm to Plate'.

'Stakeholder dialogues' with NGOs are used to split campaign alliances and isolate the 'radicals' who can then be portrayed as hardliners. They are also useful for corporations to find out what the current concerns are and what language is being used by the opposition, in order to appropriate that language.

Masquerading as grassroots.

E.g. the National Smokers' Alliance which is paid by the tobacco industry. The industry paid 100 million dollars to PR firm Burson Marsteller to create this 3 million member organisation. Likewise church members, the unions and the elderly were encouraged by the biotech industry to demonstrate with placards 'Biotech saves children's lives', and 'Biotech equals jobs'. They paid for 100 members of a Baptist church to go to Washington and paid for their lunch. Jerry Morrison, a long time labour organiser, was hired by Burson Marsteller to speak to unions and farmers about the benefits of the biotech industry.

At the World Summit in Johannesburg a march by poor farmers that drew a lot of public attention was organised by the Sustainable Development Network (SDN), linked to the UK Institute of Economic Affairs, the Free Trade Institute etc. The farmers on the march gave 'bullshit awards' to Vandana Shiva and other anti-globalists. In the magazine 'Nature Biotechnology' Val Giddings (vice-president for food and agriculture of the Biotechnology Industry Organisation (BIO), see below) wrote about this march how *'the farmers were speaking for themselves at last, against those who profess to be their advocates'*. William F. Kirk from agrotech firm DuPont admitted *'product acceptance went so fast with the farmers that perhaps the consumers didn't get worked on well enough for long enough'*, so that needs attending to. Burson-Marsteller specialises in 'altering public perception' and 'crisis management'. Another PR company, Direct Impact, specialised in 'grassroots PR', recruited New York residents to speak in favour of Monsanto's artificial growth hormone for milk cows

Industry lobby groups:

BIO (Biotechnology Industry Organisation) was founded in 1993 and in 2003 had a membership of more than 1000 companies and academic institutions. It organises many conferences and conventions. They are widely publicised and expensive events with free banquets, gifts for journalists, and workshops focussing on the benefits and progress of biotech. There are branches worldwide: Australia has AusBiotech and Europe has EuropaBio, etc.

Bio has repeatedly 'beaten back' (in its own words) federal government price control initiatives on new drugs and it has achieved tax incentives favouring biotech industries.

One of the major battles of EuropaBio was around the Commission's Life Patent Directive, which was first rejected by the European Parliament in 1995 but adopted in 1998 after one of the biggest and most expensive lobby campaigns to date in Brussels.

AfricaBio is aggressively opposing the initiative for a five-year freeze (moratorium) on genetic engineering for food and farming.

In other countries similar PR-sponsored organisations groups are active in the same way.

Think Tanks are supportive sources of opinion that appear to be completely independent. In 1997 conservative or right-wing think tanks provided 53% of citations (= *mention in the media*), centrist think tanks 32 %, while progressive or left-leaning think tanks got only 16% of all citations. The fact that spokespersons for the conservative think tanks receive significant corporate support is not mentioned in the media. Many of Bush's cabinet members (2003) were closely linked to the think tanks (see p. 64 in the book for names).

The FDA (Food and Drug Administration) has declared GMOs safe.

The IEA (Institute of Economic Affairs) and ESEF (European Science and Environment Forum) are similar think tanks in Europe. They receive industry support and proudly claim they are independent from government funding and political parties but they omit to mention their corporate funding. The IEA (UK based) has been involved in the production of documentaries that have highlighted the 'health risks' of organic food and called environmental campaigners middle-class romantics who are attempting to prevent development in the south. Documentaries included the Counterblast and Equinox TV programmes. The ESEF's role was to attack obstacles to corporate interests, such as regulation, restriction and bans on pesticides, tobacco, growth hormone in livestock, chlorine, biotechnology.

Independent Scientists

A key PR strategy is to get scientists who appear to be independent to promote pro-industry views in the public domain, and their views are amplified through bogus consumer alliances such as the National Consumers' Organisation (www.foodstuff.org) and International Consumers for a civil

Society (www.icfcs.org) In 2002 it appeared that some of the vocal GM advocates do not exist at all, they are only virtual reality.

As of 2003 some of the real-life proponents (= *advocates*) were *Henry Miller*, physician, adviser of Consumer Alert, a recipient of big tobacco funding. His main focus was on the EU and its supposed protectionism. He attacked the precautionary principle and the Cartagena biosafety protocol. (for both see ch. 6)

Professor Prakash described organic food as dirty and dangerous on the Equinox programme. . When challenged about research providing proof he emailed: '*Why don't your network sponsor some research in this direction?*' He worked closely together with CEI: Competitive Enterprise Institute.

Nobel Peace laureate *Norman E. Borlaug* worked with DuPont and was involved in increasing wheat yield in Mexico. He got involved in 'shuttle breeding', moving seeds back and forth between different areas – later from Mexico to the Philippines. He denounced the short-sightedness of environmentalists who fail to see that '*fertiliser, pesticides and science stand between humanity and starvation*'. He was a major advocate for GM technology for the south in 2003.

The Hudson Institute is a think tank that receives funding from many biotechnology companies. *Dennis Avery* of the H.I. is the author of '*Saving the World with Pesticides and Plastics*', and '*How Poverty won't save the Planet*'. He claims that people who eat organic food are eight times as likely to be attacked by a deadly new strain of E.coli.bacteria, 0157. He greatly favours 'Golden Rice'. (see below, at the end of ch. 5). At the World Food and Farming Congress (2002) in London he spoke on '*The Conflict between the Affluent Consumers and the Need of the Majority*', and he is quoted as saying '*the activist stance on agricultural biotech is inhumane.*'

4 Consolidation, Contamination and Loss of diversity: the Biotech Dream Takes hold.

Consolidation

By the last decade of the 20th century pesticides had given agrochemical industries a dirty image, *and* moreover many pesticides were either banned or coming off patent, so there was not much money to be made. The pesticide companies moved into the seed industry. and began calling themselves 'life science' companies. The life science concept helped to transform old chemical dinosaurs into self proclaimed biotech saviours. TNCs used biotechnology to engineer plants for dependence on their own pesticides, and this enabled the companies to combine their old trade with the new. This explains why almost all of the early GM crops were engineered for herbicide tolerance. Contracts involved patented seeds and the firm's own brand of pesticides. Corporations also planned designer crops e.g. with additional or altered oil, protein and vitamins. Then the protests against GM crops began, and the process faltered. Many mergers took place around 2000, which was a period of reshuffling. (*see note 4 on the process of genetic modification*)

Consolidation also took place in the seed industry. Many staple crop seed varieties are developed from local seeds collected in the south, often from former colonies. The US soybean crop, now the second most important US crop after corn, was developed from a collection of nearly 5,000 lines brought back from a 1929-31 mission to China. The following data show the degree of consolidation that has taken place:

- 40% of the US vegetable seeds come from a single source
- the top 5 vegetable seed companies control 75 % of the global vegetable market
- DuPont and Monsanto together control 73% of the US corn seed market
- four companies control 47% of the commercial soybean seed market

Most of the largest seed companies are also the largest pesticide companies and agrobiotech companies. To date, most of their research has concentrated on integrating their pesticide and seed businesses. Big firms like Monsanto have bought up small firms, and access to germplasm (*5) of diverse domestic agricultural varieties is increasingly restricted: many varieties are no longer grown or sold, often because it is no longer legal to do so because of patents and national seed lists. Many old varieties are thus disappearing forever. RAFI (www.rafiusa.org)wrote a report on this in 2000: *The Seed Giants: who own whom?* (Additional information: In September 2005, they produced a Communique - (number 90) *Global Seed Industry Concentration 2005 - which updates the story and shows that concentration has continued.*)

In June 2000 Seminis announced that it would eliminate 2000 varieties or 25% of its total product line as a cost-cutting measure. Seminis established a cooperative agreement with Monsanto in 1997 to

develop GM vegetables with resistance to Roundup. Seminis also has production alliances with Wageningen University (and 94 other universities). In 2005, Monsanto completed a takeover of Seminis and thus became the world's largest vegetable seed company.

Contamination

GM contamination is widespread, but is this a deliberate plot or just a blunder? Don Westfall, vice president of one biotech company said in January 2001: *The hope of the industry is that over time the market is so flooded (with GMOs) that there's nothing you can do about it, you just sort of surrender.'*

There are two major pathways of contamination:

- cross-pollination of traditional varieties or
- insufficient segregation of GM materials at any stage of the production process.

Actual levels of contamination may be higher than currently acknowledged since tests are expensive.

Cross-pollination:

The case of Percy Schmeiser serves as a warning. This Canadian farmer was sued because his canola (oilseed rape) contained Monsanto's herbicide tolerance gene, although he had always replanted his own saved seed. He was sued by Monsanto for violation of the company's patent on the gene. Monsanto won because their property was found in plants on his land regardless of how it arrived there. This means that potentially any farmer whose crop is contaminated by cross-pollination or seed spillage from GM seed containing Monsanto's intellectual property can be sued by Monsanto because plants with Monsanto's gene were found in his fields. He and his wife had to abandon their own seed which they had been saving for over 50 years. They destroyed it, which was a painful decision. Many countries do not yet have US-style (strict) patent laws but are being strongly pressurised to adopt them. If they do so their farmers face the same fate.

Seed smuggling: farmers hear rumours about wonderful new seeds and naturally wish to obtain them. Seeds have been smuggled from Argentina into Brazil, even though Brazil has resisted legalising GM crops for some years. The contamination is now quite serious in some regions of Brazil. In Eastern Europe, Monsanto's RoundUp soya seed was planted in Rumania before any legislation had been introduced and the country has been identified as a source of contamination for the rest of the region.

Pakistan was opposed to GMOs but decided to allow the import of GM seeds that had been legalised in their country of origin after they had been smuggled in from China, the US or Australia.. Farmers desperate to get hold of seed with higher yields or insect resistance are vulnerable to bogus seed salesmen, and they may not get the right seed for their region or the right information about how to use them.

Insufficient segregation: Over three quarters of all GM seeds in 2000 were sown in North America. Aventis' GM *maize StarLink* was only meant for *animal* feed, because the particular Bt toxin (*4) (a protein called Cry9C) could trigger allergic reactions in humans. This maize showed up in corn chips and taco shells, and 300 products were pulled from grocery stores in the US in September 2000, and also in the UK and Japan and many other parts of the world. It was pulled off the market altogether but had already contaminated other stocks. The corn trade with Japan ceased but returned to normal in 2002. TWN says they have already paid 1 billion dollars in damages. Scientific American reported (November 2000) that 44 people had complained of being made ill by Starlink and that these allegations would be investigated. There are reports from different parts of the world of people handling crops of GM products and falling sick, but they have not been scientifically investigated.

In the autumn of 2001 researchers called Chapela and Quist found that the *native maize varieties (criollo) in the Oaxaca region of Mexico* are contaminated with GM material. The closest region where transgenic corn was ever known to have been planted was 60 km away from the Oaxaca fields. Yet the contamination proved to be widespread. This region is the cradle of maize, and it is crucial to preserve the old varieties and landraces. Chapela noted that these genetically diverse crops are less vulnerable to disease, pests and climate change and must not be lost.

On the day the Chapela and Quist article about the contamination appeared in Nature there were many messages on the internet discrediting the researchers, some by people who didn't exist, and most by people linked to the industry. The article was withdrawn by Nature, which later also rejected findings by Mexican scientists that confirmed the Chapela Quist research. Yet Mexico imposed a

moratorium on new plantings of GM maize to protect the centre of origin. Researchers are still trying to find out whether transgenes can ever be bred out of the plant population again.

Contamination through food aid: In 2000 5-6 million tons of corn entered Mexico from the US as food aid and was distributed through the country. Though it was only meant for consumption, Mexicans bought it cheaply and one female subsistence farmer in a remote area where transgenic crops were found reported planting it to see if it was better than their own corn.

A new source of contamination is through pharmaceutical crops, held up as a possible cheap alternative to expensive medicines. Research includes corn engineered with trypsin for diabetes, with a compound to treat diarrhoea, or with human genes to produce specific antibodies, e.g. against breast cancer and arthritis, Two tests with drug and chemical-producing crops went wrong in 2002:

In Nebraska a soy harvest was contaminated by 'volunteer plants' which had been left over from a crop of pharma-corn on the same land from the previous season. ProdiGene was fined.

In September 2002 ProdiGene had to pay damages in Iowa for food crops contaminated by pharma-corn in nearby fields .

In the EU there has been a long battle over the regulation of GM in the food chain. A major part of the struggle has been over thresholds of contamination (is 0.5 or 0.9 % contamination acceptable?) The debate is not yet finished. The Commission wished to leave the tricky issue of co-existence between GM crops and conventional and organic crops to member states, even though many of the latter want EU-wide legislation to be adopted. Industry has countered by proposing a GM-free label, which would place the responsibility for the labelling as well for any contamination on those who wish to produce GM-free products. Labelling without traceability is meaningless, but tracing throughout the food chain is costly. The US warned that the costs of traceability would have to be paid by the consumer.

The EU now demands that animal feed should be labelled but not the products, so milk and meat from animals are not labelled, although animal feed is the largest use of GM products and consumers would like to have this information. In this way GM products have already entered the food chain.

There has been no real progress in developing proposals as regards liability for the consequences of contamination.

EU legislation to date demonstrates the importance of a well-informed and determined public. A 'de facto' moratorium on the approval of new GM crops remained in force for four years. In May 2003 the US complained formally to the WTO (on WTO see*1). Is coexistence between GM crops and other crops possible? Industry spokespersons insist that coexistence is possible, while organisations opposing them point to the rapid appearance of contamination even in countries where only trials have taken place. It is a difficult problem both for regulators and seed producers. Monitoring and enforcing the upper limits of contamination is going to be costly, and is seen as a disincentive to the commercialisation of GM crops in Europe.

5 The main international players and corporate influence.

Biotech corporations have carefully cultivated strong relations with governments and the public research sector. They have an increasing grip on research because *public* funding for research has dwindled. TNCs obviously target their research where they believe profits can be maximised. They can often gain influence by merely topping up funds with a small proportion of the total. The universities then provide cheap research, and apparently 'independent' advocates for corporate interests.

The corporations hold that biotechnology represents the next industrial revolution and is essential for development. Corporate lobbying has led to:

- legislation favourable to industry and the testing of GM products
- downgrading of the 'precautionary principle' (let's NOT do this, because we're not sure of the consequences). (see ch. 6 on Cartagena Protocol)
- insufficient sanctions for corporate misdeeds
- massive channelling of public money to the biotech industry
- research diverted to the most potentially profitable applications of GM technology
- GM crops being dumped on the south as food and humanitarian aid.

The World Bank and the IMF (*for both see *6*) are 'one dollar one vote' institutions and operate very secretly. In practice the Bank's agenda is set by the US, the UK and Japan, Germany and France.

In the 60s and 70s the World Bank was a major promoter of the green revolution: The high response varieties (HRV) seeds promoted in the green revolution depended on packages of inputs, and large scale farmers captured the earliest and largest gains from innovations. Many smaller farmers became indebted and many committed suicide. (*see ch.1, and the film Bullshit featuring Vandana Shiva*) Studies (CEPR) show that the World Bank and IMF with their policies of trade liberalisation, privatisation, export promotion and cuts in government spending are failing to deliver the promised economic growth, let alone improve the life of the poor.

In April 1999 the World Bank announced its Initiative For Sustainable Seed Supply Systems in Africa, (ISSSA) with 'Agricultural Services and Management Projects' in many countries in the region. The stated aim is to harmonise seed-related regulation and to promote the entry of 'improved varieties' by means of international involvement. A key aim is the removal of '*constraints (i.e. in national legislation) that limit the entry of improved varieties, constrain competition, restrict multinational involvement, and inhibit development of domestic seed companies*'. Seed associations (open to public and private seed company membership) serve to lobby and influence governments. In 2000 the African Seed Network was launched, funded by the FAO, which is working more directly with farmers, and whose views are also in line with the World Bank initiative. There is growing fear among the NGOs such as Genetic Resources Action International (GRAIN) that the WB initiative, combined with pressures to adopt the most recent version of UPOV (Union for the Protection of New Varieties of Plant) will lead to a corporate takeover of the seed sector in Africa. UPOV sets out a regime to protect the interests of plant breeders. African countries are being told that '*patents and other forms of IPR (intellectual property rights) are the key to attracting investment in biotechnology, which will uplift their economies and improve food security*'. (see also ch 2 on Plant Breeders' Rights)

Africa's seed supply system could suffer the same fate as Europe's, with the outlawing of farmer varieties that do not fit the industrial criteria of being distinct, uniform and stable, and the imposition of F1 hybrids that do not breed true when saved for planting, driving the farmer back to the (increasingly corporate) seed salesman each year. It could also facilitate the entry of technology to prevent the replanting of saved seed through Terminator technology and other genetic 'use restriction' technologies (GURTs)

The Bank, agrochemicals and genetic engineering

In 1993-5 alone, 60 million US dollars went from the World Bank (*6) to producers of pesticides in G7 countries: France (Rhone-Poulenc and Roussel-Uclaf), Germany (BASF, Bayer, Air Loyd, Hoechst) UK (Zeneca), US (FMC Corp, Cyanamid) and Japan (Sumitomo).

Paraquat and DDT, two of the Pesticide Action Network's 'Dirty Dozen' also appear in these contracts. French and German companies procured almost US 120.000 dollars of paraquat for Nigeria. (*to procure = to get a government contract*). One major WB beneficiary in those years was Cargill, the 3rd largest food corporation in the world, which hardly qualifies for WB assistance, according to GRAIN. There were heated demonstrations against the company in 1992 in India.

Agribusiness (e.g. Dow, Aventis and Syngenta) regularly participates in SHARE, (an exchange programme for exchanges of staff between the WB and these corporations)

The WB has already provided hundreds of millions of dollars to develop biotechnology in countries such as Kenya, Zimbabwe, Indonesia and Mexico. Bilateral development agencies such as those of the US, the UK and the Netherlands, and private foundations such as Rockefeller, have through the WB invested around 200m dollars in biotechnology R&D over the past decade. The World Bank has funded the FAO and public scientific research institutes such as the CGIAR but also public-private institutions to promote biotechnology in the south, such as ISAAA (for both see below)

CGIAR (Consultative Group for International Agricultural Research)

A review in 1998 says: the CGIAR challenge is '*to create a new form of public-private partnership that will protect intellectual property while bringing the benefit of this research to the poorest nations*'. The CGIAR's recent history encapsulates the struggle between two opposing movements:

- the bottom-up approach starting with farmers and working in the public domain for the common interest

- the top-down imposition of 'solutions' produced by scientists, solutions which are often owned by private companies and increasingly composed of genetically engineered seeds protected by patents.

The former approach favours decentralisation and the latter centralisation. The key issue is the fate

of the germplasm (*5) developed and shared over millennia by farmers, which forms the basis of the global food supply. This issue generally draws little public attention from the urbanised people in the north. The effect of these opposing views inside the CGIAR organisation is to make it somewhat schizophrenic in its approach. Farmers and NGOs have lobbied tirelessly against the biotech and hitech solutions, yet they seldom get a sympathetic hearing

CGIAR is an informal association of 58 public and private sector members, mainly from the north. It was established in 1971 by the World Bank and the FAO with the help of the Rockefeller and Ford foundations. They support a network of 16 International Agricultural Research Centres (IARCs), (see www.futureharvest.org). Nowadays the industrial countries, specifically OECD members, account for more than two thirds of CGIAR financing. The CGIAR is always short of funds. Links with the World Bank have always been close: its president is a World Bank vice-president. And its secretariat is based at the World Bank headquarters.

The CGIAR group includes research centres

- for maize and wheat (CIMMYT in Mexico),
- for rice (IRRI in the Philippines),
- for tropical products (in Colombia),
- potatoes (in Peru),
- for agricultural research in dry areas (Syria),
- in semi-arid tropics (India), etc.

Most decisions for these institutes have been made by a small number of white northern men from a handful of agricultural colleges in Australia, Britain, Canada and the US, with no internal or external rules of governance. Since 1997 the CGIAR has attempted to redress this balance by appointing more people from the south and more women as trustees.

In 1995 NGOs called for a review, after 14 years without reviews, focussing on bottom-up strategies with full participation from the south. However, the CGIAR members rejected the results when they came out in 1998. The struggle between the two approaches continues to this day. In 2002 the NGOs 'froze their relationship with CGIAR. The tendency is to promote solutions based on genetic engineering and market liberalisation rather than addressing fundamental issues of landlessness and access to resources.

A major role of CGIAR is to collect samples of germplasm (*5) from all over the world and preserve them for humanity. Although many commentators point out that the most effective conservation is carried out 'in situ', that is in the field, most of the preserved samples are actually preserved in gene banks or 'ex situ', where they may lose their capacity to germinate. 91% of the samples come from Asia, Africa and Latin America. 15 % of these samples have gone to developing countries, and 85% to northern countries of which 25% has gone to USA. Northern countries benefit massively from their investment in CGIAR. Mexican wheat and maize are now found in 58% of the American crops, and IRRI rice gemplasm now accounts for 75% of the American rice harvest. Other countries also benefit, e.g. Australia from durum wheat. One third of the tropical seed germplasm outflow from CGIAR now ends up with Pioneer Hi-Bred and Cargill. Pioneer is now marketing Nigerian maize in an area from Zimbabwe to Thailand. At least four CGIAR varieties are 'protected' in the US or Europe by a form of patent.

Arguments over whether patents (IPR) should be allowed on CGIAR resources have continued for years. After the row about Terminator technologies (see GURT), CGIAR banned patents from breeding materials and promised that their germplasm would be made available without restriction to researchers around the world, on the understanding that no intellectual property protection (patents) is to be applied to the material. However, the reality is more complex. Many older materials are placed under the auspices of FAO, but 10% of the 6 million gene bank accessions are held by CGIAR, and these are better documented and preserved. The Ecologist estimated that CGIAR holds about 40% of the unique farmer-bred varieties worldwide. There are several treaties regulating the trusteeship. These treaties say that germplasm must not be patented '*in the form received*', which could leave the way open for patenting anything *derived* from the germplasm. Moreover there is no obligation to *monitor* whether or not the material is later patented by the recipient. The fact that it is in the public domain makes it impossible for local communities who developed it to claim rights over it.

The interests of the two main strands struggling within the organisation are actually irreconcilable. National IARCs are starting to accept IPRs (patents) on biodiversity just to be on the safe side and to supervise *'the delivery of improved products and technologies'*, but by accepting IPRs on biodiversity they *legitimise* them, and they might gradually cave in to industry's IPR demands.

The struggle within the CGIAR over genetic engineering has been almost as intense as over IPRs. The CGIAR has the seeds but corporations have much larger funds. Henry Gorrisma of the Dutch government suggests: *'it is easy for industry to sway the CGIAR. It does not have to put up much money to exert a great deal of influence.'* TNCs have increasingly allowed agricultural research centres to access 'for free' the traits, cell lines, products and processes that they have patented. They have collaborative projects where the companies have donated genes and some technologies, but little direct funding. In short, the CGIAR is often caught up as a participant in projects which it serves without having any real control over them.

In May 2000 Oxfam and Friends of the Earth Europe (FOEE) organised a conference where it became clear that scientists within CGIAR oppose the corporate research agenda on GM but they support those genetically engineered crops that they consider beneficial to the people of the south. They would favour a different system of patent protection that allows open access to genetic materials.

The erosion of humanity's agricultural heritage

Seeds stored in gene banks need to be planted and harvested at regular intervals to remain viable and this has not always been carried out. It is estimated that even in developed countries from half to two thirds of the stored seeds have been lost.

Genetic uniformity (e.g. in monocultures) and reliance on selecting or transferring single genes leaves plants vulnerable to pests and diseases, which rapidly adapt to overcome resistance, or sweep through monocultures. Long-term stable disease resistance however is conferred by *whole groups of genes* interacting with each other and being able to alter and adapt the plant's response. This is a major reason why 'in situ' preservation of varieties is the most effective way to preserve germplasm. Farmer varieties can be lost very quickly through using modern hybrids with high level of inputs because this changes the soil ecology, which may hinder the farm variety from growing. Soils may take a long time to regenerate.

The IRRI (International Rice Institute) (see also the Green Revolution, ch. 1)

It was founded in 1960 in the Philippines by the Ford and Rockefeller foundations with a clear mandate to increase rice production and to preserve traditional seeds and varieties (germplasm). However, little research on local rice was done for three decades. President Marcos granted IRRI special favours, e.g. diplomatic immunities and freedom from legal process in the Philippines.

A conference in 1985 (25th anniversary) demanded the immediate dismantling of IRRI and demanded farmer-led research on rice. A Philippines lawyer said in 1985: *IRRI should not only be dismantled, it should be sued by the farmers' organisations...it stands indicted for complete and absolute negligence...* The 40th anniversary in 2000 was marked by mass protests by farmers.

In Sri Lanka as in the Philippines the first IRRI representative urged the government to phase out its own rice research on the grounds that IRRI could supply all the new varieties needed. In 1966 IRRI released its first variety of high-response rice, IR-8, the cross-breed of a Taiwanese dwarf and an Indonesian variety. It was widely distributed: 55% of the rice land was planted with IR-8 or similar dwarfs by 1986. It was hit by tungro disease and its successor IR-20 was fatally vulnerable to grassy stunt virus. The next one, IR-26 proved resistant to almost all Philippines diseases and pests but couldn't stand the island's strong winds. Breeders are in a constant race to stay a step ahead and few of the highly inbred HRVs last more than a few years before needing to be replaced.

As a largely self-pollinating crop, rice is a poor candidate for hybrids; HRVs have to be made stable through multiple backcrossing (repeated crossing between a hybrid and one of the partner strains) over many generations. The advent of the male sterile maintainer line (developed by Chinese scientists) opened the door to commercial F1 hybrid seeds. IRRI, the FAO and the seed companies have entered into a collaboration funded by the Asian Development Bank to develop hybrid rice technology. F1 hybrid seeds are difficult to develop and cost ten to fifteen times more than ordinary seeds and they are dependent on well-irrigated land and costly inputs. Furthermore the rice is said to have a poor flavour and is vulnerable to pests. It is not fit for small farmers, only for commercial production. The yields increases remain quite small and seed prices are becoming very high. In fact, hybridisation has been called *'the scam of the century'*.

Rice patents and genetic engineering

A number of circumstances have now come together that make it worthwhile for biotechnology companies to enter the seed market:

- increased availability of patent and seed protection
- technological advances in the development and production of F1 hybrid rice seeds on a large scale
- the availability of networks promoting micro credit and new technologies (sometimes offered in one package).

In February 2000 Monsanto enthusiastically started pouring money into hybrid rice research.

IRRI has field-tested genetically engineered blight- and blast- resistant rice and is also working on Bt rice. Components of the resistant rice, from the gene itself down to the markers and promoters (4), are patented by Monsanto, Novartis and other Northern companies and institutions.

In January 2001 the first samples of the GM pro-Vitamin A rice, known as Golden Rice, arrived at IRRI from Switzerland (see below, under 'Golden Rice'). The director said: *'this allows us to finally start on the required testing processes using local rice varieties....we will help the world's millions of poor rice farmers and consumers.'*

Many companies have patents on technologies and gene sequences involved in Golden Rice. Syngenta was granted the rights to commercialise Golden Rice and it was agreed that no charge would be made for 'humanitarian use' in any developing nation. The IRRI collection of Bt strains (a soil bacterium, *Bacillus thuringiensis*) was given to Aventis (later Bayer) in return simply for the training of some scientists in Aventis' laboratories. This will enable Bayer to genetically engineer crops with Bt toxins. For more on Golden Rice: see below.

International foundations

The Ford, Rockefeller, MacArthur and Winrock foundations are built on major profits mainly from oil and automobile industries. The Ford and Rockefeller foundations were founders and architects, with the World Bank, of CGIAR. They support projects carried out by local communities but decisions are taken and rules set by the US headquarters. Moreover, US foundations are obliged by statute to promote US interests abroad.

The Rockefeller Foundation started promoting 'molecular biology' in the 30s and it was perhaps the major proponent of the 'Green Revolution'. Now it is one of the biggest funders of genetic engineering projects in the south, through ISAAA and NGOs. It has spent a lot on rice biotechnology. In 1998 Professor Gordon Conway became president and the Rockefeller Foundation moved to take a middle position in the Global GM debate. (Conway distinguishes between the use of *tissue cultures* to cross species that would only very rarely cross in nature; *marker-assisted selection*, which helps to identify a gene in normal cross breeding, and *genetic engineering*, when he discusses biotechnology.) Conway has publicly criticised Monsanto and other companies for fast-tracking GM products in the south and developing Terminator seeds, but at the same time he supports the participation of the private sector in the expansion of R&D in the south. He believes that the needs of the poor and the interests of the TNCs can be brought together. He saw to it that Syngenta acquired the rights to Golden Rice only on condition that it make the rice freely available to farmers earning less than 10,000 dollars from it each year, but this kind of market segmentation is proving difficult to put into practice. (see Cartagena - or Biosafety - Protocol, below). In 2003 the PIPRA (Public Sector Intellectual Property Resource for Agriculture) was launched to facilitate such 'humanitarian use'. The Rockefeller foundation also funds non -GM research such as natural pest and weed management, e.g. research carried out in Nairobi using striga weeds and desmodium plants.

International organisations.

ISAAA (International Service for the Acquisition of Agri-biotech Applications) is closely linked to the CGIAR network. It brokers agreements to develop biotechnology projects and secures funding (i.e. they act as agents). There is an AmeriCenter at Cornell University, an AfriCenter in Kenya, a SEAsia Center in the Philippines, a EuroCenter at the John Innes Centre in the UK, and the AsiaCentre in Japan. The World Bank and the big biotech companies are donors. ISAAA promotes technology transfer, 'capacity building' workshops and training, and encourages the development of national regimes of intellectual property based on the US model. Such a system of 'plant patenting' has been resisted by many southern NGOs and scientists.

(case study: ISAAA brokered deals between Monsanto and Mexican and Kenyan research institutes. Monsanto engineered one unpopular sweet potato variety against the American strain of the X and Y viruses. This sweet potato project has done little to meet the needs of small farmers. However, it did help to drive the implementation of legislation on intellectual property rights (=patents) in Kenya and the introduction of industry-friendly TRIPs-style regulatory procedures in Mexico.)

The Citizens' Network for Foreign Affairs (CNFA)

It was the brainchild of former US secretary of State Henry Kissinger. It was founded in 1985 just as cracks were appearing in the former USSR. Its name suggests a civil society organisation but it is in fact an alliance of some 250 US organisations in agribusiness and banking. It is closely linked with the Citizens' Network Agribusiness Alliance, CNAA (aim: *'to redesign food and agriculture systems'*.) It has been working in the food and agriculture sector of the new independent states of the USSR and in southern Africa. It has been very active in promoting Monsanto's GM potatoes and creating a hospitable political and legal climate for US business. It is also involved in international lobbying. It was awarded 44.5 million dollars by USAID to implement a three-year Food Systems Restructuring Programme in the former Soviet Union, to challenge *'entrenched state systems' and..... promote public private partnerships and..... protect the investments of American agribusiness...'*

RAISE is a similar programme. In Zimbabwe, RAISE is designed to develop a 'web of input wholesalers and retailers who can expand their markets and sell inputs to smallholder farmers...' In Malawi RAISE trains shopkeepers and provides credit. (In contrast, UBINIG (Policy Research for Development) of Bangladesh believes that closing down shops that sell agricultural inputs is one of their major achievements.) The corporations probably hope to meet with less resistance in Africa than in Asia. In Asia people were forewarned by the: problems they experienced with the green revolution. Other CNFA programmes: Development Education (*to promote economic growth and sustainable development*), a Sponsor Programme (for US food and agribusiness executives), CNAA (see above) and the Agribusiness Volunteer Program (sending agribusiness professionals and farmers overseas).

Public Private Partnerships (ppp) between Universities and Research institutes.

Governments such as the UK, Canada, Australia and the US, have contributed funds to promote partnerships between universities and industry, something which is obviously beyond the reach of southern governments. In addition, the GATS (General Agreement on Trade and Services, *1), one of the WTO agreements, facilitates the setting up of corporate funded departments within universities worldwide. The corporations benefit in return from intellectual capital and reputation. It is another example of the appropriation of public capital. A lot of research is now designed to win corporate funding. In the US 'life sciences' was one of the fastest-growing university disciplines between 1995 and 2000, with 20% growth. Henk Hobbelink writes in *'Biotechnology and the future of World Agriculture'* (Zed Books, 1991): *'In most contracts with universities, the TNC has the right to the first look at the results and can delay publication of them until patent possibilities are investigated'*.

Sometimes companies contract out work to universities, and another approach is to sponsor high-level posts. In the US corporate funding of the universities is still less than 8% but it is having a marked impact on the direction of research. The university ethos of *free exchange of ideas* is coming more and more into conflict with the corporate desire for *secrecy*. This is evident from delays in revealing breakthroughs, less sharing of research, the blocking of reports and legal action against the reporters. Researchers may be tempted to 'talk up' results and accept research-related gifts. Business interests are not usually disclosed.

UK: The BBSRC (Biotechnology and Biological Research Council) is Britain's leading funding agency. Aim: *"to sustain research....and to help industry and government to create wealth'* It is funded by taxpayers and it is part of the government's campaign 'to ensure that higher education is responsive to industry'. Tasks:

- sponsor many of the key players, such as the Institute of Arable Crop Research and the Institute of Food Research
- sponsor British research in the race to find 'key genes'.
- fund the secondment of academics to corporations
- launched a biotechnology young entrepreneurs scheme

The BBSRC is the main public funding body (47%) of the John Innes Centre. It also funds the Sainsbury Laboratory. Both are *'companies limited by guarantee'* (i.e. non profit) the JIC is renowned for its plant research and presents itself as essentially charitably and publicly funded, but it is also funded by and has research agreements with many big agrobusinesses. Although commercial

sponsorship is less than 10%, corporate influence extends over the whole culture within which the JIC operates. Public funding was greatly increased when Lord Sainsbury was parliamentary Under-Secretary of State for Science. Until 1998 he was chairman of the Sainsbury supermarket chain which contributes significant funds to the Labour Party. The JIC pursues a strong policy of patent protection. JIC has organised pro-GM school projects, CD-ROMs and even a play for secondary schools.

Golden Rice

Golden Rice, with its promise to combat VAD (Vitamin A Deficiency) was quickly adopted as the saviour for the beleaguered biotech industry; it became their symbol for the promise of genetic engineering. However, it symbolises the top-down approach, like the green revolution (ch.1): it substitutes technical solutions for necessary political and social change.

In January 2000 an article in science announced the creation of a GM rice containing beta-carotene. As this colours the grain orange, the rice was named Golden Rice. In May 2000 AstraZeneca (now Syngenta) and German-based Greenovation acquired the exclusive rights to commercialise Golden Rice, arousing protests from the Philippines and India. The research was represented publicly as the work of the independent Zurich-based Swiss Federal Institute of Technology, led by Dr Ingo Potrykus. His 10-year long research on the subject was funded by the Rockefeller Foundation and others, and through the contribution of a carotenoid sub-project, by AstraZeneca. Potrykus said he couldn't turn his research into a 'freedom-to-operate' study because 70 patents belonging to 32 holders covered the technology used in the process. He asked AstraZeneca to help tackle the problem, and together they agreed *that 'Everything which leads to a less than 10,000 dollars annual income to farmers should be considered a humanitarian use.'* Farmers would be able to sell it only within the country and not export it.

There are at least three issues here:

- 1 the breeding of Golden Rice transgenes (= engineered genes) into local varieties, which is the inventors' preferred option. These might be local varieties, but also the widely grown high-input varieties (see ch.1) like IR64. However, production could only be used for exports if the patent had been paid for, and thus the agreement could potentially serve as a means to control the rice economy of a whole country.
- 2 potential patent infringement claims (see above, the Canadian farmer Schmeiser ch 4)
- 3 has the patent dilemma been exaggerated, providing an *excuse* to hand all the rights to Syngenta? Several arguments lead GRAIN to suggest that the latter might be the case. They note only 25 of the 60 VAD countries (*VAD= Vitamin A Deficiency, see above*) have patent systems to honour the patents and few of the patents would constrain local work on the rice.

The problem is not a lack of foods containing vitamin A but a lack of access to these foods. The most effective strategies to tackle the problem are dietary diversification, schooling for girls, food fortification and improved sanitation. Other strategies are breast feeding, infection control, supplement programmes as a temporary solution, etc.: each intervention should be country-specific. Food-based projects in progress across Africa and South-East Asia have shown that small plots of land planted with a variety of fruits and vegetables were enough to provide sufficient Vitamin A and that health conditions improved. Most palm oil has a red colour which is removed from it for marketing purposes, but this also removes the pro-vitamin A. Leaving palm oil with its original red colour might be a far more useful action than trying to persuade people to accept Golden Rice.

What has Golden Rice to offer?

Golden Rice does not exist yet in any usable form.

1. pro-vitamin A is in the 'wrong' type of rice and still needs to be crossbred into varieties grown or consumed in the VAD-affected countries.
2. no safety tests have yet been performed
3. no tests have been conducted to find out whether the beta-carotene present in Golden

Rice can be absorbed when eaten, and converted into Vitamin A. Recent data suggest that the conversion rate is not 6:1, as previously thought, but 12:1 or even 21:1

Vandana Shiva pointed out that a small child would have to eat 1.2 to 4.2 kg of uncooked rice per day, which swells to 3.6 to 12.6 kg when cooked, which no child between 1 and 3 could eat. In comparison, one carrot, whether eaten cooked or raw, will cover the daily requirement, and 100-200 grams of several other vegetables will suffice, especially when a few drops of red palm oil are added. So Golden Rice can be called a fraud, or at least an intentional diversion from relatively low-cost but effective alternatives. Furthermore, the experience of Southern farmers is that intensive rice

production with high chemical outputs put and end to their integrated farming systems that included food sources such as fish, snails, water fowl and green leafy vegetables which provided a wide range of essential nutrients, including vitamin A.

New breeds of vitamin A-rich grains have been announced (Golden Millet, and Dream Rice) which have not been genetically engineered. Even so, as with Golden Rice, they cannot answer the problem of malnutrition, which needs a more integrated solution.

Commonwealth Scientific and Industrial Research Organisation (CSIRO) (*Commonwealth = former English colonies, some of which still recognise the queen of England as their head of state*)

As an important producer of agricultural commodities, Australia has committed itself to the search for technical solutions to its problems. (Its problems include its climate, the nature of its soils and unsuitable colonial agricultural practices. It was one of the first countries where glyphosate resistance was reported in ryegrass and it has been accused of being involved in bio-piracy (*3) cases. Australia was a member of the US-led Miami Group that sought to prevent the development of a meaningful Biosafety Protocol(ch 6) and it supported the US challenge to the EU over GMOs (see below).

CSIRO is publicly funded. Australia's plant breeding research has a 15 % involvement from the seed companies, the other 85% is conducted by CSIRO and other public institutions like universities. CSIRO embraces GM research and is Australia's major cotton breeder, while the cotton market is monopolised by Cotton Seed Distributors (CSD). Both acquired US breeding lines. Already on the market is CSIRO's transgenic cotton resistant to caterpillar pests, for which it acquired the licence from Monsanto. As in the US, a convergence is occurring between private and public plant breeding and seed sectors under the impact of PBR (*plant breeders' rights, precursor of patents, see ch.2*) and genetic engineering R&D.

CSIRO is entering into joint ventures and alliances to work on its genetic use restriction technology (GURT), its biotechnology in the field crops sector, and insect bioprospecting (e.g. CSIRO creating a library of extracts and BioDiscovery screening this library for possible pharmaceutical or crop protection opportunities)

chapter 6 Corporate influence on International Regulatory bodies

Corporate influence at the World Trade Organisation

WTO rules (*1) give large transnationals a similar status to that of nations, which is hardly surprising since several of them are larger in financial terms than many countries (diagram on p.148 in the book). Over 500 corporate delegates attend the biennial WTO ministerial conferences as 'trade advisers', whilst some poor countries might have only a single delegate trying to cover all the issues.

At the Seattle ministerial in 1999 the US, Canada and Japan hoped to move the regulation of GMOs out of the convention on Biological Diversity (CBD, see below) and place it under WTO jurisdiction. This attempt was foiled however, and the Biosafety Protocol (= the Cartagena Protocol, see below) was finally agreed in January 2000. At the 2002 World Summit on Sustainable Development, however, an attempt was made by the US to put trade considerations ahead of international environmental agreements, including the Biosafety Protocol. The Ethiopian delegation led a southern revolt against the proposal at the last moment and the attempt was foiled.

This section in the book illustrates the '*revolving doors*': people who 'revolve' between (US) government and TNC roles, p 148. Examples: When Robert Shapiro was chair of Monsanto he was also chair of the President's Advisory Committee for Trade Policy and negotiations. Another example: the US Intellectual Property Committee is made up of 13 major US corporations that were instrumental in developing the Trade Related Intellectual Property Rights (TRIPs) agreement which was included in the Uruguay round of the GATT (*1), 1985-94.

The Transatlantic business dialogue (TABD)

The TABD was established in 1995 between big businesses in the EU and the USA. Some 150 corporate leaders develop common strategies that are then communicated directly to high-level officials. They seek to harmonise regulation in the EU and the USA (the goal of '*approved once, accepted everywhere*'), which would speed up the development of TNC-friendly regulation.

The TABD established the Early Warning Mechanism for potential trade disputes, a sort of fast track through government structures to obstruct or delay policies which its member businesses dislike. It was used to attack the *precautionary principle* (see below, Cartagena Protocol) in trade, the EU Take-Back directive, EU proposals to phase out HFCs, proposals to phase out animal testing and the

draft of the Biosafety protocol. The TABD seeks to establish rules for investments and tries to curb environmental legislation and labelling, it wants TRIPS to be implemented in developing countries, etc. If the TABD were to succeed, Europe would not be able to refuse GM products. TABD have not been successful yet, and in 2001 the US government indicated its intention to step up the pressure in Europe. (See ch. 7, under 'European Union legislation' for an update.)

The Food and Agriculture Organisation (FAO, a UN organisation)

It displays a rather schizophrenic approach to genetic engineering. Parts of FAO have an in-depth understanding of the problems farmers face, and other parts take an uncritical approach to genetic engineering.

- In 2000 the director General Jacques Diouf gave GM organisms his backing, but just over a month later FAO research contradicted his arguments. A report showed that, contrary to biotech claims, there *would* be enough food to feed the world over the next half-century, and that there were too many uncertainties connected with GM food.

- In 2001 the FAO was excited about the mapping of the rice genome, but Devinder Sharma - a food and trade policy analyst from India - cautioned that '*rice genome mapping cannot address the real issues of access and distribution that result in hunger*'.

- In 2001, Diouf stated that GMOs were not necessary. But at the postponed World Food summit in June 2002 in Rome, heavy agro-industry lobbying took place, and the concluding statement says: '*We call on FAO, in conjunction with the CGIAR and other research institutes, to advance research into new technologies, including biotechnology....*'

Codex Alimentarius

This body is responsible for setting internationally harmonised minimum standards on food safety and quality. It was established in the 1960s and has some 170 member countries. The CA Commission is based in Rome and jointly administered by the FAO and WHO. It is powerful in that it is widely recognised, even by the WTO. (*1)

At the final talks of the Uruguay Round (GATT, (*1)) in Marrakesh in 1994 two new agreements were added, ostensibly to prevent countries from adopting measures that could operate as '*discriminatory barriers to trade*': free trade should be safeguarded.

- The Application of *Sanitary and Phytosanitary Measures Agreement* (SPS): governments can take measures for the protection of human health but cannot use them to discriminate against any other party.

- - The *Technical Barriers to Trade* (TBT): regulations and standards, including labelling, should not create '*unnecessary barriers to trade*'.

Codex plays a major role in defining and harmonising SPS and TBT standards. It has also updated its own standards to reflect these WTO rulings. Codex has statutes, rules of procedure and many different committees. Industry recognises its importance and is heavily involved in Codex negotiations. Northern *government* delegations have included representatives of the largest *corporate* interests (Nestle, Coca-Cola, Cargill etc). For example, in the Codex Committee on Pesticide Residues (CCPR), which establishes maximum residue limits (MRLs) for pesticides in food, industry presence is striking. Lisa Lefferts of Consumers International, '*30 participants at the 1998 meeting attended from the Global Crop Protection Federation, which represents the pesticide industry.....Three of the four members of the Swiss delegation represented industry (Novartis and Nestec / Nestle)*

After a long process, Codex formally adopted the 'Principles and Guidelines on Foods derived from Biotechnology' on 9 July 2003. It sets out principles for risk analysis of GM foods and foods derived from recombinant DNA plants and micro-organisms, including allergenicity and unintended effects.

The Convention on Biological Diversity (CBD)

This was signed at the largest-ever meeting of world leaders: the Earth Summit - the UN conference on environment and development - at Rio in 1992. It calls for the conservation of biodiversity and the protection of the interests of indigenous peoples, yet refers to patents and biotechnology as a means for exploiting biodiversity. The CBD is legally binding. 181 Parties signed and ratified it - but not the USA. However, the US is always present at meetings with its handpicked delegations, which always include a large number of corporate representatives. Other countries have so far not challenged its right to intervene but they have more than once prevented the US from subordinating the international environmental agreements to the trade agreements.

Industrial lobbying of the CBD has been prolific. The Business Council for Sustainable Development (BCSD) had unparalleled access to the secretariat prior to the Earth Summit in Rio. Later it acquired the title of WBCSD (*World Business Council...*) It has 125 corporate members. Concentration of corporate power has increased considerably since 1992, with many takeovers and mergers. The Rio plus 10 meeting in 2002 was predictably a major disappointment. Industry has managed to evade any major attempt to control its activities during the intervening decade. However, proposals were presented by a broad group of NGOs in Johannesburg for *binding rules* on corporate accountability, and African networks used the summit to build their strength.

The Cartagena Protocol on Biosafety is designed to protect biodiversity from the potentially negative effects of trade in GMOs, which are defined as LMOs (living modified organisms). It allows countries to invoke the precautionary principle. It should have been finalised in Cartagena, Colombia in 1999, but for once the US and its friends - having come together as the Miami group - had miscalculated the strength of the South. The US -bullied not only the South but also the EU, and the talks finally collapsed. In January 2000 after 5 years of negotiations, 134 countries met in Montreal under the auspices of the Convention on Biological Diversity (see above), and the protocol was finally adopted. It entered into force in September 2003, in the same months as the WTO's Cancun ministerial, as if to underline the ongoing struggle between the WTO and the UN.(*1) The Protocol is a new landmark in the development of multilateral environmental agreements because it marks the first time that the north failed to dominate, in spite of heavy lobbying.

Many areas of the protocol are weak and whole groups of GMOs have been excluded from risk assessment, but it was a victory that the '*precautionary approach*' (PA) became the guiding principle for the import of GMOs. The Protocol covers only Living Modified Organisms (LMOs) which it defines in the text. It subjects certain LMO imports such as seeds for planting to an Advance Informed Agreement (AIA). This is a process which is meant to ensure that countries have both the opportunity and the capacity to assess the risks before agreeing to import a particular GMO.

However, it is not easy to trigger the precautionary principle:

- the PP can only be triggered when sufficient evidence exists of 'a threat of significant reduction or loss of biological diversity'. Even scientific researchers will be in disagreement about that.
- industry and US government representatives are known to pressurise any country that is trying to implement a moratorium on GMOs.

Before they can ratify the agreement countries are *obliged to frame national legislation* to implement it, which requires scientific, technical and legal capacity, for which they require funding, training and time. This provides plenty of opportunities for the industry to intervene. On the other hand, Bulgaria ratified early on because its legislation only required a presidential signature to do so. Hence, although it has ratified, it has no national *law* that complies with the protocol.

The Protocol has some serious shortcomings:

- Imports for 'food, feed and processing' such as maize, wheat and rape were excluded from the strict AIA (*Advanced Informed Agreement*) procedures (above) which are meant to cover the import of seeds. But such LMO commodities may include viable seed which people may plant, especially if food is short. They were later covered by '*AIA light*', a watered-down version of the stricter criteria. Furthermore, the Miami Group refused to allow GM commodities to be *labelled* as such, they only need to be documented as '*may contain LMOs*'. Thus GM-exporting countries avoided having to segregate GM from non-GM commodities. The recent (March 2006) meeting of the Biosafety Protocol in Brazil changed this ruling to say that where a cargo is known to consist of segregated and documented LMOs, it must be labelled as "*contains LMOs*", but the implementation of this has been delayed to 2012 and cargoes without full documentation are excluded – as are transboundary movements between parties and non parties to the Convention.
- two areas of LMOs were later excluded after intense lobbying by pharmaceutical industries in the EU (especially the UK) and US: LMOs intended for '*contained use*' (e.g. in fermentors, or vials with bacterial or fungal cultures) and LMOs used for medical purposes. '*Contained use*' is not defined in such a way as to prevent leakage into the environment, which is known to be occurring. It merely seeks to 'limit their contact with, and their impact on, the external environment'.

The Protocol clearly states that neither the WTO nor the Protocol take precedence. Attempts continue to be made by the US and industry to undermine, misrepresent and downgrade the Cartagena Protocol. There are also struggles over its implementation, and industry seeks to ensure

that weak levels of protection are implemented through entire regions with projects such as the Program for Biosafety Systems funded by USAID for 14.5 million dollars.

Chapter 7 National government legislation and corporate influence.

Well-informed and active citizens and reasonably independent media are vital to balance the pressures of corporations. In 2002 the US grew 66% of the world's GM crops but in the US the public has been slow to respond because they were not informed. In Europe resistance was quick to appear.

In eastern Europe neither the government nor the people were informed before GMOs were introduced. Thus Rumania had 15.000 hectares of GM crops growing before any law was passed, while countries of the former Soviet Union were for some years the "Wild East" where there were neither controls nor information.. Yugoslavia had some of the strongest laws in the region, but under cover of field trials the companies have got a foothold there, as they have in the UK. In fact, field trials are the Trojan horse of the industry, part of a process to get people used to GM crops. They give the impression that research is being carried out and maintain the idea that they can flourish alongside conventional and organic agriculture. When Croatia decided to advertise itself as GMO-free it suddenly found itself the object of threats from the US administration. However, resistance has grown steadily in eastern Europe, in both the new EU member countries and those that hope to join. The EU was faced with US action through the WTO against its de facto moratorium on new approvals, which has now ended.

Cases are recorded around the globe of Monsanto or US representatives applying pressure to judicial or national decision making processes. (e.g. as became clear from a confidential report leaked to GeneWatch at the end of 2000.)

Threatening to use the WTO is common. Croatia is one example (see above). Sri Lanka tried to establish a ban on the imports of GM foods in May 2001. The US threatened to use the WTO to overturn this. Many NGOs protested, but Sri Lanka gave up its attempt to ban the import of GM food. The TRIPS agreement obliges countries to implement law to protect intellectual property rights (patents). Currently there is a major struggle over the fact that under TRIPs countries are allowed to make an exception for plants (including seeds) and animals. In Pakistan Monsanto pulled powerful strings to obstruct proposed legislation, which might have favoured farmers' rights to save, retain and exchange seeds over those of TNCs. It was suggested it was unfair (discriminatory) that GM or transgenic plants would have to clear tough environmental and bio-safety assessments before being given protection, unlike traditional seeds.

In Ireland GM sugar beet was the first GM crop to be tested on Irish soil. In the case '(Claire) Watson vs Monsanto' Monsanto threatened that Novartis would withdraw all non-GM beet seed from sale to Irish farmers if the tests were not allowed, which meant serious implications for the Irish sugar beet industry.

As a result of public pressure, certain industry cornerstones have begun to crumble, e.g. the concept of *substantial equivalence*, according to which GM varieties of crops are considered to be (roughly) equivalent to non GM varieties and therefore not to need special trials and tests. Scientists and public interest groups around the world insisted that it was an ill-defined and pseudo-scientific concept, and now it is no longer seen as an end point of safety assessment but as a starting point. However the term continues to be used by industry as an indication of safety.

US legislation

In the US, industry has been able (partly through using *substantial equivalence*) to introduce GM crops without labelling or segregation and with a minimum of regulation, which gave the industry a massive advantage. Furthermore the US *deliberately generates surplus production*, including GM food, to donate or dump on foreign markets. There is also confusion over which US government department has jurisdiction over what. GM micro organisms ended up being regulated as toxins, while a plant engineered with insect resistance (Bt toxins) is treated as a pesticide. It remains unclear how GM animals are going to be regulated - possibly as a drug. The FDA has not yet proposed new regulation.

USDA (US Department of Agriculture)

In 1862, when President Abraham Lincoln founded the US Department of Agriculture he called it the 'People's Department', but today its primary goal is the promotion of economic and trade opportunities. The USDA's strategic viewpoint is that 96% of American agriculture's potential

customers reside outside US borders; it strongly propagates exports. Bush's choice for his Secretary of Agriculture, Ann Veneman (now head of UNICEF) shows that the highly pro-GM attitude was set to continue. She was actively involved in the Uruguay round, NAFTA and the US-Canada free trade agreement and served on the board of a Monsanto subsidiary. However, the US National Academy of Sciences is slowly developing a more rigorous approach to the issue of GM.

The FDA (Food and Drug Administration)

Its stated aim is *'to reduce the burden of regulation'*. It does not require human safety testing for GM plants, instead there are 'voluntary safety consultations'. Companies themselves are allowed to declare a new substance GRAS (Generally Regarded As Safe), as if they were cosmetics, not food additives. Under this provision the FDA cannot require safety testing: cosmetics don't need testing.. It means that no one actually knows how many GM products are on the market in the US. Moreover any tests that are carried out can be protected as 'trade secrets', 'or 'commercially confidential. This FDA ruling is more than simply an oversight: interrelationships between industry and the government, especially the FDA, are eye-opening. (examples in the book on p. 167).

Michael Hansen of the Consumers Union US notes that *'...the FDA does not state its own opinion about the safety of crops – it only states what the company believes. The letters for all 52 'safety consultations' done since the Flavr Savr tomato contain basically the same language'*.

That particular tomato was genetically engineered to slow down the softening process as it ripened. Since the action of the inserted gene was designed to block the product of another gene, not produce its own, the only assessment made was of the *antibiotic marker gene* (used to show that the engineering process had worked). Three years later the Flavr Savr tomato quietly disappeared from the shelves: it had failed the market test but it had also failed Agency safety standards, However, the Special Research Director of the Agency failed to reject it because he had been told not to screen it as a food additive.

One scientist taking part in the research: *'Simply proclaiming that 'these foods are safe and there is no scientific evidence to the contrary' is not the same as saying; 'extensive test have been conducted and here are the results'*. In May 1998 a lawsuit was filed against the FDA. At a public hearing on 30 November 1999 it was revealed that FDA scientists themselves were warning about potential health hazards of GM foods, but they were being systematically ignored by the politicians and policy makers at the FDA. Unexpected high concentrations of plant toxicants could occur, and they could be completely different chemicals from those normally found in these plants. The court decided that the FDA's decision not to regulate GM foods was technically legal. However, the FDA was already beginning to change and by the end of 2003 they were planning to require data from companies on every aspect of a new GM product.

European Union legislation

The European Commission, the most powerful but unelected decision-making body in the EU, has given funding to projects supporting crop biotechnology, e.g. to compare yield performance of transgenic hybrid oilseed rape and conventional varieties and hybrids. The results were unimpressive. In the spring of 1997 the EU commission decided to approve a variety of transgenic maize produced by Novartis (now Syngenta). This decision was challenged by 13 out of 15 member states, but to little avail because procedures demand unanimity before a Commission decision can be overturned. The European Parliament condemned the decision but the European parliament to date can in most fields only advise, not decide. The pro-biotechnology stance of the EU Commission is partly due to the lobbying of EuropaBio, the *'voice of the European biotechnology sector'*. (*7) The influence of industry was also obvious in 1997 at the negotiations on the European 'Directive on the Protection of Biotechnological Inventions (nicknamed the Life Patent Directive). The Genetic Interest Group encouraged the use of children in wheelchairs to call for the right to patent genes claiming that this would encourage new drugs to be developed. The Directive was accepted in July 1998, although the Dutch and other governments challenged it at the International Court of Justice. Their challenge was dismissed, but by mid-2003 eight EU states had still not implemented the directive.

Tensions between Europe and the US.

There is a constant menace of trade wars and sanctions if Europe fails to open up its markets to GMOs. Bill Clinton and Romano Prodi therefore agreed to establish a new transatlantic EU-US Biotechnology Consultative Forum. The group published a report in 2000 calling for the *precautionary approach* (see above, *Cartagena Protocol*) rather than the precautionary *principle*, and also stating there is a lack of substantial scientific data to back decisions against GMOs. But tensions have not subsided. Zoellick (US representative at the WTO) called the European view 'Luddite' (*obstructing,*

anarchist) and immoral *'because Africans need food'*. In May 2003 the US challenged the EU's "de facto" (it was never called a moratorium by the EU) moratorium on GMO approvals at the WTO. The WTO produced a much-delayed ruling, the longest in its history, early in 2006. In this ruling the WTO agreed that the EU, and especially certain member states, were in violation of WTO rules but also said that the complainants (US, Argentina and Canada) had failed to prove that EU's assessment methodology was inappropriate or that there was insufficient scientific evidence to back the EU position. The panel refused to rule on whether GM foods were safe or not, whether GM and non GM crops are "substantially equivalent" and whether the EU was still operating a moratorium. This has enabled both sides to claim victory. The final judgement is due later (May 2006 ?) once both sides have been able to respond.

The EU had already introduced legislation to consider applications for GM releases on a case by case basis before the verdict, so some GM products had already been approved across the EU for entry as food, feed or planting.

The US also dislikes the EU legislation on traceability and labelling that ended the moratorium before the WTO ruling but has not to date challenged it. The EU public is still against GM crops.

Central and Eastern Europe: a corporate paradise.

The situation is very diverse, with Hungary having a relatively well-controlled and transparent regulatory system, while in countries like Bulgaria and Rumania there was at first no government control on releases of GMOs. Both countries have grown GM crops and become a source of contamination.

While Tesco and Unilever are eager to reassure consumers in the EU about the absence of GM in their products they have no such scruples in south-east Europe. Monsanto and Pioneer Hi-Bred International (now owned by DuPont) have exploited the lack of regulation in Eastern Europe and the NIS (Newly independent states). The countries involved in the first round of accession to the EU are harmonising their legislations with EU directives. Several of them have superior requirements to the EU because they are parties to the Aarhus convention.

NIS (Newly Independent States) of the former Soviet Union

This was for some years the Wild East for biotech companies. There was a policy vacuum, although Russia now has some GMO provisions scattered among several regulations.

The Ukraine.

In 1997 Monsanto first imported GM Bt potatoes to the Ukraine for trials at state breeding stations and collective farms. After two years Monsanto and a Canadian company announced their intention to establish seed production, timed to coincide with the visit of the Canadian prime minister. However, the media had picked up on the controversy raging across Europe and the companies were advised to destroy the harvest. Instead, they composted the potatoes. In March 2000 Monsanto failed again. However, Monsanto's potatoes have continued to be grown across the country, without public awareness, labelling or government control. A representative of CNFA (*see ch 5, int. organisations, Citizens' Network for Foreign Affairs*) collaborated with the Ukrainian Ministry of the Environment to prepare weak and belated legislation as well as co-organising a conference. NGOs managed to thwart an extremely permissive draft law in 2001 but an almost identical one was adopted in November 2002. In December 2002 it was announced that a US and German company would develop GM pharma-plants for vaccines and therapeutic proteins in the Ukraine, probably wheat and oilseed rape. Experience in the US with ProdiGene's pharma-crops suggests that there is likely to be serious contamination with unforeseeable consequences.

Georgia

Georgia has also experienced the Monsanto Bt potato, financed in part by USAID. The crop basically failed through not being adapted to local conditions, but no compensation was paid and farmers said they were left in debt.

Russia

Although there had been little public debate, there were public protests in April 2002. Russia received the Colorado beetle via US food aid following WW II.. Monsanto has been working on Bt potatoes designed to combat the beetle and has been providing funds. At the press conference announcing these developments the US ambassador advised Russia not to regulate the technology *'to hinder the sector's development'*. However, by 2005, although two Monsanto potatoes had been approved since 2002, no GM crops had yet been legally grown in Russia, although trials of RR soya and NK603 maize have taken place.

The Balkans region (most countries in the region will become full EU members)

Bulgaria

In 1999 Bulgarian farmers harvested the first crop of GM herbicide-tolerant maize. Most of this passed unlabelled into animal feed and thus into the food chain. In 2000 Monsanto's GM maize was grown on 12.000 hectares, expected to increase to 25.000 hectares in 2001. An institute in Kostinbrod which had apparently already experimented with tobacco and alfalfa in the mid-90s, has been undertaking projects for Monsanto and Pioneer.

Bulgaria has an export market in maize and fodder. In 1996 a weak GMO law was passed, without consulting parliament. In 2000 parliament withdrew all state financing of research and development of GM tobacco and vines, fearing for their export markets.

Why was Bulgaria targeted? Although Bulgaria was the first country in the region to establish regulations for the biosafety of GM higher plants, this actually gave biotech corporations the legal basis they preferred for starting field trials – the first step to commercialisation. It was also one of the first countries to ratify the Biosafety protocol, see above. This shows that legislation introduced to control an activity, can actually promote it. However, public awareness has increased and in June 2005, a new law on GMOs came into force, which is stronger in certain respects than EU law.

Romania

Monsanto's commercial cultivation of RoundUp Ready soybeans in Romania already covered 15.000 hectares in 1999, some 20% of the total area under soybeans. When Romania introduced a government ordinance in 2000 this enabled Monsanto to legalise its operations. Romania is said to be a major source of smuggled seed to the rest of the region.

Croatia.

A resolution by the Croatian Parliament in 1998 ultimately led to Croatia declaring itself GMO-free in 2001. A leaked memo of November 2001 from the US embassy warned that Croatia must comply with WTO rules. US NGOs protested jointly with Croatians. A tour by North American farmers opposed to GM was organised in January 2002. The day before it began, the US embassy in Vienna held a press conference at which it reminded Croatia of its obligations under the WTO. They also stated that GM crops were 'substantially equivalent' to their non-GM counterparts, so labelling was unnecessary. They further claimed that Americans had been eating GM foods for years, but none had fallen ill. This claim has often been made but is fallacious, as US citizens are eating the products of animals fed with GMOs, not consuming GMOs directly. Furthermore, many unexplained allergies and illnesses are being reported in the US and in 1999 it was claimed that many were linked with soya.

Yet the proposed legislation to ban GMOs has since been dropped and new laws intended to harmonise with EU directives are planned.

Yugoslavia (Montenegro and Serbia)

Yugoslavia has the most effective legislation in its region. However, Monsanto and Pioneer have both carried out field trials in the Vojvodina - an important area for seed breeding and multiplication - and working with two of Yugoslavia's three testing centres. Monsanto has access to locally adapted varieties of GM maize in which to insert the RoundUp gene. The Institute for Food and Vegetable Crops (= IFVC) seems to be trying both to work with Monsanto and Pioneer on GM, and to produce GM-free seed and soy products, with obvious implications for contamination. GM contamination has already occurred in the Vojvodina: small areas with Roundup Ready soybeans have been discovered every year somewhere in the province. Likely sources appear to be Romania (smuggling) and Kosovo (food aid).

EU and Eastern Europe.

The EU has passed legislation on traceability, labelling and novel foods / feeds, while internal discussions continue on co-existence and liability for the possible consequences. In several cases provisions in the GMO laws are stronger in Eastern Europe than those in the EU, especially with regard to public access to information and decision-making, thanks to those countries' ratification of the Aarhus convention. However, civil society in most of these countries is still in the process of becoming accustomed to active participation. The biggest problem is implementation. Most of the countries lack the necessary institutions such as certified laboratories.

The three smallest states in the region – Croatia, Slovakia and Slovenia, have attracted the least interest from the large companies. Slovenia worked with Karinthia in Austria and Friuli – Venezia – Giulia in Italy to establish a GM-free organic agriculture zone. They hoped to support and develop the particular specialities of the region, ensuring livelihoods for local farmers and encouraging eco-holidays. In 2003 Upper Austria sought to declare itself a GMO free zone, but in 2005 the EU Commission declared its draft law illegal.

Chapter 8: Opening up the South

Introduction

Argentina is the only country in the south that grows GM crops on a massive scale (soya since 1996), and China is growing Bt cotton commercially and a small amount of tobacco. But the push for GM in the south is accelerating.

60% of Indian farmers, 80% of farmers in the Philippines and 90% of African farmers still save their own seed. Most of the smallest farmers are women. The green revolution never really reached them and their use of inputs has remained small. Corporations realise that they have to adapt their presentations to reach this massive market. Monsanto, whose traits are in close to 90% of the GM crops planted worldwide, is at the forefront of this search. Pioneer features strongly, a reminder of the agreement in 2002 between Monsanto and DuPont, owner of Pioneer, to share their technologies for mutual benefit. The large firms have 'non-profit' foundations to fund projects with universities and extension services in North and South, see below.

Microcredit schemes help to link the farmers to industrial agriculture networks. Monsanto's proposed partnership with the Grameen Bank was prevented but the intention is clear. The overseas development agencies of the Northern governments, especially the US government, provide plenty of support.

The World Bank and the WTO are promoting the drive towards the harmonisation of laws such as intellectual property provisions (patents), investment and biosafety regimes. Disasters, meanwhile, provide the opportunity to unload subsidised US agricultural produce on stricken countries, which destroys local markets and undermines self-reliance.

The importance of reaching women is a concern among the biotech promoters. Companies claim that women will need to do less weeding and spraying, which will benefit the family. It is difficult for people in the north who lack experience of the lives of women in the Third World to respond critically to such arguments. Women are also reliable payers of their debts, even though interest is often set at high levels.

The corporations may use 'growers' contracts' where patent laws are not yet in place or enforceable. Several corporations are developing and introducing technologies to control the germination of seed and expression of traits, in order to protect their intellectual property by forcing farmers to buy new seed each year instead of saving it. These 'genetic use restriction technologies', or GURTS, such as the Terminator and Traitor technologies, are intended to prevent seed saving and restrict access to the genetically engineered characteristics.

On p.187 there are tables showing that the majority (66%) of GM crops are planted in the US and that the largest proportion of the GM crops are soybeans, used mainly for animal feed. Monsanto dominates massively, with some 90% of GM crops carrying its patented traits. In 2002, according to the ISAAA, which promotes GM crops, GM corn was 9% of the world corn crop, canola 12%, soybeans 51%, cotton 13%.

Agricultural Research and Development

Since the 70s the level of *publicly* funded R&D in the North and the south (especially in former colonies) first increased and then slowed drastically. By the mid-90s the *private* sector was spending roughly equal to half the level of global *public* spending on agricultural R&D, 94% of it in the north. Private expenditure tends to be less farm-focused and more directed to machinery, post-harvest research, food and food processing. There is also a strong focus on chemicals (pesticides and herbicides: 40% of private research in the US and UK, and up to 75% in Germany). Private research outputs are generally more designed for capital-intensive, value added farming. They are no substitute for publicly funded research.

Research in the south is often disrupted by wars etc, and now there are additional barriers: complex labyrinths of patent protection may have to be negotiated, licences may need to be obtained, databases require fees for access. Thus agricultural research is becoming increasingly removed from

those closest to the soil, who are developing living knowledge and seed stock, and some would say this knowledge is being actively destroyed by agricultural R&D.

Much could be achieved through developing more publicly funded collaborative research led by farmers, which is advocated by NGOs such as MASIPAG and SIBAT in the Philippines, who actually practise it.

Promoting technology to farmers

Rural extension work was developed as a service offered by governments on aspects of farming. Its beginnings can be traced to colonialism. It was instrumental in the spread of the green revolution. Often it involves people from the North trained in colleges teaching farmers with far more experience than themselves. Increasingly the rural extension networks are being privatised, which is promoted by northern donors such as USAID and the World Bank. Trial seeds or pesticides may be offered free to farmers at first, plus credit. Slick presentation, often with videos, help to convince farmers of the superior knowledge of the companies. Presenting just herbicides at first (glyphosate or glufosinate, for example) lays the ground for promoting GM herbicide-resistant seed later, ensuring sales of both seed and herbicide.). Monsanto has reported: *'the primary classroom is the demonstration plots....Farm families in the area are invited to field days...show that the yield increased....During the last 14 years SG 2000 [Sasakawa Global 2000: see below] has helped small-scale farmers to establish 600.000 demonstration plots in more than a dozen African countries.'* (See also notes on films, e.g. Bullshit)

Corporate promotion of new technologies

Monsanto cooperates with pesticide manufacturer Rallis, which operates local promotion agencies called PEACE (Pesticide efficacy Advisory Centres) throughout India.

Zeneca (now Syngenta) promotes the use of pesticides through its 'Farmer Education and Training Team', which has developed cartoon comic papers in schools under the title of 'Adventures of the Grow Safely Team'.

The NFSD (Novartis Foundation for Sustainable Development) is a 'development organisation' founded by Novartis. One of its projects is called Provincial Advocates for Sustainable Agricultural Development, aiming to assist farmers to break out of dependency on large landowners, food companies and chemical farming. Another is an agricultural extension service in Laos. All this sounds promising, but the executive director (prof. Leisinger) is one of Novartis' main spokesmen for biotechnology, with a long history in Ciba Pharmaceuticals. Many of these projects were moved to the Syngenta Foundation for Sustainable Agriculture after Novartis spun off its agribusiness in November 2000, with Klaus Leisinger as interim executive director. AgBioWorld reports: *'...With sustainable agriculture as the framework.....Syngenta is making available at no cost a number of innovative technologies to subsistence farmers.'*

The foundation has three African projects:

- insect-resistant maize for Africa (IRMA), working on Bt maize (*4) with a Kenyan institute and CIMMYT (see above, ch 5 under CGIAR). The project aims to introduce insect-resistant maize and avoid the problem of rapidly developing resistance by intercropping with non-Bt maize to act as host to or attract maize pests, which is seen as a solution for small farmers. There are, however, non-GM and cheaper methods of combating the cornborer: growing napier grass around the field to attract it, and intercropping with Desmodium, a nitrogen fixer which repels the cornborer, suppresses the parasitic witchweed, and is good fodder for the animals.

- Mali: millet and sorghum improvement. Syngenta cooperates with the UN's IFAD (International Fund for Agricultural Development) to provide small farmers with access to adapted seeds and seed treatment packages. IFAD provides loans to more than 100 governments for projects providing *'economic opportunities for rural dwellers'*.

- Eritrea – land resource management.

The language of development organisations and others sceptical of the GM revolution has been adopted and incorporated into the companies' language, see e.g. the website of the Monsanto Fund, where its four main areas of activities are described.

Public-private promotion of new technologies

In 1985 the Japanese philanthropist Sasakawa sponsored studies to assess the possibilities of introducing a green revolution into Africa and founded the SAA (Sasakawa Africa Association) to

support agricultural extension work. The SAA formed a partnership with Global 2000, a programme of the (Jimmy) Carter Center in Atlanta, which provides information about the latest technologies and methods. The combination is called SG 2000. Monsanto has cooperated with SG 2000 since the early 1990s, and in 2000 actively supported programmes in Ghana, Ethiopia, Tanzania, Malawi and Mozambique and several other countries later on. SG 2000 works mainly with and through ministries of agriculture in southern countries, communicating with farmers through field demonstration programmes. Norman Borlaug (see ch. 3) is senior consultant for SG 2000. SG 2000 is encouraging agribusinesses to increase investments in *'input dealer development'* in project countries.

Winrock International In 1985 the Win(trhop)rock(efeller) International Livestock Research and Training Center merged with another Rockefeller's ADC (Agr. Development Service) Winrock International (Institute for Agricultural Development.)

Aim: to promote new farm technologies and create market-driven agriculture, especially post-harvesting processing (stocking and trading). Monsanto cooperates with Winrock International in smallholder projects to promote the use of conservation tillage practices (see below), sometimes using glyphosate-based herbicide.

In China the Canadian International Development Agency (CIDA) has funded rural extension work to encourage farmers to grow Monsanto's cotton and corn. The project is continuing under the sponsorship of Monsanto and IMC Global, an international mining, fertiliser and animal feed producer that operates mines in Saskatchewan.

Micro-credit Agencies

The Grameen Bank was founded in 1976 by Muhammed Yunus to provide tiny loans to very poor people. 25 Years later the Bank has 2.4 million borrowers, 94% of whom are women. At the micro-credit Summit in 1997 opened by Hilary Clinton a campaign was launched to globalise the microcredit movement. Monsanto's website in 2002 proclaimed: *'Monsanto is proud to participate..... The solutions offered to smallholder farmers are often a package of existing commercial technologies, including improved seeds, biotechnology traits..., conservation tillage practices, crop protection products and other inputs, as well as training and assistance.'* This was part of a deliberate plan announced in Monsanto's 1997 'Sustainability Report'. Monsanto has been for some years chair of the council of Corporations for the Micro-Credit Summit Campaign. The Grameen Bank are also involved in this project. The schemes are praised by the North but those affected do not always agree. Farida Akter of UBINIG (Bangladesh, see last ch) notes that it is seen as the only solution for all the problems...*'Money circulated through the poor communities self-expanded often to 130%, appropriating the remaining resources of the poor in the form of interest. Indebting the poor has become the new game of development'*.

In 1998 the Grameen Bank and Monsanto announced an unlikely alliance which triggered an international wave of protests. Vandana Shiva of the Research Foundation for Science, Technology and Ecology, India, wrote to Mohammed Yunus:....*'Your micro-credit venture with Monsanto will directly finance the destruction of the green vegetables that women collect from the fields. Round-up also has negative impacts on the fish which provide 80 % of animal protein in Bangladesh. 'After worldwide protest, Grameen withdrew from the project.*

After the 1998 floods in Bangladesh private companies were for the first time allowed to import rice seed as part of the government's post-flood rehabilitation programme. Advance Chemical Industries (ACI) took the opportunity to import hybrid rice seed from a subsidiary of Aventis (now Bayer), without informing farmers that the seeds were infertile and could not be saved. Farmers had to accept credit and pay very high interest.

Binding the farmer to the corporation.

In the US, Canada, and more recently South Africa, Monsanto uses growers' contracts with its RoundUp Ready seeds. These agreements stipulate that farmers who save and re-use the harvested seed the following season will face potentially unlimited costs and fines. Furthermore the company may dictate most steps in the farming process and even control where the farmers sell their crops. Monsanto has since brought several cases against farmers, the most famous being that against Percy Schmeiser in Canada. They have even hired detectives.

In the south surveillance is more difficult and many countries do not yet have patent laws in place. Companies may have to be content to use growers' agreements, or charge a technology fee, but another means of protecting the companies' technology is the Terminator technology. (*4)

The US patent for this was acquired in March 1998. It is designed so that if the farmer replants harvested seed, the seed will not germinate. Such seeds quickly acquired the nicknames Terminator seed or suicide seed, because the seeds produce a toxin when the germination process begins and thus kill themselves. The company (Delta and Pine Land) stated that it was protecting the environment from gene escapes into other plant species *and* protecting the technology provider's investment. There was a tremendous public outcry and Monsanto and (Astra)Zeneca publicly vowed in 1999 not to commercialise Terminator seeds. But companies have continued to acquire Terminator patents: Delta and Pine Land's Harry Collins said: *'We never really backed off'*. The USDA has licenced Terminator Technology to Delta and Pine Land, justifies the use of Terminator technology and claims that it will prevent gene flow from GM plants to other plants. However, scientists question whether Terminator technology will necessarily eliminate gene flow, as this would demand 100% effectiveness and gene stability. The consequences of contamination simply cannot be predicted from the current knowledge base. In 2005, the EU granted a patent on Terminator to Delta and Pine Land. The application was made in 1998. Monsanto has recently announced that it may develop Terminator for use in certain applications. Possibly this is a result of the problems it has had collecting royalties for its GE crops in Argentina and Brazil.

Traitor technology is a variation on Terminator. It is designed to produce seeds that require the application of proprietary chemicals to 'switch on' desirable characteristics such as drought resistance, salt tolerance, toxin production etc, or to 'switch off' undesirable ones such as the production of allergens. The official name for all these technologies is '*genetic use restriction technologies* (GURTs). Chemical switches proposed and tested to date have included the plant hormone and gas ethylene, and the antibiotic tetracycline. 'Traitor coffee', designed to make all the berries on the bush ripen simultaneously on being sprayed with ethylene to enable mechanical harvesting is already being developed. It would lead to even lower market prices, out-competing those who could not afford the technology. Perhaps the most threatening are the patents on Traitor technology relating to plants with compromised immune systems, said to be developed for research purposes, to examine the effects of pathogens. The spread of such traits to staple crops could cause a major disaster. Syngenta holds three such patents, DuPont one.

Lack of choice for farmers.

Farmers who start to rely on patented seed could eventually find themselves with no choice but to buy hybrids or patented GM varieties.

Maize in South-east Asia: After rice, maize is the region's most important crop. For the Filipinos it is a staple food, and in Indonesia it is the second most important crop after rice. More than 80% of the Indonesian maize goes to the people, but it is increasingly shipped to the north or other Asian countries for animal feed. Only two companies – Monsanto and Pioneer – are in effect in control. Maize is the subject of more biotech R&D and patent applications than any other crop. Companies are determined to reach full market deployment of GM maize in SE Asia as soon as possible while there is still opposition to these in Europe.

Argentina showed itself a model of compliance with IMF and World Bank regimes until the economy went into meltdown, and it also showed itself a model of compliance with US policy on genetically engineered crops. It has for a long time been the second largest GM crop producer in the world. In the 1980s demands for grains and oilseeds (for Europe) rose while the profit from raising cattle declined, which led Argentinian farmers to abandon their mixed crops in favour of permanent crop cultivation. It was profitable: the production of soybean in rotation with wheat, maize or sunflower allowed three harvests every two years. But it led to more large-scale farming. Some 7.000 farming families left the land each year. Now in the region north-west of Buenos Aires half of the cultivated area is managed by contractor holdings. Soil fertility soon began to decline and no-till farming was introduced (see below). This involved the use of glyphosate to clear weeds instead of ploughing. Then it was a short step to introducing Monsanto's RoundUp Ready soya. Monsanto also benefited from the increased sale of glyphosate. Use went up 250% in two years, much of it sprayed from the air. By 2000 roughly 90% of Argentina's soybeans were genetically engineered. GM maize and BT cotton were also increasing and RoundUp Ready cotton was expected soon.

Then the price of soy began to fall on international markets, yet the price of loans increased. Some farmers resorted to taking credit from agricultural input companies, to which packages of GM seed and input were often tied. Furthermore yields were not as good as had been promised, , up to 10-15 % lower than conventional yields, with the use of glyphosate having to be intensified because of the

rise of herbicide-resistant weeds. In Argentina there are few civil society organisations that protest, and consumers are not being informed (as in Eastern Europe.)

One result of the collapse of the economy in 2001 was that Argentina's farmers planted more and more soy, often by conservation tillage methods because this saves labour costs. 43% of the arable land was planted with soy in 2002. It was reported at the time that the country was bullying other countries into accepting GMOs as well. There was hunger in Argentina and the government devised programmes to teach the people to eat soya. It was the first time GM crops were consumed directly by human beings in large quantities. The wide adoption of GM soya in Argentina has led to loss of food sovereignty and food and livelihood security. However, there is some cause for optimism: people have started to create their own food gardens. By mid 2002 there were said to be 2.4 million of these 'huertas'. Most of them were urban, however, and it is essential to get small farmers back on the land.

Preparing the ground for GM

Disasters offer corporations opportunities to introduce their seeds, agrochemicals and other products. After the floods of 1998 the Bangladesh government was slow to react but the TNCs quickly determined the 'needs' of the farmers: '*HRV seeds and pesticides*'. The flood opened the Bangladesh seed market to imported hybrid seeds, which previously had been prohibited.

In Indonesia Monsanto's subsidiary used the economic crisis and crop failures in 1999 to introduce its products to farmers by means of donations of herbicide (glyphosate) plus cash and hybrid maize seeds, a typical intensive agriculture package, preparing the way for more dependency.

The US donates a lot of food, for which maize firms get lucrative contracts, through its own Food for Progress Program or through the WFP of the UN. The UN aid is distributed by Save the Children, CARE and Action against Hunger. In 1999, at least 30% of it was GM, according to USAID. WFP officials say this is not a major concern, they have other priorities.

Bosnia hesitated when offered help, and a Burundi consumers' organisation protested.

Aid is often directed at special programmes, e.g. school feeding programmes. Heavily subsidised crops are purchased in the US by organisations such as the Commodity Credit Corporation. Food may be sold on the markets of recipient countries with the proviso that the proceeds shall be used for specific development programmes. But its sale frequently undercuts local producers and in this way it can undermine internal markets. The *food sovereignty* (*2) of countries like Bolivia, Ecuador and Colombia has been compromised by these programmes. It is as if aid were being used as an alternative form of subsidy for US farmers who are finding it difficult to sell their GM products legitimately, e.g. in Europe. Some food aid will inevitably be planted in the search to increase supplies, leading to GM crop contamination of local varieties.

The struggle for Africa's agriculture

In May 2002 Zimbabwe refused US food aid on the grounds that it did not want GM food and in July 2002 Zambia followed suit. The US then accused Europe of '*causing starvation*' in Africa on the grounds that African countries might be refusing GM for fear of losing exports to Europe because of possible contamination. The EU responded to African appeals with some funding, and NGOs pointed out that there was plenty of non-GM food to be purchased, e.g. from India. Moreover, in both Ethiopia and Zambia there were food surpluses in other regions.

What was lacking was *money* to purchase the food, *infrastructure* to move it and *storage* facilities to keep it until it was distributed. Buying locally would boost local and regional markets. Distortions caused by US subsidies mean that it is actually cheaper to bring in US –produced food including subsidised transport for it, than to move food within Africa. What African countries need is long-term sovereign solutions arrived at through a bottom-up process, with donors responding, rather than imposing their own priorities.

USAID's Agricultural Initiative to Cut Hunger in Africa (AICHA) aims to accelerate smallholder-based agricultural growth in Africa. It points out the ...'*greater African economic growth means expanding markets for US exports and even more American jobs*'. At the World Food Summit in 2002 USAID announced a new programme and said in a press release: "*Biofortified crops to Combat Micronutrient Deficiency*"...*is an international collaboration focused on raising Vitamin A, iron and zinc content in crops*'.

The USAID report '*Assessment of Biotechnology in Uganda*' reveals cooperation between governments, government agencies and private corporations even more clearly. It shows how USAID

is working with Monsanto and a number of other players, including Makerere University, CIMMYT, (see ch 5 under CGIAR: research) etc. to facilitate the development of biotechnology in that country. It notes that 'While Monsanto has an interest in the development of the company's own transgenic crops, the other crops of importance to Uganda do not provide sufficient commercial benefit for Monsanto to develop on its own'. The transgenic crop of interest to Monsanto nearest to commercial production in Uganda in 2003 was Bt cotton.

When one combines these developments with the World Bank's initiative on seeds in Africa (ISSA, ch. 5) and with efforts to promote the development of IPR (= patents etc) and biosafety law as quickly as possible (for both programs see above, ch 5), the breadth of the US initiative becomes apparent.

The AGOA (African Growth and Opportunity Act) adds to the mixture. It was signed into law by President Clinton in May 2000 and purports to offer American trade advantages to eligible African countries, provided they can make progress towards establishing market-based economies, eliminating barriers to US trade and investment, initiating efforts to combat corruption, etc.: the usual measures required to create a good working context for corporations and standard Western democracy. An article in a South African paper states: 'To date [In 2003] 38 countries have been declared eligible for AGOA benefits, but only 22 had exported something by mid 2002. Five countries account for 95% of AGOA exports and most of that is oil.....more than 80% of AGOA exports to the US were made up of crude oil ... agricultural exports were a mere 1% of the total imports under AGOA. ...The primary benefit to the US economy as a result of AGOA is that oil from eligible countries is landed at lower cost to refiners'. In 2002 it was reported that the US intended to negotiate for a free trade agreement with the five members of SACU, the southern African Customs Union (South Africa and Lesotho and Swaziland, and Namibia and Botswana). In US Trade Representative Zoellick's letter about this proposal, he refers to IPR's: 'the US should seek to establish standards that reflect a standard of [patent] protection similar to that found in US law'.

In short, Africa represents a new frontier for the US and its industries.

Resistance in the South

India

In June 2001 Monsanto just failed to gain approval for large-scale planting of Bt cotton in India. There were complaints of unprecedented pressure applied to scientists and bureaucrats. The committees involved in monitoring the trials were denounced for corruption and incompetence by NGOs. The Indian Department of Plant Biotechnology wanted more trials to address concerns about gene flow and the impact on bees. It said the *antibiotic resistance gene* could cause resistance to a TB antibiotic. However, in March 2002 the department gave its approval for the commercial production of 3 Bt varieties in some parts of India, provided that certain conditions were met, such as the establishment of refugia (places where non-Bt cotton would be planted to discourage the development of resistance among the target pests). However, there are reports of farmers not knowing of these conditions, not having enough land to implement them, of smuggling, and of fake GM seed being sold to farmers. Meanwhile the Indian government is still working towards the production of its own Bt varieties, which it claims will be better than those of Monsanto's subsidiary and will provide choice on the market. With farmers being so ill-informed and vulnerable to rumours it is hard to see how they can either benefit or make a balanced choice. Since then, GM supporters and opponents have issued very different reports of the impacts of Bt cotton, the amount being planted and the response of farmers.

Brazil

The release of GM crops in Brazil was halted by the courts when a suit was filed in 1998 by a consumer organisation and Greenpeace. Federal Judge Antonio Prudente ordered the government to carry out more complete environmental and health impact studies. Weak rules on labelling were rushed through parliament in July 2001, but the agriculture minister did not get consent to allow Monsanto to plant RoundUp Ready soybeans commercially, and in February 2002 all field trials of 'biopesticide' plants were suspended. All this added up to a kind of judicial moratorium on commercial releases of GM crops and most field trials. The State government of Rio Grande del Sul was prevented by the federal government from passing a state law to ban GM crops but confiscated or burned some illegal field trials. However the same state was also a victim of smuggling from Argentina and is reported to have levels of up to 70% GM soya anyway although this is also reported to be an exaggeration. Three other states all resisted strong pressure from the government to accept GM crops in 2001-2 and they have their own biosafety commissions.

Monsanto was granted about 150 million dollars credit on favourable terms by the Brazilian government in 1999 for a chemical factory to produce the components for RoundUp, yet Monsanto appeared to accept that it would make little headway in GM soya in Brazil until 2005. Parts of the country (eg: Parana state) are consolidating their position as exporters of GM-free soya, much of it to Europe. Lula became president late in 2002. His party had been against GMOs for years but the minister of Agriculture represents agribusiness interests and Lula has twice issued decrees permitting cultivation of GM soya by those who are already involved in it. The struggle continues, but parts of Brazil still remain largely GM free.

Thailand

In September 1999 BIOTHAI – an NGO based in Bangkok – sent out an open letter accusing Monsanto of illegally releasing GM cotton for cultivation in Thailand even though Bt cotton was on Thailand's quarantine list. (Tests from fields recently leased by a local company had proved the presence of GM cotton) Meanwhile Monsanto placed adverts in Thai papers about '*GM miracle crops*', and ISAAA (see ch. 5) set up an office in Bangkok and began to try to counter NGO opposition. The Thai senate set up a committee to investigate if Thai NGOs had been hired by '*foreign organisations opposed to the development of Thailand*'. In Thailand also the struggle continues.

ConTill (conservation tillage): Monsanto's brand of sustainable development.

Soil erosion and degradation, often associated with green revolution farming methods, pose a massive threat to agricultural production, especially in the south. There are many suggestions about how to overcome the problem, e.g. no-till (non-inversion tillage, i.e. the plough is not used to turn over the soil) or lo-till. *No-till* was introduced in the 1970s in the USA as a way to save time, energy and money for the farmer. Only the top 5-10 cm of the soil is turned over, incorporating the crop residue, drilling (seed) into this layer and then rolling it. If it is done in two stages it is called *lo-tilling*. When crop residues are incorporated into the soil and especially if 30 percent or more of the residue is left on the surface, it is called *conservation tillage (con till)*. . Scientists seem to accept that this can contribute to the reduction of soil erosion and soil degradation in intensive farming systems. However, weeds and slugs can be a problem. The answer is glyphosate and slug pellets, and if bigger slug infestations occur: '*more slug pellets*'. Monsanto said in 1997: '*No-till farming eliminates plowing to prepare land for planting seeds and for weed control.*' The increased use of glyphosate for lo-till, as promoted for instance in the UK, could cause problems for the water industry in supplying potable water. Conservation tillage has thus become strongly associated with high chemical inputs.

Many soil scientists favour more benign ways to improve soil structure and increase organic carbon content, for example by adding farmyard manure or compost to the land, or incorporating cover crops or grass into the crop rotation so that these can be ploughed in. Non-inversion tillage can have a useful role on small tropical plots; here herbicide use can be replaced by manual labour.

Conservation tillage can (within limits) contribute to less carbon being released from the soil, and Monsanto is using the fact to hail their herbicide-resistant crops as a saviour in times of climate change. In negotiations the US states that agricultural lands should be seen as 'carbon sinks'.

In Africa ConTill is promoted through SG 2000 and Winrock International (for both see above). In Costa Rica Monsanto is allied with Conservation International to promote ConTill in the 1.1 million hectare nature reserve called La Amistad, on the Panama border. Monsanto is one of Conservation International's 34 corporate sponsors, with Chiquita, Mobile, Exxon etc. Monsanto does not mention that surface run-off of herbicides, which will increase through ConTill farming, is particularly dangerous in tropical regions with heavy rainfall. In La Amistad Monsanto is now collaborating with others on a bioprospecting project (biopiracy, *3). In 2001 Monsanto urged the FAO to promote conservation agriculture' and to convince farmers to use RoundUp.

chapter 9 Conclusion: Summing Up and Moving On.

Throughout this book we have looked at different ways in which the food stream is being diverted to serve the priorities of the TNCs. They are private bodies that have only recently evolved into global giants . The biotech companies are not among the largest in the world but their ability to change our lives places them among the most powerful. They are subverting a wide range of institutions and they have colonised much of indigenous agriculture through the green revolution. The loss of germplasm and knowledge is irreplaceable. Farmers are being displaced to expanding cities. All this has

intensified dependence and struck at the roots of self-reliance. It requires an unquestioning mass-consumer culture.

A facilitating factor has been the gradual development of the medieval charitable corporation into a for-profit entity with limited liability and almost the same rights as human beings. Moreover the financial markets have been 'liberated' over the last 20 years, while many countries in the south lack national rules on monopolies, and there is currently no way to tackle global monopolies. Governments of the rich countries have become increasingly complicit (e.g.: 'revolving doors', where employees of industry move into political appointments and back again). The extension of patents to cover living organisms in 1980 was vital to the biotechnology industry, enabling it to raise capital and gain monopoly control. Now they seek a harmonised global patent regime. The level of control delivered by the technology, especially the Terminator and Traitor technologies, is formidable; it reveals the naked intent of the biotech industry.

Research is being affected by a creeping corporate takeover. Governments have been complicit here too, hoping for technological solutions to problems that require political commitment. (e.g. in the field of Vitamin A deficiency, lack of access to land and food).

Genetic engineering as presented by the industry has a deep psychological appeal: people have always longed for miracles. The PR industry is full of clever ideas about how to present GM biotechnology as a dream picture.

The increased vertical and horizontal integration of the biotech industry is a microcosm for industrial development in general. Mergers and acquisitions have been approved without building in any capacity for addressing the issue of global monopolies. Meanwhile, corporations are increasingly hijacking public interest research, public funding and public institutions. A major consequence is that there is less funding and intellectual energy available for looking at methodologies that cannot be patented or otherwise controlled. (for examples see below). If they can't use it for profit they see no point in promoting or protecting it.

Where is all this leading? History may provide clues. The British East India Company began as a group of traders and ended up ruling India. Today, we run the risk of finding ourselves ruled by the corporations far more completely than that: our bodies, our brains, the products of human experience and creativity. Therefore we need to question not just the technology but the bid for power that it represents.

Already some of the current generations of GM crops are beginning to show signs of failure. Critics were long ago predicting the problems that have emerged to date, such as the build-up of resistance, and contamination. The same sort of thing has happened before: 'Miracle' HRVs of the green revolution only lasted a few years before being overwhelmed by pests and diseases. It was all good business for the companies. Chronically dependent customers are ideal fodder for generating profits. The corporations always promise new products, e.g. crops designed to tolerate salt and drought.

What they do not mention is that there are already farmer varieties of crops worldwide that do the same thing, and that all over the world people are producing food that thrives on diversity instead of monoculture, people who work *with* the soil, climate and ecology instead of treating them as obstacles. In Cuba they are developing organic food gardens. In Argentina, people started their own gardens, echoing the movement in Cuba. In Africa, many farmers are *de facto* organic or use low levels of inputs. In a report in February 2001, Jules Pretty and Rachel Hine presented 47 case studies and conclusions ('*Reducing Food Poverty with Sustainable Agriculture, a Summary of New Evidence*'). And in '*The Real Green Revolution: Organic and Agro-Ecological Farming in the South*' Parrot and Marsden of Greenpeace give more examples of alternatives to the chemical model of farming. E.g. raised beds or 'chinampas' in waterlogged areas.

All over the world there are organisations and initiatives working at grassroots level:

- UBINIG in Bangladesh, involving 100.000 farming families
- Deccan Development Society in Andra Pradesh, India, working in 75 villages
- The Green Belt Movement, Kenya since 1977, focussing on tree planting and involving 80.000 women. There are now related projects in 30 African countries.

The message is increasingly clear: we have to choose which path to take. The choices are stark, but people in the *colonised** North are gradually beginning to wake up to them: people in the urbanised areas are sceptical about GM food. (see the subtitle of this book: *Transnational Biotech companies Colonise the Food Chain*)

Change is hard work. It means rejecting systems based on perpetuating old values and old power structures. The simplest way is to create our own power structures, which requires an effort from each of us. We have to assume responsibility ourselves, individually and collectively. Only by assuming such responsibility can we bring about real change and offer real support to those, mostly in the South, who are already practising sustainable methods of food production. They have a great deal to teach us

(explanatory) NOTES (by G.Goverde.)

*1 In 1948 the **GATT** (General Agreement on Tariffs and Trade) was ratified by twenty-three countries. It was designed to encourage free trade and prevent trade wars. It was designed as an interim measure but persisted until 1995, when its last round, the Uruguay round, ended. The **WTO** is the successor of GATT and started with the Millennium Round, which was supposed to be a development round (It is still continuing at this point in 2006). The **UN** set up its own programme related to trade, the UN Conference on Trade and Development (**UNCTAD**) in 1964. There has always been rivalry between the two, the UN organisation being more concerned with social aspects and environment. The WTO is the more powerful organisation however because of its disputes settlement body which can pronounce a verdict on members that do not behave according to the rules. They can be condemned to a fine or other sanctions. Each member gets one vote in the WTO, but many decisions are taken before the official meetings in so-called 'green rooms, at venues known only to the select few, where only the richer members are present. At the larger more open meetings these members have many delegates, including business people, whereas the poorer countries have only one or two delegates who are not always aware of all the issues.

The **GATS** (General Agreement on Trade and Services) came into effect in 1995. It is a fine-tuning of the WTO regulations and it concerns the liberalisation of services such as distribution services, financial services and infra-structural services (including water and waste management). For further info see website PAL, paper on Gats and agriculture and (the summary of) 'Europe Inc'. Another WTO agreement is the **TRIPS** agreement, on Intellectual Property Rights (= patents etc-) see ch 7

*2 **Food Sovereignty** is the RIGHT of communities and countries to define their own policies in the field of agriculture, work, fisheries, food and soil.

*3 **bio-prospecting** = searching for new organisms (plants, animals etc), usually in developing countries, to be used in biotechnology. **Bio-piracy**: illegally taking away organisms for use in biotechnology

*4 **(GM) Genetic modification**: agricultural research has always used cells (e.g. yeast = 'Du.gist) in experiments, but genetic research is different in that cells are invaded and changed. In fact a lot of force is needed to enter a cell: you can add bacteria that cause cancer in the cell, or you can use an electrical stream to open up the cell, or you can use a sort of gun to shoot into it. Each of these three methods needs a **promoter gene**, and antibiotic **marker genes** are often added to keep track of the gene, which terrifies the medical community because of the antibiotic which might cause antibiotic resistance in people. The best known applications are **Bt corn**, (in which a gene has been added that is a toxin to the cornborer, an insect), and **RoundUp Ready soy**, which is resistant to the herbicide RoundUp

Some GM techniques are called **GURTs** (genetic 'use restriction' technologies. They are designed so that seed will not germinate and have been nicknamed **Terminator Seeds**. Another variety is called **Traitor seeds**. See u ch. 8 under 'binding the farmer to the corporation'.

5 *germplasm = a term used to describe the genetic resources, or more precisely the DNA of an organism, and collections of that material.

*6 The World Bank and IMF: in the World Bank votes are made according to the financial contribution of that nation. On this basis the G7 group of industrialised countries have 45 % of voting rights while the remaining 148 countries share the rest. To gain membership of the World Bank Group a country must first be a member of the IMF and pay a subscription. The primary distinction is that the IMF lends briefly to overcome short term financial instability, and the World Bank finances longer-term development.

*7 See also the book (or summary of) 'Europe Inc' (to be found on the PAL website). It is about corporate influence on European Politics

WEBSITES

www.cepr.net

Nonprofit, nonpartisan research center that seeks to promote democratic debate on important economic and social issues

www.econexus.info

Econexus (EcoNexus is a not-for-profit public interest research organisation Members of Econexus wrote the book Hungry Corporations.)

www.iatp.org

Mission: to create sustainable rural communities and regions through sound agriculture and trade policy.

www.foodstuff.org

the National Consumers' Organisation

www.genewatch.org

Concerned with the ethics and risks of genetic engineering.

www.grain.org	GRAIN – Genetic Resources Action International
www.icfcs.org	International Consumers for a civil Society
www.rafiusa.org	RAFI, Rural Advancement Foundation International
www.pal.aardeboerconsument.nl	PAL (Dutch Platform for an alternative agricultural policy. (Website also in English)
www.panna.org	working to reduce the use of hazardous pesticides world wide.

Some of the ABBREVIATIONS used in the summary:

BIO	Biotechnology Industry Organisation. (EuropaBio, AfricaBio, etc)
(W)BCSD	(World) Business Council for Sustainable Edevelopment – see ch 6 under CBD
CEPR	Centre for Economic Policy Research, see www.cepr.net
CGIAR -	Consultative Group for International Agricultural Research, see ch. 5
FDA	(American) Food and Drug Administration
FTAA	Free Trade Agreement of the Americas
GATT	general Agreement on Tariffs and Trade – see note *1
GRAIN	see websites
GM(O)	Genetically Modified (Organisms), see note 4
GURT	Genetic ‘Use Restriction’ technologies, see note 4.
HRV	High Response Varieties (Green Revolution)
IARC	International Agricultural Research Centres, see ch 5 under CGIAR
IMF	International Monetary Fund. See note 1
IPR	Intellectual Property Rights, usually indicating patents, see also TRIPS
ISAAA	International Service for the Acquisition of Agri-biotech Applications, (see ch 5 Int. Foundations)
IRRI	International Rice Research Institute, see ch 5 CGIAR
ISSSA	Initiative For Sustainable Seed Supply Systems in Africa, ch.5
MAI	Multilateral Agreement on Investment
NAFTA	North American Free Trade Agreement
NGO	Non-government Organisation, such as Oxfam, Greenpeace, etc
PEACE	(Pesticide efficacy Advisory Centres, funded by Monsanto, ch 8
PR	Public Relations (propaganda)
RAFI	Rural Advancement Foundation International, (see websites, above)
R&D	Research and Development
SDN	Sustainable Development Network (see ch 3) , linked to a free trade institute.
TNCs	transnational companies
TRIPS	Trade-Related Intellectual Property Rights, adopted in the Uruguay round (see note1) It is concerned with patents etc. See ch. 2 the TRIPS Agreement and ch 7
UN	United Nations, see note 1
WTO	World Trade Organisation, see note1

FILMS connected with the subjects

We Feed the World,

Erwin Wagenhofer, Austria, 2005.office@allegrofil.at

It is an examination of how globalization and the growth of the power of corporations has affected the production of food. The director takes us to farms in Romania where GMO maize is grown, to Brazil, a fishing boat in Brittany, a greenhouse in southern Spain, and a chicken processing plant in Austria. All to supply the incessant demands of the world for cheap food. Interspersed with comments by a UN official and the CEO of Nestlé.

Bullshit

A documentary film by Per Holmquist and Suzanne Khardalian, 2005. 73 min., contact: pea.holmquist@chello.se

The film is about Vandana Shiva, Indian environmental activist and nuclear physicist. It’s a film on globalisation and patenting, on genetic engineering, bio-piracy, and indigenous knowledge. Her opponents call her “The Green Killer” and they gave her “The Bullshit Award”. TIME says she is a hero of our times, an icon for youngsters all over the world.

The Future of Food

Deborah Koons Garcia and Lily Films, September 2005. contact info@lilyfilms.com

An investigation into the unlabeled, patented, genetically engineered foods that have quietly filled grocery store shelves for the past decades. The technical process, and interviews with farmers and scientists, shot on location from the prairies of Saskatchewan, Canada, to the fields of Oaxaca,

Mexico. Market and political forces are changing what we eat. The film also explores alternatives to large-scale industrial agriculture.

PROJECT based on the **summary** of the book **HUNGRY CORPORATIONS**

Book by Helena Paul and Ricarda Steinbrecher, Zed books 2003

summary by Margaret Goverde , g.goverde-lips@chello.nl;

A book about the influence of (agribusiness) corporations on the food chain.

level: (pre-)academic

Subjects: English / life sciences / social studies.

(For the films mentioned in this project see the end of the project.)

Module 1: chapters 1-2-3-4

1.1: Form 4 groups.

Each group studies **one** chapter in the following way:

- divide the chapter into parts in such a way that one (or two or three) person(s) of each group is/are responsible for a part of the text.
- Read this part of the text.

- *English: Make a list of words or phrases that you had to look up in a dictionary or computer. Enter the words or phrases into the computer with a short explanation.*
- *Check what lists the other people studying 'your' chapter made, make sure there are no doubles, and join the most useful words and phrases together to make a vocabulary of 'your' chapter. (not more than one page!)*

- Discuss with the others who studied parts of 'your' chapter what the main points of the chapter are. Make a short summary of the chapter. (not more than half an A4)
- Hand in a copy of your vocabulary (of the whole chapter) to the teacher, who copies it

Homework: study the vocabulary of 'your' chapter, and read the whole chapter. Try to summarise it orally

1.2

The teacher asks one person of group 1 to summarise the whole chapter that his/her group discussed, in 5 or at most 10 minutes. (Try not to read it out but to summarise it in your own words). Students of the other groups 2-3-4 may ask questions, which other members of group 1 should be able to answer.

The same procedure for the other three chapters.

If there is time there can be a short group-discussion about the four chapters.

The teacher hands the vocabulary of 4 chapters to the students.

Social Studies: collect examples of advertisements. Does the text give (objective) information or does it convey a feeling, a subjective opinion? Look up on the computer what 'branding' means. ('The brand is now more important than the product : this idea was first discussed by Naomi Klein in her book 'No Logo' (2000) Parallels with the PR activities of the agribusiness corporations?)

Homework: read the first 4 chapters and study the vocabulary of the 4 chapters. Formulate at least one question, not about the language but about the content.

1.3:

Form groups and try to answer each other's questions. The most interesting questions might be discussed in a plenary.

If possible: view the first 30 minutes of 'the Future of our Food', a film by Deborah Koons Garcia, and discuss them

Module 2 chapters 5 and 6

2.1: Chapter 5

Form 6 groups. Each group does the following assignment:

Study the text about one of the following institutions, and make notes about what its main activities are in the field of agricultural research:

- World Bank
- CGIAR
- IRRI
- International foundations and international organisations (p. 13-14)
- Universities and Research institutes (p. 14/15) and CSIRO (p.16).
- The sixth group makes notes about 'The erosion of humanity's agricultural heritage'(p.12) and 'Golden Rice'. (p. 15)

English: copy at least one sentence or passage that you found difficult to understand on the left-hand side of a page, translate it into your own language on the right-hand side (preferably on the computer), and hand it in to your teacher. The teacher collects passages / sentences from the different groups, inserts them into one document, checks them and copies them for everybody.

The teacher puts the above list on the blackboard. One person from each group explains about the institution (or about Golden Rice and the agricultural heritage)

Group discussion about the World Bank, about the relationship between corporations and research institutes, about Golden Rice and Vandana Shiva's criticism.

Social studies: find out which NGOs in your country make statements on the World Bank and IMF. (See note 1 to 'Hungry Corporations'). If your country is a developing country the government probably had to draw up a PRSP (Poverty Reduction Strategy Paper) to qualify for loans from IMF and World Bank. Find out if there is such a PRSP for your country, and find out what the government and NGOs have to say about it.

If possible, view a part of 'Bullshit', which is about Vandana Shiva.

Homework:

Study the passages (translations) the teacher hands out to you. Read chapter 5, and if possible try to have a good look at Vandana Shiva's website: <http://www.vshiva.net>

2.2: chapter 6

Same procedure as above. Form 6 groups. Each group studies one of the following regulatory bodies.

- WTO
- TABD
- FAO
- Codex Alimentarius
- CBD
- The Cartagena Protocol

The teacher puts the above list on the blackboard. One person from each group explains about the institution.

Group discussion:

- which regulatory bodies are the most beneficial to consumers?
- Which regulatory bodies are the most beneficial to multinational companies?

Homework: now read the whole of chapter 6

Divide roles (see below, next module). Skim chapters 7 and 8, focussing on parts that seem important to you for 'your' role. Read 'your' part them carefully

Module 3: (chapters 7-8-9)

3.1

Role-play: meeting in the Convention on Biological Diversity (see ch. 6)

The teacher recommends the composition of the group, taking the situation in the students' home country into consideration.

For suggestions for roles see the list on the next page. There should be at least one 'northern' (developed) group and at least one of the 'southern' (developing) groups, but you can also decide to have roles from all 5 groups.

In the list on the next page a distinction is made between a-members (government officials, business representatives) and b-members (farmers, representatives from NGOs etc.).

Make sure there are more a- than b- delegates. The students should be aware of the fact that b-delegates usually have little information and little money (sleeping in tents maybe) and too many responsibilities.

There are always many more a-delegates, who can take turns and take a rest during three-week meetings. They stay in nice hotels.

These human things matter a lot!

It stimulates cooperation if there are at least 2 members of the same group, e.g. two farmers from Paraguay, 2 government officials from Brazil, etc. Present the roles to the students and ask them to pick roles they have some affinity with, e.g. because of their background.

Situation 1

Poor farmers are holding a demonstration against Terminator technology. Delegates from different parts of the world come to the meeting in buses, straight from the hotels. The demonstrators stop the buses. (*The delegates could be students sitting in a classroom. The demonstrators come in and shout at them.*) Since the delegates now can't go to the meeting they ask the demonstrators to come in and sit next to them and they start discussing things then and there.

The teacher should make sure that 'the demonstrators' are aware that several issues are at stake:

- *fear of Terminator technology (and of gentech generally). What could happen?*
- *smallholder farming versus industrial monoculture farming (the latter necessitating increasing spraying with chemicals)*
- *patents owned by big companies such as Monsanto. (e.g. the farmers might be members of a smallholder cooperation wanting to grow 'responsible soy' from their own saved seeds. They don't want these to be contaminated.*

Or they might be from a cooperation of Indian rice farmers who can't grow the traditional rice because Monsanto has a patent on it. They don't want to pay for seed of that patented rice.

The government and business delegates are certain that in the end everybody will benefit from the free market. The best innovative farmers will survive, and the consumers will win be better off in the end because of low prices in a market where there is fierce competition.

Situation 2 (Now reverse roles!)

It is important to CHANGE roles , so that students see how perceptions then change and how they then argue differently.

Conference at the CBD (Convention for Biological diversity).

Each person (or group of persons) makes a proposal for what they need in their country / region. Set a time-limit (15 minutes?) .

One group says what they need, another group responds according to their wishes.

The teacher puts some points on a flip chart. After all groups have had their say it may be possible to come up with some points that everybody agrees on: a 'position' or 'declaration'!

Remember after the role play that there is still the summary to be finished! 3.2:

Read chapter 9 and discuss: any parallels in your country to the examples mentioned at the end of ch. 9 (i.e. 'alternatives' for industrialised farming)

If possible: view parts of 'We feed the World', e.g. the part about Brazil, and (parts of) a film viewing agriculture from the African perspective, e.g. 'Malawi'.

Roles that you could pick from:

Africa:

- a- A representative of an African government that is a member of e.g. NEPAD or SACU (Southern African Customs Unit) (*in-between category a and b, really*)
- b- African NGO, e.g. a partner of Oxfam.
- b- Representative of an African farmers' organisation (from Zambia and/or Uganda)

Europe:

- a- the Commissioner for Trade (member of the European Commission (= sort of government))
- a- Minister for International Development from one of the member countries, e.g. England (such a minister is often advised by their minister for Trade)
- b- representative of a farmers' organisation from the eastern Europe (NIS countries and Balkans)
- c- Member of Friends of the Earth (environmental NGO based in Western Europe)

Asia

- a- Representative of an Asian government (e.g. Indonesia and/or Thailand and/or India)
- b- Vandana Shiva
- a- Chinese government official and/or a Russian government official

United States, Canada, Australia

- a- Representative of the US government
- b- Canadian farmer
- a/b Australian consumers' organisation
- a A patent lawyer working for Monsanto

Latin America:

- a- Representative of the government of Brazil
- b- Argentinian farmer from MST (Movimiento Sin Terra – the landless farmers)
- a- A former CEOs (Chief Executive Officers) of Monsanto, now representing the Costa Rica government

FILMS connected with the subjects

We Feed the World,

Erwin Wagenhofer, Austria, 2005.office@allegrofil.at

An impressive well-made film about the effects of globalisation and the power of corporations on our food. The director takes us to farms in Romania where GMO maize is grown, to Brazil, a fishing boat in Brittany, a greenhouse in southern Spain, and a chicken processing plant in Austria. All to supply the incessant demands of the world for cheap food. Interspersed with comments by a UN official and the CEO of Nestlé.

The Future of Food

Deborah Koons Garcia and Lily Films, September 2005. contact info@lilyfilms.com

If you are interested in GMOs you should see this film first. The developments that led to GMOs, explanation of the technical process and the disturbing experiences of the Canadian farmer Schmeiser introduce the subject. Unlabeled, patented, genetically engineered foods have quietly filled grocery store shelves for the past decades. Interviews with farmers and scientists are shot on location from the prairies of Saskatchewan, Canada, to the fields of Oaxaca, Mexico. Market and political forces are changing what we eat. The film also exposes alternatives to large-scale industrial agriculture, such as community supported agriculture..

Bullshit

A documentary film by Per Holmquist and Suzanne Khardalian, 2005. 73 min.,
contact:pea.holmquist@chello.se

If you found the former films slightly depressing you should end by seeing this one about Vandana Shiva. She is an Indian environmental activist and nuclear physicist. It's a film on globalisation and patenting, on genetic engineering, bio-piracy, and indigenous knowledge. Her opponents call her "The Green Killer" and they gave her "The Bullshit Award". She is an indomitable lady who conserves seeds, gives courses and fights patents. TIME says she is a hero of our times.

Malawi: A film about agriculture from the African point of view. Some African farmers apparently know quite well what's going on. By KMF Productions Email: peadarking@eircom.net
