

# IMPLICATIONS OF TRIPs FOR FOOD SECURITY IN THE MAJORITY WORLD

GERARD DOWNES



*Prepared for Comhlámh Action Network by Gerard Downes, October 2003*

Gerard Downes is a graduate of the University of Limerick where he obtained an undergraduate degree in History, Politics and Social Studies. He is currently pursuing a postgraduate degree programme in the Department of Politics and Public Administration at the University of Limerick, where he is specialising in an analysis of the food-security implications of the TRIPs Agreement. Gerard has been a Government of Ireland scholar since October 2001.

*Published by and Available from*

Comhlámh, 55 Grand Parade, Cork. Tel: 021 4275881 E-mail: [comhcork@iol.ie](mailto:comhcork@iol.ie)

Comhlámh, 10 Upper Camden Street, Dublin 2. Tel: 01 4783490 E-mail: [info@comhlamh.org](mailto:info@comhlamh.org)

[www.comhlamh.org](http://www.comhlamh.org)

*A Note on Terminology*

Throughout the manual, the phrases 'Developing Countries', 'Third World', 'developing world', etc. are used to describe the countries of Africa, Asia and Latin America. We recognise and encourage a vibrant debate on the issue of terminology. Comhlámh Action Network has chosen to use the phrase Majority World in its work.

*Acknowledgements*

Comhlámh gratefully acknowledges funding by Ireland Aid through the National Committee for Development Education, Trócaire and ActionAid Ireland. This document has been produced with the financial assistance of the European Community. The views expressed herein are those of the authors and can therefore in no way be taken to reflect the official opinion of the European Community.

*Comhlámh*

Established in 1975 'Comhlámh, Development Workers in Global Solidarity: Ireland' is an organisation of volunteer members committed to working for sustainable development. It does this through supporting, empowering and training development workers, development educators and campaigners, and engaging with these in action for just, equitable and sustainable development. The particular contribution of Comhlámh stems from being an organisation of volunteer members, being informed by the experience of Irish development workers worldwide, not being involved in delivering aid overseas, and approaching development and social justice in an integrated way.

Comhlámh seeks to act in solidarity and partnership with people struggling for economic and social justice everywhere.

Volunteer members of Comhlámh are active in raising public awareness on a number of development and justice issues:

- promoting good practice and equality in aid delivery;
  - welcoming immigrants to Ireland and promoting a multi-cultural Ireland;
  - seeking equitable trade relations between industrialised countries and the South;
  - supporting people seeking to engage in development work overseas and in Ireland;
  - providing skills training to development educators and campaigners;
  - welcoming home returned development workers;
  - involvement in a range of issue-based programmes including work relating to the integration of refugees, health and anti-racism
-

# CONTENTS

<b>SUMMARY OF MAIN FINDINGS</b>	<b>1</b>
<b>1 INTRODUCTION AND BACKGROUND TO TRIPS</b>	<b>3</b>
1.1 Introduction to Report	3
1.2 Food Security Defined	3
1.3 Biodiversity Defined	4
1.4 Patent Law in Developing World	4
1.5 Background to TRIPs Agreement	5
1.6 Why Did Developing Countries Sign TRIPs?	6
1.7 Developing Countries and TRIPs Article 27.3(b)	7
<b>2 COST OF INTELLECTUAL PIRACY – VALUE AND PROPRIETORSHIP OF PLANT GENETIC RESOURCES</b>	<b>9</b>
2.1 Cost of ‘Intellectual Piracy’	9
2.2 The Value of Plant Genetic Resources	9
2.3 Access to Plant Genetic Resources Under Patent Laws	10
2.4 Concept of ‘Ownership’ of Resources	10
<b>3 THE FAO’S INTERNATIONAL UNDERTAKING (IU) / FARMERS’ RIGHTS DEFINED</b>	<b>13</b>
3.1 The International Undertaking on Plant Genetic Resources (IU)	13
3.2 Farmers’ Rights Defined	13
<b>4 BIOPIRACY – NATURE’S GIFT OR SCIENCE’S PATRIMONY?</b>	<b>15</b>
4.1 Inventions or Discoveries?	15
4.2 Biopiracy	15
4.3 Why Can ‘Pirates’ Operate Legally? ‘Prior Art’ as a Concept	16
4.4 SADC (South African Development Community) Statement, March 1999	17
<b>5 TRIPS ARTICLE 27.3(B) / PLANT VARIETY PROTECTION</b>	<b>19</b>
5.1 The ‘North–South Divide’	19
5.2 Africa Group and 27.3(b)	19
5.3 Patenting a Process in Article 27.3(b)	19
5.4 What is a ‘Distinct, Uniform and Stable’ Variety?	20
5.5 Plant Variety Protection (PVP)	20
5.6 Cost of Securing a Patent	20
<b>6 TRIPS AND BIOTECHNOLOGY / GMOS</b>	<b>21</b>
6.1 Biotechnology: The Background	21
6.2 Development of Biotechnology	21
6.3 Benefits of GMOs?	24
6.4 Technology Transfer: TRIPs in an Unequal World	25

---

<b>7 GENETIC DIVERSITY ERODED</b>	<b>26</b>
7.1 The Green Revolution Revisited	26
7.2 Mono-cropping in Agriculture	27
7.3 Gender Dimension of TRIPs	27
7.4 Shiva's BBC Reith Lecture, 2000: Herbicides and Pesticides	28
<b>8 CONSOLIDATION OF SEED INDUSTRY</b>	<b>29</b>
8.1 The Gene Giants	29
8.2 Public vs. Private Research	30
8.3 TRIPs: Liberalisation or Monopolisation?	31
8.4 Vandana Shiva on TRIPs and Corporate Control	32
<b>9 TRIPs BY STEALTH: THE UPOV CONVENTION</b>	<b>33</b>
9.1 The UPOV Convention: Origins	33
9.2 Capacity of Farmers to Save Seeds of PVPs (Plant Variety Protection) Under UPOV: How Limited?	33
9.3 Bilateral, Regional and Sub-regional Trade Agreements Using TRIPs as Subterfuge	34
9.4 Summary of Food-security Features of UPOV 1991	36
9.5 The EU and 'TRIPs-plus' Provisions	37
9.6 UPOV Convention Summary and Conclusions	37
<b>10 IRELAND AND THE TRIPs AGREEMENT</b>	<b>39</b>
10.1 Ireland's Position vis-à-vis TRIPs and the European Biopatenting Directive	39
10.2 Ireland Aid and TRIPs	39
10.3 The Irish Plant Breeders' Rights and Plant Variety Rights Office, Backweston, Leixlip	40
10.4 The European Biopatenting Directive	41
10.5 Pressure on Ireland: Canvassing Votes in the European Council of Ministers	41
<b>11 THE FINING OF FARMERS</b>	<b>43</b>
11.1 The Fining of Farmers: Examples from the Industrialised World	43
11.2 Germany: The Case of Josef Albrecht	43
11.3 Scotland: The Case of Potato Farmers	43
11.4 Canada: The Case of Percy Schmeiser	44
11.5 US: The Case of Becky and Denis Winteboer	45
<b>CONCLUSION</b>	<b>46</b>
<b>BIBLIOGRAPHY</b>	<b>48</b>
<b>NOTES</b>	<b>51</b>
<b>ABBREVIATIONS</b>	<b>52</b>

---

## SUMMARY OF MAIN FINDINGS

- The TRIPs (Trade Related Intellectual Property Rights) Agreement means that member states of the WTO (World Trade Organisation) must enact domestic legislation which provides for minimum standards of intellectual property rights protection.
- The TRIPs Agreement was included on the agenda of the WTO after intensive lobbying by a small coterie of thirteen multinational corporations who comprised the Intellectual Property Committee (IPC).
- The TRIPs Agreement makes the privatisation of the world's biodiversity a reality. This violates both the Convention on Biodiversity and the International Treaty on Plant Genetic Resources for Food and Agriculture. Both of these are legally binding UN treaties which have been ratified by Ireland.
- The TRIPs Agreement requires that member states of the WTO provide for the protection of plant varieties by means of patents, plant breeders' rights, a combination of both or a *sui generis* ('of its own kind') system which in reality means the UPOV Convention (see page 33).
- The TRIPs Agreement will reinforce the phenomenon of 'biopiracy' where natural resources are appropriated and patented by companies or organisations, e.g. the neem tree, turmeric, the Mexican enola bean, etc.
- The 1952 Patent Act of the US does not recognise 'prior art' outside its borders. This means that 'innovators' or 'inventors' in the US can claim what they have created as 'novel' even though the product may have been patented elsewhere. This is the basis of biopiracy.
- The TRIPs Agreement makes no provision for the 'benefit-sharing' of plant genetic resources. Neither does the agreement recognise the principle of 'prior informed consent' between those extracting the genetic materials and those who claim ownership over those resources.
- The TRIPs Agreement does not recognise the contribution of farmers, communities and indigenous peoples in the conservation and creation of genetic resources by human selection for millennia.
- Article 27.3(b) of the TRIPs Agreement requires that member states allow the patenting of plants and animals that have been produced through 'non-biological' and 'microbiological processes'. These references are to the new biotechnologies of genetic modification (also known as 'genetic engineering').

- The TRIPs Agreement legalises the patenting of ‘life forms’ such as genes, gene sequences, plant varieties and micro-organisms. These are discoveries in nature but organisations have been able to claim them as ‘inventions’.
- In a multitude of secretive bilateral treaties, regional agreements and investment treaties, a significant number of developing countries have been forced to adopt the provisions of the UPOV Convention which is very stringent in terms of what farmers are permitted to save and exchange from their harvests. Under the TRIPs Agreement countries are ostensibly allowed create their own *sui generis* systems of plant variety protection. This flexibility is being negated by the imposition of the UPOV Convention.
- The TRIPs Agreement (and the related UPOV Convention) render illegal the sale and exchange of seed in agriculture. Almost one and a half billion farmers depend on the saving of ‘across-the-fence’ sale and exchange of seed for their livelihoods. The TRIPs Agreement means that many farmers will no longer be able to continue these practices. In terms of food security, the termination of such practices will be catastrophic.
- Plant breeder legislation has already led to farmers being fined for selling and exchanging seed as well as selling uncertified seed in industrialised countries such as the US, Germany, Scotland and Canada. The TRIPs Agreement will reinforce and expand the power of plant breeders.
- Proponents of the TRIPs Agreement state that the agreement will lead to a greater transfer of technology and more investment in developing countries. A World Bank study proved that this was not the case in reality.
- Legislation required under TRIPs is leading to the consolidation of the seed market in certain countries. For example, Monsanto and DuPont now control 75% of the Brazilian corn market. Since 1997, Monsanto’s share of the Brazilian maize seed market went from 0% in 1997 to 60% two years later by acquiring small local firms.
- As an antitrust case brought against the five ‘gene giants’ (Monsanto, DuPont, Dow Chemical, Novartis, AstraZeneca) shows, the ‘giants’ act as a cartel, restricting competition, breeding a narrow selection of crops and keeping prices of inputs for farmers, such as seed, much higher than should be the case. Their expansion into developing countries will reinforce their grip on markets and will lead to the consolidation of the food chain by a quintet of powerful conglomerates.

# INTRODUCTION AND BACKGROUND TO TRIPS

## 1.1 INTRODUCTION TO REPORT

This report will serve as an overview into the World Trade Organisation's (WTO) Trade Related Aspects of Intellectual Property Rights (TRIPs) Agreement and the extent to which the agreement, particularly Article 27.3(b) of the agreement, impinge upon food security in the developing world.

The report begins by looking at the genesis of and motivation for the TRIPs Agreement. It then looks briefly at the transformation in agriculture wrought by the 'gene revolution' and the consequent rush to patents that it has wrought. The potential impact of the most contentious article of the TRIPs Agreement, namely Article 27.3(b) upon the developing world is then assessed.

It has been claimed that since the Uruguay Round of trade talks which begot the TRIPs Agreement, there has been a consolidation of the seed industry, with certain firms enjoying monopoly privileges in certain key sectors. This trend is at variance with the WTO's aspiration of greater liberalisation of trade. However, the greatest danger to food security in developing countries may come from the implementation of the UPOV Convention (International Convention for the Protection of New Varieties of Plants) which has been used by powerful states in bilateral, regional and sub-regional trade agreements as a means to ensure the compliance of developing countries with the provisions of the TRIPs Agreement.

As a result of the TRIPs Agreement, WTO member countries must provide intellectual property rights protection for plant varieties, either in the form of patents or through a *sui generis* (i.e. of its own kind) system. The *sui generis* provision in theory should allow countries to develop their own system for protecting plants. In practice, however, the UPOV Convention has become the most widely used model for implementation of countries' *sui generis* obligations. One of the reasons why this is so is because UPOV is the only plant variety protection system that exists in international IPR law.

## 1.2 FOOD SECURITY DEFINED

Food security can be defined as more than simply ensuring that there is an adequate amount of food cultivated or available on the market. Food security also encompasses the question of whether people are able to purchase enough food to satisfy their basic nutritional requirements. (Dutfield, 2002) It has been stated that the use of patents on plant genetic resources in the developing world could jeopardise food security because with three-quarters of the world's population that live below the poverty line involved in agriculture, 'anything that increases the costs of agricultural seed or other inputs could be damaging'. (Oxfam, 2002: 220)

Equally detrimental to poorer farmers could be restrictions on their rights to retain the seeds on which the following year's harvest is dependent. As the Indian environmentalist Vandana Shiva writes: 'Seed is the first link in the food chain. It is the embodiment of life's continuity and renewability; of life's biological and cultural diversity. Seed for the farmer is not merely a source of future plants/food; it is the storage place of culture, of history. Seed is the ultimate symbol of food security.'

Traditionally, farmers save their seeds after each harvest and replant them the following year. Many farmers, particularly those in developing countries, trade and exchange seeds locally with other farmers. For breeders this means that they have difficulty recouping the investments made in improved varieties through repeat sales. Many plant varieties have originated in the seeds that farmers have selected and sown for thousands of years. Such practices of on-farm experimentation and conservation 'form the basis of food security and livelihoods for communities throughout the developing world'. (UNDP, 2003: 216) Even in industrialised countries, it is quite common for farmers to reuse seed from a previous harvest, although for many crops 'legal purchase is now the rule'. (CIPR (Commission on Intellectual Property Rights), 2002: 58) Legal mechanisms, such as those outlined in Article 27.3(b) of the TRIPs Agreement, could force farmers to purchase seed each year and, as a consequence, force them off their landholdings in their millions.

The TRIPs Agreement will have far-reaching implications for the developing world in agriculture, particularly in the sphere of biodiversity. Developing countries retain 90% of the world's biodiversity and are the source of genetic resources that are of enormous benefit to industry and agriculture. (Dutfield, 2000) Traditionally, these genetic resources have been transferred freely to developed countries on the understanding that they formed part of humanity's 'common heritage' as has been outlined in the FAO (Food and Agricultural Organisation) *International Undertaking on Plant Genetic Resources*. (FAO Resolution 8/83) It was perceived that developing countries would benefit from this transfer of resources as many of them lacked the financial and technological means to develop the resources themselves.

### 1.3 BIODIVERSITY DEFINED

The term biodiversity refers to 'all living organisms, their genetic make-up and the communities they form'. (Biggs, 1998: 116) Biodiversity is also 'the essential ingredient of biotechnology which can recombine genetic traits in the DNA and use them to create genetically changed life forms'. (Ibid.) Both biodiversity and biotechnology are intimately connected, and it is now impossible, as one commentator asserted, 'for those concerned about sustainable development to talk about biodiversity without talking about biotechnology'. (Ibid.)

### 1.4 PATENT LAW IN DEVELOPING WORLD

Prior to the TRIPs Agreement most countries in the developing world had especially weak patent laws in the areas of food and drugs, 'because they are so fundamental to any society's needs'. (Biggs, 1998: 133) It was for these reasons that industrialised countries did not permit patents to be granted on food, chemicals, plants or animals until the 1960s. Some



countries, such as Switzerland from 1850–1907, Austria, France, Britain before 1852 and the Netherlands from 1869–1912, abolished all their patent laws on the grounds that they amounted to little more than monopolistic practices and acted as deterrents to indigenous innovations. (Monbiot, 2002: 19)

In 1998, the high-income countries of the Organisation for Economic Co-operation and Development (OECD) accounted for 86% of all patent applications worldwide. This earned those OECD countries over 97% of global royalties and licence fees. In contrast, that same year, the world's least developed countries earned less than 0.5% of all royalties and licence fees. In this way, among many others,

TRIPs works against latecomers or imitators by increasing the price of technology and restricting their options for technological catch-up. Further, it affects future economic development, which is likely to increasingly rely on the power of ideas and information, threatening to leave behind countries that lack research capacity'. (UNDP, 2003: 207)

## 1.5 BACKGROUND TO TRIPs AGREEMENT

The TRIPs Agreement is one of the three pillars of the WTO – the others being trade in goods and services – and it was negotiated during the Uruguay Round of trade talks that took place from 1986–1994 under the auspices of the GATT (General Agreement on Tariffs and Trade). The TRIPs Agreement came into effect with the establishment of the WTO on 1 January 1995. The agreement was framed with the intention of protecting intellectual property on a global scale by means such as patents, copyrights and plant breeders' rights. Intellectual property rights are defined by the WTO as the rights that are given to persons over the creations of the mind such as inventions, works of art and literature and designs. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time, usually twenty years. In order for a patent to be granted it must fulfil certain criteria. The object being patented must be novel, innovative and useful. (Meek, 2000)

In the Uruguay Round members of the GATT undertook to make their domestic legislation conform to the TRIPs Agreement and therefore allow all inventions, with a few exceptions, to be patentable. Placing intellectual property rights within the WTO means that those members that fail to comply with their obligations under the TRIPs Agreement face the possibility of having trade sanctions imposed upon them by the WTO's Dispute Settlement Understanding (DSU). Developing countries were accorded a five-year time lag on implementation meaning that their legislation had until 1 January 2000 to become 'TRIPs-compliant'. Least developed countries were allowed until January 2006 before implementing the agreement. The review of Article 27.3(b) of the TRIPs Agreement is currently ongoing in the TRIPs Council.

TRIPs was, both politically and technically 'one of the most difficult issues on the Uruguay Round agenda'. (Hoekman and Kostecki, 1995: 151) The issue of intellectual property rights protection was new to the GATT and involved a North–South confrontation. The United

States, in particular, assumed an aggressive position when the issue of intellectual property rights was discussed during the Uruguay Round. US companies, particularly pharmaceutical corporations, played a major part in determining the framework of TRIPs. (Weissman, 1996)

James Enyart, a senior Monsanto employee at the time of the Uruguay Round of negotiations, stated about TRIPs that ‘industry identified a problem, crafted a solution and sold it to our governments’. (Enyart, 1990: 54) Monsanto was ‘one of the corporations to demand that the GATT ... incorporate a worldwide patents regime, in order to protect what it claimed were its inventions’. (Monbiot, 2000: 253) The powers invested in the beneficiaries of the TRIPs Agreement were astounding. As Hutton writes, the US forced through GATT a framework agreement on TRIPs ‘protecting the enforcement of intellectual property rights, with the result that the US Patent Office – as the gatekeeper controlling the exercise of patents in the world’s largest market – would become the *de facto* upholder of all advances in the information age’. (2002: 203)

Therefore, it may be accurate to state that the TRIPs Agreement was not only derived as a means of confronting intellectual piracy and counterfeiting on a global scale. The TRIPs Agreement was also regarded as a component of the policy of ‘technological protectionism’ ‘aimed at consolidating an international division of labour whereunder Northern countries generate innovations and Southern countries constitute the market for the resulting products and services’. (Correa, 2000: 5) Worried at their declining position in world trade, a scenario for which intellectual piracy was perceived as a major contributory factor, US industries were anxious to establish international rules that would counter this trend.

The growing importance of intellectual property for the United States can be illustrated by its increase as a percentage of exports. In 1947, for example, intellectual property comprised almost 10% of all US exports. By 1986 intellectual property formed 37% of US exports. In 1994, intellectual property accounted for over half of the United States’ exports.

## 1.6 WHY DID DEVELOPING COUNTRIES SIGN TRIPs?

The theory of democratic bargaining among sovereign states that was formulated by the Australian academic Peter Drahos states that for democratic bargaining to take place at least three conditions must obtain. Firstly, all relevant interests need to be represented in the negotiating process (what Drahos calls *the condition of representation*). Secondly, all those present in the negotiations must have full information about the consequences of various possible outcomes (*the condition of full information*), and thirdly, one party must not coerce the other (*the condition of non-domination*). In the negotiations on TRIPs none of these conditions prevailed. Most decisions on intellectual property were taken by the ‘Quad’ of the United States, Japan, Canada and Europe. Developing countries were rarely represented at the negotiations and only ten intellectual property experts from the developing world attended talks on TRIPs; all parties did not have full information as to the consequences of the TRIPs Agreement: there was little doubt that there would be massive trade gains for the United States but little assessment of what TRIPs would mean for developing countries and virtually no mention of the consequences of TRIPs for food security. By use of

its Section 301 provision (see Section 1.7), the United States was able to coerce states such as India and Brazil into accepting TRIPs onto the WTO's agenda.

Prior to, and including the Uruguay Round, industrialised countries had asserted that improved intellectual property rights (IPRs) protection would lead to greater technology and investment flows to the developing world. The assumption made by industrialised countries involved in the negotiations was that developed and developing countries would benefit alike from the introduction of greater global IPRs protection. (Correa, 2000) By forfeiting the intellectual property arena to the developed world, developing countries were to be accorded greater leverage on areas of arguably greater importance to their economies, namely agricultural subsidies as well as more access to Northern agricultural and textile markets.

The United Nations Development Programme (UNDP) in its report *Questioning the Ownership of Knowledge* (1999) stated that the developing world receives \$50billion in aid on an annual basis. However, the cost to the South of interest payments on debt combined with unequal terms of trade which deflate prices for its commodities or prevent them being sold at competitive prices was estimated at \$500billion.

Since the signing ceremony in Marrakesh those promises have not been maintained. In fact, since 1994 agricultural subsidies have increased significantly to farmers in the United States and Europe. Overall, the World Bank states that agricultural subsidies paid to farmers and agribusinesses to protect the markets of the industrialised world from competing with produce from the developing world are seven times (\$US350billion) what the South receives in aid annually (\$50billion).

Developing countries' acceptance of the TRIPs deal in the Uruguay Round also stemmed predominantly from a mix of fear that without it they would be increasingly vulnerable to 'unilateral arm-twisting by the US and the EU, and a growing perception that IP (Intellectual Property) laws also had benefits in terms of allowing participation in knowledge-creating activities, providing consumers with access to new products, and giving industries better opportunities of obtaining cutting-edge technologies'. (Hoekman and Kostecki, 1995: 149)

## **1.7 DEVELOPING COUNTRIES AND TRIPS ARTICLE 27.3(B)**

It is important to stress that developing countries, up to the Seattle Ministerial Conference of 1999, did not adopt a coherent position regarding the highly controversial Article 27.3(b) of TRIPs. In fact, prior to the Uruguay Round of talks, some developing countries had initiated a strengthening of their domestic IP legislation in the hope of attracting greater foreign direct investment and technology.

As a result, developing countries did not act as a cohesive block on the issue of IPRs at the Uruguay Round. Some developing countries enacted tighter legislation in the IP field in direct response to the threat of unilateral trade sanctions by the United States under Section 301 of its 1974 Trade Act,<sup>1</sup> while some brought in legislation in response to fears of

being undercut by competitors in other developing countries. Some developing countries believed that stricter IP protection would benefit their economies because it ostensibly formed part of a coherent move towards a more free-market economy. (Hoekman and Kostecki, 1995)

The respective positions adopted by individual countries towards Article 27.3(b) are dependent on numerous factors, namely, if the country is a net food importer; the extent of its biodiversity; the nature of the farming community within that country; the degree to which that country has industrialised and whether that country has an established biotechnology industry; the amount of pressure exerted upon an individual country by another; and whether trade-offs in other areas, such as agricultural subsidies, have been promised as an incentive to conform to the provisions of the article. (Hoekman and Kostecki, 1995)

Tansey wrote in 1999, the year that the review of Article 27.3(b) began, that developing countries would at least wish to maintain their options regarding the implementation of the highly contentious article. This would entail having more time to examine the issues and possibilities and would mean a minimum position of no change to the text as is. If, however, the article is to be revised, then many civil-society groups and governments would prefer plants and animals to be excluded from patentability and that the requirement for a *sui generis* system of protection of plant varieties be removed. (Tansey, 1999)

What has happened in the interim is that Article 27.3(b) has still not been fully reviewed. One reason for this is that developing countries have interpreted the term 'review' to mean a possible rewriting of the article's provisions; developed countries, such as the US, define 'review' as meaning an update on the implementation of the article. This semantic dispute is one of the many reasons why TRIPs has been called 'a dream come true for patent lawyers, a nightmare for everyone else'. (Oxfam, 2002: 208)

## **COST OF INTELLECTUAL PIRACY – VALUE AND PROPRIETORSHIP OF PLANT GENETIC RESOURCES**

### **2.1 COST OF ‘INTELLECTUAL PIRACY’**

The TRIPs Agreement was formulated as a consequence of heightened concern voiced by innovators and inventors at the plagiarising of intellectual property and the limited safeguards granted to innovators under international trade law. (Grubb, 1999) Industrialised countries entered the Uruguay Round negotiations with the clear objective of universalising the standards of intellectual property rights protection. (Correa, 2000) The US International Trade Commission estimated in 1988 that US-owned corporations were being defrauded of between \$40billion and \$60billion per year thanks to what it termed ‘foreign intellectual piracy’. In 1999 the Commission revised this estimate to between \$100billion and \$300billion. (Dutfield, 2000)

### **2.2 THE VALUE OF PLANT GENETIC RESOURCES**

However, the Canadian-based organisation ETC (Action Group on Erosion, Technology and Concentration) counters these figures by stating that the value of germplasm from developing countries to the pharmaceutical industry in the early 1990s was at least \$32billion a year, and that genes from fields in developing countries of fifteen major crops contribute over \$50billion per annum in annual sales in the US alone. (ETC, 2002) Shiva states that ‘the accusation of “piracy” that the US is making against the Third World is more applicable to the US itself’ (Shiva, 1993: 126) and she estimates that the US owes the developing world \$302million for royalties for farmers’ seeds, and \$5.1billion for pharmaceuticals. (Ibid.)

It has been estimated that foreign genetic resources have added \$3.2billion to the \$11billion annual US soybean crop and about \$7billion to the \$18billion annual corn crop. This is quite apart from the fact that all of the top fifteen crops in the US, with annual sales of \$50billion, originally come from foreign sources. (UNEP, 1992) The contribution of wild varieties to the US farm economy between 1976 and 1980 has been put at \$340million per year, while the total contribution of wild germplasm to the American economy has been estimated at \$66billion. (Shiva, 1991)

Estimates of the true value of plant genetic resources worldwide vary substantially. For instance, two NGOs which between them represent the interests of the seed industry in over sixty countries, namely the International Seed Trade Federation (FIS) and the International Association of Plant Breeders (ASSINSEL), have calculated the value of the global seed market at \$30billion a year. On the other hand, the genetic resource consultant Dr Daniel Putterman puts the figure at \$13million. (Dutfield, 2000) Dutfield emphasises that no matter which figure is more representative of the true value of plant genetic resources, what cannot be calculated is the importance of such biodiversity for the millions of subsistence

farmers around the world who depend upon them for their survival. (Ibid.)

Developing countries have been paid only an infinitesimal fraction of the value for the raw materials and knowledge they contribute. (ETC, 2002) The United Nations Development Program (UNDP) claimed in 2001 that a 2% royalty charge levied by developing countries on genetic materials developed by local communities in the southern hemisphere that have been patented in the industrialised North would generate more than \$5billion from medicinal plants alone. (UNDP, 2001)

### 2.3 ACCESS TO PLANT GENETIC RESOURCES UNDER PATENT LAWS

From 1990–95 the number of biotechnology patents granted globally was 25,000, which accounted for 1% of the total patents granted worldwide; 37% of those biotechnology patents emanated from the United States, another 37% came from Japan, whilst 19% originated in the EU. Developing countries accounted for less than 2.6% of all patents. This figure is ‘one indicator of the dramatic North–South asymmetry existing with regard to the innovative capabilities in modern biotechnology’. (Correa, 2000: 174)

The granting of a patent entails a prohibition (*ius excluendi*) of the use of patented material in the countries where the rights have been recognised. Given the territoriality of patent rights, the title holder cannot exercise his/her rights outside the jurisdiction where the patent has been registered. But he/she can prevent the importation of products made elsewhere containing the invention. (Correa, 2000: 176)

The ability of patent holders to prevent the importation of products containing the invention that have been made elsewhere is one of the primary concerns of Indian cotton producers given the patent on all transgenic cotton taken out by the US agri-chemical corporation Agracetus. Farmers in the Andean region have also expressed grave concerns regarding the patent taken out by Colorado State University on quinoa. Up to the ruling in August 2001 by the United States Patents and Trademark Office (USPTO) regarding the patenting of basmati rice by the Houston-based corporation RiceTec, it seemed possible that basmati-rice farmers in sub-Himalayan India and Pakistan would have to pay royalties on their produce.

Peter Day, the director of the AgriBiotech Centre of the State University of New Jersey, writes that, ‘in theory, the patent system is supposed to make material available for further research by protecting the interests of the patent holder. In practice, the patent holder can find many ways to block distribution of the patented material and to limit the uses made of it’. (Day, 1995: 83, quoted in Correa, 2000: 173)

### 2.4 CONCEPT OF ‘OWNERSHIP’ OF RESOURCES

If countries claim ‘ownership’ of genetic resources and biodiversity as is feasible under Article 15 of the United Nations Convention on Biological Diversity and in the 2001 International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) but not in the TRIPs Agreement, numerous difficulties will arise. For example, a new plant

variety may be the product of centuries of breeding and cross-breeding which in themselves are products of selection and breeding by farmers in many parts of the world. Carlos Correa wrote that ‘in every country, most of the germplasm used in agriculture comes from other countries and it is often very difficult or extremely costly, and sometimes practically impossible, to determine the country of origin’. (Correa, 2000: 168)

Table 1, which shows the sources of plant-derived calories in Brazil, demonstrates one example of how plant genetic resources which are deemed indigenous to a single country or particular area may in fact have their origins in a different part of the world. The banana, for example, which is a major cash crop in South and Central America, originated in south-east Asia. Wheat originated as a crop in the near east but the specific genes which inspired the semi-dwarf wheats made famous by the Green Revolution came from Japan via the US and Mexico. (Crucible Group, 1994)

**Table 1: INTERDEPENDENCY OF PLANT GENETIC RESOURCES**

<i>Crop</i>	<i>Share of Plant-derived Calories (%)</i>	<i>Centre of Origin</i>
Sugar	20.38	Indochina
Rice (paddy)	17.64	Asia
Wheat	15.29	West & Central Asia
Maize	12.20	Central America
Soybean	8.84	China/Japan
Cassava	7.10	Brazil/Paraguay
Beans	6.40	Andes
Bananas	2.22	Indochina

*Sources: Crucible Group, United Nations Food and Agricultural Organisation (FAO), 1994*

Dutfield suggests that there is ‘strong evidence that if a developing country establishes a strong regulatory regime for access to crop germplasm, industrialised-world crop breeders would be affected far less than breeders in the South that might wish to exchange germplasm with countries sharing the same agro-climatic conditions’. (Dutfield, 1999: 5)

The importance of conserving and using in a sustainable manner the world’s plant genetic resources for food and agriculture – given that the development and sustainability of agriculture are highly dependent on access to PGRs – is ‘broadly recognised today’. (Correa, 2000: 167) In order to prevent the calamity of genetic erosion and to engender more sustainable methods of agriculture the FAO Commission on Genetic Resources for Food and Agriculture recognised a number of key areas where urgent action is required.

One of these areas is farm conservation. Farmers not only use seeds. Their role is vital in the process of conserving and improving plant varieties. By their activities farmers ensure the evolution of crops. It is through this process of evolution that new varieties are created through ‘genetic recombination, mutation and hybridisation within and between cultivated and wild plant populations’. (Correa, 2000: 167) The contribution by farmers to the evolution and creation of new varieties and the maintenance of plant varieties has been recognised

in the 1983 International Undertaking on Plant Genetic Resources (IU).

The Convention on Biological Diversity (CBD) has stressed the importance of *in situ* conservation. The convention also created rules regarding access to PGRFA and on benefit sharing, in the context of states' sovereignty over such resources. It also outlines what is required of the Conference of the Parties (COP) to the CBD in regard to intellectual property rights.



## **THE FAO'S INTERNATIONAL UNDERTAKING (IU) / FARMERS' RIGHTS DEFINED**

### **3.1 THE INTERNATIONAL UNDERTAKING ON PLANT GENETIC RESOURCES (IU)**

Fears regarding the intellectual piracy of genetic resources in developing countries were first voiced in a public forum at the 1983 twenty-second session of the Food and Agricultural Organisation (FAO). That meeting adopted the International Undertaking for Plant Genetic Resources (IU) which recognised free access to all plant genetic resources, 'based on the universally accepted principle that plant genetic resources are a heritage of mankind and consequently should be available without restriction'. (FAO, 1987)

The lifespan of the 1983 IU in its original form proved to be limited. At the March 1987 meeting of the FAO Commission on Plant Genetics several industrial countries objected to the IU arguing that genetically modified materials did not constitute part of the 'common heritage of mankind' and that 'certain benefits derived from that heritage were considered the fruits of free enterprise'. (Nijar and Ling, 1994: 279) As a result of this pressure and as a consequence of the slow progress under the original text, an agreed interpretation of the 1983 IU was accepted. According to this 'interpretation', plant-variety rights were excluded from the common-heritage concept. The 'interpretation' allows corporations in industrialised countries to patent modified materials and categorise them as new varieties.

Article 5 of the IU that was adopted in 1983 states:

It will be the policy of adhering Governments and institutions having plant genetic resources under their control to allow access to samples of such resources, and to permit their export, where the resources have been requested for the purposes of scientific research, plant breeding or genetic resources conservation. The samples will be made available free of charge, on the basis of mutual exchange or on mutually agreed terms.

However, when this declaration was made the model of PBRs (Plant Breeders' Rights) used at the time – that is, the 1978 UPOV Convention – clearly stated that the use of protected varieties as the source material for further variations and the reuse of saved seeds by farmers was permitted. Since then the 1991 UPOV Convention, in tandem with the growth of patents on plant materials, including genes, has altered the legal framework 'in which on-farm conservation and germplasm exchange are to take place'. (Correa, 2000: 168)

### **3.2 FARMERS' RIGHTS DEFINED**

Therefore, while UPOV 1991 is fastidious in the protection given to the commercial

breeding sector, it virtually ignores the rights of farmers who not only use seeds but also are 'key players in the conservation and improvement of plant varieties'. (Correa, 2000: 167) The implications for food security in many developing countries of this omission of farmers' rights could be grave.

Farmers' rights as a concept was defined by the FAO conference Resolution 5/89 (twenty-fifth session of the FAO Conference, Rome, 11–29 September 1989) as 'rights arising from the past, present, and future contributions of farmers in conserving, improving, and making available plant genetic resources, particularly those in the centres of origin/diversity. These rights are vested in the International Community, as trustees for present and future generations of farmers, for the purpose of ensuring full benefits to farmers, and supporting the continuations of their contributions, as well as the attainment of the overall purposes of the International Undertaking'. (Quoted in Tansey, 1999)

The 2001 International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) leaves it at the discretion of national governments to implement farmers' rights. Protecting farmers' rights is essential to maintaining diversity within the food chain as it is the ingenuity of farmers which has created and maintained biodiversity for millennia.

N.B. The concept of farmers being allowed to save, use and exchange seeds is not acknowledged in the TRIPs Agreement.

## **BIOPIRACY – NATURE’S GIFT OR SCIENCE’S PATRIMONY?**

### **4.1 INVENTIONS OR DISCOVERIES?**

The WTO states that ‘for something to be patentable it has to be an invention ... the scope of the patent right only extends to the invention and not to any underlying genetic material’. (WTO: 2000: 34) TRIPs has provoked debate regarding the definition of what constitutes an ‘invention’ in certain cases. Some commentators, such as Martin Khor, director of Third World Network, have argued that certain life forms which have been patented are not inventions but rather are discoveries in nature. Speaking at the 2002 United Nations World Summit on Sustainable Development in Johannesburg, Khor stated that although the patenting of life forms is a relatively new phenomenon, its incidence has grown rapidly in recent years, particularly since the introduction of the TRIPs Agreement.

### **4.2 BIOPIRACY**

The phenomenon that has been dubbed ‘biopiracy’ involves claiming ownership of biodiversity, much of which emanates in the developing world. The Indian environmentalist Vandana Shiva has defined biopiracy as ‘the use of intellectual property systems to legitimise the exclusive ownership and control over biological resources and biological products and processes that have been used over centuries in non-industrialised cultures’. (Shiva, 2001: 49) Shiva also states that patent claims over biodiversity and indigenous knowledge that are based on innovation, creativity and the genius of people in the Third World are acts of biopiracy.

Concern has been growing among governments and NGOs regarding the extent to which intellectual property rights ‘may jeopardise the exercise of sovereign rights over biodiversity and endanger the implementation of a balanced multilateral system based on a principle of shared access’. (Correa, 2000: 170) This concern has been exacerbated by the proliferation of patents granted on genetic resources in developing countries. Patents have been granted on natural products such as quinoa, the neem tree, ayachusca, turmeric, barbasco, kava and endod.

Some of the patents which have been granted are wide-ranging and could limit access to a large area of germplasm. For example, the patent taken out by Agracetus refers to all genetic modifications of cotton regardless of the germplasm in use. Another patent granted to Plant Genetic Systems covers the introduction of Bt into a vast range of field crops; while the patent obtained by Lubrizol covers sunflower seed with a high oleic-acid and a low linoleic-acid content.

Patents have been taken out on materials held in trust in gene-banks at various Consultative Group on International Agricultural Research (CGIAR) centres. CGIAR holds 40% of the

world's plant genetic resources in its various *ex situ* gene banks. The practice of patenting material from these gene banks has led to CGIAR calling for a moratorium on the granting of intellectual property rights (IPRs) on designated germplasm held in their centres. The stated aim of CGIAR is that such germplasm is held in trust for the global community and should not be subject to private rights via IPRs by those institutions, companies and individuals that have appropriated the material. CGIAR's stated policy is that IPRs may not be taken out on any of their material 'in the form received', a phrasing that has been exploited by other centres of research. For example, Genetic Resources Action International (GRAIN) has outlined instances where institutions have 'borrowed' material from CGIAR's gene banks, ostensibly for the purposes of research, carried out minor modifications on the material and claimed a patent on it.

The notion of patents on life forms such as plants and animals highlights many ethical issues which, according to some commentators, 'should be a sufficient basis to prevent any private party from obtaining exclusive rights on such materials'. (Correa, 2000: 173) Oxfam, in its pamphlet *Cut the Cost: Patent Injustice: How World Trade Rules Threaten the Health of Poor People* (2000), stated that the WTO should amend its rules to help prevent biopiracy. The first thing the WTO should do, writes Oxfam, is to harmonise the TRIPs regime with the Convention on Biodiversity. Patent holders would be obliged to disclose the origin of the biological materials used in their 'inventions'. Patent holders would also have to demonstrate that they received the 'prior informed consent' of the original holders of the knowledge used to develop their products.

#### 4.3 WHY CAN 'PIRATES' OPERATE LEGALLY? 'PRIOR ART' AS A CONCEPT

Proponents of the TRIPs Agreement maintain that its existence will lead to greater technology transfer from industrialised countries to poorer ones. This is because companies and organisations will be able to invest in countries in the secure knowledge that their innovations are being protected by domestic patent law.

Historically, countries which were not technologically advanced 'borrowed' technology for a period of time from more technologically proficient countries. The countries which lagged behind in technology would then provide monopoly or exclusive rights to the person introducing the technology. For example, in the fourteenth century England was deficient in the production of technology compared to its European counterparts. Skilled artisans were encouraged to practice their craft in England and to teach apprentices their skills. In return, the artisans were granted patents on their works which gave them monopoly rights over their skills while they were being introduced. It was estimated that a skill took seven years to teach. As a result, artisans were given patents of either seven or fourteen years on their respective crafts as an incentive to impart their gifts to apprentices.

However, the United States was the first nation state to enact a different type of patent law, one where skills or innovations introduced into the US could be treated as 'presumed to be unknown'. Patents were granted in the US on innovations that had been known elsewhere. However, under the Connecticut law, invention was treated as 'bringing in the supply of

goods from foreign parts, that is not yet of use among us'. This allowed, for example, John Fitch to be given a patent in the state of Pennsylvania from 1787 which accorded him 'sole and exclusive right and privilege of constructing, making, using, employing and navigating all and every species or kinds of boats or water crafts' in the state for a period of fourteen years. This despite the fact that James Watt had not only invented the steam engine but patented it in Scotland in 1772. Fitch was given his patent because Watt's steam engine had not been patented in the US but also because the latter's invention was 'presumed to be unknown' under the law of Pennsylvania. Watt's steam engine was not considered 'prior art' in the US. 'Ignorance of assumption', therefore, was enshrined in the US Constitution. This denial of 'prior art' was reinforced in the Constitution in 1952 under Section 201 of the United States Patent Act which refers to 'use in the US' as prior art – not, it must be underlined, in other countries.

This Constitutionally enshrined principle of the denial of 'prior art' outside the boundaries of the US allows for the proliferation of biopiracy, as US 'innovators' can claim that ignorance of a product within the US allows for its patenting under the Constitution. At the beginning of the twenty-first century it is not uncommon to read an assertion such as 'patents have become the most important asset of the US and a growing component of exports'. (Shiva, 2001: 19)

#### 4.4 SADC (SOUTH AFRICAN DEVELOPMENT COMMUNITY) STATEMENT, MARCH 1999

The organisation Genetic Resources Action International (GRAIN) has argued that TRIPs is the first international treaty to make the privatisation of biodiversity compulsory – and to do so as a principle of international trade. (GRAIN, 2001) Christopher May writes that under the TRIPs Agreement when bio-prospecting companies 'discover' new natural compounds or plant varieties, these 'newly discovered' bio-resources can be appropriated and removed from the public realm by patenting. This appropriation is likely to be geographic as well as economic as the biotechnology industry is centralised in developed states. (May, 2000) The ire of several developing countries at the 'privatisation of biodiversity' was exemplified by the Southern African Development Community (SADC) workshop on TRIPs in March 1999 whose summation stated:

The problem with TRIPs is that the only inventions it recognises are those that meet the criteria of novelty, inventiveness, and industrial applicability or usefulness ... This system of rights denies property rights to local and indigenous knowledge, practice and innovations. TRIPs only recognises as worthy of protection inventions that conform to the northern definition ... Rights are recognised only when they generate profits and are capable of industrial applications ... Local people end up being exploited and made even poorer by developed countries because their knowledge is accessed freely, then 'treated' in laboratories in the north, and ownership rights claimed through patents. Royalties are then paid to new owners by those who make use of their patented products. (Quoted in Joseph, 1999: 50–1)

A year later a coalition of civil-society organisations from India and the US (but curiously

not the Indian government) challenged the ruling by the US Rice Federation allowing rice grown in the US to be advertised using the word ‘basmati’. As a result of such pressure, the ‘Battle for Basmati’ was won by the civil-society groups on 14 August 2001 when the USPTO (United States Patent and Trademark Office) refuted RiceTec’s claims to fifteen of the twenty patents it had been granted four years earlier.

**Table 2: SELECTED EXAMPLES OF BIOPIRACY**

<i>Turmeric</i>	A plant of the ginger family, turmeric contains properties which make it an effective ingredient in medicines, especially those used to heal wounds and rashes. In 1995, two Indian nationals at the University of Mississippi Medical Centre were granted a patent on the use of turmeric in wound healing.
<i>Neem</i>	A tree from India and south-east Asia, neem is now planted across the tropics because of its medicinal properties. In 1994 the European Patent Office granted the US corporation W.R. Grace a patent on neem as a ‘method for controlling fungi on plants by aid of a hydrophobic extracted neem oil’.
<i>Hoodia Cactus</i>	A plant traditionally used by the San bushmen of the Kalahari Desert to stave off hunger and thirst on their long hunting trips, hoodia was licensed by the South African Council for Scientific and Industrial Research as the drug P57 by the pharmaceutical company Phytopharm in 1997.
<i>Ayahuasca</i>	Traditionally used by shamans in the Amazon Basin to diagnose and treat illnesses, a patent on a variety of ayahuasca was granted to an American citizen, Loren Miller, in June 1986.
<i>Basmati</i>	In 1997, the Houston-based firm RiceTec was given a patent on twenty varieties of basmati rice, a type of rice that is grown predominantly in the Punjab provinces of India and Pakistan. RiceTec claimed that ‘basmati’ is a generic term and should not apply solely to rice grown in the Punjab.

## TRIPS ARTICLE 27.3(B) / PLANT VARIETY PROTECTION

### 5.1 THE 'NORTH-SOUTH DIVIDE'

Article 27.3(b) of the TRIPs Agreement requires WTO members to protect plant varieties, either through a *sui generis* (of its own kind) regime such as plant breeders' rights (PBRs) or through patents or a combination of both. The article states that member states of the WTO may exclude from patentability:

Plants and animals other than microorganisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, Members shall provide for the protection of plant varieties either by patents or by an effective *sui generis* system or by any combination thereof. The provisions of this subparagraph shall be reviewed four years after the date of entry into force of the WTO Agreement. (Quoted in Tansey, 1999: 6)

The TRIPs Agreement will initiate a global system of patent protection for micro-organisms and microbiological process. Heretofore, many developing countries eschewed patent protection, particularly for life forms. Implementation of the TRIPs Agreement, therefore, has had and will continue to have, far-reaching implications for the developing world in the sphere of biodiversity. (Dean, 2001) Under TRIPs, the owner of a patented product can prevent a third party from 'making, using, offering for sale or importing it without their consent'. (CIDSE, 1999: 6) Article 27.3(b) has been under review since 1999, but the contrasting positions taken on it by developed and poorer countries led one commentator to assert that 'TRIPs has already sparked a clear North/South divide'. (Action Aid, 1999: 2)

### 5.2 AFRICA GROUP AND 27.3(b)

In August 1999 Kenya, speaking on behalf of the Africa Group, proposed that the review process for Article 27.3(b) of TRIPs should stipulate that plants and animals along with all other living organisms and their parts cannot be patented. The Africa Group insisted that those natural processes which produce plants, animals and other living organisms should not be liable to patenting and that Article 27.3(b) of TRIPs violated a basic tenet of patent law, namely that substances and processes in nature are not 'inventions' per se but 'discoveries'. Kenya argued that micro-organisms, being natural living things and microbiological process being natural processes, are not inventions but life forms, and therefore 'discoveries in nature'. (CIDSE, 2000: 26)

### 5.3 PATENTING A PROCESS IN ARTICLE 27.3(b)

With regard to the patenting of a process used to produce a plant, provision for which is made in Article 27.3(b) of TRIPs, an owner of that patent is entitled to exclusive rights over

the plants obtained using that process. Farmers, for example, may not be allowed to use any seeds emanating from a plant derived using a patented process. One of the peculiar facets of the TRIPs Agreement is that the burden of proof in a dispute over patented processes is shifted to the defendant who must prove that a product has not been produced by the patented process. This is an aspect of the agreement that is 'in contrast with normal legal practice'. (CIDSE, 1999: 13) Also, if a process used to produce a plant is patented, then the patent holder has exclusive intellectual property rights to any future plants obtained with that process. (Correa, 2000)

#### **5.4 WHAT IS A 'DISTINCT, UNIFORM AND STABLE' VARIETY?**

While Article 27.3(b) of TRIPs allows WTO member states to exempt plants and animals from patenting, it nevertheless obliges signatories to provide for the protection of new plant varieties. A variety is considered distinct if it is distinguishable in one or more important characteristics from any other plant variety; uniform if it is 'sufficiently uniform in its relevant characteristics with variation as limited as necessary to permit accurate description and assessment of distinctness and to ensure stability'; and stable if 'the relevant characteristics remain unchanged after repeated propagation'. (Tansey, 1999: 10)

#### **5.5 PLANT VARIETY PROTECTION (PVP)**

Plant variety protection (PVP) can only be accorded when a new variety fulfils these criteria. One of the possible problems to be encountered is that where a farmer, in experimentation, uses a variety that has been protected, the onus is on that farmer to prove that the genotype of the variety they have bred – that is, the genetic or factorial constitution of that variety – is significantly different from the original plant. If not, the new variety may be classified as 'essentially derived' from the protected variety. Under the UPOV Convention of 1991, the farmer's new variety may not be grown or sold without the permission of the licence holder. (Oram, 1999) The Africa Group has stated that the difficulty with these criteria of distinctness, stability and uniformity is that they are seen to favour the production and use of genetically uniform crops. (Correa, 2000) A preliminary study in the US demonstrated that PVP led not only to a decline in plant-breeding creativity, but also to higher seed prices for farmers, a decrease in public investment with regard to plant breeding and a reduction in the information flow from the private to public sector. (UNDP, 2003)

#### **5.6 COST OF SECURING A PATENT**

The cost of obtaining a patent can prove quite exorbitant and beyond the means of many organisations in the developing world. For example, in the early 1990s the preparation of a patent application in the United States cost around \$20,000. A patent application in the EU could cost up to \$40,000. As patent applicants must apply for a patent in every country where they want them, pay an annual fee in order to maintain the patent and pay the costs of patent agents, the costs of filing patents can fluctuate wildly. Of the thirty-two countries surveyed by John H. Barton in the early 1990s the costs of filing patents fluctuated from \$355 to \$4,772. For biotechnology firms in the vanguard of research, 'establishing who has what rights of ownership over new processes and plant varieties is also a costly business as firms engage in litigation to determine who has what rights and to secure their markets'. (Tansey, 1999: 12)



## TRIPS AND BIOTECHNOLOGY / GMOS

### 6.1 BIOTECHNOLOGY: THE BACKGROUND

Genetic modification of plants and animals through domestication and controlled breeding in order to produce a wide range of varieties and breeds suitable for differing climatic conditions had been taking place with little or no debate for 'roughly 10,000 years'. (Paarlberg, 2000: 25) However, the advent in the early 1970s of genetic engineering – where genes can be isolated from an organism, manipulated in a laboratory and inserted stably into another organism – created unprecedented controversy in the field. The landmark case that changed the course of patenting history and set the precedent for the patenting of life forms was filed in 1971 by the General Electric Company and Anada Chakrabarty. The case was concluded in 1980 when the US Supreme Court ruled that a genetically modified oil-eating micro-organism could be patented. (Joseph, 1999: 47) The Chakrabarty case established the principle that the relevant distinction was not between living and inanimate things but whether living products could be seen as man-made inventions. (CIDSE, 1999: 16) In 1985 the US Patent and Trademark Office permitted the patenting of genetically modified seeds, plants and plant tissue.

One of the principal objections to Article 27.3(b) of the TRIPs Agreement is that the patenting of genetic resources, particularly those used in GMOs, will lead to the replacement of local and traditional varieties of crops by high-tech seeds and the spread of mono-cropping in agriculture. The UNDP states that 'genetic modifications increase gene uniformity and this can affect biodiversity in the long run'. (UNDP, 2003: 217) The erosion of genetic diversity is a phenomenon that prevailed after high-yielding varieties (HYVs) of crops were introduced during the Green Revolution of the 1960s and '70s. (Shiva, 1993)

Furthermore, most GM crops are geared towards intensive agriculture unsuited to the diversified farming systems practised by millions of resource-poor cultivators. Like the hybrid varieties pioneered at the international crop research centres during the 1960s, GM crops generally require intensive farming methods, necessitating a departure from traditional techniques such as multiple cropping, intercropping, and nutrient recycling. This trend will further disempower and marginalise farmers in the local and national food-production process. (CIPR, 2002) The plant-protection systems initiated under TRIPs are also likely to encourage the spread of genetically modified crops, putting a premium on food reproduction through biotech methods. This might mean that varieties traditionally grown in developing countries may be genetically changed, and that these new varieties will end up substituting the plants from which they were derived. (Oram, 1999)

### 6.2 DEVELOPMENT OF BIOTECHNOLOGY

The rapid development of biotechnology, particularly in the countries of the OECD, and its

application in agriculture acted as an incentive for the creation of a global system of patent protection. (Tansey, 1999) The unlocking of DNA sequences has created unparalleled opportunities for advances in medical research, industry and agriculture. One writer has stated that genetic engineering had, for the pharmaceutical, chemical and plant-breeding industries, 'opened up a biological Eden filled with overwhelming temptation'. (Drahos and Braithwaite, 2002: 156)

If advances in biotechnology, particularly the power to read and change gene sequences, are used wisely they could 'bring great benefits to humanity ... but they also pose threats'. (Oxfam, 2002: 219) Some commentators who have cast a sceptical eye over the 'gene revolution' have asserted that powerful transnational corporations 'wish to own the genetic material they have obtained where the function or application of this genetic material amounts to new knowledge'. (Biggs, 1998: 133)

Pressure applied by multinational corporations to increase patent protection has grown with the development of the biotechnology industry. The industry has sought to recoup its outlays on research and development by the introduction of more stringent patent policies for their genetically modified seed varieties. The UN FAO also maintains that as developing countries increase investment in their own plant-breeding industries their views will alter. 'In areas with good access to urban markets, even small-scale farmers may see a shift to modern hybrids as an attractive option because of their high-yield potential. In this case private sector companies are the main seed suppliers'. (FAO, 2001: 37)

During the Uruguay Round of trade talks plant-breeding companies wanted a watertight intellectual property protection regime because many of them found that certain varieties of their plants were being replanted or sold in countries with very weak or non-existent patent regimes. The world's biological and genetic materials provide the bulk of the resources used in both the biotechnology and plant-breeding industries. However, these same materials are also the basis upon which up to 1.4 billion people are dependent for their livelihoods and food security. The anthropologist Stephen Brush writes that 'plant genetic resources provide the foundation of all food production, the key to feeding unprecedented numbers of people in times of climate and other environmental change'. (Brush, 1994: 35)

Before commercial plant breeding became a lucrative trade, intellectual property rights were rarely invoked by producers. Since 1973, however, a gradual sea change in the patenting of biodiversity has evolved into a veritable flood of 'innovators' claiming that discoveries in nature can be categorised as 'inventions' and therefore liable to patenting. Heretofore, most innovations in the area of agriculture came about as a result of farmers sharing seeds freely and interbreeding animals 'to produce a wide range of varieties and breeds suitable for differing climatic conditions'. (Ibid.: 54) With the advent of modern biotechnology, fears abound that TRIPs will be invoked by corporations as a means of patenting genetic material that originates in the developing world and not sharing the benefits, as they are required to do under the 1992 Convention on Biological Diversity. Moreover, as intellectual property protection for plant varieties is reinforced and extended under TRIPs, foreign companies

may become the 'owners' of varieties originating in developing countries. (Stilwell, 2000) According to MASIPAG, the farmer-led, community-managed breeding-and-conservation collective in the Philippines, 'developing countries are currently demanding that implementation of TRIPs be deferred until its impact on biodiversity is clearly understood and made subject to the Convention on Biodiversity'. (GRAIN, 1998: 2)

The United Nations Food and Agricultural Organisation (FAO) stated in September 1998 that 'any region in the world is dependent on genetic material which originated in other regions for over 50% of its basic food production, and, for several regions of the world, such dependency is close to 100%'. (Quoted in Tansey, 1999: 15) According to the FAO, only twenty cultivated crops sustain 90% of all calorie requirements. All twenty of these crops originate in developing countries, and while all are highly vulnerable to pests and diseases, they all depend on the maintenance of genetic diversity for their continued survival. (Crucible Group, 1994) The protection of plant varieties is an issue that is 'central to the world's food supply'. (UNDP, 2003: 216) Plant varieties refer to plants that have been improved by breeding techniques in order to make them distinct, stable and uniform. Inherent in plant breeding is the possibility of increased yields for farmers and the generation of seed varieties with greater resistance to drought, pests and diseases.

One commentator asserts that 'the big transnational corporations which have developed the new biotechnologies are also likely to have a very influential effect on global consumption and production in the area of agribusiness'. (Biggs, 1998: 131) In the United States genetic engineering is being developed to cut costs in the food industry through the substitution of natural products by similar genetically engineered or wholly synthetic ones. The US' trade strategy saw the amount of sugar imports from the Caribbean decline by over \$400million between 1981 and 1984 and those from the Philippines fall by over \$600million between 1980 and 1987 'as a result of the development of genetically engineered sweeteners from maize grown in the North'. (Ibid.) If attempts to genetically engineer cocoa, palm oil and vanilla succeed then farmers in Ghana, Cameroon, Ivory Coast and Zanzibar could find their livelihoods under serious threat. Biggs further cautions that some transnational corporations could soon become universal food producers as they are moving towards selecting relevant genetic material which can be used on very basic materials to turn them into food. The total substitution of one crop for another could be a distinct possibility and farmers in the developing world are likely to be severely hit by these substitution processes. (Biggs, 1998)

While proponents of biotechnology such as the Biotechnology Industry Organisation see agricultural biotechnology as a tool to help solve problems of hunger and excessive pesticide use, critics of the technology have stated that plant biotechnology is 'not needed, will be bad for consumers' health, will impoverish small farmers ... and will increase pesticide use and reduce biodiversity'. (Pray et al., 2001: 3) Oxfam stated that although the share of transgenic crops grown in the developing world has increased from 14% in 1997 to almost 25% in 2000, coverage is almost exclusively confined to 'a small number of relatively prosperous, export-oriented countries – and a small number of commercial crops'. (Oxfam, 2002: 223)

While the dominant transgenic crops grown in the developing world continue to be herbicide-resistant soybeans and maize, those staple foods such as sorghum, cassava and other root crops are rarely grown. Very few of the newly engineered seeds on the market or in production 'are designed to meet the needs of the rural poor or to enhance the productivity of smallholder families'. (Ibid.)

Oram (1999) writes that 'rather than focussing on improving yields in marginal lands, nearly all research into GM crops is going into improving food-processing qualities, transport durability, appearance and shelf-life – traits favouring sales in Northern niche markets rather than meeting food needs in the South'. (Oram, 1999) GM crops are essentially geared towards intensive agriculture and, as such, require intensive farming methods to cultivate them. According to the Indian activist, Devindar Sharma, the patenting of crops derived by genetic modification is deemed fundamental to the existence of the biotechnology industry. 'Patents provide monopoly domination not only through technological supremacy but also by extending control over the biological wealth and the traditional knowledge of the gene-rich developing countries'. (Sharma, 1999: 10) As patents that are issued in Europe and America grant effective control over the potential economic value of genetic resources derived from *any* country, 'they create an incentive for firms to acquire genetic materials from any source for the development of profitable new drugs, seeds or other products'. (Oxfam, 2002: 220)

The TRIPs Agreement makes no provision to recognise the 'intellectual contribution made by communities over time' (May, 2000: 104) to the conservation and creation of biodiversity. While provision is made in the agreement for certain farmers' privileges such as the self-seeding and natural reproduction of seeds, 'these are not rights that allow resale or alienation of such products where they run parallel to products that are protected as intellectual property'. (May, 2000: 104) The Indian seed market is one where the imposition of IPRs on varieties would significantly change the nature of the market given that 70% of seed supply in India comes from farmers' sale of their reproduced seed. (May, 2000)

### 6.3 BENEFITS OF GMOs?

Paarlberg writes that 'the GM crop revolution will have life-changing – and even life-saving – implications in developing countries'. (Paarlberg, 2000: 30) He maintains that agriculture in the tropics is lagging, in part due to poor soil, extremes of moisture, heat, and drought, as well as 'a plenitude of pests and diseases that attack animals and crops'. (Ibid.) Some of the GM technologies that were developed for growth in temperate climates, such as Bt maize and cotton, could quite readily be adapted for planting in the tropics by transferring the desirable GM traits into indigenously grown crops through conventional plant breeding. However, Paarlberg thinks that this is unlikely to happen in areas where farmers are poor, as the incentive for private corporations to invest in such regions is extremely limited. He states that corporations 'may seek to block local adaptations if poor countries are not willing to protect corporate intellectual property rights'. (Paarlberg, 2000: 34) Hundreds of cases have already been pursued by corporations against what is claimed to be the illegal use of their genetically modified products by farmers in Canada and the US. (Monbiot, 2002)

Oxfam, in its report on world trade, stated that the use of genetically modified crops might be of benefit to developing countries in certain cases. The report cited the use of Bt maize or Bt cotton, which is now grown in at least five developing countries. Bt (*Bacillus thuringiensis*) is a gene that is toxic to some insects and thus represents an invaluable means of protecting a farmer's harvest. A study of 283 cotton farmers in northern China during December 1999, for example, showed how farmers using cotton seeds modified by the implant of the Bt toxin were able to control the cotton bollworm, a menace that had become evermore resistant to chemical controls. (Oxfam, 2002) Farmers also reduced their reliance upon pesticides substantially without reducing the output and/or the quality of cotton. According to the authors of the report, weak intellectual property rights protection resulted in little benefit to the government research institutes or foreign firms that developed the Bt varieties. (Pray et al., 2001)

Paarlberg asserts that intellectual property rights protection for GM crops in developing countries tends to be too weak rather than too strong, and that while the TRIPs Agreement requires all WTO members to provide IPR protection for plant varieties, many developing countries 'will try to satisfy TRIPs without giving up traditional privileges of farmers to replicate and replant protected seeds on their farms'. (Paarlberg, 2000: 34) Other proponents of patents on life forms state that IPRs will stimulate innovation because patents will reward investment in research and development. The negative impact of patents would be negated by the benefits that would be derived from new and improved varieties.

#### 6.4 TECHNOLOGY TRANSFER: TRIPs IN AN UNEQUAL WORLD

The TRIPs Agreement is likely to reinforce, or even exacerbate, the chasm between the developed and developing worlds in the global-knowledge economy. The payment of royalties and licence fees for the use of technology has been growing rapidly since the 1980s. According to a United Nations report, the amount paid by developing countries in licence payments that were linked to the transfer of technology in 1998 was almost \$15billion – seven times the figure that prevailed in the mid-1980s.

One simulation study undertaken by the World Bank shows how the six major industrialised countries would benefit from the implementation of the TRIPs Agreement by over \$40billion, with the US alone benefiting by more than \$20billion. The study showed that under the TRIPs Agreement, India will pay \$1billion more in licence payments to industrialised countries, Mexico will see its bill increase by \$2billion, while China will be forced to pay up to \$5billion more in technology transfer payments.

A World Bank study in 2001 of twenty-six developed countries estimated that TRIPs will lead to rent transfers to nine of them (of which Ireland is one) of \$41billion. These transfers are as a result of what the bank sees as the unequal distribution of technology and technological capacity and they will further raise the cost of implementing the TRIPs Agreement 'for countries with already scarce resources'. (UNDP, 2003: 207) It can be assumed that some of this technology transfer will be in the area of agricultural biotechnology as countries are forced to pay royalties for the use of genetically modified seeds and plant varieties.

## GENETIC DIVERSITY ERODED

### 7.1 THE GREEN REVOLUTION REVISITED

Despite the greatly increased yields, especially in rice and wheat, that were synonymous with the Green Revolution, dependency on HYVs (high-yielding varieties) and the inputs that accompanied them became so great in some countries that by the early 1990s a mere five of the supposed 'super varieties' of staple crops accounted for 90% of the rice-growing areas of both peninsular Malaysia and Pakistan, nearly half the rice lands of Thailand and Burma, and approximately a quarter of the rice area of China and Indonesia. (GRAIN, 2001(b)) As a consequence of such dependency, Asia lost much of its crop diversity.

In the Indian state of Andhra Pradesh, for example, implementation of the principles of the Green Revolution led to a loss of up to 95% of traditional rice varieties without their collection or documentation. (Ibid.) At the end of the twentieth century, 75% of India's rice production came from a mere ten varieties, whereas India was once home to 30,000 varieties of rice. (Joseph, 1999) Likewise in China, at the time of the communist revolution in 1949, there were 10,000 different varieties of wheat in use; by the 1970s only 1,000 of those varieties were still planted. In the United States, approximately 97% of the food-plant varieties that were available to farmers in the 1940s are today no longer in use. (Ibid.)

Some of the cross-pollinated seeds used in the Green Revolution were often less resistant to diseases than some of the traditional seeds. In addition to this, the planting of only one variety of a plant – known as 'monoculture' – created what Seitz terms 'an ideal condition for the rapid spreading of disease or for the rapid multiplying of insects that feed on that plant'. (Seitz, 1988: 63) The new seeds used in the Green Revolution were also less tolerant of too much or too little water meaning that droughts and floods 'have a more harmful impact on these plants than on the traditional varieties of the grains'. (Seitz, 1988: 63)

The Green Revolution facilitated the creation of a private seed industry, a process that was accelerated in the 1980s when the World Bank combined with private interests within the United States to create first-generation (F1) hybrids that are produced by cross-pollinating two compatible parent plants. These F1 hybrids initially provided higher yields to farmers but they lose this advantage in later generations, meaning that farmers are compelled to purchase new seeds before each planting. Nevertheless, the market for hybrid plants is burgeoning over Asia: in the Philippines, the area of yellow corn planted to hybrid varieties increased from 10% in 1991 to 70% six years later. (GRAIN, 2001) For corporations such as Monsanto the hybridisation of new crops is worth between \$1billion and \$2billion per year. (Ibid.)

## 7.2 MONO-CROPPING IN AGRICULTURE

The most obvious danger of mono-cropping is that the practice can be catastrophic if the crop is afflicted by disease. (Brown, 2002) Historical precedent illustrates the dangers of a narrowing genetic base. The wheat-stem-rust epidemic of 1953 and 1954 – when 75% of the wheat harvest was destroyed in the United States – the southern US corn blight of 1970, the 1975 loss of half a million acres of rice in Indonesia to damage caused by the rice hopper insect, as well as the Irish Potato Famine of the 1840s, have been invoked to highlight the potentially calamitous consequences of reliance on a single crop. Preserving genetic diversity, proponents assert, is necessary to assure continued genetic improvements in food crops.

Even the high-yielding varieties of the Green Revolution did not all prove immune to disease. In 1970–71 the corn-blight epidemic in the United States resulted in the loss of up to 15% of the corn harvest ‘because of genetic uniformity’. (Shiva, 1991: 46) The new rice varieties introduced by the Philippines-based International Rice Institute (IRRI) in the late 1960s proved vulnerable to pests and diseases. The rice variety IR-8 was afflicted by bacterial blight in south-east Asia in 1968 and 1969 and was destroyed by the tungro virus in 1970 and 1971. In Indonesia more than half a million acres of land under new rice varieties were ravaged by pests. Even the rice variety, IR-36, which was supposedly resistant to eight major known diseases and pests, proved fallible to two different viruses. In the Indian state of Punjab, insects and pests which, prior to the Green Revolution had proven to be insignificant, became major problems with the onset of new rice varieties. By 1991, rice cultivation in the Punjab had become vulnerable to ‘about 40 insects and 12 diseases’. (Shiva, 1991: 47)

## 7.3 GENDER DIMENSION OF TRIPs

This is a dimension of the impact of TRIPs on biodiversity in the developing world that ‘is often overlooked’. (UNDP, 2003: 217) TRIPs affects women in a plethora of issues such as reproductive health, agriculture, food security as well as traditional knowledge in foods and medicines as women are the primary users and maintainers of biodiversity. (Ibid.) In the poorest households in the developing world, traditional diet consists of ‘a finely balanced mix of cultivated crops and plants and fruits found in the wild. Women, more than men, tend to use the forest as a source of a wide variety of insects, plants and plant products to supplant the basic diet, especially during food shortages’. (UNDP, 2003: 217)

Shiva demonstrates how Monsanto’s creation of herbicide-resistant plants, thanks to GM technologies, has resulted in the killing of weeds that are an essential part of the food supply in south Asia and Africa. In India, for example, women use up to 150 species of plants as medicine, food or fodder, which would ordinarily be described by the biotechnology industry as weeds. In West Bengal, 124 of so-called ‘weed’ species collected from rice fields are of economic importance to local farmers. Shiva shows that in a Tanzanian village more than 80% of vegetable dishes are prepared from uncultivated plants. ‘What is a weed for Monsanto is a medicinal plant or food for rural people’. (*Houston Catholic Worker*, 1997) She also demonstrates how thousands of rural women whose livelihoods are dependent on the reeds and grasses used in basket and mat weaving are seeing their incomes decimated by the spread of herbicide-resistant varieties. (Shiva, 1993)

The dissemination of herbicide-resistant plants and technologies is detrimental to agriculture and food security given that, according to Shiva, ‘herbicide resistance excludes the possibility of rotational and mixed-cropping which are essential for a sustainable and ecologically balanced form of agriculture’. (Shiva, 1993: 113) Shiva cites a report which demonstrates a loss of at least \$4billion per annum to farmers in the United States as a result of herbicide spraying. The destruction in the developing world will doubtless be greater because of higher plant diversity and ‘the prevalence of diverse occupations based on plants and biomass’. (Ibid.)

#### **7.4 SHIVA’S BBC REITH LECTURE, 2000: HERBICIDES AND PESTICIDES**

In the course of her Reith Lecture on poverty and globalisation in 2000, Vandana Shiva, Director of the Research Foundation for Science, Technology and Natural Resource Policy, outlined the devastating effect of the consolidation of the food chain by a handful of corporations. The epidemic of farmers’ suicide in the Warangal area of Andhra Pradesh, according to Shiva, can be directly traced to the farmers’ use of hybrid cotton seeds. Those working on the land in the region who had traditionally grown pulses, millets and paddy were ‘lured by seed companies to buy the seeds referred to by the seed merchants as “white gold”, which were supposed to make them millionaires. Instead they became paupers.’<sup>2</sup> The native seeds of the Warangal farmers have been displaced by these cotton hybrids which cannot be saved and so need to be repurchased every year. In addition to the farmers’ dependence on the seed corporations, the hybrids themselves are susceptible to pest attack, meaning that spending on pesticides in the region has increased from \$2.5million in the mid-1980s to \$50million in 1997.<sup>3</sup> The use of pesticides in other areas of India, such as Bhatinda in Punjab, has killed off pollinators such as bees and butterflies and created horticultural sterility.



## CONSOLIDATION OF SEED INDUSTRY

### 8.1 THE GENE GIANTS

The consolidation of the seed industry has led to five so-called ‘Gene Giants’ – namely DuPont, Pharmacia, Syngenta, Dow and Aventis – laying claim to a global market share of 60% of the pesticide industry, 25% of the world’s seed market and almost 100% of genetically modified crops (GMOs). (Meek, 2000: 11) The top ten seed companies control approximately one-third of the worldwide trade in that industry. (Action Aid, 1999) A survey by the London *Evening Standard* in 1999 showed that a mere thirteen companies control 81% of 1,600 patents for genetically modified crops and the technologies that are associated with them. (Monbiot, 2000) Various patents have already been taken out on numerous varieties of five major food crops, namely rice, maize, wheat, soya and sorghum. Almost three-quarters of these patents are owned by five large corporations. (CIPR, 2002)

On 2 March 1994 the biotechnology group Agracetus was granted a soybeans species patent by the European Patent Office. This patent allowed the group to officially own all possible or future modifications of soybeans in Europe. As a \$27billion food-and-feed crop the implications of a patent on soybeans are startling. (Crucible Group, 1994) Agracetus had earlier taken out a patent on all possible modifications of transgenic cotton, meaning that the corporation would have the rights to ‘any cotton treated with any gene, by any company, for any purpose, now and in the future’. (Monbiot, 2000: 253) At the time, Agracetus’ main rival Monsanto was incandescent at the granting of the patent on transgenic cotton to Agracetus. However, Monsanto then bought its main rival and all its patents. Any objections to the transgenic cotton patent were soon rescinded. (Ibid.)

Despite claims made within the biotech industry that varying groups of farmers growing diverse crops have accepted and implemented the concept of agricultural biotechnology, the reality is that the introduction of genetically engineered crops has, according to Michael D.K. Owen of the Department of Agronomy in Iowa State University, been characterised by uniformity in agriculture, industrial agriculture and corporate concentration. (Owen, 2001) This uniformity can best be exemplified by the fact that in 2000 only four crops – soybean, maize, cotton and canola – accounted for virtually all the genetically engineered crops that were sown that year. Of crops grown that year, 98% were limited to three countries – the United States, Argentina and Canada – while three-quarters of the area dedicated to genetically modified crops in 2000 was for a single trait: herbicide tolerance. One company – Pharmacia (a merger of the agribusiness wing of Monsanto, Pharmacia and Upjohn) – accounted for 94% of the total area sown with genetically engineered seeds. (Paarlberg, 2000)

What is particularly galling for an organisation such as the WTO – which espouses greater

liberalisation of trade in order to stimulate competition, trade and growth – is that the ‘Gene Giants’ who called for the TRIPs Agreement today find themselves subject to an antitrust suit in the US. The *Biotechnology Law Report* of 2000 documents how a consortium of farmers in the United States and other countries have brought a private antitrust action against Monsanto, DuPont, Dow Chemical, Novartis, AstraZeneca and other corporations. The farmers allege that, from 1996 onwards, the named companies entered into a licensing arrangement to create a cartel ‘in which Monsanto would be the “hub” of the GM industry, and the co-conspirators the “spokes”’. (Drahos and Braithwaite, 2002: 165) The farmers claim that Monsanto and the other companies used patents to fix prices and restrict trade in the GM corn and soybean markets. In other words, the farmers allege that these companies have formed an illegal cartel – a scenario which scarcely corresponds to the WTO’s vision of freer trade.

## 8.2 PUBLIC vs. PRIVATE RESEARCH

The headlong rush to privatise research can be traced back to the introduction of the Bayh-Dole Act by the US Congress in 1981. The Act permitted universities and small businesses to own patents on inventions they had developed with federal funding. The primary reason given by supporters of the Act for its introduction was that the United States was losing out technologically to countries such as Japan, and that the introduction of a stronger patent regime would stimulate creativity in American universities and enterprises.

Before the introduction of Bayh-Dole inventions which were developed with federal funding ended up in the public domain, or the patents in these inventions was put in the trust of the relevant federal funding agency. Once this knowledge was privatised, however, a latter-day equivalent of the Gold Rush ensued, and by 1986 universities and hospitals had increased their patent applications in the area of human biological research by 300% compared to five years previously.

This shift away from publicly funded research ending up in the public domain and instead entering private hands has led to a scenario which, according to Peter Drahos, can be encapsulated as such: patents instead of being a reward for private inventors putting their information into the public domain have instead become a means of recycling public information as private monopolies. (Drahos and Braithwaite, 2002)

The seed industry has claimed that plant variety protection granted through plant breeders’ rights (PBRs) has helped to increase private plant breeding R&D (research and development) for certain crops, namely wheat and soybean. (CIPR, 2002) However, there was no evidence of a corresponding boon to R&D in the public sector. Some critics of PBRs have argued that the public sector is being squeezed out of applied research by private organisations that are intent on creating a ‘basic research agenda for the benefit of corporations’. (Tansey, 1999: 10)

An example of the enormous discrepancies in public and private funding of biotech-related research is that the Consultative Group on International Agricultural Research (CGIAR),

which holds in trust one of the world's largest *ex situ* collections of plant genetic resources, spent \$25million on such research in 1998 compared to the \$1.26billion invested by Monsanto alone. (CIPR, 2002) This latter figure is a vast increase on the spending on agricultural biotechnology by Monsanto ten years previously in 1988 (\$55million), or by ICI (\$15million) and DuPont (\$15million) in the same year. (Biggs, 1998) For Shiva, corporations such as these have an 'immediate strategy', the purpose of which is 'to increase the use of pesticides and herbicides by developing pesticide and herbicide-resistant varieties'. (Shiva, 1993: 110)

For Oxfam, one of the consequences of the 'market failure' in terms of public vs. private research is that commercial interests and markets will continue to dominate innovation and the identification of future food priorities. Almost inevitably, hardly any of the newly engineered seeds which appear on the market 'are designed to meet the food needs of the rural poor or to enhance the productivity of smallholder farmers'. (Oxfam, 2002: 223)

The UK Commission on Intellectual Property Rights (CIPR) in its 2002 report on intellectual property rights and development policy made a plea for more public-sector research to aid poorer farmers, stating that if the Green Revolution, which was developed and applied with public-sector funding, failed for the most part to reach poor farmers living in agro-ecologically diverse rain-fed environments, it is apparent that biotechnology-related research led by the private sector will be even less likely to do so. (CIPR, 2002)

A workshop sponsored by the US Department of Agriculture and a number of organisations from the US in 1993 concluded that the patenting of PGRs could impede the exchange of materials among universities, research centres and government and private laboratories. In 1997, a follow-up seminar to that workshop was held. One of the parties to the seminar was adamant that 'full and open access to genetic materials' be upheld, and that 'the appropriate standards for utility patents be reconsidered ... in light of the potential for serious impediments to effective research and genetic resources use, especially in the public sector in countries with limited economic resources'. (Quoted in Correa, 2000: 173)

### 8.3 TRIPs: LIBERALISATION OR MONOPOLISATION?

The TRIPs Agreement has led to a huge increase in the number of patents taken out by agri-biotech corporations. Contrary to the WTO's aspiration for greater liberalisation of trade, there is an inherent danger in the TRIPs Agreement that it could lead to corporations being granted monopoly privileges over life forms. This greater diffusion of patenting rights 'has contributed to a concentration of power in the seed industries of a number of developing countries ... while the combination of stronger patent laws and reduced competition has driven up prices'. (Oxfam, 2002: 224)

Even fervent proponents of the WTO, among them Jagdish Bhagwati of Columbia University, have already stated that the TRIPs Agreement itself does not belong in an organisation committed to liberalising trade, and he has referred to TRIPs as representing 'the collection of a royalty payment'. (Dutfield, 2000)

The CIPR states that the acquisition by the five major agro-biotechnological corporations of 67% of the Bt (*Bacillus thuringiensis*) patents by 1999 reduces competition because innovative start-up firms find considerable barriers to entry in the market. Monsanto and DuPont now control three-quarters of the Brazilian corn market between them, thanks primarily to stricter patenting laws over plant genetic resources. The Commission pointed out that, after the introduction of plant variety protection in 1997, Monsanto took its share of the local maize seed market from 0% that same year to 60% by 1999 by acquiring three locally based firms. (CIPR, 2002)

#### 8.4 VANDANA SHIVA ON TRIPs AND CORPORATE CONTROL

Shiva writes that ‘... the completion of the Uruguay Round of the GATT and the establishment of the WTO have institutionalised and legalised corporate growth based on harvests stolen from nature and people. The WTO’s TRIPs Agreement criminalises seed-saving and seed-sharing. The Agreement on Agriculture legalises the dumping of genetically engineered foods on countries and criminalises actions to protect the biological and cultural diversity on which diverse food systems are based’. (Shiva, 1993)

## TRIPs BY STEALTH: THE UPOV CONVENTION

### 9.1 THE UPOV CONVENTION: ORIGINS

While developing countries were allowed until 1 January 2000 before implementing the TRIPs Agreement, and even though the review of Article 27.3(b) of TRIPs is currently ongoing, a more stealthy and surreptitious means of enforcing implementation of the plant variety provisions of TRIPs has been unearthed. The UPOV Convention (Unione Internationale pour la Protection des Obtentions Végétales – International Convention for the Protection of New Varieties of Plants) has been touted as a solution to the obligations that developing countries face with regard to plant variety protection under Article 27.3(b) of the TRIPs Agreement, particularly with regard to implementing a *sui generis* regime for plant variety protection. UPOV provides a framework for intellectual property rights of plant varieties, and is as such ‘an off-the-shelf solution to developing such legislation’. (CIPR, 2002: 62) These rights are most often referred to as plant variety rights or the European system of PBRs. (Dutfield, 1999: 27) UPOV is the only plant variety protection system that currently exists in international law. (Dutfield, 2002)

UPOV was the first internationally recognised multilateral convention on plant variety protection. The convention was first signed in Paris in 1961 and eventually entered into force in 1968. It sought to set common rules for the recognition and protection of intellectual property over new plant varieties obtained by plant breeders. UPOV has been amended on several occasions, as in 1978 when the convention allowed farmers to retain seeds and use protected seeds to develop their own strains. (Oxfam, 2002) UPOV 1991, on the other hand, requires members to grant twenty-year exclusive year rights to plants, with the rights of farmers to retain and use protected seeds left to the discretion of national governments. UPOV 1991 was essentially developed for institutionalised, commercialised breeding in the developed world where farmers have to pay royalties on the use of seeds. In its crudest form, it may be possible to say that the UPOV Convention in 1991 was strengthened to ‘stop farmers from replanting protected varieties’. (Crucible Group, 1994: 96)

### 9.2 CAPACITY OF FARMERS TO SAVE SEEDS OF PVPs (PLANT VARIETY PROTECTION) UNDER UPOV: HOW LIMITED?

Critics have argued that the criteria used for protection – which states that varieties must be distinct, uniform and stable – will lead to genetic erosion. These criteria, according to the FAO, will lead to the replacement of varieties of seeds that are genetically diverse and adapted for local conditions with genetically uniform modern varieties. (Joseph, 1999) Tansey writes that the UPOV system ‘promotes commercially bred varieties geared for industrial agricultural systems in which farmers have to pay royalties on such seed and the seed sector becomes an investment opportunity for chemical and biotech concerns’ (Tansey, 1999: 10)

As PBRs are only given for varieties that are genetically uniform they automatically limit what kind of seeds can be marketed and who can market them. As a consequence, critics argue, UPOV discourages genetically diverse and locally adapted seeds from both the market and the field. Dutfield writes that many NGOs have argued that plant variety protection as outlined in UPOV 1991 will undermine food security in developing countries by encouraging the cultivation of a narrow range of genetically uniform crops, including non-food cash crops. This, it has been stated, will result in diets becoming nutritionally poorer and crops becoming more vulnerable to disease. Also, the limits preventing farmers from acquiring the seeds they wish without paying a royalty to breeders will impoverish them further.

According to the International Cooperation for Development and Solidarity (CIDSE) the implementation of UPOV 1991 has seen the capacity of farmers to save seeds of protected varieties being restricted, subject to national discretion. Concomitant with this outcome, the rights of breeders have been strengthened vis-à-vis 'essentially derived' varieties of plants in response to developments in biotechnology. (CIDSE, 1999) UPOV 1991 was essentially developed for institutionalised, commercialised breeding in the developed world where farmers have to pay royalties on the use of seeds. In developing countries, the use of plants which conform to UPOV standards of being 'distinct, uniform and stable' have led to genetic erosion and reduced biodiversity and to a situation where 'more than 75% of agricultural crop varieties and over 50% of domestic livestock breeds have disappeared from farmers' fields in the last century'. (CIDSE, 1999: 13) UPOV has been promoted by European plant breeders as meeting TRIPs' requirement for an effective system of protection for plant varieties as an alternative to patents. The EU favours inserting a reference to UPOV into the TRIPs Agreement. (CIDSE, 1999: 13)

As the UPOV-related provisions in Article 27.3(b) of the TRIPs Agreement permit the patenting of biotechnological resources, governments in developed countries are foisting UPOV 1991 on countries of the South as a means of enforcing the latter's obligations under TRIPs. While the TRIPs Agreement is concerned with minimum standards of protection, according to one group 'those minimum standards are clearly not strong enough for industrialised countries and the transnational corporations whose nerve centres they hold'. (GRAIN, 2001) While many countries are joining, or are being forced to join, UPOV 1991 'some countries are devising alternative PBR systems that aim in part to strengthen food security'. (Dutfield, 2002: 26) An example of such is where a country allows its farmers to acquire PBR-protected seed from any source but requires the protected variety to display superior qualities to those varieties already in existence. (Ibid.)

### **9.3 BILATERAL, REGIONAL AND SUB-REGIONAL TRADE AGREEMENTS USING TRIPs AS SUBTERFUGE**

Bilateral, regional and sub-regional trade agreements are the means employed by developed countries to force the developing world to establish much more stringent requirements for IPRs on plant genetic resources. As such these agreements mean that some developing countries 'become unable to take advantage of the flexibility offered under TRIPs'. (UNDP, 2003: 220) For example, under NAFTA, Mexico is obliged to enforce UPOV 1991. When the

EU negotiated its own Free Trade Agreement (FTA) with Mexico in 2000, NAFTA was used as a reference point. Under Article 12 of the FTA both sides are committed to upholding the ‘highest standards’ of intellectual property protection, which entails compliance with the provisions of UPOV 1991. (Oxfam, 2002) Under the 2000 agreement between the EU and Mexico the latter must accede to the terms of the Budapest Treaty (which deals with micro-organisms) and must provide for the ‘highest international standards’ of intellectual property rights protection.

Bilateral investment treaties stipulate that investments which flow into the South are accorded the same level of protection that they would receive in their country of provenance. ‘Investments’ in such treaties includes intellectual property rights, even potential intellectual property rights in some cases. (GRAIN, 2001) The three bilateral investment treaties negotiated by the United States with Vietnam, Jordan and Nicaragua respectively in 2000–01 ‘all include a requirement of compliance with UPOV 1991, in Jordan’s case within one year’. (Oxfam, 2002: 221) The US–Jordan bilateral investment treaty is now being used as a template for other treaties, including the treaty between the US and Chile. It can only be assumed that Chile will be ‘encouraged’ to sign up to UPOV 1991.

The negotiations of bilateral treaties are usually confidential, with the contents of the texts not revealed until the treaties are agreed upon. Consultation with either parliaments or public opinion on the details of a bilateral trade agreement are negligible, although the European Parliament has a mechanism in place to ensure that the details of bilateral trade agreements are at least discussed. In some countries, contempt for parliamentary procedure has seen UPOV 1991 adapted. In 1998, the Nicaraguan trade minister sent a plant variety protection bill to parliament under an ‘urgency motion’ – that is, a plea to adopt the bill within fifteen days. The contents of the bill corresponded to the provisions in UPOV 1991. The trade minister informed parliament that Nicaragua was obliged to pass the bill and join UPOV under the TRIPs Agreement. The bill was duly passed but it later transpired that Nicaragua had given the United States a commitment to join UPOV in the secrecy of bilateral trade negotiations. (GRAIN, 2001)

Under the Vietnam–US bilateral trade agreement of October 2001, both parties agreed that in order to provide adequate and effective protection and enforcement of intellectual property rights, they ‘shall, at a minimum, give effect to the substantive economic provisions of the 1991 UPOV Convention.’<sup>4</sup> The EU–Tunisia Agreement requires that Tunisia joins UPOV 1991 as the model *sui generis* system for the protection of plant varieties. (UNDP, 2003) The EU–Bangladesh trade agreement obliges the latter to make ‘best effort’ to accede to UPOV 1991 by 2006. This is despite the earlier drafting of a *sui generis* bill on plant varieties for compliance with TRIPs that was compiled with the assistance of government officials, the scientific community, NGOs and indigenous movements over several years. Their proposed bill will effectively be redundant once Bangladesh accedes to UPOV 1991.

Other bilateral agreements which can be categorised as ‘TRIPs-plus’ include those between the US and Cambodia, between Ecuador and Singapore, the EU agreements with Morocco

(under which the north African country must join UPOV 1991), that between Palestine and South Africa (both of whom must implement the ‘highest international standards’ of intellectual property rights protection), and the Switzerland–Vietnam trade treaty. (UNDP, 2003)

The incidence of UPOV 1991 being grafted onto bilateral, regional and sub-regional agreements as a means of fulfilling a developing country’s obligations under Article 27.3(b) of the TRIPs Agreement will almost inevitably increase. The first developing countries, apart from South Africa, to join UPOV were Argentina and Uruguay in 1994 when UPOV had a total of twenty-six members. Since then another twenty-four developing countries have joined the Union, many of whose membership formed part of a bilateral trade agreement. (CIPR, 2002) UPOV 1991 allows countries to permit farmers to reuse their own crop for seed purposes. However, it does not allow for farmers to engage in the informal sale or exchange of seeds.

#### 9.4 SUMMARY OF FOOD SECURITY FEATURES OF UPOV 1991

<i>Under UPOV 1991</i>	<i>Consequence</i>
<i>A breeder may have some rights in relation to the harvest</i>	Under the concept of ‘farmers’ privilege’, a farmer may not be sued by a breeder when a farmer re-sows his own seeds. However, according to the terms of UPOV 1991, in certain cases the breeder has rights to the farmer’s actual harvest. Therefore, if a farmer plants a protected variety without paying royalties to the ‘owners’ of that variety, the breeder can claim ownership rights over the farmer’s harvest, as well as over products derived from that harvest.
<i>Saving and exchanging seeds curtailed</i>	1.4 billion smallholders rely on the saving and local exchange of seeds for their livelihoods. UPOV, while allowing on-farm replanting, restricts farmers’ freedom to buy seeds from different sources than the original breeders.
<i>Further breeding is restricted</i>	Any researcher using a protected variety has to make substantial changes to the genotype. If not, then the ‘new’ variety will not be considered ‘new’. It will instead be regarded as an ‘essentially derived’ variety which can be used only with the consent of the original breeder.
<i>Research priorities under UPOV biased in favour of commercial crops</i>	PBRs do not encourage research into breeding related to minor crops and markets. The determination to recoup R&D outlay dictates that breeding is focussed on major crops with large commercial potential. In Kenya, for example, almost half of the protected new varieties are foreign-based roses which are cultivated for export to the lucrative horticultural market.
<i>Genetic uniformity</i>	UPOV PBR rules require that individual plant varieties be genetically uniform. Dependency on uniform varieties can have catastrophic consequences for food security. The most startling example of this is the Irish potato blight of the 1840s.
<i>Varieties can be patented</i>	UPOV 1991 allows for the patenting of varieties, but leaves it at the discretion of individual member states whether such varieties can be patented.



## 9.5 THE EU AND ‘TRIPs-PLUS’ PROVISIONS

Despite its claims to the contrary, the EU makes sure that countries impose ‘TRIPs-plus’ provisions by means of bilateral agreements. In March 2003, for example, the EU–Lebanon bilateral treaty entered into force. Under the terms of this treaty Lebanon is compelled to join UPOV before 2007. The NGO GRAIN estimates that the EU has forced TRIPs-plus commitments regarding intellectual property on life forms in almost ninety developing countries. This figure includes the Africa–Caribbean–Pacific (ACP) group of seventy-six countries who in 2000 signed the Cotonou Agreement with the European Union. Under the terms of this agreement, the parties agreed to ‘recognise the need to ensure adequate and effective protection of patents and on biotechnological inventions’. Most ACP countries have no provisions at all for patents on life forms, food or pharmaceuticals because of their importance for overall national welfare. The Cotonou Agreement is an attempt by the EU to impose radical changes on the domestic legislation of the ACP countries.

In 2002 Algeria concluded a bilateral deal with the EU which compels the north African country to ‘accede and implement UPOV (1991) Act within five years of entry into force of the negotiations’.

## 9.6 UPOV CONVENTION SUMMARY AND CONCLUSIONS

In summary, it can be stated that the 1978 UPOV Convention seems relatively benign when compared to the updated 1991 version of the convention which contains some alarming provisions, particularly in regard to farmers’ rights. Under UPOV 1978 most of the signatories to the convention introduced a farmers’ privilege under which farmers were allowed to continue using a part of one year’s harvest as seeds for the following year. Farmers were also allowed to exchange seeds with their neighbours. These traditions have been going on for millennia.

The 1991 revision of the UPOV Convention (Article 15.2) restricts the scope of farmers’ privilege that can be established under national law. The article states that each contracting party may, within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder, restrict the breeder’s right in relation to any variety in order to permit farmers to use for propagating purposes, on their own holdings, the product of the harvest which they have obtained by planting, on their own holdings, the protected variety or a variety covered by Article 14(5)(a)(i) or Article 14(5)(a)(ii).

The phrase ‘legitimate interests of the breeder’ has been interpreted widely to mean compensation or remuneration to the breeder for the use of farm-saved seeds. Farmers’ rights are defined only as the right to save seeds for replanting on their own holding. Farmers may not, under the convention, sell or exchange seeds from their own harvest. NGOs are alarmed that this provision will be catastrophic for farmers in countries such as India where the seed market is composed of 70% of saved seeds. Although UPOV allows the replanting of farmers’ seeds on their own holdings, UPOV restricts farmers’ freedom to buy seed from sources other than the original breeders.

People might ask why farmers do not use varieties of seeds which are not subject to plant

breeders' rights? This is a legitimate point but, as Robert Tripp points out in his 1999 book, *The Structure of National Seed Systems*, traditional varieties of seeds are often disparaged by governments and are often excluded from government-approved seed lists. As the NGO GRAIN states: private seed companies, when they gain a foothold in a market, displace traditional local varieties by promoting hybrids and homogenous modern varieties, often through government agricultural extension services. They also push for stronger plant breeders' rights (PBR) laws and internal policing of national seed markets.

UPOV 1991, therefore, could be catastrophic in terms of food security as it will restrict farmers' rights to sell and exchange seed or impose a royalty payment on them for doing so. This is why NGOs such as GRAIN have stated that developing countries joining the UPOV Convention will have access to their own genetic resources restricted.

## IRELAND AND THE TRIPS AGREEMENT

### 10.1 IRELAND'S POSITION VIS-À-VIS TRIPs AND THE EUROPEAN BIOPATENTING DIRECTIVE

In correspondence during December 2002 and January 2003 with Dr Jacob Rajan of the Intellectual Property Unit at the Department of Enterprise, Trade and Employment, Dr Rajan wrote that the TRIPs Agreement is one of the many agreements annexed to the agreement setting up the World Trade Organisation. Ireland deposited its ratification of the WTO agreement, together with the annexes thereto, on 30 December 1994 and became an original member of the WTO on 1 January 1995, the date on which the agreement entered into force. The European Community and the other member states of the EU are also members of the WTO. Generally, ratification of a treaty/convention/agreement by a state constitutes the consent by that state to be bound by the provisions of the treaty/convention/agreement.

Referring to Article 27.3(b) of the TRIPs Agreement, which allows WTO members to exclude from patentability plants and animals and essential biological processes for the production of plants or animals other than non-biological and microbiological processes, at the time Ireland deposited its instrument of ratification Irish legislation was already compatible with the provisions of that article.

This provision is almost identical to the provision of Article 53 of the European Patent Convention, which was concluded in 1973, and the provision in Section 10(b) of the Irish Patents Act 1992. The article stipulates that member states should not exclude micro-organisms from patent protection. This has been the case under the Patents Act 1992.

Article 27.3(b) also requires that WTO members provide protection for plant varieties, either by patents or an effective *sui generis* system or by any combination thereof. In Ireland, plant varieties could be protected not under patent law but under the Plant Varieties Act, which is administered by the Department of Agriculture and Food.

As regards Directive 98/44/EC of the European Parliament and of the Council of 6 July 1998 on the legal protection of biotechnological inventions, it is given statutory effect in Ireland by European Communities (Legal Protection of Biotechnological Inventions) Regulations, 2000 (S.I. no. 247 of 2000).

### 10.2 IRELAND AID AND TRIPs

In meetings with the person responsible for formulating positions on issues relating to the WTO, Gerard Considine of Ireland Aid, I was informed that as of yet Ireland Aid had not taken a definitive position relating to the TRIPs Agreement. Mr Considine told me that he

had taken on this role at the end of April and said that Ireland Aid hoped to have a definitive position laid out by the beginning of June 2003. As of 10 June 2003 Ireland Aid had not announced its position with regard to TRIPs. However, Mr Considine asked me to inform him of any findings I arrived at in my own research regarding TRIPs.

### **10.3 THE IRISH PLANT BREEDERS' RIGHTS AND PLANT VARIETY RIGHTS OFFICE, BACKWESTON, LEIXLIP**

I tried on numerous occasions to get in touch with Gordon Rennie, whose name was given to me as the Genetic Resources Co-ordinator of the Irish Plant Breeders' Rights and Plant Variety Rights Office, which is part of the Department of Agriculture and Food at Backweston in Leixlip, Co. Kildare. It transpired that Dr Rennie has recently relocated to the Pesticide Control Unit in Abbotstown, Dublin. After a number of calls, e-mails, faxes, etc., I was eventually put in touch with Dr John Carvill who was very helpful with my enquiries.

Dr Carvill told me that Ireland joined the UPOV Convention in 1980. He stressed that the convention is an 'umbrella' which acts as a guide for national legislators. Ireland, he stated, had ratified the convention but also introduced legislation which, although along the lines of UPOV, did not adhere rigidly to the letter of the convention. Ireland recognises the 'farmers' privilege' whereby farmers may save seed, even of a protected variety, for use in the following year's harvest. Under UPOV 1991 the issue of 'farmers' privilege' is left to the discretion of national governments. Farmers in Ireland, however, are obliged to pay royalties for the use of protected varieties of seeds.

Irish plant breeders may apply for protection in three ways. Conventional breeders in Ireland could seek plant breeders' rights for their new varieties within the Republic by sending their applications to the Irish Plant Breeders' Association. The legislation to accord plant breeders' rights within Ireland was initiated in order for Ireland to meet the criteria necessary for joining the UPOV Convention.

Irish plant breeders who wish to have their plant breeder's rights validated in every country of the European Union can apply to the Community Plant Variety Office (CPVO). The CPVO grants rights ensuring industrial property protection for eligible new varieties of plants. These rights are valid for either twenty-five or thirty years.

Irish plant breeders who have created a new variety involving genetic engineering and sophisticated technology may wish to patent the genes used in the process of shuffling the genes between particular species. Plant breeders can do this by applying to the European Patent Office for a patent. A patent is a more stringent form of intellectual property right than plant breeders' rights and as such offers greater protection to the breeder of the new variety.

Dr Carvill stressed that plant breeders' rights (PBRs) are different to patents in that a patent is for an invention that can be precisely repeated but that PBRs are given to new

plant varieties. He said that new varieties cannot always be reproduced with a high degree of predictability (unlike a mechanical invention) and for this reason most countries did not use a system of patenting for new plant varieties, but instead introduced PBRs. The patenting of plant varieties is common in the US, but plant breeders' rights are used as a form of intellectual property protection in most other countries.

Dr Carvill recognised the difficulties and potential controversies that can arise with regard to plant breeders' rights and the UPOV Convention in the developing world. He stated that the issue of farmers having to pay royalties on their saved seed was potentially a very fraught one in countries such as India, where saved seed represents almost 70% of the seed supply on the open market.

Dr Carvill stated that some countries had initiated legislation under the *sui generis* provisions of TRIPs but that when they tried to submit this legislation to UPOV it was deemed insufficient as it did not fulfil all criteria necessary under UPOV. While countries have, on paper, some flexibility to devise their own legislation, the practical reality is that such legislation must conform in spirit to the provisions of the UPOV Convention, if not always to the exact letter.

#### 10.4 THE EUROPEAN BIOPATENTING DIRECTIVE

This latter point means that Ireland's legislation corresponds to that outlined in the 1998 European Biopatenting Directive. During the Uruguay Round the negotiators of the European Commission assuaged the doubts of developing countries in the area of biodiversity by insisting that legislation within the EU did not allow such patents as were permissible under TRIPs. However, after considerable lobbying by the biotechnology industry, the European Parliament passed the European Biopatenting Directive in 1998, despite warnings by innumerable scientists and doctors that the patenting of genes would 'discourage research not only by removing financial incentives, but also by restricting academic freedom'. (Monbiot, 2000: 256)

The rules of the European Patent Office state that a patent can be granted when a substance that has been found in nature 'is new in the sense that it was not previously available to the public'. (Correa, 2000: 177) The European Directive on Biotechnological Inventions states that 'Biological material which is isolated from its natural environment or processed by means of a technical process may be the subject of an invention even if it already occurred in nature' (Article 3.3).

#### 10.5 PRESSURE ON IRELAND: CANVASSING VOTES IN THE EUROPEAN COUNCIL OF MINISTERS

In March 1998, one month before the signing of the Good Friday Agreement, the corporate giant Monsanto spotted an opportunity in Bertie Ahern's visit to Washington. An EU Council of Ministers meeting was scheduled to take place the day after St Patrick's Day at which the main item on the agenda was whether to approve Monsanto's modified maize for sale in the European market. The vote was predicted to be extremely tight and the Irish government

was wavering. (Monbiot, 2000) During his visit An Taoiseach was briefed on biotechnology by Sandy Berger, who at the time was President Clinton's National Security Council Director. As one Security Council official explained, 'In this post-Cold War era America's national interests have changed, and crises aren't always military crises'. (cited in Monbiot, 2000: 243) At the meeting of the Council of Ministers Ireland voted to license Monsanto's genetically modified maize. In Dáil Éireann – the Irish parliament – on 5 October 1999 the environment minister Noel Dempsey 'admitted that the Taoiseach had told him to instruct his officials at the European talks to vote in favour of Monsanto's crop, as a direct result of the US government's lobbying'. (Monbiot, 2000: 244)

## THE FINING OF FARMERS

### 11.1 THE FINING OF FARMERS: EXAMPLES FROM THE INDUSTRIALISED WORLD

While it is imperative to state that the TRIPs Agreement will have detrimental consequences for farmers in the developing world, it is also important to emphasise that farmers have already been subject to litigation in the industrialised world for engaging in the ancient practice of saving and exchanging seeds.

The notion that farmers could be fined for growing non-protected varieties of plants sounds faintly ridiculous. Who, after all, is going to police individual farms to ensure that a farmer growing a protected variety pays royalties? And why don't farmers simply grow non-protected varieties of plants? However, Robert Tripp (1999) states that governments often disparage traditional or 'folk' varieties of plants and don't include them on government-approved seed certification lists.

### 11.2 GERMANY: THE CASE OF JOSEF ALBRECHT

That a farmer could be challenged for growing and trading in a non-approved plant also seems ridiculous but this was the experience of the German organic farmer, Josef Albrecht, after he traded uncertified wheat seeds (which he had worked on and developed himself) with ten other farmers from neighbouring villages. Because the seeds which Albrecht traded were uncertified seeds and not recognised on the government register he was fined by the German state.

### 11.3 SCOTLAND: THE CASE OF POTATO FARMERS

In Scotland, the growing and selling of seed potato to other farmers was common practice until the early 1990s. Farmers were, until that time, allowed to freely sell the reproductive material to other farmers and merchants. However, in the mid-1990s plant breeders, through the British Society of Plant Breeders, began to issue notices to potato growers that made the selling of seed potato by farmers to other farmers and merchants illegal. Seed-potato growers were obliged to grow varieties under contract to the seed industry. The seed industry would specify the price at which the contracting company would buy back the crop. Growers were forbidden under plant breeders' legislation from selling the crop to anyone else.

The seed companies soon began reducing the acreage and prices. Seed companies that were buying seed potato from Scottish farmers for £140 were selling it on to English farmers at double the price. The farmers were forbidden from selling the seed to each other. Incensed at this behaviour, the seed-potato growers signed a petition claiming that a few seed companies were gaining control of the potato-seed market and acting as a cartel. Scottish farmers then began selling uncertified potato seed directly to English farmers at a price well below

that of the seed companies. The latter claimed that they were losing £4million in sales because of unauthorised seed-potato transactions between farmers. The British Society of Plant Breeders decided to act and in February 1995 took a case against a farmer in Aberdeenshire for selling non-certified potato seed to English farmers. The farmer was forced to pay £30,000 in compensation to the seed companies. This ‘compensation’ was deemed sufficient to cover the losses incurred by the seed industry due to the sale of unauthorised seed by a farmer indulging in the age-old practice of saving, selling and exchanging seeds.

This effectively means that under EU law farmers may not grow protected varieties without the permission of the holder of the patent or plant breeders’ right; it also means that farmers who use non-certified seed are liable to be prosecuted.

#### 11.4 CANADA: THE CASE OF PERCY SCHMEISER

Percy Schmeiser, a farmer from Bruno, Saskatchewan became a household name in his native Canada when he was sued by Monsanto for having infringed their patent on a glyphosate-resistant plant.

Schmeiser had grown oilseed rape on his fields since the 1950s. He claimed in court that the last time he had bought seed was in 1993. After that time Schmeiser saved seed and by a process of selection was able to develop his own strain of oilseed rape which was resistant to most types of pests and diseases.

In 1996 Monsanto introduced to Bruno and the surrounding environs their own genetically engineered Roundup Ready (RR) oilseed rape. Monsanto’s product was genetically modified to resist the herbicide glyphosate.

In 1998 inspectors from Monsanto took samples from Schmeiser’s fields. Their tests showed that Schmeiser’s fields were glyphosate-resistant and the farmer was subsequently sued by Monsanto. Monsanto’s patent is for a gene construct that is inserted into plants to make them resistant to glyphosate. Monsanto argued in court that its patent rights cover all plants that contain the gene construct. These plants included the variety of oilseed rape that had been developed by Schmeiser. In his defence, Schmeiser argued that he did not sow his fields with Monsanto’s Roundup Ready oilseed rape. He also stated that if the inspectors did find that his fields contained Monsanto’s product that this must have occurred by means of either Roundup Ready seeds accidentally spilling from the roadside onto his farm, or by contamination which would have occurred by cross-pollination with neighbouring fields.

Schmeiser was found guilty in court of having the genes of Monsanto’s Roundup Ready oilseed rape on his fields. He was also found guilty of not advising Monsanto that his fields contained their genes and asking Monsanto’s inspectors to remove their product. He was forced to pay a fine of \$25,000 in ‘punitive and exemplary damages’. He was also compelled to pay a fine of \$15 per acre – with 1,030 acres to his name Schmeiser had to pay an extra \$15,450. In addition Schmeiser had to pay over the value of his own crop (\$105,000). In total Schmeiser had to pay Monsanto \$150,450. The presiding judge in the case ruled that



‘the defendants grew canola (aka oilseed rape) in 1998 in nine fields, from saved seed from their 1997 crop, which seed Mr Schmeiser knew or can be taken to have known was Roundup tolerant. That seed was grown and ultimately the crop was harvested and sold. In my opinion, whether or not that crop was sprayed with Roundup during its growing period is not important. Growth of the seed, reproducing the patented gene and cell, and sale of the harvested crop constitutes taking the essence of the plaintiff’s invention, using it, without permission. In so doing the defendants infringed upon the patent interests of the plaintiffs’. (Quoted in *Seedling*, April 2003: 10)

### **11.5 US: THE CASE OF BECKY AND DENIS WINTERBOER**

In the US two farmers, Becky and Dennis Winterboer, were sued by the Asgrow Corporation. Asgrow holds plant variety protection for certain varieties of soybeans. In 1987 the Winterboers began to sell their harvest to be used as seed to other farmers. Asgrow then filed a lawsuit against the Winterboers on the grounds that the company’s property rights were being violated. In countering the claims, the Winterboers stated that they were acting within the law which stipulates under the 1970 US Plant Variety Act that farmers have the right to sell seed to other farmers. One of the consequences of the Winterboer’s action was that an amended Plant Variety Act was passed by the US Congress in 1994 which stipulated that the so-called ‘farmers’ privilege’ to save and exchange seed was to be declared illegal. As a result of the amendment, a minor number of corporations established virtual monopoly over the seed industry in the United States.

TRIPs, and its sister legislation the UPOV Convention, will ensure that this Act of Congress is replicated on a global scale.

## CONCLUSION

In its *World Development Report 1998–99*, the World Bank studied the effects of intellectual property regimes on more than eighty countries. The report concluded that the effect of intellectual property rights on trade flows in hi-tech goods was negligible. Even more significantly, the bank stated that, contrary to what proponents of TRIPs declare, more stringent intellectual property regimes do not act as a stimulus for multinational corporations to carry out research and development in those countries. The much-heralded ‘transfer of technology’ to poorer countries has thus far proven to be little more than a mirage.

Half the world relies on a few basic crops for its food and it has been estimated that 830 million people go hungry every day in the world, and that 1.4 billion poor farmers in the developing world rely on saved seed for the following year’s harvest. The TRIPs Agreement will have enormous implications in all of these facets and it is the conclusion of this report that the implementation of the TRIPs Agreement in its present form will be detrimental to almost the entire developing world. In terms of food security, it can be stated that patenting of seeds and plant varieties will discourage agricultural conservation and the saving of seeds for replanting by farmers, as the latter would be reluctant to use plants or seeds that require the payment of royalties for their use.

With a global patenting system in place, it is likely that traditional varieties of plant and crops will be usurped by genetically modified organisms, particularly as giant corporations use the introduction of plant variety legislation to consolidate their hold on domestic markets in developing countries, *vide* the example of Monsanto and DuPont gaining control of the Brazilian corn market (see section 8.1). This in turn will doubtless lead to a market in agriculture dominated by a small number of firms. As a result prices of seeds and other inputs will almost invariably rise due to lack of competition in the sector.

As the author Joseph Stiglitz wrote in his acclaimed work, *Globalisation and Its Discontents*, nobody denies the importance of intellectual property rights. However, the underlying problem with the intellectual property regime established under the Uruguay Round was that it ‘overwhelmingly reflected the interests and perspectives of the producers’. (Stiglitz, 2002: 8) With Article 27.3(b) of the TRIPs Agreement currently under review, a more equitable agreement which reflects the contributions of farmers and indigenous communities to the conservation and propagation of diversity in agriculture is required – not only in the interests of farmers in developing countries but also to safeguard public research in the industrialised world.

The main problem developing countries may have in preserving their own biodiversity and

ensuring farmers' rights is likely contained in the UPOV Convention of 1991. The manner in which this convention is being forced upon developing countries by means of bilateral, regional and sub-regional agreements as a means of ensuring compliance with Article 27.3(b) of the TRIPs Agreement is sinister in the extreme and may be why Kevin Watkins, Oxfam's senior policy campaigner, wrote that 'the reform of TRIPs is the biggest single issue the developed world could do to alleviate poverty'. (Mathiason, N. and O. Morgan, 2001: 12)

The United Nations Economic and Social Council Sub-Commission on Human Rights stated in August 2000 that the TRIPs Agreement was impeding 'the right of everyone to enjoy the benefits of scientific progress and its applications, and the right to health'. The Council went on to say that 'there are apparent conflicts between the intellectual property rights regime embodied in the TRIPs Agreement, on the one hand, and international human rights law, on the other'.

## BIBLIOGRAPHY

- ActionAid, *Patents and Food Security*, ActionAid Briefing Paper, no. 5 (London: ActionAid, 1999).
- Biggs, S., 'The Biodiversity Convention and Global Sustainable Development', in Kiely, R. and P. Marfleet (eds.), *Globalisation and the Third World* (London and New York: Routledge, 1998), pp. 113–40.
- Brown, P., 'Lack of cash puts gene banks in jeopardy', *Guardian*, 30 August 2000.
- Brush, S., *Providing Farmers' Rights Through In Situ Conservation of Crop Genetic Resources*, report to the Commission on Plant Genetic Resources (University of California, 1994).
- CIDSE, *Biopatenting and the Threat to Food Security – A Christian and Development Perspective* (Brussels: CIDSE, 1999).
- CIPR, *Integrating Intellectual Property Rights and Development Policy*, Report of the UK Commission on Intellectual Property Rights (London: CIPR, 2002).
- Correa, C.M., *Intellectual Property Rights, the WTO and Developing Countries, The TRIPS Agreement and Policy Options* (Penang: Third World Network, 2000).
- Crucible Group, *People, Plants and Patents: The Impact of Intellectual Property on Biodiversity, Conservation, Trade and Rural Society* (Ottawa: International Development Research Centre, 1994).
- Dean, M., 'Conflict between profits and philanthropy trips up industry', *Guardian*, 15 February 2001.
- Drahos, P., 'Global Property Rights in Information: The Story of TRIPs at the GATT', *Prometheus*, vol. 13, no. 1, June 1995, pp. 6–18.
- Drahos, P. and Braithwaite, J., *Information Feudalism: Who Owns the Knowledge Economy?* (London: Earthscan, 2002).
- Dutfield, G., *Intellectual Property Rights, Trade and Biodiversity: Seeds and Plant Varieties* (London: Earthscan and IUCN, 2000).
- Dutfield, G., *Literature Survey on Intellectual Property Rights and Sustainable Human Development* (Geneva: UNCTAD, 2002).
- Enyart, J., 'A GATT Intellectual Property Code', *Les Nouvelles*, 1990.
- ETC Group, 'DuPont and Monsanto – Living in Sinergy?' news release, 9 April 2002 (<http://www.etcgroup.org/article.asp?newsid=315>)
- FAO (Food and Agricultural Organisation) *International Undertaking on Plant Genetic Resources. Resolution 8/83 of the Twenty-second Session of the FAO Conference*, Rome, 5–23 November 1983.

- FAO, *Second Session*. CPGR/87/Inf. 3, Rome, 1987.
- FAO, *The State of Insecurity in the World: Food Insecurity: When People Live With Hunger and Fear Starvation* (Vienna: FAO, 2001).
- GRAIN, 'Contaminating Canada's Seed Supply', *Seedling*, April 2003, pp. 7–12.
- GRAIN, "'TRIPS-plus" through the back door: How bilateral treaties impose much stronger rules for IPRs on life than the WTO', July 2001 (<http://www.grain.org/publications/trips-plus-en.cfm>).
- GRAIN, 'Intellectual Property Rights: Ultimate control of agricultural R&D in Asia', March 2001(b) ([www.grain.org/publications/asiaipr-en.cfm](http://www.grain.org/publications/asiaipr-en.cfm)).
- Grubb, P.W., *Patents for Chemicals, Pharmaceuticals and Biotechnology: Fundamentals of Global Law, Practice and Strategy* (Oxford: Oxford University Press, 1999).
- Houston Catholic Worker*, December 2000, vol. 20, no. 7.
- Hutton, W., *The World We're In* (London: Little, Brown, 2002).
- Joseph, J., *Food: Christian Perspectives on Development Issues* (Dublin: Trócaire/Veritas/CAFOD, 1999).
- May, C., *A Global Political Economy of Intellectual Property Rights: The new enclosures?* (London: Routledge, 2000).
- Meek, J., 'Beginners guide to gene patents', *Guardian*, 15 November 2000.
- Monbiot, G., 'Patent Nonsense', *Guardian*, 12 March 2002.
- Monbiot, G., *Captive State: The Corporate Takeover of Britain* (London: Macmillan, 2000), p. 253.
- Oram, J., 'The TRIPS Agreement and its implications for food security', International Famine Centre, Cork, September 1999 ([www.recrea.f9.co.uk/biopatents.htm](http://www.recrea.f9.co.uk/biopatents.htm)).
- Oxfam, *Rigged Rules and Double Standards: trade, globalisation and the fight against poverty* (Oxford: Oxfam, 2002).
- Owen, M.D.K., 'Handful of Corporations Dominates Commercial Agriculture', 2001 (<http://www.weeds.iastate.edu/weednews/top%20seed%20companies.htm>).
- Paarlberg, R., 'The Global Food Fight', *Foreign Affairs*, May/June 2000, pp. 24–38.
- Pray et al., 'Impact of Bt cotton in China', *World Development*, May 2001, vol. 29, no. 5, pp. 1–34.
- Seitz, J.L., *The Politics of Development: An Introduction to Global Issues* (New York: Basil Blackall, 1988).
- Sharma, D., 'Conquests by Patents', *Pakistan Observer*, 22 August 1999.
- Shiva, V., *Monocultures of the Mind: Perspectives on Biodiversity and Biotechnology* (London and New Jersey: Zed Books, 1993).
- Shiva, V., *Protect or Plunder* (London and New York: Zed Books, 2001).
- Stiglitz, J., *Globalisation and Its Discontents* (London: Penguin, 2002).

Tansey, G., *Trade, Intellectual Property, Food and Biodiversity: Key issues and options for the 1999 review of Article 27.3(b) of the TRIPs Agreement* (London: Quaker Peace and Service, 1999).

UNDP, *Human Development Report* (New York: UNDP, 2001).

UNDP, *Making Global Trade Work for People* (New York: UNDP, 2003).

UNEP, *Global Biodiversity Assessment* (Cambridge: Cambridge University Press, 1995).

Weissman, R., 'A Long Strange TRIPS: The Pharmaceutical Industry Drive to Harmonise Property Rules, and the Remaining WTO Legal Alternatives Available to Third World Countries', *University of Pennsylvania Journal of International Economic Law*, vol. 17, no. 4, winter 1996, pp. 1069–1125.

Wilkinson, J. and P. Castelli, *The Internationalisation of Brazil's Seed Industry: Biotechnology, Patents and Biodiversity* (Rio de Janeiro: ActionAid, 2000).

WTO, *The WTO – Why It Matters: Resource Booklet for 4th WTO Ministerial Conference* (Geneva: WTO Publications, 2000).

#### **OTHER WEBSITES**

<http://www.ictsd.org/dlogue/2002-04-19/Kuanpoth.pdf>

Kuanpoth, J., *The Political Economy of the TRIPs Agreement: Lessons from Asian Countries*.

<http://www.ita.doc.gov/td/industry/otea/301alert/about.html>

United States Department of Commerce Website.

<http://www.ifad.org/poverty/index.htm>

IFAD, 2001, *Rural Poverty Report 2001: The Challenge of Ending Rural Poverty*, Rome: IFAD.

[http://www.vietventures.com/us\\_vietnam\\_agreement\\_text.htm](http://www.vietventures.com/us_vietnam_agreement_text.htm)

Agreement between the United States of America and the Socialist Republic of Vietnam on trade relations, October 2001.

## NOTES

- 1 Each year the USTR publishes a 'Special 301' report. In 2000 the report highlighted how Ireland was obstructing the copyright of US writers and artists: 'Ireland's commitment to enact comprehensive copyright legislation has not been met ... The US government remains hopeful that Ireland will take steps necessary to complete the legislative process in the very near future, but will feel compelled to consider other options in the face of further delay'. The threat may only be implied, but countries such as Brazil have felt the full force of Section 301 in the form of trade sanctions.
- 2 [http://www.news.bbc.co.uk/hi/english/static/events/reith\\_2000/lecture5.stm](http://www.news.bbc.co.uk/hi/english/static/events/reith_2000/lecture5.stm)
- 3 Ibid.
- 4 Taken from text of the *Agreement Between the United States of America and the Socialist Republic of Vietnam on Trade Relations*, October 2001  
([http://www.vietventures.com/us\\_vietnam\\_agreement\\_text.htm](http://www.vietventures.com/us_vietnam_agreement_text.htm)).

## ABBREVIATIONS

ACP Group	Africa–Caribbean–Pacific Group
ASSINSEL	International Association of Plant Breeders
Bt	<i>Bacillus thuringiensis</i>
CDB	Convention on Biological Diversity
CGIAR	Consultative Group on International Agricultural Research
CIDSE	International Cooperation for Development and Solidarity
CIPR	Commission on Intellectual Property Rights
COP	Conference of the Parties
CPVO	Community Plant Variety Office
DSU	Dispute Settlement Understanding (WTO)
ETC	Action Group on Erosion, Technology and Concentration
F1	First Generation
FAO	Food and Agricultural Organisation)
FIS	International Seed Trade Federation
FTA	Free Trade Agreement
GATT	General Agreement on Tariffs and Trade
GMO	Genetically Modified Crop
GRAIN	Genetic Resources Action International
HYVs	High-yielding Varieties
IP	Intellectual Property
IPC	Intellectual Property Committee
IPRs	Intellectual Property Rights
IRRI	International Rice Institute
ITPGRFA	International Treaty on Plant Genetic Resources for Food and Agriculture
IU	International Undertaking on Plant Genetic Resources
NAFTA	North American Free Trade Agreement
OCED	Organisation for Economic Co-operation and Development
PBRs	Plant Breeders' Rights
PVP	Plant Variety Protection
R&D	Research and Development
SADC	South African Development Community
TRIPs	Trade Related Intellectual Property Rights
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UPOV	Unione Internationale pour la Protection du Obtentions Vegetale (International Convention for the Protection of New Varieties of Plants)
USPTO	United States Patents and Trademark Office
WTO	World Trade Organisation