

PATENTS IN AGRICULTURAL BIOTECHNOLOGY AND THE RIGHT TO FOOD

Prof. Geertrui Van Overwalle

1. Patents in Agricultural Biotechnology

Historically, agricultural research was publicly funded and delivered as a *public* good directly to farmers through seeds incorporating advanced traits.¹ Public sector institutions and universities were leaders in developing improved crop varieties which were transferred to farms through cooperative extension services.²

This model has changed dramatically over the last few decades. The results of agricultural research have increasingly been treated as *private* goods and protected through various forms of intellectual property (IP). A very *first* initiative in this direction was taken in the U.S. in 1930 with the introduction of the Plant Patent Act (PPA), allowing patent protection for asexually reproduced plants. A *second* wave of appropriation started in Europe with the adoption of a plant breeder's rights regime for plant varieties in the Netherlands in 1942³ and in Germany in 1953.⁴ These regimes were largely revised, and extended to other countries, at the occasion of the establishment of the International Convention for the Protection of New Varieties of Plants of 1961, creating a Union for the Protection of New Varieties of Plants, commonly known under

¹ BENNETT, A. B. and BOETTIGER, S., 'The Public Intellectual Property Resource for Agriculture. A Standard License Public Sector Clearinghouse for Agricultural IP', in VAN OVERWALLE, G. (ed.), *Gene Patents and Collaborative Licensing Models. Patent Pools, Clearinghouses, Open Source Models and Liability Regimes*, Cambridge, CUP, 2009, 135-142; DELMER, D.P., NOTTENBURG, C., GRAFF, G.D. and BENNETT, A., 'Intellectual Property Resources for International Development in Agriculture', 133 *Plant Physiology*, 2003, 1666-1670.

² CONWAY G. and TOENNISSEN, G., 'Feeding the World in the Twenty-First Century', 402 *Nature*, C55-58

³ *Besluit van de Secretarissen-Generaal van de Departementen van Landbouw en Visscherij en van Justitie betreffende de rechtspositie van den kweeker van voortkweekingsmateriaal van cultuurgewassen en het verkeer met zoodanig materiaal* of January 5 1942, *Verordeningsblad voor het bezette Nederlandsche Gebied*, January 10 1942 (referred to as *Kwekersbesluit 1941*).

⁴ *Gesetz über Sortenschutz von Saatgut und Kulturpflanzen* of June 27 1953, BUNDESGESETZBLATT I, 440 (1953) (referred to as *Saatgutgesetz 1953*). A first bill for a plant breeder's rights act was already introduced in 1930, but at the time it failed to become law.

its French abbreviation UPOV (Union pour la Protection des Obtentions Végétales).⁵ IP protection for plants got a *third* and *final* boost with the availability of fully fledged patent protection for plants under the Utility Patent Act (UPA) in the US as a result of the *Chakrabarty* judgment of the Supreme Court in 1980 and the US Patent and Trademark Office (USPTO) Board of Appeals and Interferences decision *In re Hibberd* in 1985.⁶ In Europe patent protection for plants under the European Patent Convention (EPC) was formally confirmed following the implementation of the EU Biotechnology Directive of 1998⁷ into the EPC.

The changes in the legal framework led to a greater utilization of formal IP protection of agricultural advances by the public sector. It also led – amongst other things – to the development of a research intensive private sector, making major contributions to agricultural biotechnology and taking recourse to IP protection.⁸ The growth in patents related to agricultural biotechnology can be seen in Figure 1.

⁵ For more, see VAN OVERWALLE, G., 'Patent Protection for Plants: a Comparison of American and European Approaches', 39 *IDEA-Journal of Law and Technology* (USA), 1999, 143-194 [http://www.idea.piercelaw.edu/articles/39/39_2/5.VanOverwalle.pdf].

⁶ For more details, see VAN OVERWALLE, 1996; VAN OVERWALLE, 1999.

⁷ Directive 98/44/EC of 6 July 1998 of the European Parliament and of the Council on the legal protection of biotechnological inventions, *Official Journal L* 213, 30/07/1998 p. 0013.

⁸ KOWALSKI S.P., EBORA, R.V., KRYDER, D. POTTER, R.H., 'Transgenic Crops, Biotechnology and Ownership Rights: What Scientists Need to Know', 31 *Plant*, 2002, 407-421.

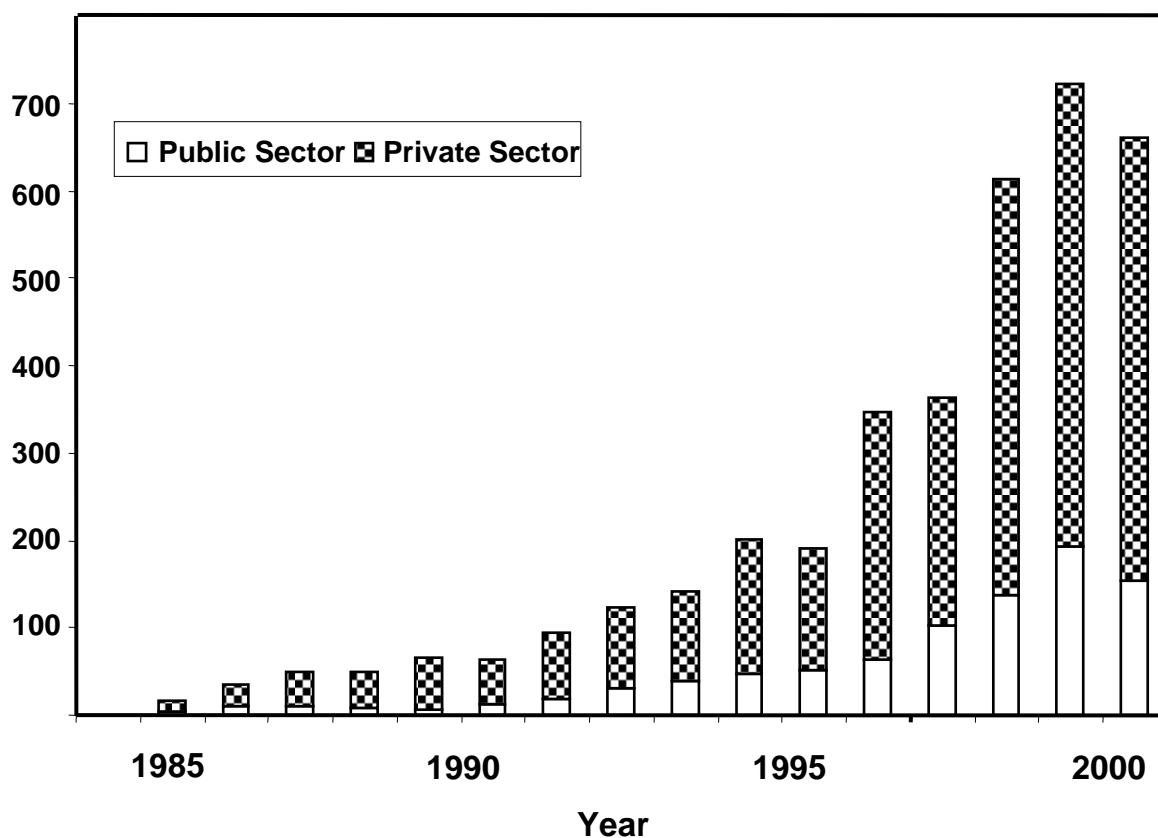


Figure 1. Patents issued in the US Patent and Trademark Office in the area of plant biotechnologies between 1985 and 2000 for both public and private sector organizations (reprinted from Delmer et al., 2003).

An illustrative example of the complex patent portfolio in the area of crop improvement, resulting from the increasing use of IP protection, is Golden Rice. Potrykus, a Swiss scientist, succeeded in genetically enriching rice grains with β -carotene, the precursor to vitamin A, which gives them a yellow color, hence, they are called Golden Rice. Potrykus wanted to transfer the Golden Rice materials to developing countries for further breeding, and to introduce the trait into the local varieties consumed over there. However, a freedom-to-operate survey initially uncovered 70 patents, belonging to 32 different companies and universities, embedded in Golden Rice.⁹

⁹ RYDER, R.D. et al., *The intellectual and technical property components of pro-vitamin A rice (Golden Rice): a preliminary freedom to operate review*. In ISAAA Briefs 2000 No. 20, ISAAA: Ithaca (also available at www.isaaa.org).

Concern has been voiced that the exponential growth of patents in the field of agricultural biotechnology, might not only hinder *research and development* of (subsistence and specialty) crops, but, more importantly, hamper access to the products of this technology, *food*, especially for the underprivileged.

2. Relationship between Patents and the Right to Food

2.1. Patents and Human Rights

The relationship between patent rights and human rights and has been undertheorized for a long time. IP rights have remained a “normative backwater” in the burgeoning post-World War II human rights movement.¹⁰ Only over the last decade, human rights discourse has gained wider attention and commentators have started to explore the relationship between IP and human rights in more detail.¹¹ Two major approaches can be witnessed. A first school of thought takes the view that human rights and IP are in fundamental *conflict*. Strong IP protection is undermining, and therefore incompatible with, a broad spectrum of human rights obligations, especially in the area of economic, social and cultural rights. This approach can be witnessed in Resolution 2000/7, which stipulates that “Actual or potential conflicts exist between the implementation of the TRIPs Agreement¹² and the realization of economic, social and cultural rights”.¹³ Resolving this conflict lies in the recognition of the primacy of human rights law over IP

¹⁰ HELFER, L.R., ‘Toward a Human Rights Framework for Intellectual Property’, *Vanderbilt University Law School Public Law and Legal Theory. Working Paper 06-03* (available at <http://ssrn.com/abstract=891303>, last visited July 2006).

¹¹ Cf. HELFER, L.R., ‘Human Rights and Intellectual Property: Conflict or Coexistence?’, *Minnesota Intellectual Property Review*, Fall 2003 (available at http://law.vanderbilt.edu/faculty/pubs/helfer-humanrights.pdf?abstract_id=459120).

¹² The multilateral trade negotiations in the GATT Uruguay Round, which were concluded in 1993 and resulted in the formation of the WTO, encompassed for the first time discussions on aspects of intellectual property rights. The result of those negotiations was embodied in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), contained in an Annex to the WTO Agreement (see http://www.wto.org/english/tratop_e/trips_e/t_agm0_e.htm, last visited April 26 2006). Membership in the WTO implies adherence to the TRIPS Agreement.

¹³ United Nations, Sub-Commission on the Promotion and Protection of Human Rights, Resolution 2000/7, ‘Intellectual property rights and human rights’, 17 August 2000 (available at <http://www.unhcr.ch/Huridocda/Huridoca.nsf/0/c462b62cf8a07b13c12569700046704e?Opendocument>).

law and in viewing IP as instruments designed to fulfill human rights objectives.¹⁴ A second way of thinking claims that human rights and IP are essentially compatible and can *coexist*. Indeed, human rights and IP focus on the same fundamental question and share the same goal. Both human rights and IP rights aim at enhancing welfare and the benefit for society.¹⁵ Both legal regimes equally try to define appropriate scope of private rights, while safeguarding public interest. A clear exponent of this attitude is reflected in the International Covenant on Economic, Social and Cultural Rights (ICESCR).¹⁶

We agree that human rights can coexist with IP rights.¹⁷ Human rights are valuable and necessary complements of patent rights. Human rights serve as a counter balance of patent rights when centering too one-sidedly on trade, access to markets and economic calculus. For patent law to be widely accepted and generally recognized as a tool fostering both private and public interest, it is vital that current patent law regimes are inextricably linked with human rights discourse, and that human rights assist in defining the utter limits of patent rights. Patent law should be moulded as a human rights compliant legal framework to promote innovation. Our normative claim is based on a reassessment of the notion of public interest in patent law and an analysis of human rights treaties. Human rights can be factored into patent law, through the gateway of public interest.¹⁸ A post-modern interpretation of public interest proves to offer a more than

¹⁴ This is the view taken by DRAHOS, P., 'The Universality of Intellectual Property Rights: Origins and Development', *Intellectual Property and Human Rights*, Conference organised by the WIPO in collaboration with the Office of the UN High Commissioner for Human Rights to commemorate the 50th Anniversary of the Universal Declaration of Human Rights, Geneva, November 9 1998 (also see <http://www.wipo.int/tk/en/hr/paneldiscussion/papers/index.html>). The paper presented at the WIPO Conference was later published in *I.P.Q.*, 'Intellectual Property Rights and Human Rights', *I.P.Q.*, 1999, 349-371.

¹⁵ This is the view taken by GEIGER, C., 'Constitutionalising' Intellectual Property Law? The Influence of Fundamental Rights on Intellectual Property in the European Union', 37 *IIC*, 2006, 371-500.

¹⁶ International Covenant on Economic, Social and Cultural Rights, adopted by the General Assembly, resolution 2200A (XXI) of 16 December 1966, and entered into force on 3 January 1976 (also available at <http://www.ohchr.org/english/law/cescr.htm>).

¹⁷ VAN OVERWALLE, G., 'Human Rights' Limitations in Patent Law', *The Human Rights Paradox in Intellectual Property Law*, GROSHEIDE, W. (ed.), Oxford, Edwar Elgar Publishing Ltd, 2009 (in press).

¹⁸ VAN OVERWALLE, G., 'L' intérêt général, le domaine public, les *commons* et le droit des brevets d'invention', in *L'intérêt général et l'accès à l'information en propriété intellectuelle*, Buydens, M. & Dusollier, S. (eds.) Brussel, Bruylant, 2008, 149-175; VAN OVERWALLE, G.,

skeletal basis for taking into account human rights into patent law, and to have prompted new human rights standards in the patent law system.

2.2. Patents and the Right to Food

Human rights fulfill different functions in a patent law context. Some rights and values act as a basis to limit the coming into *existence* of patent rights in certain fields. Yet other human rights, serve as limitations with regard to the *exercise* of patent rights. As we will explain below (see section 3.), the right to food may well fall into both categories: it can be employed to limit the coming into existence of patent rights on crops and it might be used to instigate indulgent behavior when it comes to the exercise of patent rights.

3. Safeguarding the Right to Food

The right to food is proclaimed in the ICESCR. The right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which one is the author, is subject to limitations and must be balanced with other rights recognized in the ICESCR, more in particular with the right of everyone to an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions (article 11 (1) ICESCR). In view of “the right of everyone to be free from hunger”, the states shall take the measures which are needed “to improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge” (article 11 (2) ICESCR). Likewise, states should ensure that their protection regimes constitute no impediment to their ability to comply with their core obligations in relation to the rights of food, health, and education.¹⁹ Ultimately IP is a social product and has a social function.²⁰

'Klinische proeven en volksgezondheid. Naar een herijking van het algemeen belang in het octrooirecht', *Tijdschrift voor Privaatrecht (TPR)*, 2000, 899-968.

¹⁹ General Comment n°17, 2005, par. 35.

²⁰ Ibid.

3.1. Through Carving out Crop Patents

One way to factor in human rights in patent law, is by excluding plants from patent protection. Discussing the possibility of safeguarding the right to food through denying IP protection, is by far not new. In some countries it was a matter of debate in the 19th century whether inventions related to nutrition could be barred from patent protection, for reasons of hindering food supply. Fierce debates took place in legal doctrine and parliament in the Netherlands²¹, Belgium²², Germany²³ and in the US.²⁴ Echoing these concerns, the first German Patent Act of 1877 explicitly excluded food products from patentability.²⁵ However, most food exemptions in patent law were repealed afterwards.²⁶

The debate on the right to food and patents was recently re-opened, at the event of the development of genetically modified crops. Suggestions were raised to support the right to food by limiting patent protection for (genetically modified) plants and plant seeds. Such an approach can be based on article 27 (3) (b) *first* sentence of the TRIPS Agreement²⁷, which stipulates that Members may exclude from patentability plants and animals other than micro-organisms, and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes.

²¹ VAN LEEUWEN, J.C., 1951, Tussenkomst op het *Symposium betreffende gebieden waarover de bescherming door octrooien zich behoort uit te strekken*, BIE, 1951, (106), 107.

²² The controversy found its origin in a passage from the report from the Parliamentary Commission, which said that products, such as chocolate, macaroni, gingerbread, etc. should not be patentable as they were in fact nutrition. See VAN OVERWALLE, G., 1996; VAN OVERWALLE, G., *The Legal Protection of Biotechnological Inventions in Europe and in the United States. Current Framework and Future Developments*, Leuven, Universitaire Pers, 1997, 78 p.

²³ MARX, W., 'Zur Patentierung von Pflanzenzüchtungen', *GRUR*, 1952, (456), 458.

²⁴ LESSER, W., 'International Patent Agreements for Protecting Biotechnology Products and Processes Worldwide', *Agribusiness*, vol. 3, 1987, (351), 363.

²⁵ In the same train of thought, the US Plant Variety Protection Act (PVPA) explicitly excluded six crops, viz. oca, celery, tomatoes, peppers, carrots and cucumbers from its field of application, the so-called crop exemption. See VAN OVERWALLE, 1999.

²⁶ See VAN OVERWALLE, 1996; VAN OVERWALLE, 1999.

²⁷ The multilateral trade negotiations in the GATT Uruguay Round, which were concluded in 1993 and resulted in the formation of the WTO, encompassed for the first time discussions on aspects of intellectual property rights. The result of those negotiations was embodied in the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), contained in an Annex to the WTO Agreement (see http://www.wto.org/english/tratop_e/trips_e/t_agm0_e.htm). Membership in the WTO implies adherence to the TRIPS Agreement.

Besides article 27 of the TRIPs Agreement, article 8 of the TRIPs Agreement might also serve as a welcome basis to restrict the patentability of food. Article 8 (1) clearly stipulates that Members may, in formulating or amending their laws and regulations, adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provisions of the Agreement. Over the last years, this provision has been widely used to discuss public health issues in patent law and prevent potentially obstructive effects of patents. It might be equally important to bring this provision into action to secure the right to food.

Various countries have used the flexibility of article 27 (3) (b) to limit what constitutes patentable subject matter and have excluded plants from patent protection.²⁸ A typical example are the Andean Pact Countries, which stipulate that “the entirety or part of living beings as encountered in nature, natural biological processes, biological material existing in nature or which may be isolated, including the genome or germplasm of any natural living being”²⁹ shall not be considered inventions. The same is true of Brazil and Argentina.³⁰

However, the optional nature of the *first* sentence of article 27 (3) (b) of the TRIPS Agreement has equally led to a different approach with regard to the patent protection of plants. Some countries, amongst which all EU Member States, find patents on biological resources useful and do not opt for the implementation of the exclusionary TRIPS provision in their patent law. They have established patent protection for biological material, plants and animals mirroring the EU Biotechnology Directive. Under such a

²⁸ Cf. *Integrating Intellectual Property Rights and Development Policy*, Report from the Commission on Intellectual Property Rights established by the Secretary of State for International Development of the British Government in May 2001, London, September 2002, p. 114 (available at http://iprcommission.org/graphic/documents/final_report.htm). Also see VAN OVERWALLE, G., ‘Biotechnology and Patents: Global Standards, European Approaches and National Accents’, in *Genetic Engineering and the World Trade System*, Daniel WÜGER and Thomas COTTIER (eds.), Cambridge University Press, 2008, 77-108.

²⁹ Article 15 (b) of the Subregional Integration Agreement of the Andean Community (Cartagena Agreement), Decision 486 – Common Provisions On Industrial Property (14 September 2000), see http://www.wipo.int/clea/docs_new/en/ac/ac005en.html.

³⁰ For more, see VAN OVERWALLE, G., ‘Biotechnology and Patents: Global Standards, European Approaches and National Accents’, in *Genetic Engineering and the World Trade System*, Daniel WÜGER and Thomas COTTIER (eds.), Cambridge University Press, 2008, 77-108.

regime, patent protection is available for subcellular fragments (such as gene sequences, vectors, plasmids, etc.), micro-organisms, plant cells, plants *per se* and plant seeds *per se*. The underlying argument for admitting patent claims on food was put forward in a decision of the European Patent Office (EPO), long before. The EPO ruled that, given the nutritive value of genetically modified plants exceeds that over conventionally obtained plants, and the fact that those plants may give rise to a better management of food shortage in the world, exploitation of such genetically modified plants cannot consequently be considered immoral or against public order.^{31 32}

3.2. Through Collaborative Licensing of Crop Patents

Given the fact that few countries have put the flexibilities of TRIPs to use, and provide patent protection for agricultural biotechnology, additional routes should be explored to navigate through the quagmire of granted patents. Some models already exist for facilitating access to patented gene technology, such as the research exemption creating access for experimental purposes. However, recent studies addressing this issue tend to be skeptical regarding this exception.³³

Other models that could render proprietary biotechnological inventions accessible for further use are under discussion. A decade ago, it has been argued in the law and economics literature that the occurrence of a multitude of patents, held by many patent holders (so-called “patent thicket”³⁴) may adequately be remedied through collaborative

³¹ Opposition Division, March 31 1992, (concerning European patent application bearing publication number 122.791, *Lubrizol (Plant Gene Expression)*).

³² Opposition Division, December 15 1992, concerning European patent application bearing publication number 242.236, *IIC*, 1993, 618; Technical Board of Appeal, February 21 1995 (T 356/93) (Appeal on the decision of the Opposition Division, December 15 1992), *Plant Genetic Systems* case. For more, VAN OVERWALLE, G., 'Protecting Innovations in Plant Biotechnology : Patents or Plant Breeders' Rights ?', *Mededelingen van de Faculteit Landbouwwetenschappen Universiteit Gent (Proceedings of the Sixth Forum for Applied Biotechnology, Brugge)*, 1993, vol. 57, 1521-1536.

³³ LEI, Z., JUNEJA, R. and WRIGHT, B.D., 'Patents versus Patenting: Implications of Intellectual Property Protection for Biological Research', *Nature Biotechnology*, 2009, 36-40.

³⁴ SHAPIRO, C., 'Navigating the Patent Thicket: Cross Licenses, Patent Pools and Standard Setting' in E. Jaffe et al. (eds.), *Innovation Policy and the Economy* (Vol. I), MIT Press, 2001, 119–150, (also available at <http://haas.berkeley.edu/wshapiro/thicket.pdf>).

licensing measures.³⁵ Such measures are ‘collaborative’, as they presuppose active cooperation between various parties; they are contractual’ in nature, as they are the result of a consensus between parties, rather than an initiative from the legislator.³⁶ Recently, various governmental and non-governmental organizations have suggested that collaborative models, such as patent pools and clearinghouses, are useful mechanisms to deal with the specific problems of access and use of patented genes, diagnostic methods, technologies and tools that are used in genetics. This suggestion has been taken to heart at the academic level and the plasticity of said models in a biotechnology setting has been thoroughly explored over the last years in scholarly literature.³⁷

3.2.1. Patent Pool

A patent pool is an agreement between two or more patent owners to license one or more of their patents as a package to one another, and to third parties (users) willing to pay the associated royalties.³⁸ Patent pools have been suggested to clear patent thickets in the field of genetics.³⁹

A leading example of a patent pool in the area of agricultural biotechnology is the Golden Rice pool. Confronted with a patent suite of some 70 patents (see section 1.) the 6 key-patent holders were approached, and an agreement was reached that allowed Potrykus to grant licenses, free of charge, to developing countries, with the right to sub-license.⁴⁰ Consequently, a humanitarian board (HumBo)⁴¹ was established as a voluntary association to assist in the associated governance and decision making. So far,

³⁵ MERGES, R.P., ‘Of Property Rules, Coase, and Intellectual Property, 94 *Columbia Law Review*, 1994, 2655-2673.

³⁶ VAN OVERWALLE, G., 2009.

³⁷ See VAN OVERWALLE, G. (ed.), *Gene Patents and Collaborative Licensing. Patent Pools, Clearinghouses, Open Source and Liability Regimes*, Cambridge, Cambridge University Press, 2009, 479 p. (in press); VAN OVERWALLE, G., VAN ZIMMEREN, E., VERBEURE, B., MATTHIJS, G., ‘Models for facilitating access to patents on genetic inventions’, 7 *Nature Review Genetics*, February 2006, 143-148.

³⁸ MERGES, R., ‘Institutions for intellectual property transactions: the case of patent pools’, in *Expanding the Boundaries of Intellectual Property*, DREYFUSS, R. et al. (eds), Oxford University Press, 2001, pp. 123–166.

³⁹ VERBEURE, B., VAN ZIMMEREN, E., MATTHIJS, G., VAN OVERWALLE, G., ‘Patent pools and diagnostic testing’, 24 *Trends in Biotechnology (TIB)*, vol. 3, March 2006, 115-120.

⁴⁰ Press releases 16 May 2000; 22 January 2001; and 14 October 2004 (see www.syngentia.com).

⁴¹ See www.goldenrice.org.

approximately 20 master licenses have been granted to institutions in developing countries in Asia.⁴² The Golden Rice pool is an example of how private and public organizations, in a combined effort, dealt with the surrounding patents to create a non-profit humanitarian (and therefore probably atypical) patent pool in the form of a single licensing authority.

3.2.2. Clearinghouse

A clearinghouse refers to a mechanism whereby providers and users of goods, services and information - or patents so you wish - are matched.⁴³ Clearinghouses have equally been suggested in the field of agricultural biotechnology as an adequate model to cut through a tangled mass of patents.⁴⁴

A major example of a clearinghouse in the area of agricultural biotechnology is The Public Intellectual Property Resource for Agriculture (PIPRA). PIPRA's goal is to mobilize technologies from a wide range of public/non-profit technology providers to address specific projects for the improvement of subsistence and specialty crops that are not being addressed by commercial seed and agricultural biotechnology companies. PIPRA and its members believe this landscape of IP can be more effectively managed collaboratively and by using a set of shared principles. PIPRA's primary strategies to improve access to patented technologies are to: 1) provide a one-stop IP information clearinghouse for access to public sector patented technologies, 2) provide a resource for the analysis of patented technologies for implementation of specific projects, 3) develop gene transfer and gene-based trait technologies that have maximum legal "freedom to operate", 4) act as a technology transfer clearinghouse by clustering public sector

⁴² Anatole F. KRATTIGER, personal communication.

⁴³ KRATTIGER A.F., 'Financing the bioindustry and facilitating biotechnology transfer', *IP Strategy Today* 2004;1:1-45.

⁴⁴ GRAFF G.D. and ZILBERMAN D., 'Towards an intellectual property clearing house for ag-biotechnology: an issues paper', *IP Strategy Today* 2001, 1:1-14; GRAFF G.D., CULLEN S.E., BRADFORD K.J., ZILBERMAN D., BENNETT A.B., 'The public-private structure of intellectual property ownership in agricultural biotechnology', *Nat Biotechnology*, 2003, 989-95; VAN ZIMMEREN, E., VERBEURE, B., MATTHIJS, G., & VAN OVERWALLE, G., 'A Clearinghouse for Diagnostic Testing: the Solution to Ensure Access to and Use of Patented Genetic Inventions?', *Bulletin of the World Health Organization*, 2006, 352-359.

technologies ready for transfer and 5) support the development of IP management best practices and capacity enhancement in developing countries.⁴⁵

The European counterpart of PIPRA is EPIPAGRI, an initiative established with the support of the European Commission.⁴⁶ EPIPAGRI aims at proving the feasibility and benefit brought by collaborative management of IP of European public research organizations involved in agricultural sciences. EPIPAGRI's activities include the development of an IP information exchange system, establishment of patent clusters according to products, and dissemination of the project results to stakeholders, including relevant external public research organizations, industry, networks, and policy-makers. EPIPAGRI will also make agricultural biotechnology inventions more accessible to emerging countries thus, contribute to enhancement of public welfare at the large extent.⁴⁷

3.2.3. Open source

A licence is open source if it allows anyone, anywhere, for any purpose, to copy, modify and distribute the software (where distribution takes place either for free or for a fee) without having to pay royalties to the copyright owner.⁴⁸

Some working examples of open source have emerged in the life sciences, mainly in the field of agricultural biotechnology. A prominent example is the Biological Open Source (BiOS) License from the Centre for Applications of Molecular Biology in International Agriculture (CAMBIA), a private non-profit research institute located in Canberra.⁴⁹ Founded by molecular biologist Richard Jefferson about fifteen years ago, CAMBIA pioneered, and subsequently patented the GUS and TransBacter technology serving as a

⁴⁵ See BENNETT, A. B. and BOETTIGER, S., 'The Public Intellectual Property Resource for Agriculture. A Standard License Public Sector Clearinghouse for Agricultural IP', in VAN OVERWALLE, G. (ed.), *Gene Patents and Collaborative Licensing Models. Patent Pools, Clearinghouses, Open Source Models and Liability Regimes*, Cambridge, CUP, 2009, 135-142.

⁴⁶ See, <http://www.epipagri.org>.

⁴⁷ See

http://cordis.europa.eu/fetch?CALLER=FP6_PROJ&ACTION=D&RCN=79854&DOC=1&CAT=PROJ&QUERY=1164191494095.

⁴⁸ HOPE, J. in ' G. (ed.), *Gene Patents and Collaborative Licensing Models. Patent Pools, Clearinghouses, Open Source Models and Liability Regimes*, Cambridge, CUP, 2009. Also see, HOPE, J., *Biobazaar: The Open Source Revolution and Biotechnology*, Harvard University Press, 2008.

⁴⁹ See <http://www.bios.net>.

prominent research tool in agricultural biotechnology. The BiOS initiative was launched in 2004⁵⁰ and is intended to make these biological research tools widely available. Improvements made to these enabling tools are to be shared under the BiOS open source license regime, but the products or materials made, created, or obtained by using them, do not fall under this provision and can be commercialized on a competitive and proprietary market under non-open source conditions. Indeed, the BiOS initiators are not adverse to users of these tools filing patents on products made by use of the tools, the intention is to preserve public access to the initial tools and later improvements and modifications.⁵¹

4. Recommendations

In an attempt to safeguard the right to food in a patent context, two major initiatives might be contemplated.

In an attempt to restrict the coming into *existence* of a suite of IP rights possibly threatening the right to food, one step might be to convince patent legislators to carve out plant patents from patent law. Such policy measure can be based on article 27 (3) (b) TRIPs Agreement.

In an endeavor to govern the *exercise* of patent rights and facilitate access to and use of a twisted mass of patents in agricultural biotechnology, another measure might be to stimulate governmental and non-governmental institutions, such as the UN, to assist in setting up collaborative licensing structures by funding the formation costs or by taking the lead as co-founders of such mechanisms as patent pools, clearinghouses or open source in the field of agricultural biotechnology. A major challenge here will be to set up collaborative licensing mechanisms under regular economic/commercial conditions in a for-profit context, next to creating such architectures on humanitarian license terms in a non-profit setting.

⁵⁰ DENNIS, C., 'Biologists Launch 'Open-Source Movement'', 431 *Nature (News)*, 2004, 30 September 2004, 494.

⁵¹ See BOETTIGER, S. and BURK, D., 'Open Source Patenting', 1 *JIBL*, 2004, 221.