

Intellectual Property Protection: Who Needs It?

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The world is faced with an unprecedented explosion in technology. Not all of this is universally welcomed – the irritation of mobile telephones on public transport comes immediately to mind – but the new technologies affect every area of our lives. Nowhere is this more true than in agriculture.

Changes in farming proceeded slowly but steadily for thousands of years, but accelerated during the last two centuries as scientists and other observers came to understand the farming process, the need for particular nutrients and rotations, and the nature of pests and diseases. Further acceleration followed after the 1950s with increased mechanization and the introduction of effective pesticides, herbicides, and fungicides. Biotechnology has accelerated the pace of change once again throughout the 1990s.

Biotechnology provides a major opportunity to meet the nutritional needs of an expanding world population, with finite land resources. It offers a new approach to the control of pests and diseases, it will provide crops of improved nutritional quality; and it will bring about increased yields.

Biotechnology is unlikely to be a complete solution to our agricultural problems, but it will play a key role in a sustainable agriculture that also uses integrated pest management and plant breeding techniques. That is the expectation in industrial countries, but it is only a hope for many others. There is a pressing need for the agricultural revolution to spread throughout the world, but to achieve it, we must provide an incentive to the innovators and owners of the new crop production technologies to share them.

There are many forms of encouragement - from argument to finance - and one of these is the subject of this paper. The process of technology exchange will be encouraged and facilitated by a strengthening of intellectual property laws, especially those of the developing countries. Unfortunately, like modern biotechnology, intellectual property rights (IPR) are controversial and often misunderstood.

This paper addresses some of these misunderstandings, and indicates how strengthening intellectual property rights will enable farmers throughout the world to receive the latest developments in crop production.

Intellectual Property

Intellectual property is a broad term used to cover patents, designs, trademarks, plant breeders' rights, copyright, and trade secrets. All of these have a part to play in the development and commercialization of plant production products. However, the three most important IPRs in this context are patents, plant breeders' rights, and trade secrets. None of these creates as much argument as patents.

A patent is a monopoly of limited scope, granted to the owner of an invention, for a limited period of up to 20 years. It is a right that is effective *only* in the country that grants the patent. While it is in force, a patent enables the owner to exclude others from using the invention commercially in that country.

A patent provides the innovator with a limited period within which he/she has the oppor-

tunity to recoup his/her investment in the research and development (R&D) of the invention. In return, the inventor discloses the invention to the public, and that disclosure enables other scientists and interested parties to use the invention in their own research. In due course, that research may lead to further innovation, and society will benefit. It is no coincidence that those countries with strong research-based industries are also those countries with strong intellectual property laws.

IPR is national in character, and like other national laws they vary from country to country. Attempts to bring some harmonization into this area have succeeded in the Agreement on Trade Related Aspects of Intellectual Property Rights, generally referred to as TRIPs. TRIPs, which entered into force in 1995, applies to all members of the World Trade Organization (WTO). TRIPs, however, is not a complete remedy for inadequate laws since it lays down only minimum levels of protection, rather than providing for the optimum. Nevertheless these levels are important, none more so than the basis for a patent set out in Article 27. Article 27 provides that patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are *new, involve an inventive step, and are capable of industrial application*.

Patent rights are of little use if they cannot be enforced, and TRIPs also provides that member countries shall ensure that enforcement procedures are available under national law, so as to permit effective action against any act of infringement of an IPR. Enforcement is a particular concern in the field of biotechnology, where the capability of biological materials carrying genetic information to self-reproduce makes the copying of an invention and the infringement of patent rights all too easy.

The implementation of TRIPs will undoubtedly strengthen IPR in many parts of the world, but implementation is unlikely in the short term. Developing countries are permitted a transitional period, until 2005, within which to bring their intellectual property laws into compliance with the minimum standards laid down in TRIPs. Unfortunately, many developing countries lack the means rather than the will to take the necessary steps.

Objectives of IP Laws

The objectives of intellectual property law are stated succinctly in TRIPs: The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology. It is useful to consider these two aspects separately.

Promotion of Technological Innovation

The cost of developing a new plant protection chemical is over US\$150 million; the cost of developing a new transgenic plant commercially is comparable. The investment in R&D must be recovered, and the monopoly period - provided first by patents and second by protection of the confidential data supplied in regulatory packages - is essential to provide the innovator with sufficient time and opportunity to make that recovery. Without IP protection, research-based companies would be unable to bear the risk of the major investment in R&D required to bring those technologies to the market.

The incentive effect of patents for developing countries is sometimes questioned on the grounds that these countries have little private sector research, and may produce few inventions. It is certainly true that inventors in those countries file few patents domestically or abroad, but without adequate IPRs, there is little incentive for local companies to set up their own research departments, nor for foreign companies to bring their technology and their research capabilities to the countries. It is left to the public sector to be the major fund provider of this research. That funding is vital, but it is not sufficient.

Technology Transfer

Farmers must have the opportunity to obtain modern crop production products at a reasonable price. Local research organizations need access to the latest technologies in the form of transfer of materials and know-how to further their own research, research which is often necessary to provide solutions to peculiarly local problems. These requirements can be met partially in developing countries by means of technology transfer.

The importance and benefits of technology transfer are widely recognized, and it is consequently a cause for concern and regret that in the field of crop production, technology transfer proceeds so slowly. While part of the problem lies in funding, another factor results from the two sides – the technology providers and the technology receivers – viewing each other and the technology transfer process with suspicion.

The private sector, potentially the major provider of new technology, ought to be eager to provide technology that will lead to the development of new markets. Companies are worried, however, that providing their know-how, whether by sales or by licensing, is tantamount to giving the technology away, unless it has the protection of enforceable IPR. In the case of biotechnology, where reproduction of plant material is relatively simple, companies may be powerless to prevent their technology from being copied and their markets destroyed or undermined by those who have not incurred the expenses of developing the technology.

The developing countries that want and need the technology fear the technology provider's demands for stronger IPRs which, they believe, will lead to higher prices and a drain on currency reserves. These concerns are real - and are discussed later - but there is clear evidence that strengthening IP laws leads to an increase in technology transfer to the benefit of both the provider and the recipient.

In the recent past, as an example, companies in industrial countries were reluctant to bring their products into the Chinese markets. There was inadequate patent and data protection, and once companies had established their market, generic manufacturers rapidly appeared to reap the benefit. These local manufacturers also exported the products to neighboring states where there was either weak or no patent protection, or where enforcing patents required a long and uncertain litigation process. As a consequence, China was deprived of the latest plant production products.

China has recently strengthened its patent law, and although it still needs improvement in its enforcement procedures, companies are now not only prepared to collaborate with Chinese companies, they are actively seeking collaboration.

Apprehensions

There are many concerns surrounding intellectual property law, and although these are often based on misunderstanding, they remain a barrier to progress. It is essential that those who believe that strengthening IPRs will be beneficial, should listen and inform. As a contribution to this process, I would like to consider four specific issues: prices, local development of technology, theft of resources, and ethics and morality. This is by no means an exhaustive list of possible topics.

Prices

It is argued that IPRs lead to an increase in prices. While it is true that products containing new technology will generally be sold at higher prices, that is not the same thing as a general increase in prices. The old technologies remain; indeed the introduction of new technologies may well make the old ones cheaper.

New genetically improved seeds are more costly to develop and produce, and those increased costs must be recovered. Farmers expect to pay a higher price for seed which will bring added value, but no farmer will pay more for the benefit than the increase in value which it will provide. Producers have little choice but to price their products so as to share the added value with the farmer.

Such arguments will be of little interest to poor and subsistence farmers. In order to receive the benefits of the new technology, they must first acquire the seed. Intellectual property will not be of much help to them. They will require the assistance and support of government agencies and international organizations such as the World Bank (Lele, Lesser, and Horstkotte-Wesseler 1999).

It is also argued that without IPRs, local companies would be able to copy the products and bring them to the local markets at much cheaper prices. That may be true but the advantages - such as they are - are short term, and serve to delay the introduction of new products. Moreover, if the originator ceases to act as product steward for the products, the result is often a flow of sub-standard products with inadequate instructions for their use, and which are ineffective.

Local Development of Technology

Some opponents of intellectual property claim that patents inhibit local research, and interfere with the work of local companies and research organizations.

The freedom to carry out research is safeguarded under patent law; experimental use for research purposes is not an infringement of the rights of the patent owner. Scientists are free to take the invention, to modify it, and to incorporate it into their own research programs. Dissemination and use of knowledge in this way is a fundamental part of the original contract between the owner of the patent and the state granting the right. It results in the faster development of the technology, and the introduction of new products and processes.

Public funding of research in developing countries plays an essential role in addressing local problems, but it will not be sufficient. There are always other demands on the available money. Local companies and research organizations need inward investment, in finance and in the form of materials and know-how. Yet again, however, it has to be acknowledged that these materials and know-how have a value to the private sector which will be unwilling to supply them if it feels that in doing so, it will lose control over them.

Publicly funded research organizations themselves do not always make the best use of the intellectual property protection that is available. The International Agricultural Research Centres of the CGIAR, for example, have tended to favor not seeking intellectual property protection, a position that was noted in the 1996 OECD Survey "Intellectual Property Technology Transfer and Genetic Resources": "[The] Centres have to operate in a changed research and funding environment and to collaborate with organisations for which intellectual property is a necessary counterpart to their willingness to invest in development. This has long been true of industrial organisations, and academic and public sector organisations are also now taking a more positive attitude towards protecting innovations resulting from their research. The International Agricultural Research Centres may therefore wish to review their own positions in this respect." The recent CGIAR center statements on genetic re-

sources, intellectual property rights, and biotechnology reflect the evolution of the centers' thinking on these issues (CGIAR 1999).

Patenting the results of this research would not prevent the IARCs from making them available, but it will give them the option of entering into cross-licensing agreements or collaborations with companies holding other intellectual property of interest. Patents become bargaining chips that can be traded to further the research aims of the IARCs.

Theft of Resources

A recent attack on the private sector is that companies in industrial countries are stealing the resources and know-how of local populations, patenting these resources, and then denying the use of the technology to the population who had used it, often for centuries. The case of the Indian neem tree is often quoted.

Indian farmers have used the seeds of the neem tree for pest control for centuries. The American company, W R Grace, discovered a process for extracting the oil from the seeds, and applied for patents. Alarmists spread the story that the Grace patents would prevent farmers from continuing to use their traditional methods of pest control. The story created understandable consternation amongst Indian farmers and a worldwide outcry against big business. The story is nonsense.

Patents are granted only for inventions that are new and not obvious, and the use of the neem seeds in pest control fell into neither of these categories when Grace applied for its patent. Grace could not monopolize the use, nor could a patent give Grace ownership of the neem tree or its seeds (Grace buys seed on the open market). And finally, no patent can stop anyone from doing something which he was doing before the patent application was filed.

Similar stories are now circulating concerning the so-called theft of genes by the industrial world. If this does occur, then it will be illegal under the provisions of the Convention on Biological Diversity.

In any event, it is worth stressing again IPRs extend only to the new inventions created from the isolation and transference of the gene. The identification of a gene with a useful trait in a

local plant, and the transference of that gene into a different crop plant, may entitle the discoverer to patent the use of that gene in the transformed plant, and perhaps to the transformed plant itself. However, the patent will give the innovator no rights over the original plants, which can continue to grow or be grown without reference to the patentee.

Ethics and Morality

TRIPs provides that inventions may be excluded from patentability if their exploitation should be prevented in order to protect *ordre public* or morality. It is important to note that it is the exploitation of the invention that is of concern here, not the invention itself. This distinction has been missed by many, and has resulted in the morality arguments being extended from the use of biotechnology to biotechnology itself, and from there to biotechnological patents. Parties who believe that biotechnology is immoral also argue that patenting biotechnological inventions – or, more emotively, patenting life – is immoral. Many patents, particularly in Europe, are presently being attacked on these grounds.

The consequences of attacking patents on moral grounds may not lead to the results which opponents of biotechnology hope, a point noted by Jefferson (1999) in his expert paper prepared for the Secretariat advising the Convention on Biological Diversity. The paper is an exhaustive review of the so-called “terminator” genes, referred to in his paper as “genetic use restriction technologies” and abbreviated to GURTs.

A patent only confers a *negative* right on its proprietor to prevent others from using the protected invention for a limited period. The right to positively use or not use the invention by the patent holder is, hence, not addressed by the patent law which is primarily an instrument for promoting research by ensuring the possibility of excluding imitation by third parties.

Hence, if the GURT patent were to be found inviable or invalid on any grounds, the effect of non-protection would be that the relevant method would remain or be put in the public domain. The absence of protection would not automatically lead to stopping the eventual adoption and diffusion of the GURT technology; on the con-

trary, such an absence may foster its dissemination.

In less elegant words, what has been invented cannot be uninvented. Even if a patent is cancelled on the grounds that the invention is immoral, the inventor is still able to use the invention. Indeed, everyone is free to use it. Patent law is not the route to regulating the use of biotechnology (see also Leisinger, This volume).

The Way Forward

The case for strengthening IPRs in developing countries is, I believe, overwhelming, and the need to strengthen these rights is urgent. Countries should evaluate their positions without delay, and should be encouraged to implement TRIPs – or better, to improve upon TRIPs – as soon as possible. That said, the modification of intellectual property laws requires money and skilled advisers, both of which may be in short supply in some developing countries.

Funding and other technical assistance is available. The World Intellectual Property Organization (WIPO) has an agreement with the World Trade Organization (WTO) to provide assistance to developing countries to meet their TRIPs commitments, to provide technical assistance in drafting, and to train staff and provide software. However, the limited resources of WIPO and WTO remain a constraint and could mean that some countries are unable to meet their commitments, even by the 2005 deadline.

The World Bank and other international development agencies could certainly help by providing resources to the WTO or directly to developing countries for this purpose. Such funding would not only increase the number of countries meeting their TRIPs obligations by the deadline or even earlier, it would also promote open and constructive discussion of TRIPs in the next WTO round.

There is a further and additional approach which could save both time and resources. There is little logic in many different nations, each having similar standards and economic goals, to examine and grant patents for the same invention. The most efficient and economic approach is a regional organization, such as the African Regional Intellectual Property Office (ARIPO), the

African Intellectual Property Organisation (OAPI) or the European Patent Convention, which centralize the examination and granting of patents for all member countries into one office.

Conclusion

Enforceable and strong IPRs are essential to encourage the transfer of the latest technologies to developing countries, and for stimulating research in these same new technologies. They are vital for the modernization of crop production in developing countries.

Weak intellectual property laws and the inability to enforce intellectual property rights will limit the access of developing countries to the new technology, which is so important for the development of their agriculture and the saving of valuable environmental resources. Weak laws will inhibit much-needed inward investment.

Each country must evaluate its own intellectual property laws and needs carefully, but I

would urge all developing countries to strengthen these rights as soon as possible, and for the World Bank and other international development agencies to assist them in this endeavor. I am confident that the benefits – the access to the new technologies and inward investment - will follow.

References

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