Intellectual property in agricultural trade

A report for the Rural Industries Research and Development Corporation

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Foreword

Intellectual property is becoming increasingly important to agricultural trade. The success of Australian agriculture may be determined more in the future by our ability to engage in effective marketing and product innovation, than our ability to continue to improve yields. If this is the case, the international rules governing the trade aspects of intellectual property are important in defining the path of Australia's continued development in the agricultural sector.

The Agreement on Trade Related Aspects of Intellectual Property (TRIPs) sets minimum standards for intellectual property (IP) rights around the world. TRIPs is due to be reviewed at the end of 1999. In this context, it is timely to consider what opportunities the international IP framework gives Australia and to begin to form an opinion about what outcomes are desirable for agriculture in the coming TRIPs review.

This publication considers how changes in the TRIPs agreement might impact on Australian agriculture. It identifies some areas where Australian agriculture stands to gain, and some areas where it stands to lose. Following that, it suggests what might be a good outcome from the coming review of TRIPs and which industries are likely to be most affected.

This report, a new addition to RIRDC's diverse range of over 250 research publications, forms part of the Global Competitiveness R&D program, which aims to identify important impediments to the development of a globally competitive Australian agricultural sector and support research that will lead to options and strategies that will remove these impediments

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Abbreviations

GI – geographical indication

GMO – genetically modified organism

IP – intellectual property

OECD – Organisation for Economic Cooperation and Development

PBRA – *Plant Breeder's Rights Act 1994*

PBR – plant breeder's right

TRIMs – Agreement on Trade Related Investment Measures

TRIPs – Agreement on Trade Related aspects of Intellectual Property

UNIDO – United Nations Industrial Development Organization

WTO – World Trade Organization

Executive summary

Product differentiation and innovation are likely to be increasingly important to agricultural industries in the future. As competition in world markets continues to intensify, the greatest advantage may accrue to those producers who use intellectual property (IP) to the greatest advantage. If this is the case, the way the international trading system treats IP will be increasingly important. The Agreement on Trade Related Aspects of Intellectual Property (TRIPs), which sets minimum standards for IP protection, is due to be renegotiated this year. With this in mind, it is important to consider what opportunities this may bring for Australian agriculture.

Intellectual property is special

Intellectual property is different from physical property. This is because intellectual property is solely a construct of the mind. A consequence of this is that, if one person is using an item of IP there is no physical constraint on another person using the same item of IP. This creates an important problem. If one person has some valuable IP, there is no constraint on it being copied by others.

The capacity for the same piece of IP to be used by many people at the same time retards the development of markets for innovations — why pay for something that can be copied? Without markets there is little incentive to innovate as there are no means to get a return on innovation.

Similarly, there is no physical constraint on a firm's successful brands and labels being copied by competitors. Such duplication reduces the informational value of brands and labels.

A solution — allocating property rights

Since innovation and information are both judged to be valuable in a market context, the government allocates property rights over innovations, brands and other forms of IP. It does this through several different IP rights regimes

Different IP rights regimes

It is useful to divide IP rights regimes into three broad categories:

- regimes that protect innovative endeavour: this includes the patent system, other *sui generis* (lit: one of a kind) registration systems such as the *Plant Breeder's Rights Act 1994* and trade secret law;
- regimes that protect reputation: this includes the trademark system, the law relating to geographical indications and the body of law commonly known as 'passing off'; and

- regimes that protect expression: this is the purpose of copyright law. Copyright has only limited application to agricultural production, the most significant impact being the provision of limited protection to agricultural software.

Contentious areas of TRIPs are likely to include the protection given to geographical indications (GIs) and the recognition given to biotechnological innovations by the patent system.

GIs identify a good as coming from a particular country, region or locality where a particular quality, reputation or other specific characteristic is essentially attributable to that geographical origin. An example is 'champagne'. There are two forms of GI protection. The weak regime only prohibits the use of a GI when its use creates confusion as to the origin of a product. The strict regime, which applies to wine and spirits, prohibits the use of a GI, regardless of whether it induces confusion. The use of qualifications, such as 'in the style of champagne' is also prohibited under the strict regime.

It may be proposed in the coming review of TRIPs that strict GI protection be extended to cover food and drink other than wine and spirits. It may also be proposed that protection be extended to names only indirectly linked to a region, such as 'feta', or to cover traditional expressions, such as 'brut' or 'reserve'.

Patents give property rights over innovations to innovators for a period up to 20 years. During this time the owner of the patent has the exclusive right to produce, sell or otherwise exploit the innovation. Patents are acquired in Australia by registering the innovation with the patent office.

Patents create markets for innovations

Allocating property rights over innovations facilitates the development of markets. Allocating property rights over innovations means that one person cannot duplicate the innovative idea of another without breaking the law. This creates an incentive to pay for the innovation. Patents allocate property rights over innovations and, as a result, facilitate the development of markets.

Without property rights over innovation (that is, without patents):

- the development of markets are retarded;
- producers do not have markets in which to get a return on R&D — so there is little incentive to engage in innovation; and
- consumers do not have markets in which to acquire innovative products.

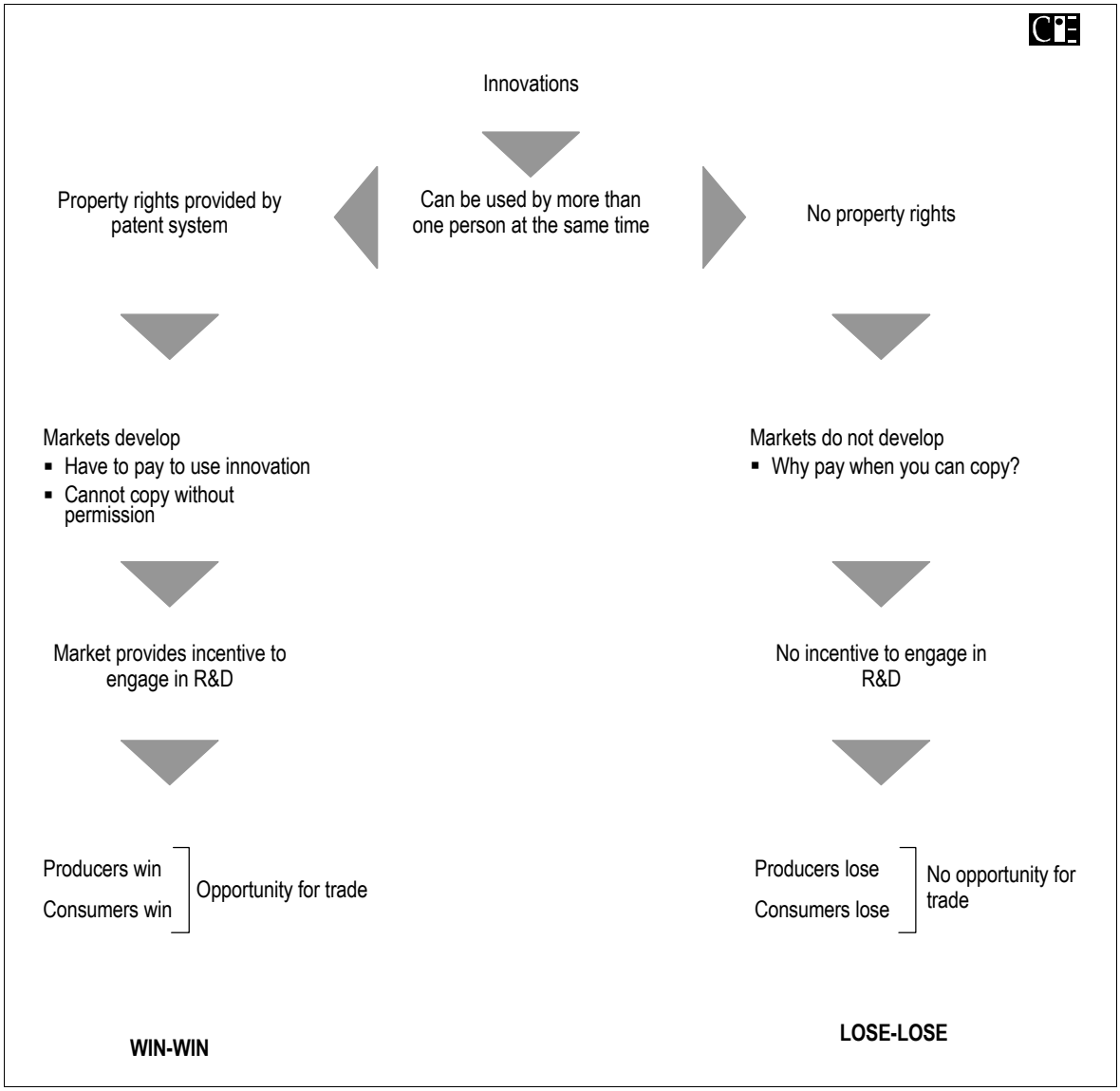
With property rights over innovation (that is, with patents):

- markets for innovative products can develop;

- producers have an incentive, provided by the market, to engage in R&D; and
- consumers have a market in which to acquire the benefits provided by innovations.

A schematic representation of these points is contained in chart 1. The implication of this line of reasoning is that, by facilitating the creation of markets for innovations, patents place both the consumers and producers of innovations in a better situation — a win–win situation! This provides Australia with an in-principle argument to support an international agreement, such as TRIPs, that is designed to extend the recognition of patent law.

1 **Patents create a win-win situation**



GIs restrict access to generic food terms

Without IP protection, successful brands and labels can be duplicated by competitors. This erodes the quality of information available to consumers in making their purchases and inhibits the ability of producers to distinguish their products in the marketplace. Hence, IP regimes, like trademarks, perform a useful function in allowing information to be communicated within the market system.

The weak form of GI protection seems consistent with this desirable outcome. However, the strict form of GI protection can restrict access to generic food names such as 'champagne' or 'burgundy'. This would appear to diminish both the quality of information available to consumers and the ability of producers to compete in affected markets. There appears to be few opportunities for Australian producers to benefit from GI protection.

The suggested extensions to GI protection, including the protection of traditional expressions, all appear to restrict access to generic food terms in the same way as the current strict GI regime seems to.

The magnitude of the disadvantage that GI protection imposes on producers who are unable to use a protected GI is likely to depend on: the existing industry reputation; the efficacy of marketing; the extent to which consumers are educated about the product; and the extent of the language controlled.

Desirable outcomes from a renegotiations of TRIPs

A renegotiation of the TRIPs agreement is imminent. With this in mind, it is important to have a clear picture of what might constitute a desirable outcome from such a renegotiation. It follows from the analysis in this report that a set of desirable outcomes might include the following.

- Increased compliance with existing obligations by developing countries. IP laws generally facilitate the development of markets by allocating property rights. It is in Australia's interest to have many export markets for our agricultural innovations and brands. It is also in Australia's interest as a consumer of agricultural innovations from abroad to have market mechanisms that lead to the rapid development of innovation globally.

- The extension of the minimum standards of patent protection to include mandatory protection for biotechnological innovations. Australia already has patent protection for biotechnological innovation. It is in the national interest to develop other markets for innovations in this area. As both consumers and producers of this technology, Australia would have much to gain from the continued evolution of global markets for biotech innovations.

- No extensions of GI protection. Restricting the access of Australian producers to some generic food terms does not appear to have any significant compensating benefit.

The major finding in this report is that, while Australian agriculture should support the continued expansion of the application of patent law, it should oppose the expansion of the application of GI protection.

Other implications and extensions

The analysis of patents and GI protection is extended in three directions. This report examines:

- which industries are likely to be most affected by GI and patent laws;

- what issues are raised in formulating a domestic response to likely changes in TRIPs; and

- some of the issues involved in owning and managing IP.

The impact on industry

A set of criteria are developed to evaluate which industries are most vulnerable to an expansion of GI protection and which industries' research programs have the most to gain from patent protection and plant breeder's rights (PBR). It is suggested that:

- the cheese and, possibly, the fruit industries may experience significant harm from an expansion of GI laws; and

- the wine, cotton, wildflower and cheese industries have the greatest potential to benefit from patent and PBR law. Wool stands to gain the least.

Toward a domestic response to TRIPs

An appropriate response to TRIPs may be just as important as achieving a good outcome from the coming renegotiations. The full exploration of the issues involved in formulating such a response is beyond the scope of this report. Important issues include:

- how government organisations own and utilise IP; and

- the ability of organisations to provide incentives to researchers.

It seems relatively clear that a domestic response would include the following activities:

- identifying and removing impediments to R&D;

- maintaining strong links between the research and commercial arms of industries and organisations so that R&D remains relevant;

- raising the level of awareness of IP issues; and

- maintaining an appropriate level of quality in Australia's agricultural produce so that GIs have a minimal impact on producers.

Issues for owners of IP

Many issues arise from owning IP. Enjoying the rewards offered by IP ownership involves making sound commercial decisions. Issues discussed in this report are:

- the costs of IP;

- how to use brands to market innovations;

- whether to license a product or produce it; and

- the management of IP in joint ventures in developing countries.

1. Introduction

Some astounding agricultural innovations are occurring nowadays. Crop varieties are now available to farmers that have built-in pesticide resistance. Scientists at Tokyo-based Snow Brand Milk Products have come up with a way to clone cows, just by using cells found in milk (*Time Magazine*, 10 May 1999, p. 59).

The amazing array of possibilities that advances in technology give us makes it important that we have the correct institutional arrangements in place to take advantage of these possibilities. An important aspect of this is the allocation of property rights to intellectual endeavour.

The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) has a large part to play in how such property rights are allocated. By setting minimum standards for the intellectual property (IP) protection granted by member states, the TRIPs agreement plays an important role in the protection of IP rights in world trade. A big issue is how the institutional structures that TRIPs puts in place impact on Australia and, in particular, Australian agriculture. This inquiry becomes even more urgent in the face of an impending review of TRIPs, which is expected to start at the end of 1999.

This report identifies some of the opportunities, and pitfalls, for Australian agriculture in the coming review of international IP law.

The use of IP may be an important element in the success of the agricultural sector in the future. Borrell (1998) presents the case for a future shift in Australia's comparative advantage away from broadacre bulk commodities, toward products that can be differentiated through the addition of marketing services and IP. Borrell presents several reasons supporting this view of the future.

First, developing countries are likely to become increasingly commodity competitive. Yields appear to be growing faster in developing countries than in developed countries. This suggests that Australian bulk commodity producers are likely to be caught in a cost–price squeeze as global commodity prices continue to fall.

Second, transforming products in ways which differentiate them from competitors' products and which increases their value to consumers does offer scope to increase the returns to agriculture. Compared with developing countries, developed countries' advantage lies in knowledge based services. Australia's future competitive advantage may lie in using this knowledge to differentiate products.

Third, rising income, a wider range of products, efficient global communications, international influences and demographic change are causing lifestyle and attitudinal changes. These are causing consumers to demand higher and more consistent quality products, a wider diversity of products and higher levels of service attached to each

product. The Japanese food services industry, which has grown at around 7 per cent for the last twenty years, is used by Borrell to illustrate this trend.

This story suggests that the growth of Australian agriculture may be determined much more in the future by success in marketing, product innovation, product differentiation and service delivery than in improvements in yields. Borrell uses the example of wine to illustrate how important value adding services have become to an agricultural exporting industry. Of every dollar of Australian wine exports, 77 cents is payment for bottles, labels, marketing services, 'wine-making' capital and know-how. If IP such as brands, trademarks, labels, quality guarantees, marketing networks, new processes, genetic engineering and innovative management styles are the future source of increasing returns to Australian agriculture, how the international trading system deals with IP will become increasingly important to the sector.

The IP problem

All forms of IP are very different from normal, physical property because they are solely a product of the mind. What the owner of IP can control is an intellectual creation. The most important distinction between IP and other forms of property is that if one person is using IP, it will not stop another person using the same IP. For instance, if one farmer is using an innovative plough design, there is no physical constraint on a neigbouring farmer using the same design. This is compared to the constraint that, no matter how hard they try, both farmers cannot use the same plough at the same time.

For valuable forms of IP, this capacity for simultaneous use by many people creates a problem. Without legal rules, valuable IP could be appropriated by anyone who can get their hands on it.

For innovations, this is a problem because it makes it very hard to get a return on R&D. To sell an innovative idea you need to articulate what that idea is or use the idea to make some other product. This can mean that the idea is revealed in the marketplace. Even if it is not so revealed, there is always the possibility that an employee may take an idea and reveal it to someone outside the firm.

The potential for multiple simultaneous use creates a situation where, as soon as an innovator comes up with an idea, it is appropriated freely by everyone else — it gets copied. This makes it hard for markets to develop and exchange to occur: why would a person pay for an idea they can copy freely? In this world without IP law there is little incentive to innovate because markets for innovative products fail to emerge. Without markets, innovators cannot sell their products and gain a reward for their innovative endeavour.

A similar problem arises for brands. Highly successful, recognised branding can be copied by competitors. This erodes the value of the brand to the original producer and also to consumers — if others copy the brand name, the brand ceases to identify the product. This decreases the information available to buyers when they make their

purchase choice. Markets work best when there is plenty of useful information about the nature of what is being bought and sold.

So, without some legal regulation, markets for innovation can fail to emerge and imitators can dilute the usefulness of brand names. Government solves this problem by allocating property rights over the IP. Property rights give exclusive rights for the use of an item of IP to one person. By allocating these rights, the problem of simultaneous use is removed. The control of the use of an item of IP rests with the owner.

Property rights lie at the heart of this report. The next chapter examines the nature of the property rights that are used to solve the problem of simultaneous use. It also identifies the most contentious areas in the coming review of TRIPs — the application of patent laws to biotechnology and the extension of the protection of geographical indications (GIs).

Chapter 3 examines more closely how a lack of patent protection (property rights over new ideas) results in an absence of markets for innovation. The addition of patent law allows markets to develop by removing the problems created when people can appropriate ideas freely. The creation of markets is a win for consumers and producers as they can now both benefit from exchange and a faster rate of innovation — a win–win situation!

Chapter 4 examines how the extension of GI protection (property rights over a specific form of labelling) compares to the status quo. In this chapter the point is made that GIs do not enhance the ability of producers to identify their product in the market — trademarks and other forms labelling laws already do this adequately. Instead, GIs can tie up the ownership of generic terms used by many producers to describe the nature of their product. This could harm both consumers and many producers by inhibiting the ability to communicate the nature of products.

The following chapters discuss the implications and extensions of these findings. Chapter 5 looks at some of the issues involved in managing IP. Chapter 6 discusses optimal outcomes for Australia from a review of TRIPs. Chapter 7 raises some issues in formulating a domestic response to likely changes to TRIPs. Finally, Chapter 8 tries to identify those industries that have the greatest potential to be affected by GIs and those industries which have research programs likely to be in a position to benefit from patent law.

2. Intellectual property rights

What are intellectual property rights?

Intellectual property rights are the bundle of rights that attach to the ownership of abstract creations of the mind, such as the expression in a novel or the innovative step in an invention.

It is useful to divide IP rights regimes into three broad categories:

- regimes that protect innovative endeavour: this includes the patent system, other *sui generis* (lit: one of a kind) registration systems such as the *Plant Breeder's Rights Act 1994* and trade secret law;
- regimes that protect reputation: this includes the trademark system, the law relating to geographical indications and the body of law commonly known as 'passing off'; and
- regimes that protect expression: this is the purpose of copyright law. Copyright has only limited application to agricultural production, the most significant impact being the provision of limited protection to agricultural software.

Table 2.1 summarises the main aspects of the three regimes.

What is the purpose of protecting IP?

The purposes of IP regimes vary. Regimes that protect innovation are intended to provide incentives to innovate. These regimes reward successful innovation by providing property rights to the innovator. This is distinct from other forms of assistance, such as subsidies, which provide rewards for undertaking innovation but not necessarily for realizing a commercially successful outcome. Patents, and similar schemes, are result-based forms of reward.

Regimes that protect expression (that is, copyright) are justified along similar lines to regimes that protect innovation. By offering property rights over the expressive element in a novel or painting, the artist is given an incentive to create new things.

Regimes that protect reputation are generally justified on the basis of reducing the consumer's search costs in the marketplace. By allowing traders to have exclusive rights to a label, trademarks and geographical indications can make it easier for traders to communicate to consumers the nature of the goods on offer.

2.1 **Characteristics of different IP regimes**

	Instruments	*Is registration required?*	*Statutory or common law?*	*Covered by TRIPs?*
Protection of expression	Copyright	No	Statutory	Yes
Protection of innovation	Patents	Yes	Statutory	Yes
	Plant breeder's rights	Yes	Statutory	Yes
	Trade secrets	No	Common law	Yes
Protection of reputation	Trademarks	Yes	Statutory	Yes
	Geographical indications	No	Statutory	Yes
	Passing off	No	Common law	No

The three regimes operate in various forms in developed countries, but less so in developing countries. Australia's IP regimes are well developed in comparison to those of developing nations. IP rights are granted on a country-by-country basis. So, by applying for IP rights in many countries, an innovator may get a 'global' patent. The best way to appreciate how the different regimes work, however, is to look at their operation in Australia.

How do regimes that protect innovation work?

The patent system and the system created by the *Plant Breeder's Rights Act 1994* (PBRA) work in similar ways. An application for registration is made to a registering body (for example, the patent office), which evaluates the innovation. If the innovation meets certain requirements of novelty, non-obviousness and usefulness, the innovator is granted a set of rights over the innovation for a limited time. These rights typically include the exclusive right to produce, sell and otherwise exploit the innovation. Patents, and the rights given under the PBRA, last for up to 20 years.

To get a patent the innovator must make public the nature of the innovation. This releases knowledge into the public domain. However, the nature of the patent inhibits the use of this knowledge.

Trade secret law is dominated by the common law action of breach of confidence. A successful action of breach of confidence requires: that the disclosed information had a sufficient quality of confidence; it must have been imparted in circumstances giving rise to an obligation of confidence; the disclosure must have been unauthorised and; some

detriment must have been suffered as a consequence. Trade secrets and know-how may also be protected contractually.

In contrast to patents, trade secret law allows others to duplicate an innovation — if they can work out how to do it. Similarly, trade secrets have the potential to protect an innovation forever, while patents only give a maximum of 20 years of protection and require full disclosure. With this in mind, the choice between the different forms of protection is an important strategic decision. Trade secrets may be better for innovations that are methods of manufacture or products that cannot easily be reversed engineered — for example, Coca-Cola ingredients have been protected by trade secrets for decades. Patents may be preferred for product innovations that are easy to reproduce.

Trade secrets, patents and the PBRA are important in protecting agricultural innovation. The innovations brought about by advances in biotechnology are generally protected through the patent system or through the PBRA. A body of opinion exists that opposes the patentability of all genetic material, but at the moment Australian law allows genetic material to be protected.

How do regimes that protect reputation work?

The trademark system, the law relating to geographical indications and the body of law commonly known as 'passing off' are all directed toward protecting the reputation of producers in the market place.

The trademark system is a registration system that is, in many respects, similar to the patent system. A trademark is submitted to the registering body who assesses it on the basis of distinctiveness, potential to confuse and its similarity to other trademarks. If the mark meets the set of prescribed criteria, the owner is granted exclusive use of the mark for as long as the owner continues to use it.

Geographical indications (GIs) identify a good as coming from a particular country, region or locality where a particular quality, reputation or other specific characteristic is essentially attributable to that geographical origin. A variety of domestic legislation combine to prohibit the misleading use of geographical indications. Special legislation regulates the use of GIs relating to wine and spirits. These provisions impose stricter limitations on the use of GIs, prohibiting qualification through the use of expressions such as 'in the style of', 'imitation' or 'of the type'.

The action of passing off is a common law counterpart to the trademark registration system. It allows a trader to bring an action against another trader who has, or is likely to, confuse consumers as to the origin of the goods. The test is whether the reasonable consumer would be confused to the point of thinking that one trader's goods came from the other trader. This confusion must be detrimental to the complainant.

Trademarks and passing off actions are not intended to create large profits in markets through establishing barriers to entry, however this can be the result in the short term. The market value of labels, such as 'champagne', 'feta', 'burgundy' or 'Drizabone', is

significant in maintaining market share. High levels of label recognition make it difficult for other firms to compete with firms that own distinctive labels. This barrier is, of course, limited as nothing actually prevents other firms from establishing their own labels.

Interactions between regimes

Regimes that protect innovative endeavour and those that protect reputation may seem to have little scope for interaction. Legally, this is certainly the case. However, commercially, the regimes are related in affecting the cost–benefit evaluation behind any investment decision. The return to investment in R&D is determined by the commercial potential of an outcome. The ability to exploit the rights given by a patent will, at least partially, be affected by the ability to market a product through brands and labelling (that is, the ability to create and protect reputation).

Ownership is only half the game…

For patents, the PBRA and trademarks, the owner of the IP has the right to exclude others from using their property. However, to do this they need to litigate. IP litigation is a costly process both in terms of money and time. Typically, IP cases require highly specialized lawyers, involve very complicated factual detail and are concerned with a body of law that, in some areas, is still being developed. This means that a firm's decision to enforce their IP rights is often a complicated strategic commercial decision.

Similarly, other firms may anticipate that an IP owner will not choose to enforce their IP rights. It may be apparent that the gains from enforcement do not outweigh the costs, particularly as a patent comes close to the end of its term. In this instance, the IP right confers little more than a bitter aftertaste and some moral outrage to the owner of the violated rights. The owner may have been better off licensing their IP in the early stages of the patent, and getting some profits from other firms, rather than finding themselves helpless in the face of patent violation.

This illustrates how the 'smart' implementation of IP rights is crucial to the successful use of IP. In this sense, ownership is only half the game.

The international IP environment: TRIPs

Traditionally, IP law is a nation-specific construct. Each nation has the power to set their own rules regarding IP. However, this leads to a melange of rules across nations, making it difficult for international business to operate smoothly where technology transfer and IP are crucial elements to trade. With this in mind, a multilateral trade agreement was established to create some international standards for IP law. This agreement is called the Agreement on Trade-Related Aspects of IP Rights (TRIPs).

TRIPs came into effect on new year's day 1995. TRIPs covers copyright, trademarks, geographical indications, designs, patents including genetic material and plant varieties,

circuit designs and undisclosed information (covering trade secrets and test data submitted to governments).

The effect of TRIPs is to set minimum standards for the protection of IP in signatory states. Australia meets these standards and, in some areas, significantly exceeds them. The most likely outcome of a renegotiation of TRIPs, in broad terms, would be to alter international standards of IP protection but leave domestic levels unchanged. Some of the areas of TRIPs that are likely to have the most effect on agriculture are set out below.

- Geographical indications. Article 22 defines GIs and stipulates that member states restrict the use of GIs to only those parties whose products originate in the geographical area to which the GI refers. The definition seems to require that there be an element of confusion, on the part of the consumer, as to the geographical origin of the product before that product infringes the GI. The contentious nature of this provision becomes apparent when it is compared with the special provisions that govern GIs and wine and spirits. Some countries may want the broad category of GIs strengthened to more closely resemble the strict model applied to wine and spirits. For instance, Greece may benefit if the definition of GI were strengthened to allow them to capture the name 'Feta' without having to establish some level of confusion on the part of consumers.
- Wine and spirits. Article 23 makes the application of GIs to wine and spirits much stricter than to other products. Another party may not use a GI even if there is no confusion on the part of consumers as to geographical origin. The provisions go further and prohibit qualified use of GIs, so that saying 'in the style of champagne' would also be prohibited. It may be argued that the rules governing the application of GIs to wine and spirits create significant market barriers, with little justification on the basis of protecting reputation, thereby creating rents for European producers.
- Biotechnology and genetically modified organisms (GMOs). Article 27.3b governs biotechnology and GMOs, as well as plant varieties. This provision will be reviewed this year and so is particularly important from a policy perspective. The effect of this provision is to require that member states:
  - must provide patent protection to micro-organisms (like bacteria);
  - must provide patent protection to non-biological and microbiological processes for the production of plants and animals;
  - must protect plant varieties; and
  - may exclude plants, animals and essentially biological processes for the production of plants and animals.

  The problem with the provision is that it is unclear what constitutes the difference between a plant and a plant variety, or a microbiological or biological process. This means a range of levels of obligation exists, with the choice left to member states as to which obligation applies to which subject. The different levels of protection and lack of clarity seem to encourage rent seeking between nations.

- Plant varieties. Article 27.3b also applies to plant varieties. Here, as above, a lack of clarity in the provision creates a difficult and uncertain environment for cultivators.

IP and competition law

Any discussion of IP should mention competition law. This is because, to many people, IP law and competition law seem to be in direct conflict. Some people view IP as giving monopoly power, while competition law seeks to regulate and limit monopoly power. On a more pragmatic level, IP litigation usually involves some element of competition law.

In Australia the main source of competition law is the *Trade Practices Act 1974* (TPA). Part IV of this act, broadly speaking, prohibits the use of market power in a manner detrimental to competition in a market. However, the act gives a limited exemption in the case of IP. This exemption gives the owner of the IP some freedom in the terms of licenses used in relation to IP.

However, these exemptions do not exempt the owner of IP from liability if they use a substantial degree of market power in an unauthorised manner, such as preventing the entry of a competitor into a market or deterring competitive conduct. There are other areas in which the owner of IP is still liable to be prosecuted for breaking the provisions of the TPA.

Rather than viewing competition law and IP as being in opposition, it is more helpful to view them as complementary. IP exists to give incentives while competition law regulates abuse of the incentive schemes. More fundamentally, the property rights given by regimes like patents are important in establishing markets. Without the property rights created by such regimes, innovative products are unlikely to be able to be traded. In these instances, IP creates the market and competition law attempts to regulate it.

Competition and TRIPs

The TRIPs agreement addresses the intersection of competition law and IP in article 40. Article 40 focuses on anticompetitive licensing practices. These rules give member states the freedom to decide what is an appropriate form of response to the potentially anticompetitive impact of granting IP rights. This means that member states have complete discretion over how to address the potentially anticompetitive elements of IP law.

The only mandatory element of the provisions in article 40 is that member states must enter into discussions with other member states, upon request, if an IP owner, who is a national of one of the states has fallen foul of the competition laws of the other. So, if a conflict over competition and IP emerges, the states affected must talk. There is nothing to say that these talks must be successful.

Unraveling the puzzle…

Two distinct areas of IP law may be affected by forthcoming TRIPs negotiations: regimes that protect innovation and regimes that protect reputation. In the next chapters we examine how IP rights affect market and trade outcomes in each of these areas.

3. Analysing patents and plant breeder's rights

Intellectual property differs from physical property in that many people can use a single item of IP at the same time. This makes it hard for markets for innovations to develop, as there is no physical constraint on a person copying an idea. This chapter examines how the patent system facilitates the development of incentives and markets for innovation. The patent system does this by allocating property rights over innovations. The markets created by allocating property rights allow benefits to accrue to both consumers and producers of innovation. Consumers and producers can both benefit from mutually desirable exchange when markets for innovations are created.

The important areas of innovative endeavour

The coming TRIPs review will impact differently on different areas of agricultural production. It is important to single out which areas of innovation are most likely to be affected by the negotiations. The earlier discussion of TRIPs suggests that the areas most likely to be affected by a revision of TRIPs include:

- innovation in GMOs;
- innovation in biotechnological processes; and
- the development of new plant varieties.

The examples in the following discussion focus on these areas. As patents and the PBRA work in similar ways, this discussion tends to concentrate on patents.

Models of markets with IP

There are two different ways of viewing the way in which patents, and similar regimes, affect markets. The two approaches differ in the modeling of how the rights given by a patent operate in a market.

The first approach is to view the rights associated with patents as giving monopoly rights over a product. When an innovator is granted a patent they are awarded the exclusive right to the commercial enjoyment of the innovation. It is argued that this amounts to a monopoly, although how it differs from a normal property right is unclear. Under TRIPs these rights must last for at least 20 years. The purpose of this limited 'monopoly' is to provide an incentive to engage in innovation.

Domestic monopolies impose costs on society

The problem with monopolies is that they distort markets by concentrating power in the hands of a single market participant. Trade is socially beneficial when the value of the product to the buyer is greater than the cost of production to the seller. A perfectly competitive market allows all such trade to take place. However this is not in the best

interest of the monopolist. A monopolist maximises profit by manipulating quantity or price so that not all socially beneficial trades take place. By restricting the amount of trade in a market a monopolist can raise the price that they receive for each unit sold and, hence, maximise profit.

Judged against a perfectly competitive market, the socially beneficial trades that do not take place impose a cost on society. This is because society would be better off had they taken place. In effect, we pay a price for granting the monopoly.

The 'monopoly right' approach is not the right one for this analysis

Many patent analyses adopt this framework and evaluate a trade-off between the costs of monopoly and the benefits of generating innovation. This is a good framework for evaluating, for instance, whether patents should last for 20 or 30 years.

The problem is that this approach is inadequate for evaluating situations where patents may not exist. This is because it is built on an assumption that a market, of some sort, will always operate. One of the key findings of the following analysis is that this may not be the case without patents. Thus, the benefits of a patent scheme should be evaluated using a framework that does not implicitly assume markets always exist.

A preferred approach builds on the idea of IP giving property rights (building on Novack 1996) as opposed to monopoly rights. The framework is set out below.

Patents and markets: a preferred approach

Chart 3.1 shows the preferred framework in which patents should be analysed.

Stages 1 and 2: A firm wants a new product so it innovates

When a firm decides it needs to develop a new product it will engage in R&D to come up with something new. Once this R&D results in a commercially valuable innovation, the firm sets about getting property rights over the innovation through a patent.

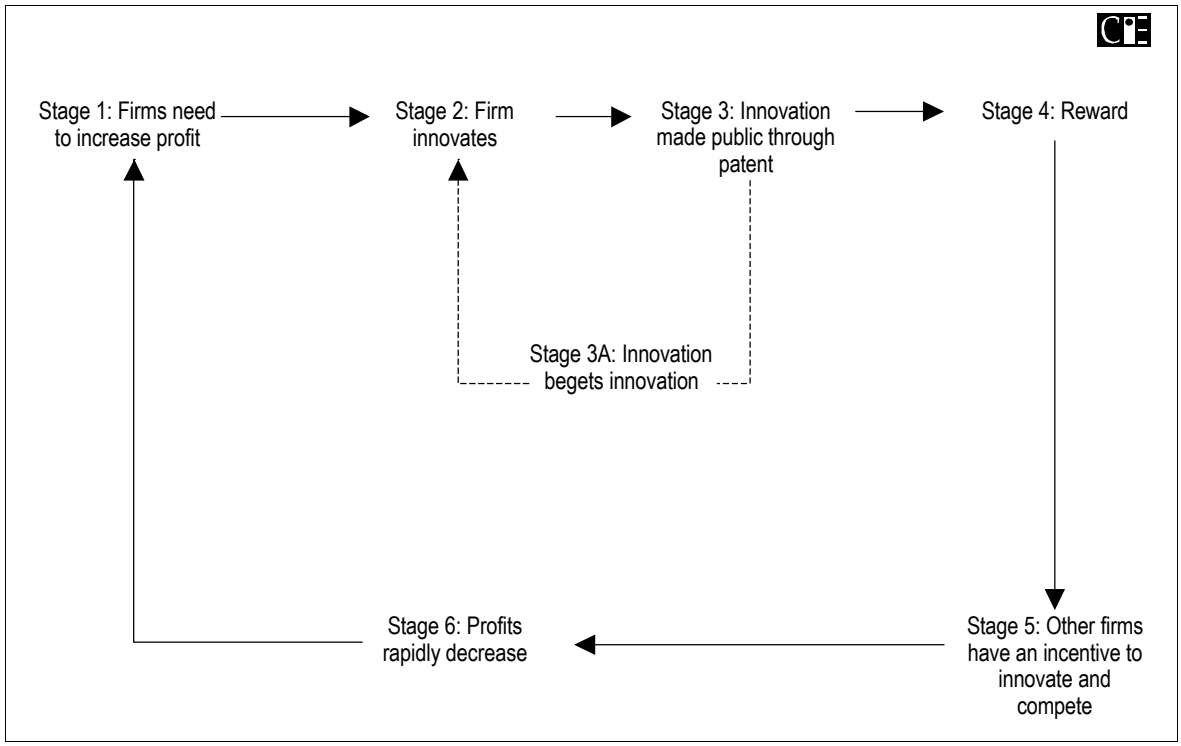
Stage 3: The innovation is made public through the patent and the market

Once the patent is applied for, the innovation is in the public domain. The nature of the innovative step must be disclosed. The act of commercialisation also helps to reveal to the public the nature of the patent by allowing it to be viewed in terms of its commercial application.

Stage 3A: Innovation, by itself, begets innovation

Innovation tends to be a progressive process. Typically, one innovation draws on other innovations. In this way, the body of knowledge builds on itself. The ease with which this can occur depends on several factors. The patent system can affect this through a number of avenues.

3.1 **The preferred model of innovation and patents**



Patents require disclosure

To get a patent an innovator must disclose the nature of the innovation. This means that the insight that resulted in the innovation is brought into the public sphere. Without some sort of patent scheme, many of these important insights would probably be kept secret. So, in this respect, the patent scheme encourages further innovation.

Patents may restrict freedom to operate

The patent system grants exclusive rights over the patented invention. Another invention will infringe on an existing patent if it incorporates all the essential elements of the patented invention. Final authority rests with the courts to decide what constitutes the essential elements of a patent.

This can inhibit the freedom of firms, other than the patent holder, to operate in the market. The absence of this freedom to operate is most clearly apparent where one invention builds on another. If the primary invention is patented and yet is a necessary component of the later invention, infringement is likely to have occurred. This is because the major invention is likely to have incorporated all the essential elements of the primary invention. Thus, the commercial application of the later invention is inhibited by the patent over the primary invention.

In this instance a contract would need to be entered into to gain use of the patented invention. This contract would require some 'consideration', perhaps taking the form of a fee. As opposed to a case where the original patent did not exist, the existence of the original patent (over the primary invention) is likely to reduce the incentive to other firms to innovate.

Patents provide an incentive to 'design around'

A response to the restrictions that patents put on related innovation, outlined above, is to 'design around' the patent. This involves trying to come up with a new innovative step that achieves a similar outcome to the original patent. If a firm is successful in doing this then they can enjoy the benefits of a patent without having to pay a fee to the original innovator. This process of 'design around' has the added benefit of forcing innovators to think laterally. Thus, patents can provide an incentive to broaden, as well as deepen, our stock of knowledge. In this way, patents can encourage further innovation.

All these effects are closely related to stage 5, where firms try to enter the market to capture some of the rewards earned by the innovator.

Stage 4: The innovation reaps a reward

Central to the 'property rights' approach is the idea that the property rights given by a patent allow the innovator to reap a reward for the effort expended in R&D. Without these property rights there would be little incentive to innovate and there would be no trade in products that have clear and recognisable elements of innovation. The product of intellectual capital would not be observable in the market place.

To see this, it is important to appreciate how property rights allow exchange (trade) to occur. For a firm to be in a position to exchange they need to have something that their trading partner wants. Without property rights, there is no incentive to exchange as people can just use the idea or product. Without property rights over an idea or object, it is not possible to stop a person doing as they wish with the idea or object. There is no recourse to complain, as there is no prior claim over the idea or object.

If this were the case, there would be no point trying to sell the freely available commodity as anyone who wanted it could just take it. This is why property rights are important in creating markets. Without property rights there is nothing to stop people taking things for free.

It is through the creation of the market mechanism that the return to innovation is realised. The property right over the innovation stops other people adopting the innovation for free and allows a reward to be realised through trade. In this sense, the approach builds on the idea that a prerequisite of trade is clearly defined property rights.

The matter is complicated when there is a scarce resource that the invention draws on. This scarce resource may be such that the adoption of the idea by others is limited. In such an instance, innovation will still occur and markets will emerge. However, the return

in this instance is really accruing to the scarce factor rather than the innovation itself. The scarcity of the resource rather than the value of the innovation determines the return to the firm.

This may be the case in the biotechnology industry; the complexity of some of the techniques may require a level of expertise that is a scarce resource. In this instance, some innovation would occur without the property rights given by patents, with the returns attributable to the scarcity of skills rather than the intrinsic value of the innovation. Furthermore, such innovation would only be likely to occur in areas where such skills are in short supply.

Patents, then, are important in creating a market environment where the returns to innovation, as opposed to other factors of production, can be realised.

IP rights give rewards to innovators

The owner of a genetically modified cotton strain has exclusive rights over its production and sales. These rights and the fact that the genetically modified cotton has some desirable attributes give the owner the ability to charge a higher price than would be charged otherwise and, consequently, capture a proportion of the benefits that the product brings, through profit. Hence the owner of the IP right earns a reward for the effort expended in R&D.

The innovator gains by capturing some of the extra profits generated as a result of adopting the innovation. These extra profits can be due to cost reduction or product differentiation, or a combination of the two. The key point is that both the user and the 'supplier' of the innovation share the benefit. How much each receives of the extra profit depends on the nature of the market for the innovation – how unique it is, what substitutes exist and so forth. But the critical thing is that it is IP rights that create the market, which then sorts out the appropriate share.

Innovation as cost reduction

Many innovations are aimed at reducing the costs of production of a commodity. An example might be the Bt Cotton strain developed by Monsanto. This cotton strain is marketed as being insect resistant, reducing the costs of spraying and insect control (box 3.2).

The reduction in the costs of production created by these products results in extra profits generated by producers. The innovator makes a profit by tapping into this extra profit. To maximise their gain, innovators want to extract as much of this extra profit from producers as possible. This might occur through pricing policy, licensing agreements, royalties or some other scheme.

3.2 **Cost reducing innovation: Bt Cotton**

The transgenic strain of cotton, Bt Cotton, developed by US firm Monsanto, is an example of innovation aimed at reducing the costs of production.

Bt Cotton is engineered to produce a natural insecticide that is a deterrent to the bollworm. Bollworm is a common pest that can ruin a cotton crop. The most tragic example of this occurred in 1997 when a plague of bollworm hit the cotton growing regions of southern India. The resulting hardship saw 200 debt-burdened farmers commit suicide.

Bt Cotton is reported to exterminate 90–95 per cent of all bollworm that try to infest. This means that farmers save on pesticides and have a far-reduced risk of crop failure.

The evidence generally supports these claims. In a survey conducted by specialists from the North Carolina State University and the University of Georgia of 300 farmers in the US south, it was found that yields increased by 11.4 per cent on adoption of Bt Cotton (in 1996). Pesticide applications were 72 per cent lower on Bt Cotton. The increase in yields and lower pesticide use reduce the cost per unit of production.

However, it must be noted that some Texas growers were so dissatisfied that they filed a lawsuit again Monsanto.

Bt Cotton illustrates how some innovation is cost reducing. It also illustrates how the cost savings give innovators extra capacity to extract a return for their investment. Monsanto's pricing policy appears to reflect this; an initial access fee is charged for the seed, along with a price per unit. In addition, growers must agree not to use any seed produced by the Bt Cotton.

Innovation as product differentiation

Innovations may also be directed at producing a new product. An example of this might be a new variety of apple, such as the 'pink lady'. This sort of innovation does not make it cheaper for a producer to produce; instead, it gives the producer a distinctive product to bring to market. By offering a differentiated product, a producer can ask for a higher price.

The wildflower market is a good example of differentiated products. Wildflower growers aim to differentiate their product on the basis of novelty; the higher the novelty, the higher the price (box 3.3).

In this instance, innovators who own IP rights will try to extract the extra profits that a differentiated product earns for the producer.

3.3 **Innovation as product differentiation: wildflowers**

Over 90 per cent of cut flowers exported by Australia are wildflowers. Australian wildflower exports earned $27 million in 1995-96. Domestically, Australian wildflowers have a wholesale value of around $24 million.

New varieties of flowers often command a price premium. Because of this, considerable R&D effort in the wildflower industry is directed toward developing new varieties. In this way, innovation is used as a means of product differentiation.

The cut flower market tends to be highly competitive. On standard varieties, prices are pushed down to just cover costs. It is estimated that operating costs for growers account for between 50 and 70 per cent of revenue. This leaves 30–50 per cent of revenue to reward land, capital and enterprise.

In comparison, new varieties can command significant premiums — up to 400 per cent at the wholesale level at certain times. These premiums provide the incentive to bring new products to the market.

The key to capturing these premiums is to have a distinctive, novel product. The R&D in wildflowers tends to be directed toward finding and developing flowers with the capacity to stand out in the market place.

Typically, these premiums do not last long. Buyers will tend to seek new, novel flowers. The novelty value of a flower also decreases with production levels. Since few flowers become standards, the pricing of innovations encourages growers to pursue new varieties so as to stay ahead of the market.

The wildflower industry is a good example of how innovation can be used to differentiate products. The high premiums often attached to novel varieties provide the incentives to engage in innovation.

It is interesting to note the value of PBRs in this market. Often, returns to new varieties are small in relation to the cost of a PBR. However, it is important to take out PBRs on varieties that have a chance at becoming standards. A PBR on a standard flower is a useful commercial asset.

Stage 5: Success attracts competition

Nothing attracts competition like the sight of someone else making a lot of money. As an innovator gains a greater and greater reward, more and more competitors will be attracted. The nature of this competition will depend on the time left to go on the patent.

If the patent is almost about to expire, then competitors may start to stockpile the product that is patented so that, once the patent does expire, they can enter the market. This behavior is especially prevalent in the pharmaceutical industry. In Canada, patent holders have tried to stamp out this behaviour in the courts.

If the patent has expired, then competitors will duplicate the product and enter the market as a direct competitor.

If the patent has some time left, then competitors will try to enter the market in several different ways. They may try to develop a new product that is distinct from the patent but achieves the same end (that is, design around), they may try to license the product from the patent holder, they may try to use an existing but different product to enter the market (for example, use pesticides to take some of the market from pest resistant crops, or vice versa), or take the patented product and improve on it, then sell it back to the patented firm.

Whatever the stage in the life of the patent, the success of the patented product will guarantee some form of competition. This dynamic form of competition lies at the heart of the framework presented here. The property rights given to innovators encourage competition.

This view of the market assumes that, in the long run, all markets are contestable. Contestability means that, while in the short term patents may result in some firms being given a market advantage (which is the reward for innovation), in the long run markets converge to a (real world) competitive market. This effect is driven by the ability of other firms to enter into the market if they believe that there are profits to be earned. In this competitive state, all the trades that are mutually beneficial take place (taking into account unavoidable transactions costs) and the costs imposed on society by monopolies are removed. The assumption of contestability means that, in the long run, firms will always find a way to compete.

Stage 6: Competition reduces the profits of the firms in the industry

As competition rises, profits get eroded away. This is a familiar story in markets. As more producers enter markets, the amount of produce supplied rises and the price falls, reducing the profits to firms.

This decreasing profit creates incentives to innovate to, once again, change the market structure and gain more profit through the rewards offered by gaining property rights in an innovation. Thus, the cycle has turned full circle and we are back to stage one.

An alternative view

An alternative view is that markets are not always contestable in the long run. The implication of this is that success does not attract competition because of some barrier to entry to the market. This means that the initial innovator can perpetuate their market advantage beyond the initial property right, and does not have its long run profits eroded by competition. Box 3.4 considers how this might be the case in the market for genetically engineered seeds.

3.4 **Transgenic seeds — a contestable market?**

Innovations in gene technology can be divided into enabling technologies and implementation technologies. Enabling technologies are the basic techniques used in the genetic manipulation of organisms, whereas implementation technologies build on the enabling technologies to produce a specific product, such as a variety of insect resistant cotton.

Patents can be held over enabling technologies, just as they can be held over implementation technologies. The owners of patents over enabling technologies are in a particularly powerful position commercially as all implementation technologies that embody the enabling technology are in potential infringement of the enabling technology. This puts pressure on the developers of implementation technology to enter into a license agreement with the owner of the enabling technology. This makes enabling technologies extremely valuable as they allow the owners to virtually control access to the technology.

The consolidation of the ownership of agricultural biotechnology firms that has occurred over the past decade has, to some degree, been motivated by a desire of the big firms to capture ownership of valuable patents and especially enabling technologies. For instance, Monsanto bought a company called Agracetus that, in 1994, was granted a European patent (no. 301 749) over 'a soybean plant comprising in its genome a foreign gene effective to cause the expression of a foreign gene product in the cells of the soybean plant', effectively giving a patent over all transgenic soybean varieties. In 1992 Agracetus was granted a US patent with a similarly broad scope over genetically engineered cotton.

In the market for transgenic seeds this consolidation of ownership of enabling technologies means that only a handful of firms control access to key patents.

It is difficult for the patents owned by these firms to be challenged, as they are large players in the market with considerable resources. These large resources mean that they are willing to defend and pursue legal challenges. Anecdotal evidence suggests that these firms cross-license technology so that, within this group of large players, there is little incentive to challenge property rights.

The concern is that this concentration of ownership of enabling technologies perpetuates a monopoly in the market for transgenic seeds. By limiting access to enabling technologies, large firms guarantee that they will have ownership of the next stage in the development of enabling technology since they are in a position to control existing research. Hence, their dominant market position is maintained as the ability to use these fundamental enabling technologies determines the ability of firms to develop products to bring to the market.

Whether this will turn out to be the case remains to be seen — after all, the transgenic seed industry is relatively young. A key factor may be the way research evolves over the next few years.

How the contestability of the market changes the analysis

Regardless of the view of how contestable markets are in the long term, it is still true that the property rights given by patents are important in defining a market. It follows that, when compared with the alternative of the absence of a market rewarding innovative effort, the property rights given by patents are beneficial. This is because a market where

some exchange can occur is better than no market at all. In this regard, it is important to remember that people only enter into an agreement if they think they have something to gain from it — this means any trade must leave people better off than they were before the trade.

Whatever the view of contestability that is preferred, the property rights given by patents are desirable as they allow at least some exchange to occur. Without property rights there would be no markets rewarding innovation, no incentive for innovative effort and no way to benefit from such innovation. The only way that innovation would occur is if government managed it. In other words, an environment would need to be created which made the market outcome of engaging in innovation unimportant to the R&D body.

In other areas contestability does affect the analysis. If the view is taken that markets can exist which are not contestable, then the link between stage 4 (reward) and stage 5 (other firms compete) is broken. This suggests that regulation of anticompetitive behaviour may be desirable.

The introduction of regulation of anticompetitive behaviour is riddled with trade-offs in policy. While a long-term monopolistic market imposes significant costs on society in terms of inhibiting trade and possibly retarding innovation, it is not clear that the regulation of anticompetitive behaviour achieves a better outcome. This is because, by regulating and, hence, limiting the rights associated with patents, such regulation may diminish the incentive to innovate offered by the patent system. Depending on how the system is administered, there may also be significant social costs associated with the costs of litigation. This is not to say that in such an instance long term monopoly markets should not be regulated, but rather that the nature of such regulation is a complex issue and should be approached with considerable thought.

Contestability: which view to take?

A threshold question emerges as to whether long term monopolies are realistic. That is, whether markets are contestable in the long run. It is easy to think of markets that are not contestable in the long run. Examples include telecommunications (until recently), postal services, television broadcasting (only a limited number of commercial licenses exist) and wheat exporting.

The thing with all of these examples is that they are all perpetuated by government intervention. For example, the Wheat Board has a statutory monopoly over the export of Australian wheat.

It is much harder to identify markets where monopoly positions have been maintained without government help. Possible exceptions might include sectors of the computer industry, the oil industry and the biotechnology industry.

The oil industry is notorious as a market that has had a long history of anticompetitive behaviour. The disintegration of the Standard Oil Company in the early part of the twentieth century was a landmark in the development of US competition law. Meanwhile,

the oil crises of the 1970s were due to the operation of the OPEC cartel. This suggests that, in the oil market, monopolistic market structures have been maintained over long periods. However, after close inspection, it is revealed that oil industry has been characterised by extensive government intervention. OPEC is itself an agreement between governments. As Yergin (1991, p. 783) points out, 'the state-owned companies of the oil exporters have the pre-eminent position today. They are a diverse group — Saudi Armaco, Petroleos de Venezuela, Pemex in Mexico, the Kuwait Petroleum Company, Pertamina, Statoil in Norway, to name a few.'

The computer industry is often cited as an example of how monopolistic companies can emerge. Taking one point in time and evaluating market share certainly suggests this may be the case. However, indicators such as market share and the number of firms in an industry are not always the best indication of the contestability of a market (if you look at the discussion of what contestability says, there is no mention of the actual number of firms producing). The true test is firm behaviour. The number of firms does not really matter, so long as they behave in a manner that is not consistent with competition. The behaviour of Microsoft or Intel (both often cited as monopolistic) should be judged in this light. For instance, the behaviour of Microsoft in adopting a Windows format (which Macintosh had been using for years) is not consistent with a firm who believes they have an unassailable market share — it suggests a firm scared of losing customers to a competitor. More starkly, the motto of Intel is 'Only the paranoid survive', a philosophy that tends not to suggest a comfortable monopoly market. Of course, other views exist, notably in the US Department of Justice.

As to whether the agricultural biotechnology industry, and in particular the concentration of enabling technologies (box 3.4), will be characterised by perpetuating monopolies, it is impossible to be sure. For this relatively young industry, time will be the ultimate test.

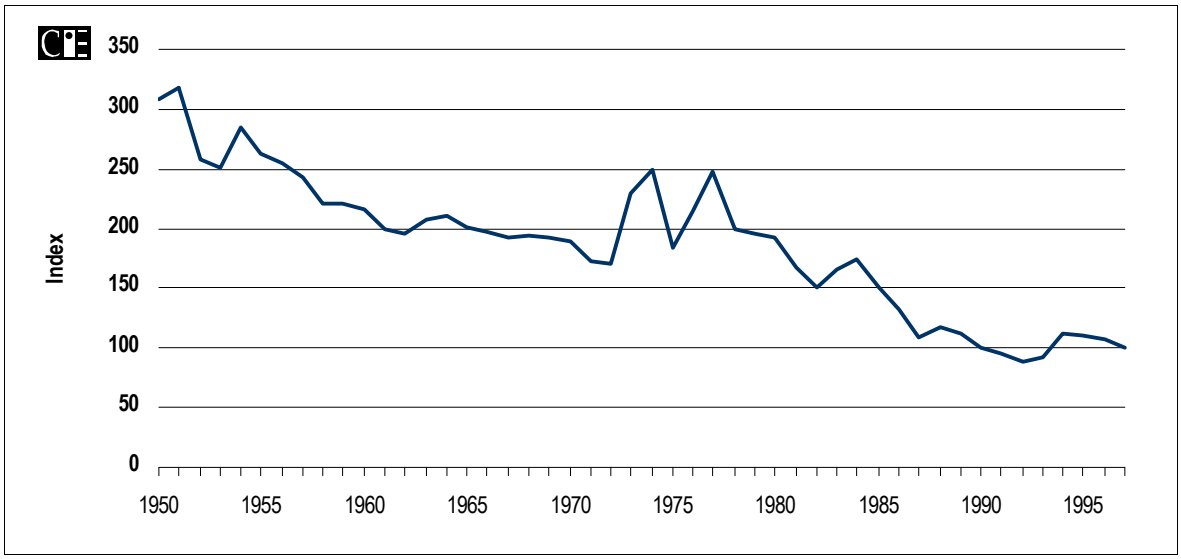
The relative paucity of unequivocal examples of perpetuating monopolies that operate without government help suggests that, in the absence of very strong arguments to the contrary, it is better to characterise markets as contestable in the long run.

Longer term issues: the effect on prices

In the long run, innovation tends to put downward pressure on the price of a given good. This can occur in two ways. Better goods are produced and competition from these goods will push down prices. Alternatively, innovation aimed at reducing producer costs becomes so widely disseminated that the whole industry supply curve shifts outwards, driving prices down as producers, as a body, become more willing to supply the market at any given price.

Both these effects will take time to occur. Critical to the downward pressure innovation puts on price is the wide adoption of the technology. One small producer using a really cheap production process will not have any effect on prices in a global market. It takes a lot of producers to take up a technology before it will have an effect on world prices. Since the uptake of technology can take time we expect this effect to be observed in the long run.

3.5 **Real prices of commodities are declining**



Data source: World Bank (1992 and 1997).

The impact of IP law on this price effect is a little hard to unravel. On one hand, a patent of 20 years is likely to slow down the rate of adoption — however, this may be offset by the added incentives patents give to engage in innovation. Intuitively, it seems more plausible that, as patents become stronger and the incentives to innovate become greater, the long run pressure on prices to fall should become larger.

Movements in real prices of agricultural commodities over the last 50 years, shown in chart 3.5, are consistent with this intuition.

Implications for international trade

The framework that has been developed in this chapter has several important implications for trade, particularly for agricultural trade where the trend is for intellectual endeavour to underpin much of the value of the products being traded.

The first critical point is that property rights create markets. It has been argued that, without property rights, no trade would occur (unless facilitated by some other scarce factor) and, without trade, there is no incentive to innovate — why come up with a good idea if someone else will just take it? In the absence of property rights, markets for innovation fail to develop. In this sense, patents are good in that *a* market seems better than *no* market, even if it harbours some inefficiencies.

The second point is that property rights create prosperity. Contemporary growth theory emphasises the role of technological advancement as a central driver of growth. IP is one of the institutional arrangements that facilitate innovation (and, hence, technological advancement) by creating markets for innovative ideas and products. The property rights given by IP are a crucial link in the dynamic system that creates technological

advancement and, hence, growth. It is in Australia's interest to have world growth, as a wealthy world helps us by giving Australia lots of wealthy customers to trade with.

Lastly, by allowing property rights over innovations to be established, patents create benefits for producers and consumers. Property rights allow markets to develop and trade to occur. Markets give the opportunity for a return to be realised on innovation, which provides an incentive to engage in R&D. Producers benefit from a market in which to sell their innovative products and consumers benefit from markets in which innovative products can be bought. As against the situation where property rights do not exist and markets fail to develop, this constitutes a win-win situation. Importantly, this demonstrates that the amount of innovation that takes place in a country has little to do with whether that country benefits from strong, clear patent law. This is because, even if no innovation takes place in the country, consumers of innovation still benefit from having markets where innovative products can be acquired.

4. Analysing GIs

Labels and brands are a form of IP that communicate the nature of products to consumers. This is an important function as markets work best when information about products is freely available. This chapter examines whether GIs enhance or diminish the ability of producers to distinguish the nature of their product in the market place. Given that producers can protect labelling through the trademark system and associated regimes, it is suggested that strict GI protection can restrict access to some generic food terms, without any significant compensating benefit. This diminishes the information able to be communicated by Australian producers to consumers.

Different levels of GI protection exist

The effect of appellations of origin and GIs depends on the rules that govern them. In the TRIPs agreement there are two types of regime that govern GIs — one strict and one weak.

The weak regime only prohibits the use of a GI when its use creates confusion as to the origin of a product. This is very similar to rules in Australia prohibiting deceptive or misleading conduct in trade or commerce. In fact, these rules existed before TRIPs and were used to satisfy our obligations under TRIPs with respect to this weak version of GI protection.

This weak form of GI protection can be justified on the basis of reducing consumer search costs by facilitating the provision of accurate product information to consumers. The test of consumer confusion means that a label is prohibited only when it is detrimental to market outcomes. On this basis, there seems little problem, in terms of economics, with this weak form of GI protection.

The strict form of GI protection only applies to wine and spirits at present. In contrast to the weak form of protection, it is a far more controversial form of regulatory control.

Strict GI protection

The owner of a GI governed by the strict set of rules does not have to prove confusion in the mind of the consumer to establish infringement. To successfully exclude another person from using the GI it need only be established that the label in question is a GI, and that it is being used by a producer that does not come from the geographical region that enjoys the benefit of the GI.

The strict form of GI protection gives a form of trademark protection to a country or region, as opposed to an individual firm. Ownership is decided on the basis of history and reputation, as opposed to actual use or market position.

Strict GI protection gives a marketing advantage

Strict GI protection gives a marketing advantage to producers from the country or region that enjoys the benefit of the GI protection. Having the exclusive use of a label (the GI) allows this group of producers to potentially differentiate their product. By doing this they can capture the benefit of the reputation attached to the GI.

Consider 'champagne'. Embodied within the label 'champagne' are a set of images and associations that have been built up over a very long period. It is a name that is associated, in our language and culture, with celebrations, opulence and luxury. These are powerful marketing images. Firms that enjoy the benefits of GIs are able to use these images associated with names, such as 'champagne'.

They also benefit from the fact that firms that are not able to use the GI tend not to have such ready access to names with such useful connotations. In comparison to 'champagne', a term such as 'sparkling wine' has little intrinsic attraction, although this may change over time.

The strict form of GI protection allows the 'owners' of the label to differentiate their product and capture associations that have built up over a long period of time. This means that they can charge higher prices based on this captured reputation and hence have a greater opportunity to achieve a position of some market dominance.

…and it can put other countries at a marketing disadvantage

GIs put countries that do not enjoy the benefits of GI protection at a distinct disadvantage. As was outlined above, 'sparkling wine' is not as useful a name as 'champagne'.

The magnitude of the disadvantage is dependent on several things.

The existing industry reputation

An industry with an established reputation for excellence is unlikely to be as affected as an industry without any reputation, or, for that matter, an industry with a poor reputation. Having an existing reputation means that consumers will tend to seek out the product of the industry, even if the name has to change in response to a GI.

For an industry with a solid reputation the detrimental effect of having to change product labels is likely to be short lived. The main challenge is to teach consumers that the names of products they like have changed.

Emerging industries

Emerging industries have no existing reputation. This means that it is difficult to enter a market which is affected by GI protection. This is because producers, by being barred from the use of a widely recognized label, can not easily signal to consumers the nature

of their product. It is difficult to enter markets as a competitor when it is difficult to let it be known that your product is in competition with other products.

Efficacy of the industry's marketing mechanism

The existing reputation of most industries will be somewhere between the two extremes outlined above. In this case, the extent of the detriment caused by the GI protection will depend on the efficacy of the marketing that is employed. If the firms in the industry can establish a distinct reputation quickly in the market then the detriment caused by GIs will be small.

Establishing a reputation requires vision, a quality product, resources and flexibility. It requires that the marketing body, whether that be individual firms or an industry body, be able to treat different products differently. Marketing is, fundamentally, about establishing distinctiveness and portraying difference to the greatest advantage to meet the distinctive demands of various groups of consumers.

Whether an industry is able to market its product effectively will depend on how well they fit this picture. An inflexible, under-resourced marketing mechanism that is unable to recognize and exploit differences in products may hinder the adjustment of an industry to new GI rules.

Market sensitivity

Imagine 'bratwurst' was protected as a GI and is owned by German producers. If Australia wanted to export Australian produced bratwurst to France then this is a big problem, as the French would know exactly what bratwurst is and would be likely to attach a high premium to the 'real' thing. However, if Australia wants to export Australian bratwurst to, say, Laos, then not being able to call it 'bratwurst' would not be a problem as consumers in Laos are unlikely to have a clue what bratwurst was. Calling Australian bratwurst 'German sausage' is unlikely to have any impact on the commercial successes of Australian bratwurst in Laos.

The point is that to evaluate the impact of a GI it is important to remember the markets that Australia operates in and the name recognition of consumers in those markets. It may be that, by opening up markets, Australia can choose the name of products, thereby making GIs irrelevant.

The amount of language controlled

The last factor affecting the scale of detriment imposed by GI protection is the scope of language captured by GIs. Currently, the strict GI regime just covers language that is directly linked to both product and place. Only identifiable terms that refer to a geographical region and product originating in that region are captured.

There is a possibility that the forthcoming negotiations of TRIPs will extend this protection. The EU are likely to push for protection of products that are strongly

associated with a particular region but whose names do not coincide with that of a geographical location (such as 'feta'). There is also a push to protect so-called 'traditional expressions' such as 'reserve' or 'brut'. The precise nature of the link that these expressions have to the countries that claim them seems to lack definition. However, it is evident that the EU has a clear agenda based on broadening the scope of language protected.

The greater the scope of language that is controlled by a country, the harder it is to market a product. Past a certain point, this broad form of protection starts to look similar to a prohibitive tariff or quota. Imagine trying to market wine if none of the language that has built up around wine can be used. It would be virtually impossible. Tying up language in this way would amount to a form of trade protection giving dominant market share to the country that enjoys the protection. All other producers would be able to trade wine but would not really be able to identify it as such. In effect they would be locked out of the wine market, having to compete in an 'alcoholic grape juice' market.

This is an extreme example but it illustrates how the ownership of language can affect market outcomes and possibly replicate some of the anticompetitive elements of subsides, tariffs and quotas.

GIs may provide good incentives to industry

The imposition of GI protection imposes a short-term detriment on an industry. This detriment provides a strong and immediate incentive for an industry to engage in aggressive marketing and engage in cost or quality improvements as a way of differentiating their product.

Hence, having to deal with GIs may force an industry to work harder at creating positive market outcomes rather than free-riding on reputations attached to names that have been established by other market participants.

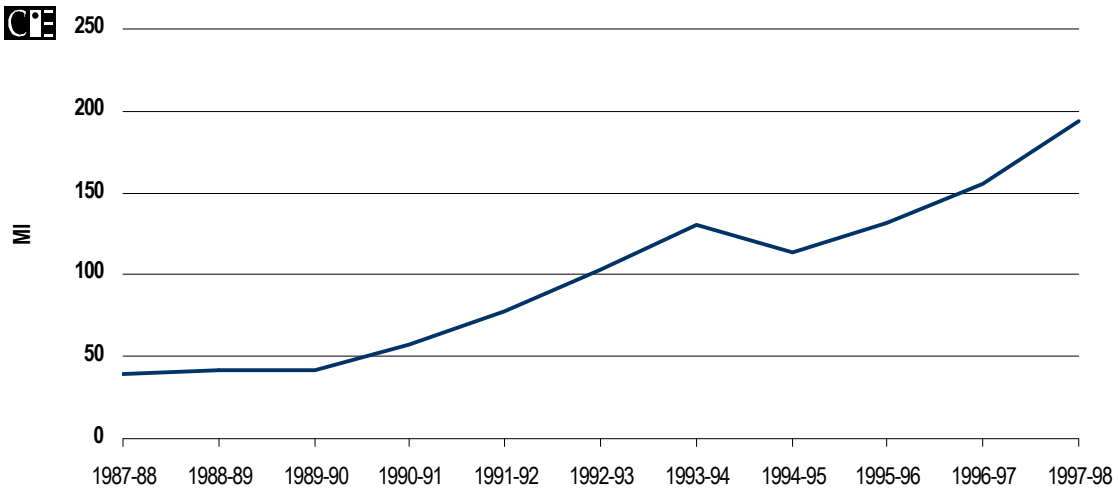
This incentive story may be valid. However there is no reason why an industry cannot be aggressive and dynamic while at the same enjoying the benefits of a name. This argument would seem to apply only to those industries that are operating below their potential in the first place.

4.1 **Case study: the effect of GIs on the Australian wine industry**

The protection of GIs was first introduced to the wine industry in 1993 via a bilateral agreement between the EU and Australia. Since TRIPs has come into effect, the range of GIs protected has increased progressively as time goes by.

Over this period the Australian wine industry has done exceptionally well in establishing export markets. Chart 4.2 shows the increase in wine exports over the period from 1987-88 to 1997-98. For the first three years of this period there was little growth in Australian wine exports. However, in 1990-91 exports of wine took off. Since then growth has been remarkably consistent, except for the 1994-95 year in which the vintage was drought affected. The average growth rate of exports since 1990-91 has been 22 per cent per year. This tends to indicate that the introduction of GIs has had little effect on the performance of the wine industry in Australia.

4.2 **Growth in Australian exports of wine**



It is important to understand why this might be the case — after all, intuition would seem to suggest that the wine industry would be particularly vulnerable to the introduction of GIs.

Key factors in the strong growth of wine exports in the face of increased GI protection can be grouped into two categories, marketing and consumer characteristics.

Marketing

The Australian wine industry has a very flexible marketing structure compared to many other agricultural industries. The Australian Wine and Brandy Corporation (AWBC) has a general charter to promote Australian wine. Alongside this, the AWBC also issues export licenses which are granted provided that producers meet minimal standards of quality (essentially that the wine is identified correctly and is of a marketable character).

Continued on next page

4.1 **Case study: the effect of GIs on the Australian wine industry** Continued

The responsibility for marketing individual products lies with producers. The AWBC only provides opportunities, such as trade fairs, for producers to exhibit their wines. This focus on the marketing role of producers has several positive incentive effects. It means that producers are very aware of market tastes and regulatory issues. So producers can tailor products for markets. It also means that production is very flexible — if one variety is popular while another is not, it means that the less popular variety can easily be dropped. This decentralized marketing approach means that marketing resources within the industry are allocated to products with the greatest potential. That is, the marketing mechanism is both relatively efficient and flexible.

The branding of Australian wines is also important. Wines are sold on the label. Australian producers have been concentrating on developing label recognition in markets, and have generally been able to do this without referring to GIs. For instance, it is very difficult to buy Australian claret. Instead, what were once identified as Clarets are now identified by grape variety, such as cabernet sauvignon. In addition to this, the branding of Australian wines has tended to draw attention away from the generic style of the wine and instead concentrate on the vineyard and specific product. For instance, Penfolds Koonunga Hill is well known by name, not so much by variety.

Consumer characteristics

Wine drinkers are generally well educated about the product they consume. And they are generally willing to be further educated. They are a discerning bunch for whom the quality of a product is generally apparent. They also appear to quickly develop brand loyalties to products that are appropriately priced for quality.

This is an advantage when trying to overcome the labelling restrictions GIs impose. The high level of discernment and brand recognition amongst wine consumers means that once a product is established as being of a satisfactory quality, it will be remembered as such.

To demonstrate the discernment amongst consumers between wines it is sufficient to consider the prices of wines in a bottle shop. Penfolds Grange Hermitage, a premium wine, sells for around $300 a bottle, Penfolds Koonunga Hill, a pleasant drinking wine, sells for around $12 a bottle, and Penfolds Rawsons Retreat sells for around $8 a bottle and appeals to yet another segment of the market.

Quality is always important

The ability of Australian wine makers to expand their export markets has a lot to do with the flexible nature of the industry's marketing structures and the intelligent use of branding. Similarly, the wine industry benefits from an informed and discerning clientele. However, it is important to note that these factors could only contribute to the robust growth of exports because of the basic quality of Australian wine. The fanciest marketing in the world cannot hide a substandard or over priced product. The Australian wine industry has performed well because they got the basic requirement of product quality right, and then built on it.

The implications for trade

GI protection is, fundamentally, about the ownership of language. To be able to benefit from GI protection, a country must have originated the terms in question. The name must be linked to both a product and a region.

Deciding whether a country can benefit from the rules about GI protection is really about deciding how that country is linked to the development of language. New countries and cultures may not have been able to make a contribution to the development of language. Old countries and cultures have been in a position to make such a contribution.

The potential of a GI to be a barrier to trade has much to do with the generality of the language that is tied up. The protection of specific language such as 'Danish feta cheese' is less of a problem than 'feta cheese', which is less of a problem than 'cheese'.

There may be some potential for a few sectors of Australian agriculture to gain protection of a GI. However, it must be noted that the value of a GI lies in the historical associations that surround the product. A GI with few such associations would have little value in the marketplace.

Where Australia does have potential GIs (perhaps in cut wildflowers) it may be that alternative forms of protection may be available. Before focusing on GI protection, it seems prudent to make sure other avenues such as trademark protection (with the trademark being owned by an industry body) are not available. In these instances trademark protection has the advantage of relying on a well developed body of legal principle, as opposed to the still developing body of principle underlying GI protection.

It is important to remember that in gaining a GI over, say, 'champagne', the Europeans are obtaining ownership of a term that is highly unlikely to be protected by trademarks, or any similar regime, due to the highly generic nature of the term.

Extensions of GI protection, such as traditional expressions, are even more starkly about the ownership of language. If GI protection as it stands now has little scope to benefit Australia, such extensions have even less. Such extensions have the potential to be significant barriers to trade.

5. Capturing the rewards from IP

It has already been noted that ownership is only part of the IP story. Much of the reward involved in owning IP is dependant on how these rights are used and the surrounding market conditions. This chapter aims to illustrate this point by looking at some of the broader issues that arise in the management of IP.

Owning IP is, itself, a costly exercise

After all the R&D has been paid for, it still costs money to acquire a patent. The level of cost of IP varies from regime to regime. Table 5.1 shows rough estimates of the cost of acquiring IP rights across several different regimes.

From table 5.1 it is easy to appreciate that the cost of acquiring IP rights differs markedly between regimes. In particular, the difference in cost between a trademark and a patent is significant. It is also important to note that these costs are not complete.

All IP rights can be acquired internationally. This tends to mean going to each country in which you want property rights and applying for a patent, trademark, etc. For a patent, this will typically cost between A$10 000 and A$20 000 per country. In addition to this, applications need to be in the language of the country. Translation fees for complex patents can be extremely high. For a plant breeder's right, the cost tends to be a little lower (generally closer to A$5 000).

It is important to note that some forms of IP protection are free. All those systems, such as trade secrets, which are derived from the common law, are free in the sense that there is no application cost. Similarly, GI protection does not cost the producers who enjoy its benefit.

The last, and perhaps most important, cost associated with IP is the cost of litigation. IP rights are rights to exclusive use that are enforced by courts. To assert the right given by a patent or trademark against an infringement requires litigation. Sometimes the threat of

5.1 **The cost of IP in Australia** A$

	Provisional application	*Total cost for grant*	*Cost of updating right for full lifetime (not discounted)*	*Total cost*
	$	$	$	$
Patent	2 000	5 000–8 000	6 740	11 790–14 790
Trademark	–	300	–	300
PBR	–	2 000	6 000	8 000

Source: IP Australia and AFFA.

litigation is a sufficient deterrent, but at times, especially when the stakes are high, litigation is the only option.

Litigation is extremely costly. The costs take the form of legal fees, lost time assembling information, the chance of having to foot the other side's bill if you lose, stress and bad publicity. Litigation in IP is particularly expensive because it requires specialised lawyers to conduct the matter.

The costs associated with IP mean that the way owning IP fits in with the overall commercial strategy needs to be clearly thought out. Mismanagement of IP is liable to impose considerable costs on an organisation and erode any benefit IP may have brought. This can destroy the reward aspect of IP.

Branding is important in gaining the rewards of innovation

Patents reward those innovations that are successful in the marketplace. Being successful in the marketplace requires a quality product, but it also requires clever marketing. Without a good marketing strategy it is unlikely that an innovation will receive the rewards potentially afforded by the patent system. In this respect, brands have a lot to do with the success of a new product. The example of the kiwifruit (box 5.2) illustrates this point.

Licensing an innovation can reap as many rewards as producing it

Once an innovative product — or brand name — has been developed, firms have to decide how they will use it. There are usually several options at this point. These options include producing the product, selling the technology outright or licensing it. Increasingly, firms are choosing to license their innovations to other firms to produce and collecting a royalty.

Deciding on the optimal structure of a licensing agreement can take some time and thought. However, the rewards can be substantial. The numerical example in box 5.3, based on the Australian apple industry, shows how the successful licensing of a new variety could potentially yield returns that approach the returns to actually producing the product.

5.2 **Kiwifruit and the chinese gooseberry**

The first known propagation of the kiwifruit in New Zealand was in the early 1900s. At this time the kiwifruit was known as the 'chinese gooseberry'.

It was only in the 1950s that the fruit began to be established as a commercial variety. This followed a long period of selection and grafting, when nurserymen sought to improve both the size and taste of the fruit. The most successful of these pioneers was Hayward Wright who propagated the 'Hayward' variety of chinese gooseberry. This variety came to be a standard and is still the dominant variety, both in New Zealand and around the world.

During this period the chinese gooseberry began to establish itself in the domestic, New Zealand, fruit market. However, aside from small shipments of fruit to London and Sydney, the chinese gooseberry was little more than a slightly odd novelty in other markets around the world.

Another of the pioneers of the chinese gooseberry was a man called Grahame Turner, who was a principal in a company called Turner and Growers Ltd. This company, at the direction of Grahame Turner, was pivotal in establishing the chinese gooseberry as an export commodity. They were also important in cementing the domestic base for the industry.

Turner and Growers Ltd undertook a series of initiatives which included advocating the commercial potential of the Hayward variety, developing improved methods of bringing the fruit to markets and developing markets overseas.

The cleverest thing that Turner and Growers did was to change the name of the chinese gooseberry to the kiwifruit. This overcame a considerable hurdle, in the 1960s, in terms of market development.

The success of the kiwifruit has been considerable. In 1950, 50 tonnes of fruit were produced for commercial sale. By 1995, world production was greater than 900 000 tonnes. Almost all this growth in production has occurred subsequent to the fruit being marketed as the kiwifruit. This name, which started as a brand, has been so successful that virtually all producers worldwide identify their product as kiwifruit. Now, New Zealand only produces around 35 per cent of world production.

The development of the kiwifruit illustrates how the commercial success of a good product can be triggered by a powerful brand name. The kiwifruit is doubly interesting, as it is an example of a product that was never patented or protected by a plant breeder's right. It is instructive to consider the potential returns to New Zealand's nurseries had they been able to tap into the growth in production of the fruit around the world.

Fashions, trends and public opinion

The success of a product is often determined by fashion and consumer whim. This is almost regarded as a fact of life; what is chic today may be dowdy tomorrow. Public opinion can also be instrumental in constructing more substantial barriers to the marketplace.

5.3 **Making the most of a new variety**

In this example a new variety of apple is considered. We assume it has reasonable commercial potential and so is able to attract the 30 per cent price premium that is often attached to new varieties.

Of this 30 per cent, we assume the innovator is able to license the variety so that a 5 per cent price premium goes to the innovator and a 25 per cent premium accrues to the grower and supply chain.

Since the hypothetical variety is commercially attractive, we assume it captures a 5 per cent share of world production.

Australia's apple industry is worth $0.25 billion and makes up 1 per cent of the world market. Hence, the value of one year of the income stream from royalties attached to the new variety is calculated as follows.

- $250 million x 5 = $1.25 billion [5 per cent of world market at current prices]
- 1.25 billion x 0.05 = $62.5 million [value of one year of royalties]

The stream of royalties have the following net present values (NPV) if they last for the time periods indicated.

	2 years	***5 years***	***10 years***
NPV of royalty stream discounted at 5% ($million)	116.21	221.62	482.61

Given that the gross value added of the apple industry is estimated conservatively at between $75 million and $125 million per year, it is clear how the income stream from royalties can approach the benefits from actually producing.

This example, although based on strong assumptions, illustrates the potential benefits to licensing technology.

This can often be the case with innovations, particularly when the innovation involves a fundamentally new way of viewing things. A case in point is the controversy that has surrounded genetics. Box 5.4 shows how European public opinion almost scuttled the agricultural biotechnology industry.

It is important to remember that innovation carries with it change, and people can react adversely to change that they do not feel comfortable with. The success of an innovation, and hence the size of the reward a patent carries with it, can depend on the way people embrace, or fail to embrace, this change.

As shown by box 5.4 on Europe, public sentiment, which may or may not have a strong logical basis, can drive government policy on international trade and whether property rights are assigned to new technologies. This is important for innovators to remember. Those involved in the innovative process need to be aware of the need to retain public confidence and enthusiasm for the technologies under development if the rewards of this innovation are to be properly realised.

5.4 **Trading on good will**

Agricultural biotechnology, and genetically modified crops in particular, generate a bewildering array of public reactions. Producers tend to look at the promise of yield increases with hungry eyes, and bankers and financiers get excited by the opportunity for high yields of a different sort.

Not everyone is so keen, however. Consumers have generally failed to embrace the notion of genetically modified food. Europeans, in particular, are almost militantly against it.

In the UK a groundswell of public opinion has prompted three of the major supermarket chains to ban the stocking of genetically modified foods. In a national survey the *Guardian* newspaper found that 96 per cent of British consumers want genetically modified foods specifically labeled. Only 14 per cent of British consumers are happy with the introduction of such foodstuffs. The Prince of Wales has even entered the debate, arguing the case against biotechnology in agriculture.

Austria, Luxembourg, France and Ireland have also had groundswells of opinion against genetically modified foodstuffs. The governments of all these countries have followed public opinion and hampered the introduction of genetically modified crops in their countries. Austria, Luxembourg and France have banned the sale of such crops.

The arguments put forward against genetic manipulation of foodstuffs tend to fall into three broad categories.

- People are scared of the possibility of releasing artificial traits into the natural ecosystem. Scientists have rendered genes which make plants sterile — what if this got into the ecosystem and wiped out whole species?
- There is concern that genes that, say, create immunity to bacteria in plants would enter the human body and generate harmful pathogens in the stomach (this argument appears to be based on a misunderstanding about the nature of human biology).
- Lastly, some people claim that scientists have no clear plan of action if something goes wrong (this argument seems to be in ignorance of the procedures that surround, for instance, field trials of transgenic crops).

These concerns appear to be spreading through the developing world. So much so that enough countries had misgivings about genetic engineering that a protocol on biosafety was proposed at the February 1999 meeting of the United Nations Convention on Biodiversity in Cartagena, Columbia.

This protocol sought to impose strict controls over trade in GMOs. It was proposed by several members of the EU and several developing countries. The protocol would have allowed countries to ban imports of any genetically modified product. Opposition from Canada, Argentina, Australia, Uruguay and Chile scuttled the proposal.

This case study illustrates how public opinion has the potential to shape trade and trade agreements.

Technology transfers and joint ventures

Entry into a new market may require that a firm set up a plant in a foreign country or enter into a joint venture (box 5.5), on the supply or production side, with a company that is resident in the country. The incentive to enter into this sort of arrangement can be dramatically reduced for a firm that gets its competitive advantage from IP if the country that it is trying to set up in has only weak recognition of IP rights.

The problem is that it is difficult to keep secrets in a joint venture. This means that joint venture agreements normally address the issue of who owns the IP in the commercial partnership. If this issue is not addressed, the partner company may have an incentive to extract the IP and use it to their advantage, potentially in competition with the original owner.

The problem with some developing countries is that, while they require joint ventures to be entered into for access to their markets, they do not have a clear and robust IP infrastructure. It is almost impossible for a foreign firm to get their property rights over intellectual endeavour recognised in these countries. This creates a virtual barrier to trade by effectively barring technology rich companies from entering markets in those countries.

This is an important issue for innovators. In countries with potentially weak IP infrastructure, owning a patent or brand will not be enough. The ability to enforce and write contracts over this property, for instance, in joint venture agreements, must also be evaluated. If IP is misappropriated, then the rewards that IP give will begin to be eroded.

This also has a clear policy implication. Stronger recognition of IP rights in developing countries has the effect of opening up markets. This has the capacity to benefit both Australia and our potential trading partners, by allowing mutually beneficial trades to take place.

5.5 **Indonesian foreign investment restrictions**

Joint ventures have long been a part of foreign firms establishing a commercial presence in Indonesia. Until recently, joint ventures were the only way overseas companies could invest in Indonesia. This changed in 1996 when the government allowed 100 per cent foreign owned companies to be established in some industries, these are known as PMAs (Penanaman Modal Asing or foreign capital investments). Further deregulation has followed in Indonesia, largely forced by the Asia crisis and IMF intervention.

However, certain industries still require joint ventures, or some other form of Indonesian involvement, to be entered into if a foreign firm wishes to establish an Indonesian presence. These industries include food and drink manufacturing, animal husbandry and agricultural production. Even in those industries where PMAs can be established, many advisors still recommend joint ventures as a means of bridging cultural gaps and establishing business networks.

6. What is a good outcome from TRIPS?

The forthcoming negotiations

It is expected that the TRIPs agreement will start to be reviewed during the year 2000. This means that the minimum standards of IP protection available globally will probably change.

It is important to think about what changes are likely to happen and which changes we want to happen. To think about this we need to have a clear picture of:

- how changes in IP impact on the agricultural sector economically; and
- the agendas of other countries in the coming review.

We have already discussed in depth how IP, and in particular patents and GIs, affect agricultural markets. Patents facilitate the development of markets for agricultural innovation, while GIs have the potential to restrict access to key generic food labels. Now we examine what other countries are likely to be pushing in the coming negotiations. Then we discuss what may be in Australia's best interest.

Who wants what?

In the coming review of TRIPs it is likely that countries will divide into three areas:

- the United States
- Europe
- developing countries.

Each area is likely to be pushing a different agenda, which is dictated by their level of development, expertise in innovation and, to some extent, reputation for food production.

The United States

So far, the United States has been a dominant player in the development of TRIPs. This is not surprising as the United States appears to be the largest producer of commercial IP in the world. This is especially true of biotechnology (see appendix A).

In the coming negotiations it is likely that the United States will spend a lot of effort on the formulation of much stronger compliance provisions in order to try to curb piracy in developing countries and put pressure on developing countries to increase the rate at which they are instituting adequate IP regimes.

It is difficult to anticipate the United States position on the patentability of biotech and GMOs covered by the controversial article 27.3b. On some interpretations of the provision the protection afforded biotech firms selling technology may be adequate. However, the ambiguity of the section makes it foreseeable that the United States will try to reformulate it in a clear manner. Whether the United States attempts to strengthen the section is unclear, especially given the current mood in Europe against genetically engineered products.

There seems little incentive for the United States to want any change to the provisions governing GIs and there certainly seems nothing to suggest the United States would want protection for traditional expressions (see Europe below). The United States is a young country and few, if any, major agricultural or food products have a link to the country in a manner that would invite GI protection.

Europe

Major issues for Europe are likely to be the patentability of biotech and GMOs, the development of rules surrounding GIs and the introduction of protection for traditional expressions.

Currently Europe, and the United Kingdom in particular, has considerable public distrust of genetic engineering and almost anything to do with biotech. This has emerged in a climate that saw food technicians discredited during the BSE scare in 1996. So, when scientists are reported speculating about health implications of biotechnology, only pessimistic stories are credible to the public. In addition to this, it has been reported (*The Economist* 18 July 1998) that European biotech firms are having trouble recruiting management, which suggests a weakening European biotech industry. These factors suggest that Europe will tend to oppose any strengthening of the rules regarding the patentability of biotech and GMOs. Instead, they will go along with public opinion.

The primary focus for European negotiators is likely to be the protection of GIs and the introduction of traditional expressions. Europe, as the cultural origin of many popular foodstuffs worldwide, may be in a position for its producers to gain from restricting the use of names and allied terms. It is less clear that European consumers will gain. They may end up paying more for the same, or inferior, quality if GIs reduce international competition.

It has been noted that the rules surrounding GIs for wines and spirits are stricter than those that apply to other foodstuffs. It seems likely that the European Union will push for this to change, so that all foodstuffs are covered in the same way that wine and spirits are. In this way, the European Union may gain control over names like ‘feta’ (Yeed 1997).

The European Union is also likely to try to extend this protection to cover ‘traditional expressions’. Traditional expressions cover those turns of phrase or words that have come to be intimately linked to a certain product. For instance, the word ‘tawny’ is so linked to ‘port’ as likely to be considered a ‘traditional expression’.

Developing countries

The main issue for developing countries will be compliance. Developing nations are likely to oppose stronger compliance measures for many reasons. In particular, complying with TRIPs requires expertise and resources that many countries will not have.

It also appears that many developing countries are beginning to follow the lead of Europe in pushing for increased GI protection. The reasons for this are unclear, as it is doubtful whether most developing countries protect their own GI's domestically. Without domestic protection, it is not possible to benefit from TRIPs protection.

Working out what is in Australia's best interest

Australia is a relatively small economy, with some expertise in agricultural innovation, that does a high proportion of its trade with Asia. This makes Australia fairly unique and suggests that it will not fit easily into any of the three camps outlined above.

This initial impression is confirmed in the following analysis. Australia's best interest does not coincide with the position of any one camp, but instead is best served by pursuing its own agenda.

GIs and traditional expressions

The experience of the wine industry suggests that the current rules surrounding GIs are not hurting Australia too much and may have even provided an added incentive to aggressively differentiate our product in the marketplace and pursue quality improvements in order to establish reputation.

However, it must be noted that the abolition of GI protection would leave the wine industry no worse off and would enable the accurate use of terms such as 'champagne' to describe Australian products.

There is little to support an increase in the level of protection given to GIs. Assigning effective ownership of language to a country gives one country a marketing advantage over others. This will, almost exclusively, benefit European producers at the expense of the rest of the world. This is because a huge proportion of the worlds traded foodstuffs can be linked historically to Europe. Australian producers have little chance of ever enjoying GI protection on a large scale.

The introduction of traditional expressions takes this one step further. By capturing the language that is used to describe a type of product, a country can seriously inhibit the ability of competing countries to market the same product.

The difference between GI protection and the protection of traditional expressions is one of scale. Protection of traditional expressions effectively transfers ownership of know-

how in food preparation to the countries of origin by making it almost impossible for a competitor to legally describe a product in language a consumer is familiar with.

This is a particularly concerning form of trade protection in a world where language and people are becoming more global. It has the potential to hurt Australia more than other countries, due to our historical reliance on immigration to transfer know-how.

Compliance

Australia exports a large proportion of our agricultural produce to Asia. As our ties with Asia become even closer and Asian economies continue to develop, it is likely that our exports to Asia will be highly dependent on IP and associated expertise. As our exports become increasingly dependent on embodied IP, it becomes correspondingly important that we can retain ownership of that IP when it leaves our shores.

Being able to control the ownership of IP is particularly important when entering into joint ventures overseas. Unless the ownership of IP can be clearly and meaningfully articulated, there is a high risk that a joint venture will result in the leakage of know-how and competitive advantage. This risk is most likely to manifest itself if the joint venture is unsuccessful. The greater this risk, the less the incentive to enter into joint ventures.

Thus, as Australia continues to venture into Asian markets it is important that these markets continue to develop IP infrastructure. Therefore, increased compliance with TRIPs by developing nations is in the national interest.

Patents

The existence of property rights has been identified as a prerequisite for trade. Thus, clearly articulated property rights would appear to be in Australia's interest. Australia should pursue the strengthening of the obligations TRIPs imposes on the patentability of biotechnological innovations so that, as far as possible, the international obligations mirror Australia's domestic law.

As was explained to in chapter 3, clearly defined property rights allow markets to operate. This is particularly important for an area like biotechnology, where the potential welfare benefits from trade appear to be large. Trade in biotechnology and related products is aided by well articulated, strong property rights.

Deciding what is an optimal outcome comes down to a choice between two cases. In the first case, property rights are not granted and markets fail to develop. This is the case where member countries are given discretion over whether to grant patents over some biotechnological innovations. In the second case, property rights are allocated and a market is able to develop, albeit with some short-term imperfection. From a welfare point of view, having a market is preferable to not having a market, as it allows at least some trade to take place.

As was indicated in chapter 3, everyone can benefit from the allocation of clear property rights over innovative endeavour. To think that only the leaders in innovation prosper is a fallacy. IP rights do not give a right to extract profits at the expense of the welfare of others. To put this proposition is incorrect — if a product is not welfare improving, consumers will not buy it. Thus, even a country that does not engage in innovation benefits from stronger property rights over intellectual endeavour by gaining access to the product of the intellectual endeavour of others. Thus, taking other rules such as patent length as given, it is in Australia's interest to lobby for more recognition of IP rights.

This provides a clear basis for supporting increased recognition for the property rights attached to biotechnology — that is, strengthening article 27.3b of TRIPs. There may also be some benefit in developing the competition provisions in article 40, depending on how the long-term contestability of markets is viewed.

7. Toward a domestic response

It is important to think not only of desirable outcomes from TRIPs, but also of the best response Australia could have to a revision of world IP law. Likely outcomes from TRIPs might be that protection for GIs and other appellations of origin become marginally stronger, the application of patent law to biotechnology becomes clearer, with more uniform protection, and the rate of compliance with existing obligations increases markedly.

An important question to raise is: how will this affect Australian R&D? Similarly, it is important to consider how Australia should respond to clearer and stronger property rights over intellectual endeavour. This is a big question — we can only begin to touch on it here.

IP and incentives

The question of incentives is at the core of much of IP law. Patents and related regimes are commonly justified on the basis of providing an incentive to innovate. In comparison, trademarks and GIs seem to have few incentive effects on innovation. In addressing the issue of how greater world recognition of IP will impact on Australian R&D, it is important to consider how the incentive effects of patents are generated.

Patents reward outcomes

The patent system does not reward R&D per se. Instead, it rewards the useful and original application of R&D. That is, it rewards R&D that has enabled a new product to be brought to the market. This is an important point for three reasons:

- it means that actual commercialisation must take place before an innovator is rewarded for effort expended in R&D;
- the innovation must have an identifiable owner before any rewards are accrued; and
- unsuccessful innovation is not rewarded.

Another important point is that the patent system is essentially a market driven system of reward. Only those products that are successful in the market accrue rewards. Although the patent grants property rights, there is no guarantee of financial benefit from actually having a patent. Consumers in the market must accept the product. This means that patents only reward innovation that is desired by consumers. Only innovation that will be successful in the market is given an incentive by the patent system.

Thus, it becomes clear that the patent system is quite unique in the nature and mechanism of the incentives that it provides.

- A system of tax incentives rewards the process of innovation, regardless of the success of the final product. The patent system only rewards successful outcomes.
- A system of government sponsored prizes (the most famous example being that offered to the first person to work out a practical method to calculate longitude) requires the government to guess the social benefit of the innovation. The patent system lets the market do this.
- Government conducted R&D requires the government to pick winners. The patent system provides a mechanism whereby inventors judge the viability of their own inventions with reference to the market.

In comparison to other incentive schemes, patents offer a unique form of incentive. The sort of project that will be encouraged by a patent system will tend to have the following characteristics.

- Clear commercial application.
- A high probability of success.
- Significant return on investment (at least large enough to cover costs of development, production and obtaining a patent).
- Marketability.

The incentives for 'private' and 'public' R&D are likely to be different

Private and public organisations tend to have different incentive mechanisms within them. This means that it is likely that patents provide different incentives for R&D in private and public institutions. Key differences between private and public institutions that engage in R&D are how funding is arranged and how ownership of innovation is dealt with.

The effect of these differences is best illustrated by considering polar examples. Consider the 'private' R&D organisation that is completely self-funding and retains all ownership of its IP. This firm would have the greatest incentive from the patent system. It would rely on the returns to successful innovation to fund itself; hence, it would aim its R&D at those areas likely to result in successful, marketable products with high returns. By retaining the IP, it can realise the rewards of the patent system by either selling on the property rights, licensing them or commercialising the product.

The polar 'public' firm, meanwhile, is not self-funding, but is funded by tax receipts. Furthermore, because it is funded by tax receipts, the IP that is produced is seen to belong to the entire country and so is disseminated into the community as soon as it is produced, to be taken up by any person who might find it useful. The 'public' R&D organisation has no reason to retain its IP, either financially or otherwise, and, instead, it may actively give away any IP it may have. The patent system has no incentives for this organisation.

In reality, both private and public organisations lie somewhere between these extremes. Increasingly, organisations such as the CSIRO are being forced to become somewhat self-funding. By the same token, private firms receive tax concessions for R&D, which amount to a form of partial subsidy.

The point is that private organisations tend to lie closer to the end of the scale for which patents provide the greatest incentives. Furthermore, private firms are more likely to take advantage of the patent system, for the reasons outline above – a greater need for self-funding and a less ambiguous position on the question of ownership.

What is the impact of changes in global patent law on Australia?

As the property rights that attach to intellectual endeavour become more widely acknowledged, the incentive effects of the patent system are likely to increase. The impact this has on Australian R&D is dependant on the relative mix of 'private' and 'public' R&D in the country.

The more R&D that is conducted in the 'private' style, by organisations that are self-funded and able to own their IP, the greater will be the impetus given to Australian R&D by the likely changes to TRIPs. It also follows that the greater the proportion of 'private' R&D that is conducted, the more Australia will be able take advantage of the property rights that potential changes to TRIPs could afford.

Over time, it is likely that a broader recognition of IP rights will create incentives at the margin for more private firms to engage in R&D. However, the entry of firms into the R&D business may be 'crowded out' by the amount of R&D conducted in the public sector. In other words, the public sector may be using R&D resources and supplying R&D to markets that would otherwise be provided by 'private' R&D providers. The extent of this crowding out is an important determinant of Australia's ability to profit from the international IP system over time.

The impact on agriculture

In Australia, agricultural industries are made up of atomistic producers. Because producers tend to be relatively small, they tend not to have the resources to engage in R&D on their own. However, it is widely acknowledged that agricultural R&D is valuable. On this basis, the government engages in a large proportion of agricultural R&D in Australia, in order to correct the under investment in R&D that would occur if small producers were not assisted.

However, the high proportion of public R&D in agriculture tends to suggest that agricultural industry is unlikely to be in a position to be able to extract the maximum benefit from the rewards and incentives offered by a patent system. This is because, as was outlined above, effective ownership of IP by 'public' organisations can be difficult to implement and low levels of self-funding reduce the need for some 'public' R&D organisations to exploit their IP.

A related point, for which there is anecdotal evidence from the USA, is that researchers in many public R&D organisations have considerable apathy towards commercial activity on cultural grounds. There is a suggestion that some researchers believe that if they wanted to be in 'business' they would be working in the private sector — one of the perceived benefits of working in the public sphere is that commercial decision making is not needed.

This tends to suggest that, taken as a whole, the agricultural sector is less likely to feel the incentives provided by the patent system than would other sectors for whom R&D is run more closely to the private model. It follows that the agricultural sector is less likely to be in a position to capitalise on the rewards offered by the patent system.

Domestic responses to likely changes in the international IP system

Towards a response to patents and the trade in innovation

The central proposition underpinning any strategy in response to the growing recognition of IP rights is that those people and organisations that have the potential to create IP must be able to own it. This seems an obvious statement and is clearly a necessary condition for success in trade based, primarily, on IP.

However, for publicly run R&D organisations it has the potential to raise some thorny questions. Since much R&D in the agricultural sector is done by public organisations, these are important issues to think about.

One potential problem arises when the question of funding is considered. Consider an organisation that is primarily funded by taxation, but also receives some funding from industry. Accept, for the moment, that the R&D organisation can own IP rights. Who should the returns of R&D, which can be realised through the patent, be distributed to? If the organisation keeps the funds, this suggests there is less need for external funding, but which funding body should reduce its contribution? If the returns are transferred to industry, how is it done? If the organisation is giving returns to industry, why is the taxpayer, in effect, subsidising a virtually private firm?

In this instance, the solution seems to be to set up the organisation according to the normal model of corporate governance with industry and the government having the same position as shareholders. However, this begs the question why is the government involved in what is now a private organisation?

A more contentious paradox arises when the manner in which a public organisation manages its IP is considered. A public R&D organisation, typically in agriculture, operates to benefit a collection of small producers. The organisation conducts research that is intended to benefit all producers. To reap the rewards afforded by the property rights IP law gives, the public R&D organisation should sell its IP to the very firms that the IP was created to benefit. This does not seem a problem except where the purpose of the R&D organisation is to give an R&D subsidy to the industry. The price involved in selling the R&D may offset the subsidy intended to be created.

The R&D organisation is also bound by the fact that it cannot just give away its IP to the industry that it is trying to benefit. If it does this, the members of the industry may sell the IP to others. In this way, the organisation may get next to no benefit from owning IP. This would mean obtaining a patent would be too costly when compared with the benefit.

The point is that, for public organisations, owning IP creates some difficult problems. The source of all these problems is that the effective commercial exploitation of IP may not be consistent with the mission and purpose of the organisation. This is not to say that public organisations should not own IP, or that the problems are without solutions. Public ownership of IP seems to raise complex issues that need to be resolved on an organisation-by-organisation basis if Australia is to be able to extract the maximum benefit from broad recognition of IP rights.

Another area where public R&D organisations may run into problems is their ability to give incentives to individual researchers. Many private R&D organisations give incentives to individual researchers to come up with useful innovation. This can take the form of ownership of a proportion of the IP or a bonus. These sorts of incentives are important as they provide a tangible link between researchers and commercial outcomes.

In a similar vein, it is important to create strong links between research and commercial arms of industries and organisations. Scientists are, by definition, not specialist marketers. It is important that scientists and marketers work together in organisations.

These problems do not arise in the case of privately run R&D. Questions of ownership are clear and commercial expediency is the sole motivating force. Hence, the patent system creates few problems for such organisations, aside from the process of engaging in R&D and deciding on the best way to manage the patent once it is obtained

In giving Australia the best chance to benefit from broad recognition of IP rights, several other steps need to be taken. These include:

- educating management and research bodies about the various ways to gain property rights over innovation;
- educating management and research bodies about how to use IP to their best advantage;
- reducing, as far as possible, the costs of obtaining IP rights; and
- finding and removing disincentives for private firms to engage in R&D.

Towards a response to GIs

A potential development in the next round of TRIPs is that GIs and other forms of traditional expression be given greater protection. It has been argued already that this would not be in Australia's best interest. The question becomes: how do we make the best of this situation, should it arise?

The experience of the wine industry suggests that it is possible to still prosper in the face of such barriers to trade. The key seems to be to establish a reputation independent of the protected language. The three key elements to being successful in this regard are having:

- a quality product
- a distinctive brand
- a flexible and efficient marketing mechanism.

Having a quality product is an extremely important element. Without a quality product consumers will not choose the product. This is especially the case when the product is already at a disadvantage due to an inability to use a protected label.

Once a quality product is established, it is important that the product have a brand that enables it to be recognised for what it is in the marketplace. This is elementary marketing, products should have a distinctive brand. However, the point is doubly important when the product is competing against other products with access to brand names that are more established in the market.

The last point, that flexible and efficient marketing mechanisms are needed, is the area where there exists the most scope for industry introspection. Increased protection for traditional expressions and GIs means that marketing needs to be smarter to clearly identify those products with potential in a given market and the best way to market them. This means being able to recognise and acknowledge difference, and exploit it. Products need to be tailored to the markets that they are to be sold in to gain the best possible market position.

Smart marketing requires a flexible and efficient marketing body that is able to change strategies quickly to keep pace with tastes and changes in rules. Industry-wide marketing bodies may not have this luxury if they are unable to make decisions quickly, to treat different products as different, or target those products that have the most chance of success in the market.

Marketing bodies also need to have close links with producers to communicate the characteristics of products that are most likely to succeed and also to understand the precise nature of the products that are being sold.

8. Impacts of GIs and patents by industry

This report has, up to now, talked about the impact of IP on agricultural trade in general terms. However an important question is: where does IP have the greatest impact? More importantly, it is necessary to draw up a set of criteria for evaluating this. It is clear to the casual observer that great differences exist across agricultural industries. It is these differences that in turn drive the different impacts of IP across agricultural industries.

This chapter draws on the insights gained in previous chapters to try to anticipate those industries that are likely to be most affected by changes to the rules regarding patents and GIs. The key contribution of the chapter is to suggest what seem to be important criteria in assessing this. These criteria are then applied to a range of agricultural industries to attempt to discover which industries may experience the greatest impact from any changes to patent or GI rules.

GIs and other appellations of origin

Five key criteria are used to evaluate the exposure of industries to a possible strengthening of the rules regarding appellations of origin.

1. *Is the product a basic commodity?* Basic commodities have little exposure to GIs as they tend to be generic commodities with few roots to any one culture or region.

If the answer to the above question is 'yes', it is judged that the product is unlikely to be affected by GIs. An answer of yes to any two of the following four questions also leads us to conclude that the product is unlikely to be affected by GIs.

2. *Is the marketing mechanism in this industry highly sophisticated?* A sophisticated marketing mechanism is likely to be able to quickly and successfully respond to any change in the rules regarding what are permissible labels.
3. *Are Australian brands and varieties well established both domestically and overseas?* If Australian brands and varieties are well established, it is unlikely that GIs will have much effect on the product. Only small changes to labels are likely to be needed to fulfil labelling requirements.
4. *Are consumers well educated and discerning about the product?* If consumers are educated and discerning about the product, it is likely that they will quickly adjust to different labelling.
5. *Does the product originate in a region other than Europe?* Products that originated in Europe are likely to be most affected by GIs as they are the products that Europe is most keen to protect.

When applying this set of criteria to Australian agricultural production, it appears that most products are not likely to be affected by changes to the rules surrounding GIs. This is because most products are basic commodities. The list of basic commodities includes

wheat, beef, veal, lamb, mutton, wool, barley, sorghum, oats, maize, cotton, rice, pulses, pigs, poultry, canola and sugar.

Some products that are not basic commodities are also unlikely to be affected. The cut wildflower industry, for instance, employs varieties that are indigenous to Australia. Furthermore, the varieties often have distinctive Australian names, such as the kangaroo paw.

Wine is unlikely to suffer much detriment from changes to GI laws, but for different reasons to those products above. As discussed in chapter 4, the marketing system within the wine industry appears to be highly efficient and responsive to consumers. Similarly, consumers tend to be educated about the product and willing to pursue quality. Lastly, Australian brands are well recognised in export markets.

Two areas that may not be well protected against changes to GI rules are the fruit industry and the dairy industry.

Cheese, in particular, appears to have considerable exposure to detriment from extensions to GI rules. The vast majority of cheese types that are produced in Australia are European. For instance, gloucester, gouda, mozzarella, parmesan, neufchatel, camembert and feta are all produced in Australia. This sort of exposure needs to be off-set by good marketing mechanisms and an increased focus on brands rather then types or styles if any potential detriment is to be minimised.

Sectors of the fruit industry may also have some exposure. Many varieties of pome and citrus fruit have links to Europe. Apples, for instance, have been grown in England for many hundreds of years. Fruit is a more ambiguous case than cheese. For instance, while the apple has been grown in England for centuries, several varieties are Australian, such as the Granny Smith, which was first propagated near Sydney.

Patents and PBRs

A range of equally important criteria may be used to evaluate the impact of changes to patent law on an industry. It is anticipated that, for almost all industries, increased recognition for IP rights will have a positive effect. The question is: which industries' R&D programs are in the best position to benefit from the patent and PBR systems, bearing in mind that the recognition of patent rights over the products of biotechnology is likely to increase?

There are eight criteria:

1. *The level of R&D conducted by the industry*. The greater the R&D effort expended by the industry the greater the potential of receiving rewards through the patent system.
2. *The potential returns to R&D in that industry*. The greater the commercial potential of research in the industry, the greater the potential rewards offered by a patent, or PBR.
3. *The proportion of R&D that leads to a commercialised product*. The more R&D that is directed toward commercial application, the greater the potential reward from the patent system.

4. *The amount of R&D that is privately conducted*. The patent system, as a general rule, offers the greatest incentives to privately run organisations.
5. *The importance of biotechnology to the industry*. Biotechnology is where most of the changes in global patent laws are likely to take place. Hence, those industries that have the greatest interest in biotechnology have the greatest to gain.
6. *The amount of export markets supplied by this industry that has weak IP regimes*. Weak IP regimes can create effective barriers to trade. The reduction of these barriers benefits those exporters who trade with those countries with weak IP regimes.
7. *The strength of links between researchers, producers and marketers*. The greater the links between researchers, producers and marketers, the greater the chance that commercially viable innovations will be created.
8. *The level of awareness of IP issues*. The greater the awareness of IP issues in an industry, the greater the capacity to use IP successfully.

Table 8.1 shows how these criteria might apply to agricultural industries and how industries can be grouped into those where there is a high potential to benefit from patents and those where the potential is medium or low. This sort of exercise, while conceptually sound, is difficult to do in practice for several reasons. First, data on most of the criteria simply do not exist and informed judgement is often the best that can be used. Second, as at this level of aggregation a great number of activities are not picked up. It is likely that many sectors of industries do not conform to the characterisations outlined in table 8.1. That said, the exercise of characterising industries according to the above criteria is a useful exercise. It illustrates how different industries can be affected differently by the patent or PBR system. It is also a first step in the identification of areas that would benefit from review. For example, the suggested characterisations in table 8.1 suggest that a potential area for action is the understanding of IP issues by agricultural producers and researchers.

Most importantly, the table suggests that only a few agricultural industries may be in a strong position to take advantage of the property rights (such as patents) that are available over innovation. This in itself is an important observation as it suggests that this may be an area needing to be incorporated into some industry strategies.

It is also important to note that some products are more amenable to a process of continual innovation than others. It is no accident that the input intensive products involving some element of processing tend to have the most to gain from patents. By comparison, it is hard to differentiate basic commodities like sugar and the scope for product innovation is limited.

8.1 **Possible potential to benefit from patent (or PBR) rules**

	Comments
High	
Wine	High levels of R&D with consistently high returns. A large proportion of R&D leads to a commercialised product with a similarly high proportion being conducted privately. Biotech has some potential to impact on the industry. Most export markets have strong IP. Links between researchers, producers and marketers are strong and the general level of IP awareness is high. Considerable scope for product innovation and receiving a reward in the market place.
Cotton	Significant investment in R&D with a balance between public and private. Biotechnology has been seen to be increasingly important to the industry. Some export markets have weak IP. Strong links between researcher and producers exist. The level of awareness of IP issues tends to be high.
Wildflowers	The wildflower industry has a strong emphasis on developing new varieties. A high proportion of this new product development is done privately. Biotechnology may have some potential to benefit the industry. Most exports markets have strong IP. Links between researchers and growers are strong, while the level of IP understanding, particularly of PBR, is high.
Cheese	R&D in cheese tends to yield high rewards. A significant proportion is conducted privately. Biotechnology may have some limited application. Several export markets could be characterised as having weak IP. The links between researchers and producers tend to be strong. The industry is generally aware of IP issues.
Medium	
Pigs and poultry	R&D tends to be well supported with a relatively strong investment in private R&D. Biotechnology may have considerable application to the industry in the medium term. Very few export markets have weak IP. The links between researchers and producers tend to be quite strong. The industry tends to be aware of IP issues.
Rice	R&D tends to be well supported although comparatively little is private R&D. Biotechnology seems to have reasonable benefits for the industry. Several export markets have weak IP. The links between researchers and producers tend to be quite strong. The industry tends to have a grasp of IP issues.
Wheat	Significant investment in R&D but with an emphasis on public rather than private. Biotechnology has been seen to be increasingly important to the industry. Some export markets have weak IP. Quite strong links between researcher and producers exist. The level of awareness of IP issues tends to be above average.
Barley	A comparatively high investment in R&D yielding reasonable returns. Very little, if any, R&D is done privately. Biotechnology has some potential to benefit the industry, especially malting barley. Links between researchers and growers are productive, while the level of IP understanding is average.

Continued on next page

8.1 **Possible potential to benefit from patent (or PBR) rules** Continued

	Comments
Beef and veal	R&D tends to yield good returns although comparatively little is commercialised or conducted privately. Biotechnology seems to have considerable application to the industry, at least in the medium term. Several export markets have weak IP. The links between researchers and producers tend to be quite strong. The industry to date has not relied on IP to achieve gains.
Fruit – pome and stone	While the quantity of R&D is not high in comparative terms, what is done tends be high quality. Little R&D is commercialised and very little is conducted privately. Biotechnology has significant application to the industry. Several export markets have weak IP. Links between those conducting research and growers tend to be quite strong. The industry as a whole has a reasonable grasp of IP issues
Fruit – citrus	The quantity of R&D is relatively high. Little R&D is commercialised and very little is conducted privately. Biotechnology has significant application to the industry. Several export markets have weak IP. Links between those conducting research and growers tend to be below average. The industry as a whole has a reasonable grasp of IP issues
Pulses	A comparatively high investment in R&D yielding reasonable returns. Little is done privately. The majority of export markets have weak IP. Links between researchers and growers are below average, while the level of IP understanding is also below average.
Lamb and mutton	R&D tends to yield good returns although comparatively little is commercialised or conducted privately. Biotechnology seems to have considerable application to the industry, at least in the medium term. The links between researchers and producers tend to be quite strong.
Sorghum	While the quantity of R&D is not high in comparative terms, what is done tends be fairly high quality. Little R&D is commercialised and almost none is conducted privately. Biotechnology has significant application to the industry. Most export markets have weak IP.
Oats	The quantity of R&D is relatively low. Little R&D is commercialised and very little is conducted privately. Most export markets have weak IP. Links between those conducting research and growers tend to be below average.
Maize	A comparatively low investment in R&D, however returns can be significant. Almost no R&D is done privately in Australia. Biotechnology has been seen to benefit the industry. Several export markets have weak IP.
Canola	Comparatively low R&D, however returns can be significant. Almost no R&D is done privately in Australia. Biotechnology has considerable potential to benefit the industry. Several export markets have weak IP.
Fisheries	While relatively little R&D is conducted, the returns to R&D are significant and much is commercialised. Only a small amount is conducted privately.
Sugar	A significant amount of R&D is conducted, much of which is conducted privately. However, there is little scope for product innovation and differentiation – the vast proportion of innovation is process based.
Low	
Wool	The level of R&D conducted is falling. Little R&D is commercialised and even less is conducted privately. Some export markets have weak IP. Links between researchers and producers appear to be weak.

9 Closing remarks

The coming review of the TRIPs agreement gives an opportunity to establish a set of rules that will significantly enhance the existing environment for trade in products that have a considerable amount of IP invested in them. The key areas for agriculture seem to be the protection of GIs and the extension of patent law to include all non-human aspects of biotechnology.

Australia is likely to gain from increased recognition of IP rights attached to biotechnology. On the other hand, an extension of the protection offered to geographical indications represents a significant pitfall for some areas of Australian agriculture.

In considering these propositions, it is useful to remember the apparent future direction of agricultural production in Australia. As world markets become more congested, it is likely that the significant returns to producers will be in marketing, product innovation and specific service provision. To do all these things requires recognition of IP rights. In particular, as marketing becomes more important, there is little reason to diminish the ability to market a product by tying up labels and language in GIs and 'traditional expressions'. By similar reasoning, as biotechnology and genetic techniques become more mainstream, it is important that the property they create is respected.

This framework creates a challenge for Australian agriculture. To benefit from the evolving international IP framework, it is important that Australian agriculture uses its IP effectively. This has been a big theme in this report. Having the correct legal frameworks in place is only a small part of a successful outcome. To successfully trade in agricultural markets which are increasingly shaped by advances in technology and marketing, it will be important to be a world leader in the management of intellectual assets.

Being a leader in the management of intellectual assets involves many things. Primarily, success rests on the quality of the R&D conducted in Australia. Other important factors include: how R&D organizations are able to use the IP that they own; the creation of the correct incentives for researchers; the establishment of strong links between researchers, producers and marketers; the establishment of flexible and efficient marketing mechanisms; an understanding of the licensing, selling and appropriation of IP; and a basic appreciation that IP needs to be managed like any other asset.

If Australian agriculture is to reap all the potential benefits from the evolving international IP environment, it is important to have a clear picture about what the desired legal framework is. Just as important is to have a clear picture about how this framework should be used.

Appendix A: World activity in agricultural biotechnology

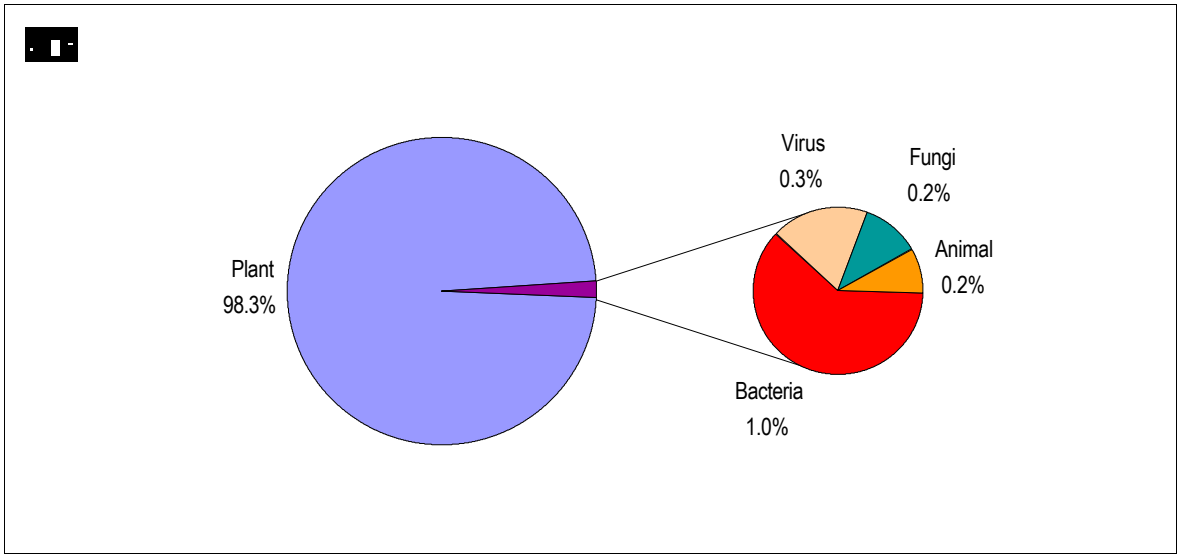
This report identifies the treatment of biotechnology by patent law as one of the potentially contentious issues to arise in the forthcoming renegotiations of TRIPs. The key provision, article 27.3b, is due to be reviewed this year.

With this in mind, it is helpful to have a picture of the global pattern of research and activity in agricultural biotechnology. A useful source of indicative evidence is the Biotrack database complied by the OECD. Biotrack records field trials of genetically modified organisms in OECD member countries. It also includes some data from non-member countries contributed by UNIDO.

The database gives some indication of which countries are doing what in the field of agricultural biotechnology. It is important to remember that the database can only be viewed as indicative — many important biotechnological activities will not be represented, such as research into the use of gene markers to enhance conventional breeding methods. Only research that requires field trials is recorded. Bearing this in mind, the database provides a useful insight into world activity in one of the areas most likely to be affected by changes to TRIPs.

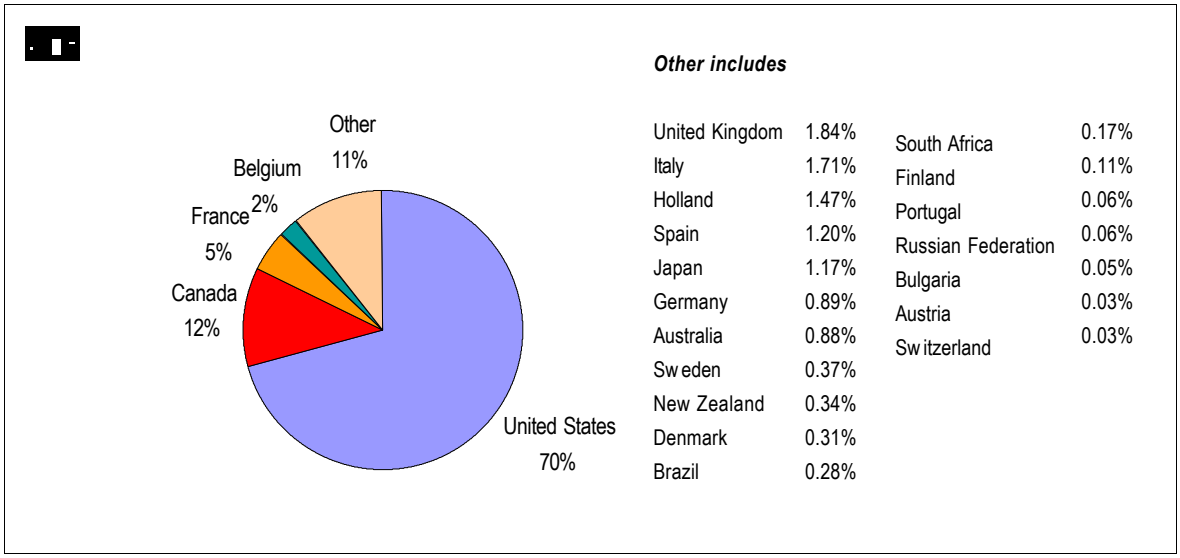
The Biotrack database records data from 1986. Chart A.1 divides the data by biological kingdom. As can be seen, over 98 per cent of field trials involve plants. This indicates that the vast bulk of commercially viable research involves the genetic modification of plants.

A.1 **Biotrack: data entries by kingdom**



Data source: OECD (1998).

A.2 **Biotrack: data entries by country**



Data source: OECD (1998).

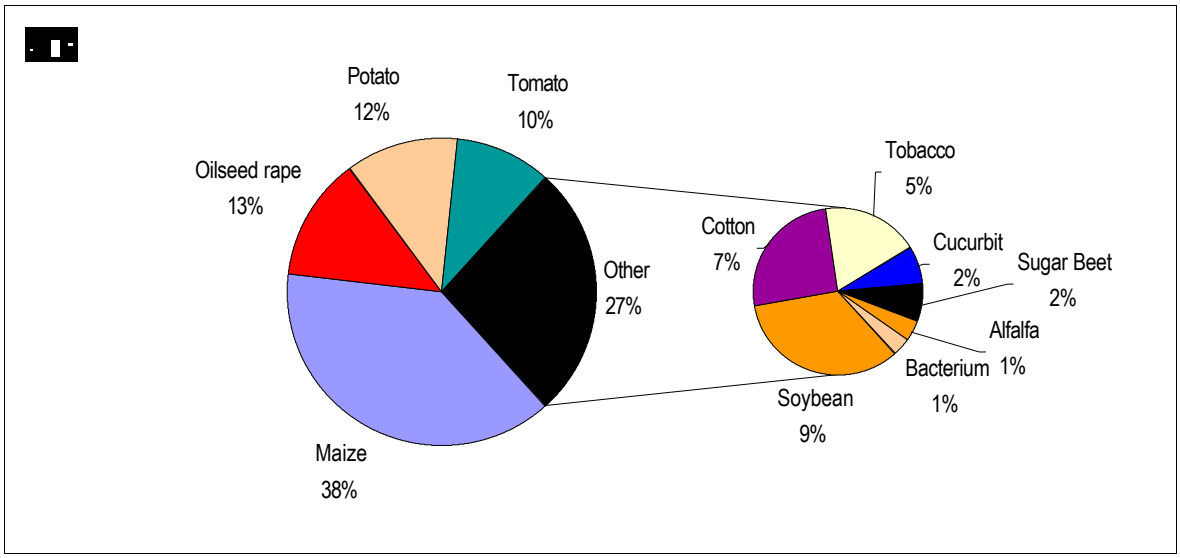
Chart A.2 divides the data by country. The USA dominates research in this area, conducting over 70 per cent of world field trials since 1986. Over 82 per cent of field trials have taken place in North America — 0.88 per cent of recorded trials have been conducted in Australia. Data provided by Forster and Rees (1998) suggests that around half of these Australian trials have been conducted by overseas companies.

Chart A.3 shows field trials by the common name of the subject. It is revealing that many crops that are important for Australia, such as rice, sugar cane and wheat, have not been the subjects of many field trials. This is consistent with the US concentrating research in those areas that are of greatest benefit to US producers, such as maize, sugar beet, soybean and rape.

Chart A.4 shows data entries by year. It is interesting that an explosion in GMO field trials occurred in the early 90s and then dropped off after peaking in 1995. This interesting phenomenon may have a number of explanations. Possible explanations include:

- increased public awareness of GMO research, and the ethical and health debate surrounding it may have placed pressure on governments and researchers to more closely control field trials; and/or
- it may be that the relatively easy research has been done, making it harder to take further steps; and/or
- companies conducting research may have decided that it is not as profitable as they once thought and, as a result, reduced the quantity of resources allocated to research and commercialisation.

A.3 **Biotrack: data entries by common name**

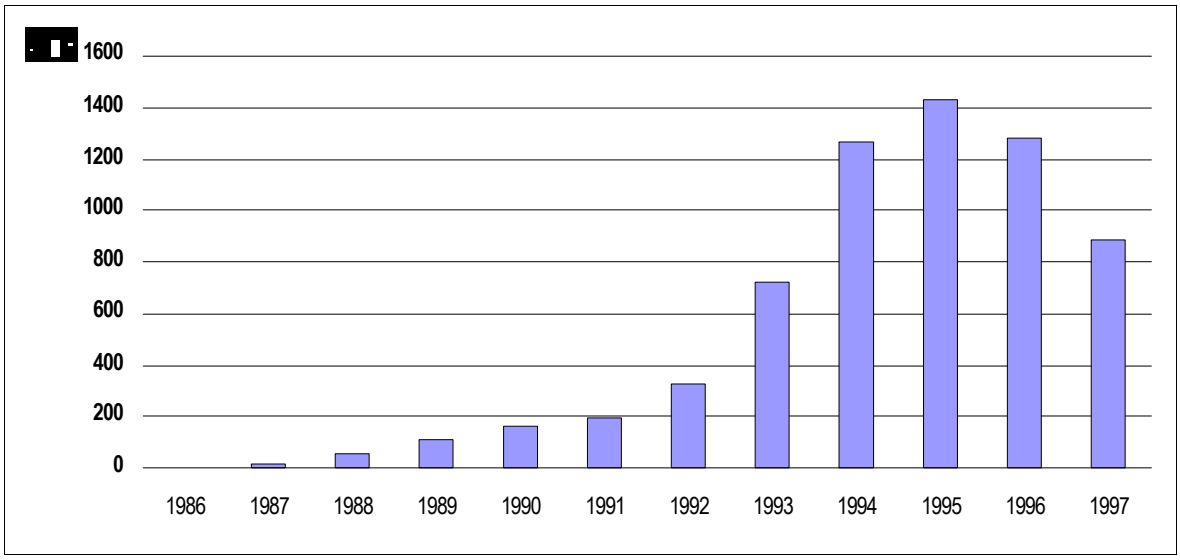


Data source: OECD (1998).

Where are transgenic crops being planted?

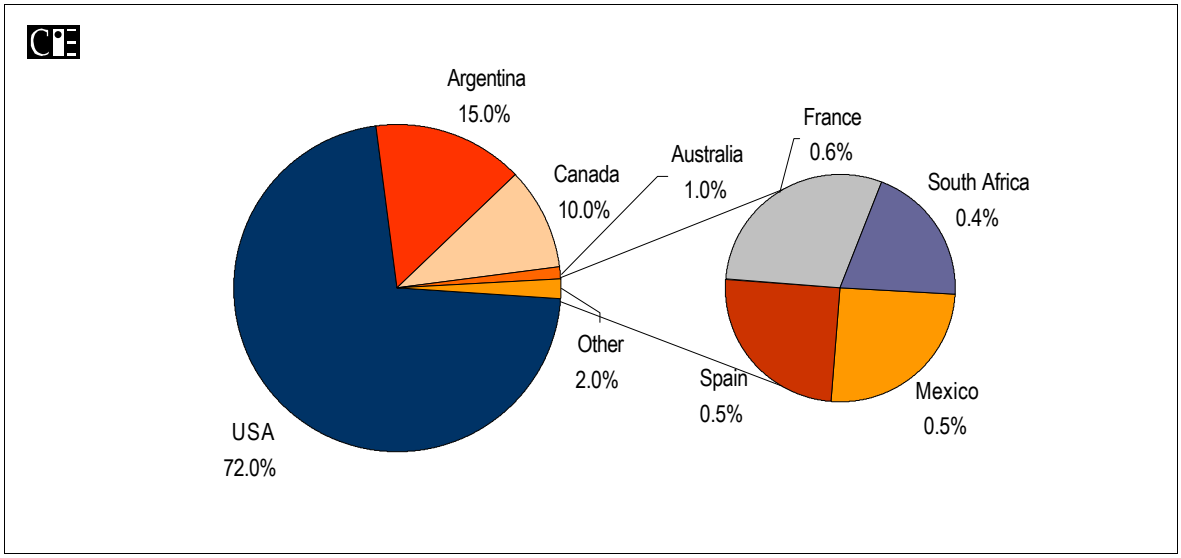
There is considerable data available on the adoption of trangenic crop varieties. Chart A.5 shows that the USA tends to be dominant in the adoption of transgenic crops. This is not surprising since they also appear to be leaders in the development of these crops. Canada and Australia have a proportion of world crop area that is consistent with the proportion of field trials being conducted in each country. Argentina and, to a much lesser extent, Mexico stand out as having a significant proportion of the global transgenic crop area and yet having very few field trials.

A.4 **Biotrack: data entries by year**



Data source: OECD (1998).

A.5 **Share of global transgenic crop area** 1998



Data source: ISAAA.

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