



# Gene technology and patents

**The patent system is designed to provide an incentive to innovation — so that those who have invested money on research and development are given the opportunity to obtain a reward for their expenditure, and to promote the spread and use of knowledge.**

## What is a patent?

A patent is a limited, fixed term monopoly granted by the government to the inventor. It gives the patentee (the inventor) the exclusive right to make, use, or sell the invention, as long as the patent lasts. The patentee may choose to use the invention themselves, or they may grant licences to others to do so. The patent gives the right to take legal action against parties who make or use the invention on a commercial basis, or who sell the invention, without the permission of the patentee. It does not enable the patentee to prevent people from continuing activities commenced before the date of the patent. Also, the patentee's ability to use the invention will depend on whether or not there are earlier patents in the field, and whether these earlier patents cover the invention.

Most patents actually cover improvements, and it is therefore very common for a patentee to have to negotiate a licence with an earlier patentee in order to be able to use the improved invention, and vice versa, so that the earlier patentee can utilise the improvement.

## Limitations

Patents are granted on a country-by-country basis and their duration is usually 20 years from when the patent application was filed. If a patent is to be used in more than one country, patents have to be applied and paid for in each country. In Australia, the 20-year time frame is also dependent on annual renewal fees. Maintaining a patent can be costly. Once the patent has lapsed or expired, the claimed invention is free for general use.

## How to obtain a patent

In order to be patentable, an invention must be novel and must involve an inventive step. In addition, the patent applicant must lodge a patent specification — a carefully worded document describing the invention in sufficient detail to enable a person who is skilled in the relevant field to carry out the invention solely by the reference of the specification, and without having to resort to an undue degree of experimentation or take an inordinate amount of time.

For an invention to be patentable, not only must it be novel, but an inventive step must also be involved — it must be different from what has been previously known and/or used. In most countries, patent applications are examined by a Patent Office for novelty and the inventive step. The Patent Examiner will carry out a search of the patent and scientific literature, and will compare the invention as described in the specification and defined in the claims.

Specifications are a very important source of technical information, and once the patent has expired, all the information contained in it is made freely available to the public, allowing the invention to be used by others.

## Biological inventions and patents

Naturally occurring compounds, such as proteins, nucleic acids and other biological molecules, are treated by patent law in exactly the same way as other chemical compounds. Examples of patentable biotechnological inventions include living organisms (other than humans), cell lines, vaccines, antigens, antibodies, pharmaceutical formulations, and chemical processes using enzymes or living organisms.

Australia granted its first patent for a living organism (a yeast strain having improved properties for bread making) in 1976.

## Patents and research

There is some concern that the existence of a patent or patent application may affect research in that particular area. A patent covers commercial use of an invention. Thus research directed at making new inventions, improving an existing invention, finding new uses for an invention, or to producing a non-infringing product does not infringe on the patent. A patent granted in one country does not restrict the use of the particular innovation in other countries, unless the patentee holds licenses in all of them.

## Resources

Many research organisations in Australia do not possess the resources required to research and develop a GM product and deliver it to the marketplace.

When research organisations are successful in developing a patentable invention, the patent system provides an opportunity for the organisation to recoup some of the expenditure invested in the research and development phase. The patent system also provides the organisation with the opportunity to protect the invention. Further, it provides the opportunity to 'trade technology' with overseas organisations as well as attracting overseas investments.

## Australian alliance

In 2006, a joint venture project was launched to develop and commercialise new wheat varieties designed to improve human health and reduce the incidence of diabetes and obesity. The joint venture known as Arista Cereal Technologies Pty Ltd sees the Grains Research and Development Corporation (GRDC) partnering with CSIRO and Biogemma (a subsidiary of Limagrain).

According to a GRDC media release, the partnership is an opportunity to:

- provide higher margin specialised grain products for Australian farmers to grow for Australian markets
- invest in new technology to ensure that the Australian grains industry remains competitive and financially sustainable by participating in new higher, value markets
- promote and maintain good health and developing 'frontier' technologies
- increase farmer income opportunities to assist their competitiveness in both traditional markets and new market segments.

With many critical and enabling technologies being covered by intellectual property rights, it is important for Australia to develop skills and valuable intellectual property of its own to use as bargaining chips, to ensure that Australian agribusiness maintains the freedom to operate in these areas.

## Rice — international cooperation

The genetic map of rice has been shared since 2000, when Monsanto announced it would make the information available through a database on its website to researchers worldwide. The information has the potential to assist both traditional rice breeding and the development of GM rice.

The development of 'Golden Rice', to fight vitamin A deficiency in developing countries involved research institutions from several countries working together. The delivery of the GM rice free to subsistent farmers will also be an example of international cooperation between more than 32 different companies and universities, whose intellectual and technical property rights have been given freely to the humanitarian project.

## Life sciences organisations

Many large crop protection and animal health companies have recognised the potential of gene technology and are becoming more focused in this area. They are vertically integrating their businesses and forming alliances — investing in genetic research, and identifying and patenting genes. Like all research organisations, these companies have the opportunity to patent material and gain a fair return on their initial investment.

## Ensuring choice

In the end, the market place will determine what GM products are available. In most instances, in addition to a variety of conventionally-bred products, there will be more than one GM product for farmers and consumers to choose. This choice will help determine the products purchased, and the prices paid.

## Further information

Golden Rice: [www.goldenrice.org](http://www.goldenrice.org).

IP Australia: [www.ipaustralia.gov.au](http://www.ipaustralia.gov.au).

*R&D partnership targets 'super-healthy' wheats.* 2006.  
CSIRO Food Futures Newsletter: [www.csiro.au/news/newsletters/o611\\_food/story2.htm](http://www.csiro.au/news/newsletters/o611_food/story2.htm).

