Queensland Government Submission
to the

House of Representatives

Standing Committee on Primary Industries and Regional Services

Inquiry into Primary Producer Access to Gene Technology

Parliament of Australia
House of Representatives

Standing Committee on Primary Industries and Regional Services

Inquiry into primary producer access to gene technology

1. The future value and importance of genetically modified varieties

- The economic and environmental benefits of gene technology to primary production have been so obvious that most industries now acknowledge that it not a question of if they will take up this technology but when.
- A comprehensive overview of the dramatic uptake of this technology is presented in the document *Global Review of Commercialized Transgenic Crops: 1998 (*Copy Attached*)*.
- The unprecedented uptake of GM crops by growers in North America and China is a result of the benefits to growers of enhanced *input* traits — traits such as herbicide tolerance and pest resistance in soybean, maize, cotton, canola and potato. These have resulted in lower growing input costs, higher yields and hence improved economic viability.
- Varieties with resistance to insects, fungi or bacteria will provide the means of reducing the growing use of chemicals and consequently will enhance the "clean green" image of Australia's crops and the quality of our foods.
- Genetically modified cotton varieties have a critical role in the cotton industry when combined with other integrated pest management strategies. The result will be a dramatic reduction in the use of insecticides in the industry and hence major environmental benefits.
- Direct benefits to growers in the USA through reduced production costs have been estimated at $1 billion US in 1998.
- The second wave of genetically modified products now emerging in numerous field trials, contain beneficial *output* traits — traits that provide direct consumer benefit from food plants through enhanced nutritional qualities:
  (a) modified composition of nutrients such as oils, proteins, carbohydrates;
  (b) addition of 'nutriceuticals': vitamins, isoflavinols, antioxidants, trace nutrients and other dietary supplements that are beneficial but under-represented in normal diets or in diets under specific conditions of climate, geography, poverty, *etc.*);
  (c) enhanced appeal (colour, flavour, shape, size);
  (d) enhanced storage and transport qualities.

- There is also the development of products that alleviate, and in fact reverse, the impact of human food and fibre production on natural ecosystems. This has three components:
  (i) development of plants that thrive in the marginal lands towards which agriculture is inevitably pushed by spreading urbanisation: tolerance of low and irregular water; salt tolerance; ability to maximise use of available phosphate; ability to fix atmospheric nitrogen to provide essential nitrates; control of plant architecture, flowering and fruit/seed setting; resistance to diseases; and many other instances of optimisation of plants for available resources;
  (ii) plants and microorganisms engineered for bioremediation of sewage, landfill and degraded land and waterways;
  (iii) reconstructing (re-engineering) the physiology of plants to greatly increase the yield of useable biomass under a broad range of conditions.
- Genetically modified germplasm can be patented, *i.e.* for the first time in the history of agriculture, the intellectual property (IP) inherent in seeds — and their derivatives — is subject to monopolistic ownership and exploitation on a global scale. The most valuable input — and output — for large-scale agriculture has now become intellectual property.
- If Australia fails to develop broadly applicable, fundamental, enabling technologies (IP), our growers will forever pay royalties offshore, or worse, be denied access to valuable cost-reducing technologies and germplasm. If we do develop such technologies, we have a two-pronged strategy: (i) use the technologies ourselves and gain value from licensing their use elsewhere; (ii) use the technologies as bargaining chips for IP held elsewhere.

2. The ability for producers to compete using traditionally available varieties

- Intensive agriculture will continue the strong trend towards genetically modified crops since input costs are the over-riding factor in the viability of intensive enterprises. Markets for high volume commodities based on quality attributes will not remain viable for long without genetic modification as the technologies become simpler and more robust — an inevitable consequence of the massive international effort in biotechnology.
- For the foreseeable future, “organic” practices will preclude the use of genetically modified organisms. Substantial markets in Europe and Japan, together with niche markets in many other countries (Australia and the USA included), will ensure the viability of “organic” enterprises. However, the value of these markets is recognised internationally. North America can and will supply ‘identity preserved’ (non-GMO) produce, albeit at a premium in the short term. If Australian producers continue to develop significant export markets with GMO-free produce there is no doubt they will be subjected to fierce competition from the Americas — North and South.
- While it is expected a market will continue to exist for traditional varieties this market is likely to shrink over time and the use of traditional varieties will be confined to small-scale production with its attendant higher production costs.

3. The commercialisation and marketing of agricultural and livestock production varieties

- The cotton industry in particular has significant concerns about these issues. Their industry provided large Research & Development contributions for the advancement of genetically modified varieties and management strategies, and was still forced to pay very high licence costs to the intellectual property owner Monsanto.
- The issues of commercialisation and marketing of new varieties, their cost to producers and other impediments to their utilisation are interrelated. If the rights to gene technology become concentrated in the hands of a few large private organisations, these companies will be in a position to control not only the commercialisation and marketing of new genetically modified varieties but also the marketing of the produce of those varieties. It is not too difficult to envisage arrangements whereby the producer is simply a contract grower in the middle of the loop between the owner of the variety and the seller of the produce. The question will not be "what will be the cost to producers of new varieties?" but rather "how much will they be offered to produce a crop?"

4. The cost to producers of new varieties

- If advances in biotechnology are controlled by multinationals it is almost certain that growers will face major increases in the cost of seed. As can be seen from the Monsanto experience the cost is not related so much to the cost of production but on what the market will bear. This can be alleviated to a major extent through support for competitive endeavours, particularly by public programs.
- The cost of genetically modified varieties will vary greatly, depending on ownership and licensing of the technologies and germplasm. Without doubt, technologies (IP) developed within Australia will be available more readily and at a more reasonable cost than technologies developed elsewhere.
- The question arises as to how Australian IP will be commercialised. There will be a certain amount of IP that is developed specifically for Australian growing conditions and markets, but by and large this will not have a significant presence overseas. Generic enabling technologies will reap maximum benefit from licensing to major players. It is essential that this be done under terms that are favourable to Australian growers
- A reasonable estimate of costs can be made by comparing the licensing costs for Monsanto's Ingard® cotton varieties in Australia and the USA, and extrapolating to RoundUp Ready® and Bt-containing soybeans and corn.
- Savings to cotton growers in Queensland are much less dramatic than initially forecast due to the cost of licenses presently charged – on the Darling Downs for example the insect pressure is usually low and licensing costs just about balance out the savings in insecticide use. In a region with traditionally high heliothis pressure and requiring a greater number of sprays there will be more significant benefits.

5. Other impediments to the utilisation of new varieties by small producers

- The major impediment is the potential to be denied access to patented technologies and germplasm that are of value to Australian enterprises. Individually, small producers have no bargaining power but collectively, they could constitute a market of sufficient size to warrant licensing.
- The continuing lack of a definitive regulatory regime for gene technology makes overseas corporations reluctant to introduce their technologies to Australia since the risk of success, and associated cost, is unknown and unknowable.
- The most effective guarantee of access is Australian-developed technologies.

6. Assistance to small producers to develop new varieties and the protection of the rights of independent breeders, in relation to genetically modified organisms

- It seems clear that there is a specific and important role to be played by patent systems in the protection of biotechnological inventions and the further development of biotechnology. Patents provide inventors and investors with a degree of certainty to enable ongoing investment in what is generally expensive, long term and high-risk research.
- Australian requirements for patentability of biotechnological inventions are no different to those for any other invention. The invention must be new, involve an inventive step, have a practical or industrial application, that is be useful, and be the product of human ingenuity or intervention.
- In Australia only human beings and the biological processes for their generation are specifically excluded from patentability. Therefore provided that all the requirements for patentability are met, a patent that relates to a new organism be it plant, animal, or microorganism, or a process that uses living organisms is patentable. No objection can be raised to a claim simply because it is or makes use of something living.

7. The appropriateness of current variety protection rights, administrative arrangements and legislation, in relation to genetically modified organisms

- Restriction of access to information, germplasm or patented technology poses one of the major threats to progress through plant improvement and biotechnology. While this is largely out of our hands and more in the international scene, the only approach to successfully avoid the problem is to establish linkages with multinationals.
- At present our main advantage in bargaining with the big players is that we have the best locally adapted genotypes and the resources to evaluate any potential new varieties. Legislated regulation is non-existent, other than for pest-resistant plants. This is a significant impediment in terms of actively discouraging commercial application of both overseas and Australian innovations.

- A detailed review of Australian PBR and patent law is required to determine whether either or neither is appropriate to protect the interests of Australian innovators and users of biotechnology.
- It should be noted that many enabling patents for genetic modification of plants have not been filed in Australia. While researchers are free to use these technologies within Australia, products of the technologies cannot be sold in countries where the patents are in force.
- The rate of innovation should be considered in determining appropriate mechanisms for protection of intellectual property. The emergence of genomics is accelerating the rate of discovery and application to an extent that may render many patents redundant. Perhaps the cost of patent filings may not be warranted in many cases, relying instead on trade secrecy — particularly for innovations directed specifically at Australian production and marketing systems.

8. Opportunities to educate the community of the benefits of gene technology

- There is an urgent need to provide information to the community and the delay in developing a national communication strategy is having a marked effect on the acceptance of the technology. While the Commonwealth Government has an important role to play in progressing this issue each State and industry can contribute. It needs to be stressed, however, that community concern over genetically modified plants and derived products (including food) would not necessarily be alleviated by education. The underlying unease appears to be based on unarticulated beliefs and feelings more than lack of knowledge — a growing distrust of the infallibility of scientists and governments and a concern that manipulating living organisms is quite different from manipulating inorganic materials.