

# **The Future Value and Importance of Genetically Modified Varieties**

## **Submission to the House of Representatives Standing Committee On Primary Industries and Regional Services**

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### **Executive Summary**

NSW Farmers' Association as a body representing the economic, commercial and social interests of 15,000 NSW farmers supports the appropriate use of gene technology. Gene technology raises some important issues that are currently inadequately addressed.

The Association recommends that:

- a solid program of public investment in plant breeding should be maintained through direct grants to the agricultural research sector AND through a maintenance of the grower matching funds
- a system of end point royalties should be adopted to avoid breeders using closed loop marketing to receive return on their investments
- an independent body should collect the levy and distribute it back to breeders
- this body should be the Levies Management Unit, operated by the Department of Agriculture, Fisheries and Forestry
- the focus of breeding programs remain on developing varieties to cater for world markets, to support our clean green image and to promote increased disease resistance
- a round table conference should be convened containing representatives from the Australian Food and Grocery Council, the Consumers Association, the Australian New Zealand Food Authority and farmer organisations, to discuss consumer education and food labelling issues.

## Introduction

### **The Future Value and Importance of Genetically Modified Varieties**

The Association strongly believes that the responsible use of genetic modification has the potential to improve the quantity, quality, nutritional value, disease resistance, and adaptability to the environment of plant material around the world. The future of genetic enhancement lies in the pressures that are emerging to find more efficient methods of feed a growing population, from fewer acres, whilst preventing further depletion of natural resources, particularly our forests. There is no other technology that offers the scope for reducing chemical applications whilst still improving yields. Nor is there any other technology that can as rapidly alter the balance of nutrients to favour human health as can genetic enhancement.

Certainly there are risks and these have to be sensibly and carefully managed. It should be borne in mind that we now have some history in the US of consuming the products of genetically altered crops. Around the world for some years genetically altered bacteria have been used in the production of medicines (both human and veterinarian) in food additives and in enzymes with substantial benefits to animal and human health.

The Association continues to investigate claims of damage to human health through GMO's and finds no evidence that shows that the process of genetic modification has caused any problems. The Nuffield Council on Bioethics in a detailed report in the UK concluded, "there is a compelling moral imperative to make genetically modified crops readily available to developing countries who want them to help combat world hunger and poverty." Later it added, "there is no evidence to suggest that GM foods are harmful to human health."

We acknowledge the fears that longer term effects may emerge, and that these fears may be deterring some people. However the Association is reasonably confident that plant products having been stable for some years will not break down with significant consequences for human health. Clearly there is a need for a public education programme and a labelling policy that is cost effective and provides worthwhile information.

The great danger for Australian agriculture and food processing sectors is that we are denied access to plant material which has huge advantages over conventional or pre-existing material (in terms of yield, food value, adaptation to environment etc.). The consequences include probable loss of our market share to nations that do have such access.

## Terms of Reference

### **The ability of producers to compete using traditional varieties**

Clearly genetic engineering in Australia is in its infancy and the vast majority of plant material in use here today is conventionally bred. For any new variety to be accepted, whether genetically modified or otherwise, it is required to have significant financial benefits for growers. This means providing attributes such as greater yields, improved quality, or additional resistance to disease, frost and weather damage. The speed with which Australia adopts genetically modified plant material will depend on:

- (1) the benefits it has to offer over other plant material
- (2) the cost of the seed or technology
- (3) the success of our domestic genetic plant breeding industry and
- (4) our being able to access overseas material at reasonable cost (which will perform in our environment or can be adopted to perform in our environment)

Conventional wisdom suggests that growers require new technology to return seven times its cost before they will be willing to adopt it. This example is based on growers' attitudes to hybrid material when it was first introduced. The key to this question is how will conventional plant breeding stations co-operate or compete with GM breeding stations? There is a level of mutual dependence in that the genetic engineers require the best and most up-to-date plant material with which to work. Theoretically therefore, each genetically engineered breeding programme should be associated with one or more conventional breeding stations. For conventional breeding stations to be excluded or separate from genetic breeding programmes would have a detrimental effect on our ability to compete internationally.

An apparent weakness in the legislation is that under PBR (plant breeders rights) legislation, plant breeders are required to make their plant material available to other researchers for further breeding work, however no such conditions apply to the patents under which GM varieties are released. This means (we perceive), that the holders of patents for genetically engineered varieties will be able to charge the major international plant breeding stations as well as national stations for their genetic material. Holders of varieties under Plant Breeders Rights, however, stand to have their better varieties genetically modified and then patented without any royalties accruing to the original PBR holder in the longer term.

Two issues are of concern. Firstly whether genetic engineering will completely displace conventional breeding and secondly whether private (non-government funded) breeding will displace public breeding. The Association believes that a solid programme of public investment in plant breeding will still be required, particularly if smaller and newer crops are to properly catered for. This will also be necessary if the concerns of developing countries are to be catered for by the international plant breeding stations. These stations must have the capacity and the plant material to breed for the specific needs of poorer countries. There may also be some tendency to switch from PBR to patents for conventionally bred varieties.

We believe the emergence of three streams of breeding for most crops may emerge:

- Stream 1: Small and or Government plant breeders using traditional techniques
- Stream 2: As for stream one but with some capacity to buy or barter a piece of bio-technology to add to their suite of varieties
- Stream 3: Large multinational seed and chemical companies offering seed and/or chemicals and/or markets

## **The commercialisation and marketing of agricultural and livestock production varieties**

The Association has no pressures from its livestock members to seek GMOs in the livestock sector at this point in time. Our submission reflects the position in plant industries, particularly the grain industry. One of the ongoing issues with regard to plant breeding is the mechanism by which plant breeders seek to obtain a return for their material.

Under plant breeders rights legislation the breeder or their representatives can elect to collect a levy or royalty from either the seed, the harvested product or the product processed from the harvested product (they must choose one of these). Whilst up to now the main emphasis has been on seed, there is a strong push towards end point royalties (or a royalty collected on the harvested product) in the grains industry. With royalties on seed, the ability under the Act for farmers to save their seed from year to year means that the breeder only effectively collects one royalty from each grower. With an end point royalty the levy would be collected each time the grower delivers that variety. It would be a smaller royalty per tonne, but collected over more tonnes. Development of a successful variety would ensure the royalty was collected over many years.

The difficulty with establishing end point royalties is there is no viable system of collection that is independent. It is possible to operate collection systems through companies such as AWB Ltd and the Bulk Handlers, however for some holders of rights to rely on these avenues to collect royalties when companies such as AWB and GrainCorp hold the rights to competing varieties, is not a comfortable position.

The Association believes it is vital for an independent body to collect the levy and distribute it back to the breeders. For that reason we believe that it is necessary for the Levies Management Unit operated by the Department of Agriculture Fisheries and Forestry to collect varietal levies on a fee for service basis.

The rate at which the levies are set for particular crops needs to be controlled or monitored to ensure an effective system is implemented that will not disadvantage growers financially, yet will provide appropriate revenue for continued plant breeding. The current process for determining grain levy rates collected by the GRDC involves graingrowers votes through state farmer organisations being determined by the Grains Council of Australia. With regard to end point royalty systems, there needs to be a fair and equitable system of preventing unfair levy rates to growers. This must be a major consideration, as it presents many possible impediments to growers should it not be carefully monitored.

There is a very real danger that without an adequate and independent system of collection that so called 'closed loop' marketing schemes will dominate. This raises the whole scenario where owners of particular varieties will only sell growers the seed with a contractual obligation that the harvested product is sold back to them. If for example the variety is a round-up resistant crop and the owners of the rights also own the Round-Up chemical patent and contract to have all the harvested product delivered to them, then that company has a considerable position of market dominance. We must urgently develop a system of end point royalties which enables the owners of genetic material to obtain a return without having to enter into the marketing of the commodity in order to obtain that return.

The second major question which arises from the commercialisation of varieties is the policy with regard to varieties which are wholly or partly developed using a blend of growers and matching government funds. Obviously many growers would feel that a lower or even no levy should apply than in situations where there is no grower

contribution. A study of varieties and their market share indicates that there are relatively few varieties at any one time commanding a significant share of the market. The market share of any particular plant breeder or plant breeding programme fluctuates markedly as the top two or three varieties change from one breeder to another.

One can also conclude from a study of market share that public breeding programmes will be obligatory for smaller crop species, such as Durum wheat or for specialised varieties to meet particularly difficult conditions. The tonnages grown may not be adequate to support a fully commercial breeding program which will be particularly true in the case of a new crop.

At the moment the GRDC (Grains Research & Development Corporation) is part funding the breeding programmes of state Departments of Agriculture, Universities and the CSIRO. All these bodies are seeking to commercialise all their varieties and this will ultimately give GRDC a significant royalty portfolio if end point royalties become the order of the day and a successful collection system can be maintained. Growers may have some confidence that the royalties collected and repatriated to GRDC may be used in grain research in general and possibly in specific plant breeding. However they can have no such confidence that funds collected by state agricultural departments, the Universities or even the CSIRO will be fully returned to the plant breeders associated with those institutions.

What we are essentially seeing in Australia at the moment is a move towards commercialisation of the products of publicly owned plant breeding stations. Private plant breeding is and has been significant in Australia in hybrid crops (such as sorghum and maize where the grower has to purchase the seed each year). There is a significant niche market for these grains which has largely been the province of the Australian arm of American companies such as Pioneer and Heritage Seeds who are essentially modifying US material for Australian conditions. These companies have expressed the view for many years that they have been reluctant to bring in open pollinated material from the US into Australia because our systems did not allow them to obtain adequate returns on their investment. Some Australian experts have argued that there is not a great amount of open pollinated North American material that can be readily adapted to Australian conditions. Overall however the breeding of the major open pollinated winter cereals in Australia is still in the hands of Australian public breeders.

How long will this remain the case? Several consortia including: (1) between the AWB, the GRDC and the CSIRO; (2) GrainCorp, Vic Grain and Nufarm; and (3) The Victorian Department of Agriculture and the North American company Agrevo, have already been formed with the idea of developing Australian capacity in the area of GMOs and providing an avenue for overseas reciprocal deals on plant material. At this stage such deals have little flesh on them as they are in their formative stages.

None of the deals linking Australian Consortia with overseas interests seem to be exclusive. Although Australia is very vulnerable to rapid advances being made in North America to which we don't have access, it may well be that our own genetic scientists come up with the best material for growing in Australian conditions. It is however one area where we have to have a bet each way. We have to create access channels for the best overseas plant material to be made available to Australian farmers at a realistic cost.

## **The Cost to producers of new varieties**

The great problem with pricing a new variety is knowing how successful it will be before the event. Present thinking is that where GRDC funds are involved, an end point royalty of between 0.5 and 0.75% should be the appropriate level. The wheat variety Silverstar was sold by the Australian Wheat Board (AWB) in 1998 for seed, the end point royalty being \$1/tonne, with the growers registering with the AWB. Attempts in WA by the Western Australian Agriculture Department to collect end point royalties of up to 1.5% have been shelved for the time being due to the Western Australian Farmers Federation's concern about the cost based on the fact that growers have already contributed through GRDC levies, and GRDC has been involved in the breeding of those varieties.

Ideally the holders of the commercial rights need to assess based on trial data, how any new variety compares with other material on offer and seek to pitch their end point royalty at a level which encourages farmers to grow their variety. The royalty can be varied from year to year but setting it too high originally before its true worth is established in field conditions may be a mistake.

Another major cost consideration may be the necessity to segregate genetically modified varieties from traditional varieties, and to segregate amongst GM varieties based on particular characteristics. Will the cost of segregation fall evenly throughout the production chain and on the consumer, or will the producer pay the cost? The Association is concerned that unnecessary segregation where modified varieties are substantially equivalent to traditional varieties will place a burden on primary producers. It is a concern that where no premiums are offered to the producer yet the consumer is obtaining certain benefits (e.g. enhanced nutritional characteristics) then segregation will be a major cost to the grower. The extra costs placed on growers to segregate for many different reasons may have an impact on ability to utilise the available varieties.

## **Other Impediments to the Utilisation of New Varieties by Small Producers**

The Association believes that there are only small differences between the abilities of small, medium and large producers to utilise new varieties. It is largely per hectare yield, and the range of quality factors such as disease resistance, which will determine both small and large growers selection of plant material to grow. The other factor will be the cost of the seed in relation to the advantages a particular variety has over alternatives. Factors which may influence the decisions are not so much smallness in itself but awareness or knowledge of the alternatives and the technology required to best express the qualities of a particular variety. As the Australian Crop Accreditation System is developed there will be a computer database which can be accessed by all growers, describing the characteristics of available varieties.



## **Assistance to small producers to develop new varieties and protection of the rights of independent breeders in relation to genetically modified organisms**

The Association believes that continued Federal and State Government support of the breeding programme both through direct grants to the Agricultural research sector and through a maintenance of the grower matching funds is the most useful and most constructive assistance which can be provided. We need intellectual property laws which are similar or synchronised around the world. Ideally we need international agreements which make plant material available on equivalent terms across national boundaries.

The question as to whether the mapping of gene sequences (i.e. genomics) creates intellectual property rights in itself and the implications of that for control of the world's food supply need exploring. At the moment there are a reasonable number of alternatives for growers to choose from and that is likely to be the case for 5-10 years. If and when the situation arises that all the best plant material is controlled by a handful of multi-nationals, there is a real risk that Australian growers could be held to ransom. However that assumes that Australia's considerable expertise in gene technology won't be harnessed to make a contribution and also that the biotechnology industry won't attract new players.

Food trading around the world is going to be chaotic unless a commonly accepted system of product labelling is arrived at.

The Association is unsure of what is meant by the term "independent breeders" in the TOR. We believe that a strong public breeding programme will need to exist into the foreseeable future. If the word independent indicates separate from the major commercial conglomerates and embraces public breeders, then we support it. If it means separate from both public breeders and separate from the major multi-nationals, then at least in Australia we are dealing with a new animal.

In order for the Australian industry to survive and make a contribution to providing growers with worlds best plant material we need incentives and training programmes which equip us with the skills and experience to replace and build on the skills of today's practitioners.

**The appropriateness or otherwise of current variety protection rights, administrative arrangements and legislation in relation to genetically modified organisms**

The current major issue with regard to administrative arrangements for plant variety rights is the lack of an independent system for collecting end point royalties. At the moment very few varieties are being marketed in Australia under end point royalty systems. For the Galaxy wheat variety, it is proposed that the bulk handlers collect the levy on behalf of the owners (being Sunprime Seeds), and that the growers contract to deliver to Sunprime or its agents when or where a levy is not collected. There is more experience in Australia of closed loop marketing arrangements where the owner of the rights makes sure of the royalties by making the seed supply conditional on the product being delivered back to them. In many cases this arises where a marketing body with a specific interest in the variety for a particular market deliberately seeks out the rights. In some instances, for example, niche market products, this closed loop marketing may be a beneficial system for funding breeding. However for a variety with wide market appeal it does create a monopoly for the owner of the rights who may return the grower less than market value.

The Association believes that a system of end point royalties will serve equally well for conventionally bred varieties and GMO's providing the parties have confidence in the collection system. For that reason we believe that the Standing Committee on Primary Industries should recommend that the Ministry of Agriculture Fisheries and Forestry should allow the Levies Management Unit to collect varietal levies at cost to the owner of the rights. Initially the system would have to depend on grower declaration of varieties, but we are hopeful that an objective system may emerge within the next five years or so.

Some thought will need to be given as to whether conventional varieties should move to a patent system of varietal rights or whether plant breeders should have access to patent material without payment subject to it being used in further plant breeding work.

## **Opportunities to educate the community of the benefits of gene technology**

It is now a matter of great urgency to get the proposed Gene Technology Office up and running. This will provide a logical and legal framework for the development of gene technology in Australia.

The Association also believes that a round table conference should be convened containing representatives of the Australian Food & Grocery Council, the Consumers Association, the Australian New Zealand Food Authority and Farmer Organisations. The purpose of the conference would be to work through the issues surrounding food labelling and consumer education on GMO's. These would include looking at the costs and practicality of food labelling on a product group basis, prior to suggesting labelling systems which provide meaningful information to consumers. It is also hoped that such a conference could work through the evidence for and against the safety of GMO's and give a balanced view to the community on this issue.