COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON PRIMARY INDUSTRIES AND REGIONAL SERVICES

Reference: Primary producer access to gene technology

FRIDAY, 13 AUGUST 1999

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HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON PRIMARY INDUSTRIES AND REGIONAL SERVICES

Friday, 13 August 1999

Members: Fran Bailey *(Chair)*, Mr Adams, Mr Andren, Mr Horne, Mr Katter, Mrs De-Anne Kelly, Mr Ian Macfarlane, Mr Leo McLeay, Mr Nairn, Mr Secker, Mr Sidebottom and Mr Cameron Thompson

Supplementary members: Mr Griffin, Dr Washer

Members in attendance: Mr Adams, Fran Bailey, Mr Katter, Mr Sidebottom, Mr Cameron Thompson and Dr Washer

Terms of reference for the inquiry:

To inquire into and report on the following areas, with particular emphasis on the capacity of small and medium sized enterprises to access the benefits of gene technology:

. the future value and importance of genetically modified varieties;

. the ability for producers to compete using traditionally available varieties;

. the commercialisation and marketing of agricultural and livestock production varieties;

. the cost to producers of new varieties;

. other impediments to the utilisation of new varieties by small producers;

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

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

. opportunities to educate the community of the benefits of gene technology.

WITNESSES

Committee met at 9.06 a.m.

CHAIR—Before this public hearing officially opens, we have some housekeeping matters. Firstly, a submission has just come to us for the last witness who is to appear before the inquiry this morning.

Resolved (on motion by **Mr Cameron Thompson**):

That the submission from the Australian GeneEthics Network be accepted as evidence and be authorised for publication.

CHAIR—Good morning, ladies and gentlemen. I declare open this public hearing of the inquiry by the House of Representatives Standing Committee on Primary Industry and Regional Services into primary producer access to gene technology.

This inquiry was referred to this committee at the end of March by the then Minister for Agriculture, Fisheries and Forestries, the Hon. Mark Vaile. Written submissions were called for and 71 have been received to date. The committee has started on a program of public hearings and informal discussions. This hearing is the second of several that are planned over the next few months.

This inquiry concerns the use of gene technology by Australian farmers that has the potential to improve the productivity of farms and the quality of food and fibre produced. Genetically modified crops and livestock also offer the promise of lessening the impact of agriculture on the environment. The inquiry will examine the processes by which genetically modified varieties are made available to primary producers, and what steps need to be taken by government to facilitate these processes.

The committee is aware of the existence of some consumer disquiet over genetically modified food, particularly in Europe, and the possible impact this may have on Australia's agricultural export trade. The committee recognises that it will need to consider carefully how this disquiet can be addressed—for example, through appropriate regulation of gene technology and through education.

The committee's proceedings are recognised as proceedings of the parliament and warrant the same respect that proceedings in the House of Representatives demand. Witnesses are protected by parliamentary privilege in respect of the evidence they give before the committee. You will not be asked to take an oath or to make an affirmation. However, witnesses are reminded that false evidence given to a parliamentary committee may be regarded as a contempt of the parliament.

The committee prefers that all evidence be given in public, but should any witnesses at any stage wish to give evidence in private, they may ask to do so and the committee will give consideration to those requests. I now call the representatives of the Victorian government.

[9.09 a.m.]

BLACKSTOCK, Mr John McKelvie, Principal Analyst Plant Industries, Department of Natural Resources and Environment

KEFFORD, Dr Bruce, Executive Director Primary Industries, Department of Natural Resources and Environment

CHAIR—We have received a submission from you, but would you like to make a brief opening statement to the committee before we begin our questioning?

Dr Kefford—We have addressed in our submission all the issues raised and I will deal with them in sequence. In regard to the future value and importance of genetically modified varieties, the Victorian government considers that Australia's long-term international competitiveness in agriculture and food processing will increasingly depend on advances in gene technology. The potential benefits arising from the use of genetically modified varieties in terms of productivity gains to farmers, improved food and fibre products for consumers and sustainable agriculture practices with reduced environmental impacts are well documented.

The Victorian government is contributing, both through direct investment in technology and through research agreements with commercial entities and other scientific organisations, to provide our industries with access to genes for improved traits and gene technologies.

In regard to the ability of producers to compete using traditionally available varieties, the demand from consumers for new varieties and products will largely determine whether or not traditional varieties remain in production. Conventionally-bred varieties are constantly being superseded and replaced by new, improved varieties. The same market forces will apply to genetically modified varieties.

In regard to the commercialisation and marketing of agriculture and livestock production varieties, the general experience of the Victorian government, which breeds a wide range of agricultural and horticultural varieties, is that plant breeders' rights have been an effective tool for the commercialisation of new plant varieties of most species.

As a result of the need to reduce public expenditure on cereals and pulse crop breeding, licensing arrangements which provide for both seed royalties and end point royalties on grain production are increasingly being used to increase royalty returns and secure the financial viability of breeding programs.

Private sector investment, which will be necessary to accelerate the introduction of improved traits using gene technology, will not happen without end point royalties. Public sector investment in introducing and developing improved genetic resources and in maintaining the infrastructure needed for conventional breeding programs cannot be guaranteed without end point royalties. Without this investment, primary producers will not gain access to the benefits of gene technology and the international competitiveness of the grain industry will eventually decline.

In regard to the cost to producers of new varieties, the research and development costs associated with the development and testing of genetically modified varieties are much higher than those of conventional varieties. As a result of the higher cost, the large incremental benefits often conferred by GM varieties and the need to generate profits from private investors, the owners of GM varieties are increasingly using new arrangements to obtain a greater share of the benefits conferred by the varieties. While primary producers face increased costs, they will not use GM varieties unless they obtain a net financial benefit. Market forces will determine the appropriate balance. It would not be appropriate for government to intervene.

In regard to other impediments to the utilisation of new varieties by small producers, some prominent scientists and industry commentators have expressed concerns that international biotechnology companies are denying Australian scientists and primary producers access to patented genes and enabling gene technologies, and that these companies will gain monopoly power at the expense of primary producers. However, there appear to be sound reasons for a cautious approach to the licensing of such technology. In the absence of a regulatory system in Australia which provides a clearly defined pathway to market, gene technology owners face high costs and high risks of failure. With limited resources in Australia, biotechnology companies have, understandably, concentrated on commercialising the technology in a limited number of crops which offer the highest potential returns and which can be carefully managed by the companies to minimise the risk of adverse outcomes.

Until an effective regulatory system is in place, gene technology owners will not be able to invest with any certainty in the infrastructure needed to commercialise genetically modified varieties.

It is important that Australia invest in the development of gene technology in which we can capture and exploit intellectual property rights, gain competitive advantage and lever access to other technologies. However, we need not compete directly with the international gene technology companies for genes and enabling technologies they already have. To successfully commercialise the gene technology in Australia, the international companies will need access to advanced breeding lines adapted to Australian conditions and the infrastructure needed for traditional crossing and evaluation programs to produce the finished plant varieties. They then need the commercial infrastructure needed to capture the value in delivering the varieties to the market. The Victorian government considers that access to these technologies can therefore be facilitated through research agreements by public sector research agencies and through joint ventures by Australian companies.

In regard to the assistance to small producers to develop new varieties and the protection of the rights of independent breeders in relation to genetically modified organisms, individual primary producers do not have the financial resources to effectively compete against major plant breeding companies. However, primary producers in most agricultural industries contribute to statutory research levies which are matched by the Commonwealth government and administered on behalf of the producers by Commonwealth statutory R&D corporations. Given the significant government support provided to producers in this way, there seems little justification for further direct support to small producers.

In regard to the appropriateness of current variety protection rights, administrative arrangements and legislation in relation to genetically modified organisms, in the case of GM plant varieties, it is likely that the varieties will be protected by plant breeders' rights under the Plant Breeders Rights Act 1994 and the genes and gene technology processes by patent under the Patents Act 1990.

The broad scope of the patent protection could lead to restricted access of the Australian industry. As the patent confers exclusive ownership of a gene incorporated into a new variety, no other person can use the variety to breed another variety containing that gene without the approval of the patent holder. This could result in an increasing concentration of control of crop improvement activity in the hands of gene technology owners with adverse effects on industries if there is inadequate competition in the sector.

The attention of the standing committee is drawn to the compulsory licence provisions of chapter 12 of the Patents Act 1990 as a possible means of addressing the refusal of a patent holder to provide access to the patented gene technology.

Section 133 of the Patents Act 1990 provides that a person may apply to a prescribed court for an order requiring the patentee to grant the applicant a licence to work the patented invention. The court may make the order if satisfied that the reasonable requirements of the public with respect to the patented intervention have not been satisfied and the patentee has given no satisfactory reason for failing to exploit the patent. Further details on this are provided in the submission.

Finally, in regard to opportunities to educate the community about the benefits of gene technology, an informed public is recognised as critical to the acceptance and hence the commercial viability of the products of gene technology.

The Victorian government welcomes the federal government's budget initiatives dealing with biotechnology regulation and community awareness programs. Such programs must communicate accurate, balanced and easy to understand information and facilitate a national dialogue with the community to hear and respond to its concerns.

Governments cannot afford to delay engaging the public on these issues. The recommendations concerning community education from the recent Consensus Conference on Gene Technology provide useful guidance in ensuring that constructive dialogue ensues. The Victorian government is prepared to play an appropriate supportive role with the federal government in deploying and developing a national communication strategy.

CHAIR—What do you see as your role in providing information to producers about gene technology?

Dr Kefford—As a preliminary comment, there are three roles for the government in regard to gene technology. First, I refer to our important role in protecting the interests of the community in regard to food safety and the environment. Secondly, we have a role in developing technologies, including gene technologies, which have potential to improve the competitiveness of industries. However, all that technology needs to be managed in a very safe and effective way. We would regard the control of the development of that technology

as being important. Thirdly, and finally—and this is an emerging need in relation to this technology, associated with the intense interest that the community is displaying in regard to this particular technology—we regard it to be vital that we provide independent and accurate scientific information to the public in regard to this issue so that they can make informed judgments about it.

CHAIR—On those three points, you have mentioned food safety, developing the technology but controlling it, and community awareness and safety. You mentioned in your opening statement the role the federal government is playing in developing the regulations. I think you said that you regarded the Victorian state government as playing an appropriate supportive role. How much are you being consulted as part of developing the regulatory process, and could you expand on what 'appropriate supportive role' means?

Dr Kefford—I serve on a high-level working group focused on gene technology that reports to the Standing Committee on Agriculture and Resource Management. That group is taking a focus on the food and agricultural aspects of gene technology and is linked into the health department's group which is building the regulatory framework. We serve as a source of expertise to that committee and our expert staff interact effectively with that group. We have had a number of meetings in Victoria with staff from the health department and we are quite satisfied with the progress to date and that we are being listened to and are having active input.

CHAIR—You are playing a participating role.

Dr Kefford—Yes.

CHAIR—Getting back to my original question about your expertise being utilised, how are you utilising this expertise to get to the producers?

Dr Kefford—In regard to the regulatory system or just communication?

CHAIR—My original question was: what do you see your role as in informing producers about gene technology? You answered by mentioning the three different points that you regarded as most important. You have now told us about your expertise in working with the federal government in the regulatory system. How are you getting this information to the producers, both about access to gene technology, information about gene technology, and about your role in utilising your expertise in developing the regulatory system?

Dr Kefford—My experience is that, particularly, the leadership of the agricultural industries is very well versed in these issues. We deal with the leadership of our agricultural industries on a regular basis with processes associated with the emerging issues on gene technology. That level of understanding is not distributed fully throughout the community. There are some divided opinions amongst the producers about the appropriateness of the technology.

For example, some farmers would regard it as an opportunity to develop crops that are not genetically modified with a view to establishing a separate market. That is a market decision and may well be worth pursuing. We would not argue against that, but we point out that the

likelihood is there will be a comparative cost disadvantage or some disadvantages for that product in the cost of production in the future.

We intend to build on that already extensive contact, particularly with the leadership of the farming organisations, with a broader communication strategy that would incorporate discussion of a whole range of issues: the nature of the technology, its effective use, the importance that farmers place on managing the technology so there are not environmental impacts, the implications for the emerging labelling issues, the trade implications, what is happening in Europe, Asia and the US, for example. Quite a range of issues will be canvassed.

We find that there is very active discussion of this issue amongst the farming community now. There is an active discussion with the community at large. Our objective is to provide active up-to-date information to those people.

Mr Blackstock—The Standing Committee on Agriculture and Resource Management has also looked at a proposal to put to Biotechnology Australia to develop an agrifood biotechnology communication strategy as part of the national program. That was endorsed at their meetings last week and certainly the Victorian government has committed significant resources to that national program.

Mr ADAMS—That was the answer to one of my questions on what the Victorian government was doing about putting resources into that and that producers are well aware of these changes that are occurring. You feel quite confident about that, I take it?

Dr Kefford—The leadership of the producer bodies are well informed.

Mr ADAMS—Without using the words 'public interest', you did mention the difficulties of multinationals, which you seemed to push aside as not being a difficult problem. We did receive a briefing that it is going to be difficult for Australian companies to receive much of a play in these new products without really forking out a lot of the gains to multinationals who already have their little piece of gene technology in a world patent.

How do you think Victorian producers will go in having to use the seed put up to them by a multinational company and which produces the most? We have also had evidence that it may not produce in real terms that much more than a traditional crop. We have had evidence that there will be a gain for some people, but it is not always the producer who will make the gain. Do you have any comments on that?

Dr Kefford—We are perhaps not as powerless as we might seem in regard to this emerging trade in gene technology, in the sense that Australian agencies have some valuable commodities that are worthy of trading in this market. Some of the valuable commodities are our own genes and importantly our own germplasm, which is adapted to Australian conditions, and some of our technologies.

You can actually offset the cost of some of these exercises by trading technologies. For example, there are life science companies looking to put their particular genes into locally adapted germplasm because those varieties have been demonstrated to be effective in, for

instance, Victoria or Australia. They are interested in working closely with agencies such as ours to do that.

That leads to a genetically modified variety that is adapted to that location being available to the farmer. You could argue equally that that could be at a very high price. Our approach to that has been to make sure that there are other varieties that are effective in the marketplace available through other avenues. Often they might be traditionally bred or we might have, for example, a similar program with a competitor of that particular life science company. Again, we are trying to foster an effective marketplace with this whole exercise, without choking off the use of the technology.

What would achieve what you pointed out would be if we sold all our genes and all our technology to the one company. We had taken a policy position to remain a technology provider to life science companies where appropriate and to other groups where appropriate so the valuable germplasm resource that we hold in trust for the Australian community is available widely. I would like to emphasise that the value of that germplasm should not be underestimated. It is extremely valuable and it is worth the life science companies interacting with us.

CHAIR—You are saying that you have some leverage?

Dr Kefford—Absolutely. We are being courted on a regular basis by the life science companies.

Mr ADAMS—I have a question in relation to aquaculture. Is there much research going on in gene technology looking at the food position of fish in Victoria and finding sources of protein other than fish stocks?

Dr Kefford—Unlike many of the agricultural industries, the potential of improving the aquaculture species is relatively untapped. There is enormous potential to improve the performance of those organisms with traditional breeding programs and other tools.

The CSIRO in particular has done a lot of experimental work with the production of aquaculture species that are environmentally safe. The Pacific oyster is an example. It is a very productive oyster, but it has a problem in that it colonises sites that you would not want to see it colonise. It has been working on, and I understand has quite successfully used, genetic engineering to produce an oyster that cannot reproduce outside of its appropriate environment.

Another example being looked at is the production of a gene which will ultimately render sterile pest species. The European carp is an example. It is perhaps in an earlier stage of technical development. Ways of affecting the reproductive capacity of carp are being looked at so that eventually they can be eliminated from our waters. That would have a very substantial benefit.

Mr CAMERON THOMPSON—I am interested in the Victorian government position on the competing interests of consumers, farmers, researchers and retailers. In your mind, given your position, do you believe the Victorian government has a perspective as to which of

those interests it would like to serve first, second, third and fourth? Do you have an idea of that?

Dr Kefford—I think our primary role is for the widest group, which would be the population in general. To illustrate that, we would see our first responsibility as ensuring that any technology like this would not lead to a food safety hazard or an environmental hazard. That applies to the whole population. We believe the technology can be developed in such a way that that is a prerequisite for further work and that other benefits would flow to other groups such as farmers and consumers. The overriding effect is to look after the needs of the population at large, particularly in relation to food safety and the environment.

Mr CAMERON THOMPSON—How many different departments are getting involved in this exercise? Is it primarily focused within your group?

Dr Kefford—NRE contains about 70 per cent of the Victorian government's scientific effort and virtually all of the gene technology, both plant and animal. Keep in mind that the universities that conduct this work are obviously federally related.

Mr Blackstock—The Victorian government agencies are firmly committed to developing a whole of government position on this. We are working very effectively across departments, with a contact group working with the Department of Premier and Cabinet. It is working well. It is important that we develop that whole of government position.

Mr CAMERON THOMPSON—Which departments are in the contact group?

Mr Blackstock—The Department of Premier and Cabinet, Human Services, State Development, and Natural Resources and Environment.

Dr WASHER—Would you comment on the problem that I see in terms of marketing to the population. Apparently, most genes being incorporated in plants are of maximum benefit to farmers and probably to the environment. There are not yet many genes available to value add the product as far as the consumer is concerned. I know they are in the pipeline and they are coming out.

At the moment, the problem we have is that a lot of the gene value is to farmers and the environment, but when the consumer consumes the food, there is not yet a lot of value added product. It is in the pipeline. It is coming. The second stage of the gene technologies that can do that is available, but they have not yet come out. It is mainly herbicide or pesticide resistant type genes. The cost imposition we are putting on by labelling and regulations perhaps would compromise the value that we give the consumer by having a cheaper product, for example. Do you have some comments on how you see we can overcome that?

Dr Kefford—I think the argument that farmers capture the benefits and others do not needs to be examined carefully. That argument would have underpinning it that somehow farmers can capture the benefits without them flowing on to the marketplace. My view of that is that it is not true. Then there is your comment about the fact that much of the gene technology that is currently coming out is relatively simple gene technology, single genes associated with weedicide resistance or pest resistance that can confer that resistance. But

even those simple genes can have a wider effect than simply environmental benefits and cost reduction. A canola crop that is resistant to a weedicide can actually substantially reduce the cost of the pesticides and weedicides used, which has a cost benefit and an environmental benefit.

What it actually does also is lead to a far purer, higher quality product because the number of contaminating seeds are reduced. So you get a quality benefit as well. The Flavr Savr tomato was specifically designed to give a benefit to the customer and we will see those things flow through over time.

I think that we need to be aware that there is a potential to actually reduce the benefits by adding in other costs, particularly if they add no real value. We would say that consumers are clearly articulating their need to have products identified, but we want to really provide them with a benefit, not something that means that every food gets labelled with 'may contain genetically modified organisms' simply because the pervasion of the foods is such.

In particular, we are going to go through a phase where labelling is obviously going to be expanded, as the ANZFA decision says. What I would like to see emerge at the end of that is labelling that adds value, segregation where it really adds value, and an understanding amongst consumers that where it is not adding value, their concerns are being dealt with.

Mr SIDEBOTTOM—I am interested in the section of your submission on the intellectual property side of it, then the security or protection of the patent and then the accessing of the patent. You draw our attention to the compulsory licence provisions in chapter 12 of the Patents Act 1990. I am particularly interested in section 133—you mentioned accessing intellectual property where owners refuse to allow people to fairly and responsibly access that. Has the Patents Act been used for this purpose in the past or presently? If so, what has been the outcome? If there has been none, what plans do you have, if any, to test the efficacy of the act?

Mr Blackstock—When the Plant Breeders Rights Act was produced, there were a number of public interest provisions there. Clearly, there is an obligation on the grantee to make available the material at a reasonable price and in a reasonable quantity to meet the market demand. There have been claims that the broader scope of the patents did not carry with it, if you like, those same sorts of responsibilities. We examined the Patents Act and in fact found that provision, which on the surface appears to address the question of a patent holder locking away a gene, preventing access to producers and the industry and placing the industry in an uncompetitive position.

It seemed to us that the provisions there hit the mark squarely on the head. We drew the attention of the standing committee to the provisions in the hope that that could be pursued further with the Patents Office. To answer your question, we are not aware of the case history on this, particularly in relation to agriculture, but we think it is something that should be kept in mind.

Mr KATTER—I am a little at sea as to what this involves. Do we get a scalpel out and cut out a couple of atoms? Do we laser a helix? What do we do here?

Dr Kefford—I think the thing to realise is that this technology has been going on for thousands of years. To illustrate that, we would not have a grain industry if our predecessors had not selected the varieties of grains that hold the seed in the head. It does not serve the plant at all. The seed falling out of the head is actually what is designed to have happened to spread the seed around. Through natural selection, occasionally a variety will appear that has that characteristic. Our ancestors collected those seeds and reproduced them. There is a natural process going on the whole time, producing new varieties.

What has happened over time is that scientists have speeded that process up. Traditional breeding waits around for the right mix to occur. We want one that grows better or tastes better or some other feature. Plant breeders are typically very patient souls and they sit around waiting or create environments where lots of plants grow and they will pick the right one and then take it a step further.

What gene technology has simply done is make the whole thing faster and more accurate. With a variety of probes and other tools, and now very quick machines that can speed this process up, you can do this much more accurately and much faster. It gets to the stage now where you can literally map the whole genome of an organism. We are in the process of trying to map the whole human genome now. Once you have that map and you understand the function of those genes, you can manipulate them, which is a very bad word, but it is the word—

Mr KATTER—You can change the mould that mass produces the cell.

Dr Kefford—You can introduce similar genes from the same species. In some cases, you can introduce genes from other species. The technology allows that. The trick is to get it expressed. That has often been a problem.

Mr KATTER—It is simply a matter of introducing some cell material from over here into some cell material over there.

Dr Kefford—It is DNA. It is the messenger which allows the—

Mr KATTER—I understand that.

Dr Kefford—It is not simple, though.

CHAIR—In fairness to our witness, we have CSIRO and other scientists who are giving the scientific explanation.

Mr ADAMS—Does the gene express itself?

Dr Kefford—The gene may actually be located in a new cell and remain silent. The expression is a process of the promoter enabling the cell to read that message. Often you can introduce DNA sequences and they lie silent. Getting that reading to happen is a really important step.

CHAIR—The word 'manipulation' has come about because of achieving a desired result by inserting a particular gene into another host.

Mr KATTER—When we talk about gene technology, we have the fastest growing tree in the world, which is a Brazilian hybrid which is a hybrid of our Camaldulensis and Eucalyptus grandis, which are both Australian trees. It is a very simple task to take some material out of a flowering blossom from a grandis but, when we do that, the Brazilian government instrumentality that owns those plant rights can come down on us. They are a lot bigger than our little blokes up in North Queensland who are doing this, so they are going to crush us in the courts of Australia through PBR, and also through regulatory acts that will control genetic engineering.

Answer my question; I have worries about this: the big boys are going to stop the little boys from doing tasks which, in some cases, are very simple.

Dr Kefford—I think the simplicity of the technology is granted. That is a perfect example of how it can be done very simply. I think what we recognise is that there is a race on and that those that are slow to act to enter this race will be disadvantaged.

Mr KATTER—Through the courts and through the acts that we pass.

Dr Kefford—That is how the disadvantage is enforced. That is in many ways like a lot of races that relate to technology; the computer technology, for example. Those who got in first did very well and those that have come second perhaps—

Mr KATTER—The copyrights and the PBRs inhibited to some degree those people that got in slower, because they are scared of the legal action against them.

Dr Kefford—We, too, would argue that we want to be protected in the same way for the things we have.

Mr ADAMS—There will be a Bill Gates who will run the whole show.

Mr KATTER—It is one of the ways Bill Gates has been able to get where he is.

Mr ADAMS—He is so big that the American economy does not want to give him up.

Dr Kefford—We would use the same tools if some of our technology were being inappropriately used.

Mr KATTER—You know all of the things we have to do with cotton to grow it. We have some genetically programmed cotton now that does handle the bug that requires all the poisons. It has not been particularly successful. What are the inhibiting factors that stop Australia from being able to overcome the problem of that bug with respect to cotton? Why are we not moving faster in this area? Should CSIRO be getting more money or are their PBRs not strong enough?

Dr Kefford—The total effort going into gene technology in Australia in terms of the researchers such as CSIRO has been very small in reality, although we are seeing signs both in this state and in Queensland particularly of a major upgrading of effort. That will no doubt have benefits in terms of producing products that are needed for Australia. One of the things we have to realise about Australia is that we have environments and conditions and crop needs, for example, that no-one else has. We are unlikely to get other companies producing technology for our particular circumstances. You are talking to a researcher, so I have to declare my vested interest. It is really important for the Australian government to have an effort in this area for that reason alone, that we should develop our own systems to deal with our own problems because no-one else will.

Mr Blackstock—Can I make two very brief comments about Mr Katter's comments regarding the Brazilian situation. It is important to remember that Australian agriculture is based almost entirely on genetic resources we have imported from other countries. What is important is that we do have scientific resources to develop material adapted to our conditions, that we have the intellectual property policies in place to be able to protect that intellectual property and then exploit it in the marketplace.

Globally, it is important to recognise that there are at least six major players in the multinationals working in this area. That is a healthy basis for competition. The Victorian government certainly is looking to see that that competition exists and that there is a national and, as far as possible, international competitive position. If we have that, we have a healthy basis for a market that will work properly and protect all interests.

Mr GRIFFIN—Firstly, do you have any comments on the development of the Office of the Gene Technology Regulator? For example, has the Victorian government been consulted about the operation of that body when it gets going properly? Secondly, you have talked a little about public information. Is there anything particularly that you think needs to be done in that respect? In looking at that, although there is a lot of information around, particularly about the advantages of GMs in terms of a range of issues, do you think enough research has been done on some of the concerns that have been raised around the operation of genes?

Mr Blackstock—Very briefly on the Office of the Gene Technology Regulator, the Victorian government has had excellent rounds of consultation with the Commonwealth group developing the drafting instructions. We think they are doing an excellent job. They are listening to the state's concerns. We have no criticism at this point and we think they are making excellent progress which should allow documents to be in place for public consultation for a significant period early next year.

Dr Kefford—I might quickly point out that Biotechnology Australia is currently conducting some market research on attitudes of the Australian public. The information is that the Australian public to date seems to be in a state of making up its mind. There is healthy scepticism in regard to the technology and also the claims of some of the antitechnology groups.

My view is that the primary objective of communication needs to be directed at assuring consumers that government will have a regulatory system that will protect their interests. There has been, and will continue to be, a lot of communication on the science, but the

indications are that having the science explained more is not really addressing consumer needs at the moment. It is about: are you going to keep me safe? Are you going to keep the environment safe? That is my view of the matter.

Mr ADAMS—I am worried about that.

CHAIR—Can I just ask you a final question: you talked about the end point royalty system industry wide. How do you see that working when producers frequently would also be paying levies?

Mr Blackstock—The end point royalties apply mainly to the cereal and pulse industry where we have seen a significant market failure. The traditional practices of farms saving seed and of farmer to farmer sale of seeds have served our industry well. It has become a must, if you like, in terms of policies for the grain industry.

In fact, though, it has created a real problem for the industry, because it means that private investors and governments, if you like, on behalf of taxpayers, have not been able to get a reasonable return on that investment. There is virtually no private breeding in Australia in cereals, simply because people cannot get that reasonable return on the seed. If you remember, the Plant Breeders Rights Act provides for the exclusive rights to the production and marketing of seed.

What the industry is now coming to recognise, and you will see it in the submissions from the Grains Council and from the National Farmers Federation, is that unless policies and royalty mechanisms are put in place to attract that private investment and to trigger the alliances between research partners, gene technology partners and marketing operations, then producers will not get access to that technology.

At Grains Week this year, there were excellent discussions on how that market failure situation could be addressed. It was agreed that end point royalties collected at the delivery of the grain would solve that. The Grains Council final plenary session endorsed investigations into how that could be achieved. One option put forward was that there would be an industry code of practice where all the major players in the grains industry could sign off on a voluntary system of collection of end point royalties at the point of delivery. It does operate overseas. A number of industry groups are looking at how that could be put together now. We certainly endorse that approach.

Mr ADAMS—There would be a fair bit of money that would have to be put in place for infrastructure for storage if you were going to separate grains.

Mr Blackstock—I think segregation is becoming a part of the marketing chain now. There are a number of segregations in the grains industry for all sorts of quality factors. It is all about segregating to meet customer requirements. A lot of it goes on now. GM products might demand additional segregations, but that is all the more reason why a system of end point royalties becomes feasible.

CHAIR—Thank you very much for appearing here this morning.

[9.58 a.m.]

STEVENS, Mrs Naomi Lorraine, Regulatory Affairs Officer, Crop Improvement, AgrEvo Pty Ltd.

CHAIR—We have received your submission. Would you like to make a very brief opening statement before we begin our questioning.

Mrs Stevens—Thank you very much for the opportunity to contribute to this inquiry and public hearing on primary producer access to gene technology. I will do my best to assist you in your understanding and appreciation of the issues from the perspective of a technology provider.

Farmers will embrace the products that add to their bottom line. I think that is a clear message that is fairly easy to understand from all aspects. Gene technology will meet farmer and environmental needs for high yields, sustainable production and economic returns.

AgrEvo is developing a herbicide tolerant hybrid canola that we call InVigour, which we hope to bring to the Australian market in 2002. The main feature of the hybrid canola will be its superior performance, and that is yield, over existing varieties and hence higher returns for farmers. Use of the herbicide Liberty is an option for farmers who grow InVigour hybrid canola. Farmers will have a choice of whether or not to apply the herbicide to the crop.

Some other benefits of the genetically modified crop include reduced risk of soil erosion, reduced pesticide exposure, reduced total active ingredient applied per hectare to crops, introduction of a new mode of action which enables better rotation of pest control methods and thereby prolongs the life of existing tools, an extended time window for farm activities, enhanced work load management, a switch to products and practices with a better environmental profile, promotion of integrated crop management systems and enhanced resistance to drought and environmental stresses and disease. These sorts of benefits are difficult to convert into economic terms, but they do contribute to environmentally sustainable production which is important to farmers and to the broader society. So, too, is job growth, increased skills and value adding of Australian production. This would be available to the broader society through access to the products of gene technology.

It is important to AgrEvo to be a responsible global steward for its products. They are expensive to produce and they demand respect. Communication of the product features, its risks and benefits is a key activity. We are some years away from having a commercial product. We are sensitive to our national issues in the context of our global experience. At this point, our strategies for distribution, sale and marketing are not fixed. In consulting with our stakeholders and understanding their concerns and issues and nurturing their expectations, we are aiming for practical solutions so that we can share in our farmers' successes. Gene technology will provide an option to meet the farmer and environmental needs, to provides high yields, sustainable production and economic returns.

CHAIR—I am interested in the regulatory process that you went through in Canada before you got the genetically modified canola accepted there.

Mrs Stevens—The principles of the process are probably not dissimilar to what we are going through in Australia in terms of applying for a permit to conduct laboratory work initially and then field trial work. The Canadian government very quickly developed expertise in-house to understand and evaluate the products and the issues raised by the activities we were doing and developing in trying to bring to market. They were available to work through some of the issues and the introduction of the product in an environmentally safe way that was acceptable to their government and public and also to industry. That process was evolving whilst we were developing and getting experience with the product.

The canola product was in fact the first genetically modified canola to come through the Canadian system, so it was a very good test case. There was a very good relationship with government and industry and the company working through. Data was included from countries such as those in Europe where there was work also occurring in the laboratory for the characterisation of the products and some of the environmental safety aspects. That was taken into consideration also in the evaluation of the product.

Following a multitude of field trials and addressing all of the environmental safety aspects relevant to Canada, the products were released. The components of that evaluation involved environmental safety, food safety and feed safety evaluations and variety registration. Virtually all of those approvals came through at the same time for the first product that we put through.

CHAIR—What percentage of the Canadian canola crop would your product have?

Mrs Stevens—It depends what particular product. I know that 75 per cent of the canola grown in Canada are herbicide tolerant canolas. Of those, 50 per cent are the genetically modified kind, the Roundup Readys, the LibertyLinks and the InVigour canolas and the bromoxynil tolerance. There are probably five or so different products there, different herbicide tolerances. In terms of market shares, I would have to check that for you.

CHAIR—Would you check that and provide us with that information. You mentioned in your submission, and again here this morning, the stakeholder consultations that you are conducting in Australia. Can you identify who the stakeholders are?

Mrs Stevens—We can start with the farmers as an important stakeholder.

CHAIR—Farmers is very general. Where are these farmers from?

Mrs Stevens—We are looking at the broadacre canola farmers. Essentially, the farmers that are growing canola often grow wheat. The areas are very similar. We would call them broadacre farmers. We look to other stakeholders as environmentalists, academics, government—people involved at the state level as well as at the federal level—educators, our agronomists in the reseller chains in terms of input suppliers and fertiliser companies. There is a whole chain of stakeholders from that perspective. The educators are an important stakeholder for these early consultations.

CHAIR—What are the key messages that are coming out of these stakeholder meetings so far?

Mrs Stevens—One of the interesting things I picked up was that, in general, the groups that we had together were really happy that they were being consulted and being consulted some years off commercialisation. They seemed to feel that it was very nice of us when we were very open with our information in order for them to understand it, take it on board, whilst being careful not to create incorrect or unmanageable expectations. It was quite heartening to know they were happy to be involved in the process at an early stage and therefore had the opportunity to help to mould it and to influence how we would introduce the product in two or three years time.

CHAIR—Is there a requirement by GMAC on you that you must conduct the stakeholder meetings?

Mrs Stevens—The process has been developing. Initially, GMAC would have referred to it as developing a national strategy for herbicide tolerant crops. That then evolved at the same time the SCARM group picked up a particular working party on good agricultural practice guidelines for agriculture. That is where it has come to. That final document has been endorsed by various government departments, although I am not sure that everyone is aware that this is the next official step to obtaining environmental safety approval. It has been developing at the same time as we are all trying to find out what we need to do next. It is something that we have been trying to interact with.

Mr ADAMS—Your company is connected overseas to a bigger company. Can you outline the other countries that are involved?

Mrs Stevens—We are a multinational company. We have a head office in Frankfurt, Germany. We have country locations in probably all of the major countries. I forget what number. It is over 100.

Mr ADAMS—How much R&D has been done on this canola effort here in Australia?

Mrs Stevens—In Australia, we started in 1996 with some field activities. We do not have a laboratory set up as yet in Australia, so we relied on information and work that had been done in our offices overseas. That gave us a head start certainly, but there is also a long way to go.

Mr ADAMS—I see that you say there is no need for a contract with the farmers. You do not see that as being a commercial obligation, that you will guarantee the farmers something and that you will have a contract? It is the old slap on the back type of arrangement, is it?

Mrs Stevens—At this stage we do not envisage having direct contracts between AgrEvo and farmers. It may well be that there needs to be some responsibility or responsible use or recognition of the requirements between, say, the providers of the seed at the reseller level and the farmers. They may well have contractual obligations, as they do when they buy chemicals and have to use these responsibly according to the label. That in a way is a contract. We do not envisage setting up contract or licensing agreements.

Mr ADAMS—You would be two or three steps away.

Mrs Stevens—Absolutely. Although there will be responsibilities that have to carry right through from our approvals and our conditions of approval, we cannot envisage having a direct bit of paper that goes from AgrEvo to the farmers.

Mr ADAMS—It is an issue that has been raised. I have not been able to do it with the farmers. The contractual arrangements in the past, even with processing companies, have not been that tight for the farmers. If they do have a bit of a falling out over a season's crop, they are frightened to come back to take on the company, because next year they are relying on that company again to buy their crop. There is a bit of a push to say, 'Well, maybe there should be some contractual stuff as we go into these new arrangements.' As you said here in your submission, you are not really interested in going down that track.

Mrs Stevens—If you want to compare us to the way Monsanto have covered their North American market, no, and other companies have not done the same thing as well. American Cyanamid and Rhone Poulenc in Canada are similar. They have not gone down the path of the technical use agreement.

Mr ADAMS—Monsanto with the cotton growers here tried it on and said, 'Because you are using less pesticides now, it will cost you this much for your cotton seed,' which was a lot more than what the American farmers were paying for theirs. They seem to have sorted something out with some negotiations, but it was certainly a try on, I think.

Mrs Stevens—I think the key message there is being able to offer a product that is going to add value to the farmer. They are not going to buy it unless somewhere in the equation of what they spend on inputs and what it costs them to produce their final product and obtain a return they are offered a product that fits in to that equation. I think all companies would have to look at that equation and try to best match that in terms of how they offer their product, and whether they bundle it together with seed, chemicals and advice and whatever.

Mr ADAMS—That is a bit patronising. It is really about the day-to-day hustle and thrust of business. It is really the farmer having enough leverage to extract their income and their percentage from the companies they deal with.

Mrs Stevens—Yes, I guess so. The farmer in the end cannot buy the product. They can walk away.

CHAIR—Has this come out in your stakeholder meetings? Have farmers been concerned about this?

Mrs Stevens—In terms of pricing of the seed?

CHAIR—In terms of being locked into a contract and having to agree to the terms and conditions of that contract.

Mrs Stevens—We have conducted a little market research in terms of farmers' attitudes to how they are approached. I think in general you could probably say that if you start talking about legal contracts with anybody, you tend to want to call your lawyer and get advice as to whether you should be signing on the dotted line. I think there is a general

concern. We are sensitive to the fact that farmers do not want to have to sign on the bottom line for everything that they do. They need to have flexibility and an understanding of where their risks are and things like that. The idea would be to offer a package that really shares in their risks or understands what their particular individual risks are in terms of their production. That becomes very difficult to do in a standard contract form.

Mr CAMERON THOMPSON—How will this InVigour seed of yours that you are going to bring to Australia perform in Australia compared to the way it performs in Canada?

Mrs Stevens—We hope it will be adopted as widely. It certainly is potentially highly beneficial to the farmer in terms of offering significant yield advances. Of course, we cannot promise that if we get a 20 per cent yield increase in Canada, we will get a 20 per cent yield increase from the same product in Australia. That is where we are at the moment. The next two to three years will involve refining and adapting the varieties that we choose to take forward to the Australian conditions and finding out what their best potential is. Certainly, the hybrid system offers an immediate jump in hybrid vigour and therefore yield response.

Mr CAMERON THOMPSON—With respect to the seed that you are setting out to manipulate—that horrible word—will it be an Australian variety or a Canadian variety or some other variety?

Mrs Stevens—We have tackled it from as many different approaches as possible. We have started with Canadian varieties and tried to then adapt them into the Australian lines and the germplasm so they are adaptable to particular areas of Australia. I guess in the end they will be Australianised varieties. The other way of approaching it is to take the Australian varieties and go to the laboratory and put the genes into them, but that is again another long path forward. We have come from both ends. The quickest way is to adapt it from a Canadian variety.

Mr CAMERON THOMPSON—Are you not running the risk that what we pick up on the roundabout, we will lose on the hurdy-gurdy? If you do not have an Australian variety as the host, although it may perform well in other areas, it may not perform well against another pest that you are not used to in Canada.

Mrs Stevens—That is why there has to be a lot of testing done on a broad scale in Australia in different conditions. We will meet government requirements at one level and we have to meet even higher standards for us to be fully satisfied that we are not going to be at risk of the product failing. Then the farmers will use it in all sorts of different ways. Even further development will occur when the farmers adapt it to their particular ways of doing things. It really does have to be fully adapted to the environment at many levels.

Mr CAMERON THOMPSON—Can you confirm for me that it is not decided yet whether you will have it based on an Australian variety and what you are selling is the system? Is that what you are talking about?

Mrs Stevens—The system is part of the regulation. The rest of it goes into the standard plant breeding. Regardless of whether it is genetically modified or not, you have to adapt it

to an Australian variety, so it will become an Australian variety. It just carries that system along with it.

Mr SIDEBOTTOM—I refer you to reference 7 in terms of administrative arrangements and legislation:

Lack of national regulatory clarity (and legislation) is a likely impediment for access by all producers to any products of gene technology. Inconsistency in regularity definition (product versus process) is a potential source of confusion and disincentive.

Would you like to expand on that more and assist the committee with some of the more specific regulatory problems that you see.

Mrs Stevens—It is this complex world of trying to get some international harmonisation of regulations. We have even seen that within the different Australian government departments. It is trying to tackle what is the definition of a GMO and how that affects the scope of their current legislation and their operating procedures. We saw that AQIS had a much broader definition of what a GMO is from a plant pest and import risk point of view compared to what GMAC were looking at where they were only looking at a genetically modified laboratory product. That, for us, as an industry, immediately creates some distinctions because you have herbicide tolerant crops that are developed in different ways—either by irradiation or by biogenetic modification. In the end, when they are in the agricultural system, they have the same issues arising. Herbicide tolerance is an issue, as is the resistance management. The impact of that is an issue. That is where the inconsistency is a concern.

The product versus process system is the same thing; looking at whether you are regulating the product. In Canada, they have said that everything with a novel trait needs to be assessed. They have probably the broadest definition where they are assessing every plant with a novel trait, regardless of the process that produced it. If it is something novel or something slightly different, they want to assess it. I think that is quite a sensible way to do it.

Whereas here, GMAC, for instance, is looking at the fact that it is a GMO. The fact that it could have been produced by some other technology does not matter. It is much more looking at the process. A similar occurrence happens in the food safety area where it is a matter of whether you are looking at the food or whether you are trying to regulate the fact that it is genetically modified. That adds to the complications of this whole topic, where governments have based different definitions on product or process. It is just terribly confusing for everyone.

Mr SIDEBOTTOM—Certainly, the consumer as well as the producer.

Mrs Stevens—Yes. In terms of clarity being an impediment, the fact that we do not know what our next steps are in this interim phase before we get the Office of the Gene Technology Regulator up and going, what is the next step for us to get environmental safety approval? At the moment we have conducted some consultations at the same time as that requirement has been coming down and being put into place, but then will there be something else that we have to do or more hurdles to jump over? It is very difficult to say

that we can bring a product to market next year if we do not know if there might be another requirement coming down because somebody thinks it is a good idea or whatever. That clarity is very important in terms of planning for development and investment in technology.

Mr SIDEBOTTOM—Will it have an effect on the competitive side of your industry?

Mrs Stevens—Sure, especially if you look at those products that are outside the definition, which have no controls necessarily in the same way on them, and that are able to go on to the market straightaway. I refer, for example, to the triazine tolerant canolas that have resistance management issues, that are very similar to the other herbicide tolerant canolas. The immadazolinone canolas that will be launched next year do not have to go through the food safety and the environmental safety assessment that our herbicide tolerant LibertyLink or Roundup Ready canolas need to. They get on the market straightaway without any impediments.

Mr ADAMS—Why is that so?

Mrs Stevens—Because of that definition, the fact that they are not all encompassing on the basis of the product. We are certainly working towards, for instance, the National Registration Authority being involved in evaluation and control of use of the herbicide on that product. That is the only point of contact at which we can then bring everything in together. Whether they are prepared to accept all of those issues at once, we are still working through.

Mr GRIFFIN—You have talked about the regulatory area. I note from your submission—and I quote:

> Public acceptance begins with a transparent and credible regulatory evaluation. Hence the government must be involved in communicating the policy development in this area to the public through regular formal and informal consultations.

Would you like to expand on your earlier comments and on the question of that regulatory aspect? Have we a credible environment at the moment? What needs to happen to change it if it does need to be changed? What sort of consultation would you envisage government going through around the question of public information? When we talk about the question of those health and safety checks that your products need to go through, could you expand on that to give me an idea of what that actually involves?

Mrs Stevens—That was a big question. I hope I can cover all of it. I guess we are talking about the role of government in regulation and in public acceptance and also in allowing us to bring our products to market—the transparency. I would draw my experience from the way Canada—and less so perhaps Europe—and the United States have conducted themselves in ensuring that they have consultations all the time at a formal level with industry, as well as ensuring that those different stakeholder groups from their perspective in government are involved in consultations in looking at how a set of regulations and legislation for gene technology products affects them. I believe the process is fairly transparent in Canada and the US.

Credibility of the environment comes in the same way, as to how government conducts itself and what it is involved in in terms of the role of providing information about their process. We would not necessarily expect it to go out and promote our products, and it probably would not want to, but they certainly have a role to stand up and defend its processes. Those processes have to be clearly defined in order for it to defend them. Perhaps that has been one of the issues that we have been working through, but it is very important for it to have a voice and to stand up and become a credible sponsor of its own systems. That helps public confidence and credibility of its systems. We would encourage the government to be able to speak up for itself.

For instance, at the consensus conference, I believe it was a request of the particular lay panel that they did not want government involved, but it was terribly obvious that where there were questions about government process and credibility was being questioned, there were no government people there—for instance, ANZFA—to stand up and say, 'Hang on a minute. That's not correct,' or just to defend its particular processes. That was disappointing from our perspective.

If you contrast that with the consensus conference in Canada that occurred the weekend before the Australian one, where government was integrally involved in the whole process, the understanding and the outcome was at a much more understandable and acceptable level. There is quite an interesting difference there. Government has to find its voice and be prepared to stand up and defend the decisions that it has made—not necessarily the products, but the decision and the process it has used. There was a middle question about consultation and public information. You might have to remind me what you are after.

Mr GRIFFIN—Principally what things government should do. I suppose you have covered that to a degree but, looking at it in a formal sense, what should be the components of any process the government goes through to inform.

Mrs Stevens—The example that I draw from was the fact that the government in Canada had a group set up within a department that would ensure that all of the different stakeholders came to a forum and that information flowed through. I guess what we now have is Biotechnology Australia. It was a role where it ensured that where there was any opportunity to provide information about the high level working group progress or the SCARM progress or a progress of policy development, it made sure that there were at least media releases or information flowing to those stakeholders. It maintained a database of contacts and made sure that everyone received the information. It was looking at informing industry as well as informing the opponents of the technology and those that are particularly involved in the debate.

CHAIR—What other means were used to keep this flow of information going other than press releases?

Mrs Stevens—At one stage it did a roadshow. It took government people as well as the key components of whatever the issue was and went across the country. I guess it was similar to this sort of thing. There were public hearings and public forums. The more of them it had, the better. In fact, if you have any Canadian speakers come out, they are very well versed at the microphone. They are all very good at getting up and talking about these

debates at the microphone. I do not know whether we are a bit shy or something. Australians are probably good at talking to people within our own industry, et cetera, but we are not necessarily good at standing up and saying what we feel. The Canadians seem to have developed that skill very well.

CHAIR—Firstly, before they can stand up and speak with confidence, they have to have the information.

Mrs Stevens—Yes.

Mr GRIFFIN—I did not get the answer to the last question.

Mrs Stevens—I am sorry. It was about environmental checks.

Mr GRIFFIN—Just briefly, what do you have to go through for your products in order to get them listed? What process are you going through? What is the level of effort and cost required from both companies and government around the question of getting those checks done? How long do the studies take? What is the degree of detail?

Mrs Stevens—There are a number of studies. When we applied for our first field trial in Australia in 1996, we submitted virtually the Canadian dossier on our hybrid canola as well as the European dossier. That culminated in a lot of the laboratory and the basic field studies that were done to establish that. The genetically modified product was essentially identical or substantially equivalent to its conventional counterpart. For canola, the Canadians are the leaders in that science, having developed the crop. So there was a lot of molecular characterisation or laboratory work that had been completed already.

As I have said, the environmental studies looking at invasiveness and weediness and the essential aspects of how the product behaves in the environment with beneficial insects and water and anything else, was all covered from a scientific standpoint. When we came into the field in Australia, essentially we have been working with how the product interacts in the Australian conditions. We have had to make a lot of observations on that product about whether it behaves any differently. We have to compare that with other standard varieties of canola.

We have done a lot of work on herbicide development and how the herbicide is used. You cannot just use it in the same way that we do in Canada. The rates and the way it is used is slightly different. We have had to develop the environmental profile and the efficacy and the residue system for the herbicide use in Australian conditions.

The varietal development is no different from it being a non-genetically modified seed product. It has to stand up to those conditions. As we mentioned before, it goes through a number of years of adaptation trials into different zones and checking the figures and observations that the plant breeders make is pretty mind boggling. It comes down to maybe one or two different plants that they might want to take a seed from and carry forward. That data is all collected in terms of different areas and zones and disease conditions.

I guess we were virtually starting off from the point of view that there was no question that the product in Australia was not going to behave differently from its conventional counterparts. It was then looking at whether there was anything in Australia that made a difference to that. There has not been in four years of trialling it in the field. Then we need to look at the adaptation issues. Where we have moved on with the environmental safety clearances is to look at how it will be responsibly and sustainably used by the farmers. That is moving into another level.

Dr WASHER—I congratulate you on bringing to our attention how you use standard breeding techniques combined with gene technology. I think it is important that everyone understands that. Also you highlighted the importance of educated government backing. Do you feel that you have an educated government backing in the GM labelling of substantially equivalent products by ANZFA?

Mrs Stevens—I think there is a difference between ANZFA and the standards council. Certainly ANZFA has, I believe, six people educated in biotechnology who have been providing the information to feed into the ministers for their decision making. The indications are that given their decision and the situation we are in at the moment, perhaps they have not fully understood what they have been provided with. It is my personal belief that the government capacity building needs to happen in a big way in the next 12 months. If you look at the number of people employed in the Canadian government system and the fact that they do all of their evaluations in-house and that expertise has been developed in-house, that is extremely important to the credibility of their system. That would be particularly valuable to the Australian system. I would like to see a lot more experts working within the government departments so there would be more jobs.

CHAIR—You described to us the process that you are going through in your testing. Have you formed any alliances with any Australian institutions or companies?

Mrs Stevens—We have a significant joint venture with the CSIRO in terms of development of new products and research. We are also working very closely with the canola germplasm holders in Australia—Agriculture Victoria is one of them—as well as the other agricultural departments around New South Wales and Western Australia. As was mentioned this morning, they are very much a key component to our success in terms of adapting our product to the best local farming situation in Australia. We have alliances with those as well as with universities.

Dr WASHER—From the time you get your plant that you find ideal for Australian conditions, how long would it take to bulk up for commercial planting?

Mrs Stevens—It is going to vary whether it is open pollinated or a hybrid. Certainly, the hybrid system takes a little extra time because we have to increase the two parent lines and then the final first generation line, but using contra-seasons where, for instance, over summer we bulk up seed for the Canadian program. Their harvest finishes in September/October, the seed comes to Australia and goes into the ground over the summer, we increase the seed, take it out of the ground in March or April and send it back to go into the ground in April in Canada. That cuts out a significant amount of time, but it is a number of years. That is where we are at with our program in Australia. We are still trying to define those final lines

for commercialisation. It will take between now and 2002 to get enough seed bulked up to have a commercial product in 2002.

Mr ADAMS—My question is on the basis of how much Australia gets out of this. The technology and the research that your company has done has been done overseas. The intellectual property will be owned overseas, though you have some joint venture here. Is that correct?

Mrs Stevens—We do not own all of the intellectual property. With respect to the products we are talking about, even though it is a simple trait, it certainly has a lot of components of intellectual property which are owned by multiple owners. I think there are probably very few companies that would own the entire seed product in the end in terms of intellectual property without having licences or agreements with various parties, whether it is for the process that is being used or the particular piece of DNA.

Mr ADAMS—The bulk of the intellectual property is owned overseas.

Mrs Stevens—Some of it is, yes. As I said, to get it into Australian varieties then you have to use that local germplasm. That is a critical linkage.

CHAIR—Thanks very much for appearing.

Proceedings suspended from 10.46 a.m. to 11.00 a.m.

DALLING, Dr Michael John, Research and Development Director, New Technologies, Nugrain Limited

CHAIR—We have received a submission from you. Would you like to make a brief opening statement to the committee before we begin our questioning.

Dr Dalling—Only that I have a very strong personal belief, which is supported by the company, that unless Australia is able to more rapidly create a system that allows the introduction and proper management of genetically modified crops, Australian farmers will become increasingly isolated and less competitive than their contemporaries in other parts of the world.

CHAIR—Would you tell us exactly what Nugrain is.

Dr Dalling—Nugrain is a company that was established in January this year. It has five shareholders. Nufarm, which is Australia's leading agricultural chemical company, is a 50 per cent shareholder and the other 50 per cent is divided equally between the four major bulk handling companies in Australia, which are GrainCorp in New South Wales, Vicgrain in Victoria, the Cooperative Bulk Handling Company in South Australia and the equivalent body in Western Australia.

CHAIR—What gene technology activities is Nugrain involved in?

Dr Dalling—We see ourselves more as creating a platform for the delivery of technology by other parties. It is very unlikely that we will be involved directly in the development of the fundamental technology. We see ourselves more as a biotechnology logistics or a technology transfer company. We provide a route to market for both Australian developers of technology and of course overseas developers.

CHAIR—In the submission made by Nugrain, you make the point very strongly that genetically modified varieties with modified input and consumer traits will determine the long-term strategic position of companies. Would you like to expand on this and explain to the committee exactly what you mean by that?

Dr Dalling—It depends on which company you look at. The companies that own the technology are clearly competing amongst themselves. Like any other product, the efficacy and the value that that product creates both in the hands of those who buy it to use and of course the company that sells it, will be very important. You only have to see the rapid and very extensive penetration of this technology in the United States, Canada and South America and the impact that it has had on companies that do not possess the technology. Those market forces will play themselves out. At the level of individual farmers competing not amongst themselves in Australia but with their contemporaries overseas, having the technology and not having the technology is also an important factor.

CHAIR—Have you had the opportunity to contribute at all to the ongoing consultation process with the development of the regulatory authority in Australia?

Dr Dalling—I have not recently. Very quickly, my background is that I have been involved with this industry since 1981. In the United States, I was involved with a company called Calgene. I started Calgene Australia in 1982, which became Calgene Pacific, which became Floragene. I was the founding managing director. Back in those days, we were very much involved with development of the debate, both in the United States and here. Floragene has been quite successful in launching its genetically modified products all over the world; mind you, they are not food products. I acknowledge there is a difference in sensitivity.

CHAIR—Is it the blue carnation?

Dr Dalling—That is it, the flowers. In that sense, the answer is a qualified yes.

CHAIR—You are then in a unique position of having worked in the States and obviously having had something to do with the regulatory process there. Can you draw any comparisons between what you were involved in in the States and what you are observing here with our development of the regulatory process?

Dr Dalling—I think there is a very stark comparison. In the United States, you had three well-established—and respected by the consumer and everyone else—regulatory bodies: the Department of Agriculture, the Environmental Protection Agency and the Food and Drug Administration. All three, to varying degrees, depending on the nature of the release that was being sought, gave those products immense, extreme and, if you like, as a person sitting on the other side of the equation, sometimes frustrating examination. Only products that survived that screen were able then to be released. I think this is an issue that is lost in the debate at the moment—just how much those so-called genetically modified foods or 'Frankenfoods' have been tested before they were released. In Australia, we have a complete absence of a regulatory framework, although I understand we are moving towards putting such a system in place.

The Genetic Manipulation Advisory Committee, in a de facto sense, has played an excellent role in moving the development of the technology and the limited releases that have occurred along in a very systematic and safe way. For those who are close to the industry—and I acknowledge that we tend to be biased in our beliefs in terms of confidence in the technology—I think they have served the community very well, but the time has come, as has been recognised, when we need a more formal system that is more visible as well.

Mr ADAMS—I have a question about end point royalties and what you think of that as a way of people receiving payment for their knowledge. Do you think there is another way or are there other methods where we can have another system other than end point royalties?

Dr Dalling—There are various ways you can collect the benefit. When you sell any product, a person buys it assuming they are going to derive some benefit. In the case of a farmer, they will become more productive and hopefully more profitable.

In relation to the cost of the input and the perceived or actual benefit, there is clearly a link there. The developer of the technology needs a return on their investment, but the

equation that they look at is how much benefit has been created by this input and how much they are prepared to share between themselves and the farmer. They can be interesting calculations. The company can then decide to extract their share of that benefit by increasing the price of the seed by a technology fee which the farmer might pay at the time of sowing the crop—so the seed pretty much stays the same price as conventional seed—by a royalty based on the seed itself or an end point royalty.

If you look at the types of crops we grow in Australia, they are predominantly wheat and barley. Then you drop away to some grain legumes and canola is sitting about third or fourth in that list. With all those crops, there is very substantial on-farm retention of seed by farmers. If you look at this from the perspective that a satisfactory return on investment is necessary to induce companies to develop the technology and make it available here or anywhere else, we came to the conclusion that under the particular set of circumstances we have in Australia, where we do not grow crops where seed is purchased every year, such as corn where there is a hybrid seed system or cotton where you clean the seed, an end point royalty is the best way to do it. We believe it is equitable for both parties, because the rate can be set to be equivalent to that profit or gain sharing between the user of the technology and the owner of the technology.

I think the other issue which is also lost in this is that by focusing on a very strict and auditable receival system, it goes hand in glove with the regulatory system that will be imposed. The quality assurance of the grain at several levels will be very important. In other words, is it the grain you think it is in terms of the specific trait? Just as important, and particularly at the moment, will be its impact on non-genetically modified crops. Focusing at the point of receival in terms of the collection of the benefit tends to allow you also to impose discipline on both parties—the non-GM and the GM—at the level of receival.

Also, it is more readily auditable, and it obviously overcomes the issue, from our perspective anyway, of worrying about how much on-farm retention of seed there is. We do not care so long as we know where the varieties are. If the farmer wishes to use seeds from this harvest to next harvest, that is fine simply as long as we know about it. There is no transaction at that point.

Mr SIDEBOTTOM—Chairman Fran raised the question of end point royalty a little earlier in the hearing. What is required to implement an end point royalty system? To what extent and what level of support is there inside the industry? I do not only mean in terms of the breeders or the seed industry, but take the primary producers and the marketing authorities.

Dr Dalling—The support varies, not surprisingly. The first end point royalties on any varieties were only introduced in the last couple of years. There were two new barley varieties. This year there is a conventionally bred wheat variety. As I understand it, there is growing acceptance at the primary producer level, but it would be stupid to say there is unanimous support for the idea. There is a growing realisation that without that form of benefit collection investment in the development of new varieties, whether it is through traditional means or biotechnology, we will not be able to keep pace with what is happening overseas. It is not an issue specifically about biotechnology, although it clearly is an important issue for us.

At the level of the bulk handlers, you can see from the formation of Nugrain and the fact that we have the four major bulk handlers as members that there is acceptance that this is a system that will in fact come, and they obviously are positioning themselves to be able to participate in it.

Mr SIDEBOTTOM—You make a very strong point in relation to consumer issues relating to GMOs. I quote:

The consumer debate has the potential to delay the introduction of genetically modified varieties and the lack of a rigorous regulatory system will cause unnecessary uncertainty over the status of certain products.

Would you like to elaborate a little more on that?

Dr Dalling—I believe the current debate at the level of the consumer is a political debate. There is no truth at all that this technology, at the level of the food that is produced from it, either has been shown or can possess any health hazard. I think, quite frankly, any suggestions at that level are a beat-up.

I can understand people's concerns about the fundamental nature of the technology and what it does. I do not necessarily share them, but I do understand where they are coming from. I refuse to concede ground on the food safety issue. There is no scientific evidence. The issue in the United States where these crops have all undergone the most rigorous testing revealed nothing on that front. Similarly, there has now probably been—I do not know—300 million tonnes of this genetically modified grain grown over the last three to four years. I am not aware of any evidence that has emerged there that this technology or the product that it creates has caused any problem. I acknowledge that I have fairly fixed and immovable views on that.

The risk for Australia and Australian agriculture in terms of its global competitiveness—and it is probably the only part of Australian industry that every day experiences the chill wind of globalisation—is that if its competitors have access to technology that allows them to become more competitive, to lower their costs, increase their productivity and do things in better ways, the ultimate outcome of that is that our position in terms of global competitiveness will decline. It follows that rule for every industry. I think that the risk to Australian agriculture is if the consumer debate gets ahead of the rational debate and the rational analysis of the technology and its impact. That was my concern.

Where you do not have in Australia the equivalent of the FDA or the EPA, and the USDA in terms of their oversighting of the technology as they have in the United States, there is a real risk that that will simply add further fuel. Consumers are like everyone else. They look to respected, independent, transparent processes to give them comfort no matter what it is—whether it is testing food or testing drugs. In the US they have that. We have almost all of that here at the moment in Australia; we certainly do on the medical side. In agriculture we need to make sure we have filled that gap in.

Mr CAMERON THOMPSON—We have heard from AgrEvo. What importance is there, in your view, in doing the research like the trialling and the testing and picking

varieties and things that come from Australia, as opposed to material that comes from overseas? Is there any value in that? What do you think?

Dr Dalling—You mean taking the research results and test results from overseas and applying them here?

Mr CAMERON THOMPSON—If we just become a back paddock for the United States or Canada or somewhere, or whether we need to be developing these things here.

Dr Dalling—One of the important developments that occurred in the agrichemical industry over the last 20 years was the recognition by registration authorities around the world that tests conducted under internationally recognised and accepted general good laboratory practice were transferable from one jurisdiction to another. The cost of developing the new product was significant enough, but it paled into insignificance when you looked at toxicology and the like. Whatever system we develop in Australia should recognise that certain elements of the testing that has been done overseas, provided it has been done within that GLP framework, should be accepted in Australia, as we do for agrichemicals and pharmaceuticals.

The other issue is whether we should rely only on home-grown technology. I think that is what you are saying. We would be somewhat doomed to failure if we did that. Australia does about two per cent of the world's R&D and about three per cent of the world's agricultural R&D. It is a sort of Tattslotto style result if we sit back and wait for our two or three per cent to come up with something significant.

What is really the critical issue is to benchmark ourselves against what is happening overseas, not just in terms of competitiveness but in terms of the relevance of what we do and its applicability to Australia, more specifically, than the rest of the world. Similarly, we need to put in place structures—whether it be a Nugrain or a government agency like a CSIRO does not matter—that are able to cherry pick the very best that the world has to offer and marry it with what we have here. Marrying it also means not just work in the laboratory, but much more critically it means marrying it with the plant breeding systems. That is the ultimate way in which this technology is transferred. Also, marrying it to all the agronomy and everything else that occurs that supports, tests, helps deliver and regulates it and all the other factors critical to safe and sustainable delivery of the technology. It is a very complex issue. We do have all the structures in place to do it. The only one that is missing is what will now be the Office of the Gene Technology Regulator.

Mr CAMERON THOMPSON—The thought started this morning with the man from the department here in Victoria who was saying what a unique environment we have here in Australia and the materials that are available, et cetera, so that is where that came from.

Dr Dalling—We do. That is part of the technology transfer process. If there is a piece of technology in the form of a gene that confers some valuable trait, whatever it may be, it is useless unless it is put into wheat varieties or barley or clover that are adapted. We have a very wide range of distinct environmental regions. One of the problems in making it attractive to a lot of the companies to transfer this technology to Australia is that we think of ourselves as a large agricultural producer. In global terms, we are not. We produce over a

large area, and that compounds the problem because there are lots of micro-niches within that. The other reason is that we tend to be low level producers, mainly because of the climate and the poor soil.

Introducing new technology here does not provide any technology developer, whether Australian or international, of a huge market opportunity in real terms. One of the reasons Nugrain was set up was to convince them that with a very efficient method of delivery, where each of the companies did not have to do it themselves but one group could do it, we would be able to amortise those development or delivery costs across one channel and therefore make it more attractive for them to bring that technology here and make it available to Australian farmers. That is a fundamental tenet of Nugrain.

Mr CAMERON THOMPSON—I notice that the one mob missing in your comprehensive representation group is Bulk Grains Queensland. Are they a competitor of yours?

Dr Dalling—You are not the first to ask that question. You really need to talk to our other shareholders, the other bulk handlers. The commercial reality will be that, sooner rather than later, you will see them involved in some way. We have about 90-plus per cent coverage of the Australian grain receival system now.

Mr CAMERON THOMPSON—You would like to see that?

Dr Dalling—Absolutely. Many good things can come out of that. In particular, it is the ability to go back and communicate with farmers, to ensure delivery of whatever regulatory compliance is necessary, to introduce uniform systems for testing the material so we do not get into problems such as those that happened with videos and all the rest of it. We have a great opportunity with this group that we have brokered together that has lots of side benefits that in themselves will become probably very critical.

Mr GRIFFIN—You mentioned earlier the difference between the US system and the Australian system in respect of the testing of products. Could you briefly go through what is different about it? How much testing goes on in the US versus here? On from that, are there any examples you are aware of where a product has gone through the US system and then something has gone wrong?

Dr Dalling—Gone through the US system, been released into the marketplace and something has gone wrong. I am not aware of any, but there are examples kicked around about potential products that are in the pipeline and then subject to varying degrees of scrutiny early or late, but prior to release, that have been withdrawn. The most infamous or famous one is the Brazil nut allergen, from memory, that came through. It never got close to product release. It was withdrawn back in the channel, but it did start.

Mr GRIFFIN—Could you describe the channel? If I come along with a GM idea that I want to develop, what do I do? What do I do in the US versus what do I do here.

Dr Dalling—The only bit in Australia that is missing compared to the US is a federal agency—in their case, it is the FDA—that completes the picture. You have the EPA if there

is a chemical interaction, you have the USDA if it is chemical, environmental and ecological and there is an overlap, but importantly they have the food part of it, whereas we have not had that here. I am assuming that when the Office of the Gene Technology Regulator opens, it will be able to reach into various government agencies. That is another thing: please do not allow them to re-create what already exists. They should outsource from areas of specialty within what exists. Whether it is the Commonwealth or the state public service, there must be areas of excellence that are relevant to this that we can draw upon in a customer-provider model. We will address the regulations as they are developed and then they need to be adhered to.

What is missing is the FDA equivalent. The other bit that is globally missing is that we have a voluntary system that none of the companies or organisations that are developing the technology, incidentally, have broken out of as far as I am aware. They have all adhered to it. That is the only difference at the moment. There is nothing to stop anyone releasing a variety in Australia. You do it at your own public relations peril and a few other things, but there is no legal risk of releasing it.

Dr WASHER—You said the amount of research here is about two per cent, but certainly per capita we are right down in biotechnology research as compared with the US. Have you any views on why that should be?

Dr Dalling—If you look at government research in Australia and compare it with the OECD table, we used to be about sixth or seventh, which is probably a reasonably good position for a country like Australia. If you combine government with industry research, we drop almost to the bottom of that league table.

I do not know the reason. The obvious reason is that companies do not do much R&D, but we have known that for a long time. Successive governments have done all sorts of things—some good, some bad—to cause that to change. We have never had a culture of it here. It is a complex issue.

In agriculture, we were lucky that farmers, aided and abetted by government over many years, were able to organise themselves into funding blocks, like the Grains Research and Development Corporation. Prior to that, it was individual state committees, complemented by a federal body that distributed the $1 they received from the Commonwealth for every dollar or whatever it was that they collected in the individual states. That has been replaced by a more centralised group. The amount of money the GRDC spends, which is $80 million or $90 million a year, is very significant. About 10 per cent of that goes to plant biotech issues.

It is an issue that I come back to that this is still a small market for companies in ag. to make any investment here. I know from my own personal experience that it was not so much with an eye on Australia, it was an eye to the rest of the world as to where we would eventually take it.

Mr ADAMS—That is what I understood. You are basically talking about the grain industry.

Dr Dalling—We are, yes.

Mr ADAMS—We have bigger spots than that in other product. That is what I was led to believe, that we were a player and we did have a substantial amount of knowledge based in Australia but, through this inquiry, I have been receiving the opposite view; the view that we are very small, that we have some skills and some research that we have done, but we do not seem to have what I thought we had. Could you comment on that?

Dr Dalling—No, we do not, without putting too fine a point on it. There are several reasons. One is my two per cent reason. We have not focused that research enough. I do not want to get into a debate about that.

CHAIR—Drawing that out, I happened to be in the audience listening to Professor Peter Doherty in Canberra yesterday. I would like you to comment on this because, as I said earlier, you are in the unique position of having the US experience as well as here. One of the comments that he made was that in the States, you have R&D funding going into the universities where there is a very close association between the universities' research programs and the business organisations and we do not have that here. The point he was making was that if we are to develop that culture, we will have to put more money into the universities that are subject to peer review and competitiveness, rather than providing buckets of money to the vice-chancellors to distribute to their mates. I am paraphrasing him in saying that, I hasten to add.

Dr Dalling—That is why he went to Memphis, was it?

Several things have occurred. It was unfortunate in the last budget that the government gave so much money to medical biotechnology research. Where that pool of extra money should have gone is significantly distorted. I am not saying it should have gone to ag., necessarily. More important than that was the fact that you did give extra money.

The other problem we have is that organisations like the CSIRO, not through any fault of theirs—and universities are the same—will increasingly lose the plot because they have these rules that say they must get 30 per cent of their money from industry. They spend a disproportionate amount of their time looking for and then servicing such relationships, whereas those organisations should be focused, as they are in the US, on what is called the intellectual capital balance sheet—things that are there and sustainable that industry will come and take.

It is true that industry will pick and choose and that is good and bad, but mostly it is good, whereas we look at them as unqualified and unbridled centres to do that, almost without interference. As an ex-academic, you might think that is a biased view, but US universities have that freedom. That attracts excellence, and in turn that attracts people who sit around the outside waiting for good ideas to come out. They are the industrial parasites, if you like. That is a symbiotic relationship for everyone. In the US, that dynamic is managed fantastically.

Having said all that, you have all that in the middle of 250 million people, so you have on your doorstep immense wealth, and with that comes a greater population or a greater number of risk takers. We have 18-odd million people here. Even scaled back, we are probably more or less proportional, even coming back to my two per cent area. The chances

of us having a world-ranking breakthrough like the flu drug Relenza, which came out of Melbourne just the other day, will be few and far between. We should not sit and do a lot of soul searching over that, because that is the way it is. That is what happens when you only do two per cent of what is out there.

Mr ADAMS—Gene shears is another one?

Dr Dalling—Gene shears is a mixed bag—a lot of publicity, but it will be interesting.

[11.32 a.m.]

ALEXANDRA, Mr Jason, organic farmer and member, Organic Federation of Australia

KINNEAR, Mr Scott, Chairperson, Organic Federation of Australia

CHAIR—We have received a submission from you. Would you like to make a brief opening statement before we begin our questioning.

Mr Kinnear—Things have moved on since we put our submission in, so I have prepared a short three-page submission which I will read to you and I am happy to distribute it to you as well.

CHAIR—A short three pages?

Mr Kinnear—It is very short. It has some very pertinent points, and I think it will help us cut to the chase on these issues.

The organic industry in Australia believes it is important to clearly and urgently state the minimum conditions whereby our industry will be protected and able to prosper in the face of widespread production of genetically engineered crops. Notwithstanding the above, we support the notion of a five year or longer freeze on further releases of GMO trial crops or commercial releases.

We have briefly summarised the hazards here which the organic industry—and I need to stress the genetically engineered free industry—faces from gene technology. Gene intragression is essentially pollen transfer. This occurs with same species and related species. It is a risk that GMAC and all research scientists will acknowledge is present. The other risk is the escape of the crop plant to the wild. Essentially, wherever we grow crops in Australia, we have roadside refuges and paddock refuges where crop plants exist. DNA can breed in those roadside refuges and spread as a form of contamination.

Economic hazards is the key point we present to you today. The organic industry in Australia is worth $250 million approximately, worldwide $15 billion, growing at 30 per cent plus per year. The genetically engineered free market, as you have heard, has exploded in Europe and in Japan and is going to continue in Japan. There is a supermarket buying consortium that is searching the world right now for $1 trillion worth of GMO free product. The US has essentially been cut out of some of these markets already. GMO soya beans fell from 70 million bushels two years ago to three million bushels and have cut them out of the canola trade for Canada. We have to make this point: what real gains do we get?

As for economic hazards for the organic industry, pollen transfer can wipe us out. We have export standards under AQIS that demand that our product is GMO free. We cannot export product that has GMOs in it. We lose our certification. We have covered environmental hazards at length in our submission. Herbicide resistance may lead to greater use of herbicides. Insect resistant plants may lead to resistance in the insect population. I

stress that Bt, Bacillus thuringiensis, is a spray that has been in use for many years, since the 1920s. Some $60 million worth of Bt sprays are sold in the US at the moment. It is an enormously beneficial spray to organic farmers. If resistance to Bt builds up through the use of transgenic Bt crops and we lose the opportunity to use this spray, and it is not just organic, then we lose an absolutely integral tool to control grubs. It is target specific to dozens of moths and grubs that attack crops. It is a very important tool for us.

A big issue is insect resistant plants and drought resistant salt tolerant plants. They may lead to weeds moving into areas that are no longer there. A concern for organic is what happens if the weeds move into organic farms and the only way of controlling them is through chemical means. If we get an ecological hazard, a GMO hazard, the government then says, 'This ecological GMO hazard is out of control,' and orders a mandatory spraying program across the region to control it. Organic farmers are caught up in that and we lose our trade immediately.

Another issue is the extension of the agricultural estate. A very important issue is biodiversity. Jason will briefly touch on that for a couple of minutes after I finish. His expertise is in ecological issues.

I will move now to a number of protocols which are absolutely essential to protect organic and GMO free in Australia. The issue of liability has to be addressed by the regulations. It is essential. We have heard a lot of talk this morning about the need for good regulations. Let me put on the public record that the organic industry worldwide—I believe this is true—does see there may be some benefits from gene technology. We are not totally opposed to that. We are concerned about the ownership of patenting of gene technology. We are concerned about the possible risks. Of course, we believe that adequate and appropriate regulation will control, mitigate or minimise those risks. What we are saying is: let us go slowly and let us plan it out. Let us not rush through. Liability has to be worked out. If there is a problem, who is liable? Who is going to pay?

Economic damage has not been addressed this morning. I have listened to the submissions this morning. The issue of contamination of pollen transfer has not been addressed. How are the biotech industry and the government going to handle that?

The only way we can see that this will be adequately addressed is through a compensation fund similar to workers compensation where all people who trade in biotechnology feed into that fund by a levy system and that fund is set up. If I get contamination of my crop, I do not need to go through the common law system, which is expensive and risky, I have lost my trade. Here I am: I have contamination. I have lost my business. My crop is unmarketable for me. What do I do? I go through the common law system and that is expensive and risky. I may still lose. I have to prove causality. Can I identify the farm where the contamination has come from? Maybe, maybe not. What is the court system? We do not know how the court system will handle this. Therefore, a compensation fund is appropriate. We can go to that compensation fund with a test result, we have an independent valuation from a government committee that is established to estimate the economic damage and we get automatic compensation.

The government GMAC at the moment has 400-metre buffer zones around canola. Bee keepers will tell you that canola pollen is travelled by bees six kilometres or more. This is a huge issue. What are appropriate buffer zones for our industry? I would say for canola, probably 10, 15 or 20 kilometres is an appropriate buffer zone. You must be thinking: how do we have a GMO industry in canola, an open pollinated grain crop, next to an organic or a GM free industry? We have a massive market for canola. There must be canola growers all around Australia. Organics is tiny. We are one per cent of production. I am also talking here today for GE free canola growers. They are saying all around Australia, 'I want to go for this premium market. I am getting a premium for GMO free canola. How will we do that?'

I need to put on the table here today some evidence which I have uncovered. It is in the public record. I have copies here. It is GMAC's proposal reports. You asked AgrEvo this morning some questions about the canola. Today, in excess of 2,000 hectares of AgrEvo's canola is grown in this country.

I am quite angry about this because I have only just discovered it this week. There are in excess of 200 trial sites around this country. Some of this seed is being exported back to Canada—some of it for commercial production and some of it for further seed breeding programs. This is a commercial benefit to AgrEvo. It is not an agronomic trial. It is not a scientific research trial to see whether it is suited to Australian conditions. It is a clear commercial benefit.

I believe it contradicts GMAC's guidelines. We put out a press release yesterday calling on the federal government to seriously consider tearing those trials up and putting a complete halt to these exports. I think this is outrageous. I apologise to the committee that I have not picked up this information earlier. It has been available.

There is a 1,200 hectare trial in there that came to my knowledge. It is not on their public web site. I spoke to GMAC. I said, 'You have not updated your web site since 1 June.' They said, 'I'm sorry, Mr Kinnear. We only have three staff. We're very busy.' I said, 'I'm looking for a trial which I've heard about which isn't on your web site.' They emailed to me 10 attachments. I said, 'I only want the canola trials that are not on your web site.' I went through the 10 attachments and suddenly 1,200 hectares shows up. I put to you that this is the closest thing to a general release of canola. Essentially, it is. There is a commercial benefit.

CHAIR—How many sites do those 1,200 hectares cover?

Mr Kinnear—One hundred and twenty-two sites in Western Australia, New South Wales, Victoria, South Australia and Tasmania, across canola growing regions of Australia. There are others. I am estimating in excess of 2,000 hectares.

Mr GRIFFIN—How big should a trial be?

Mr Kinnear—From a scientific point of view, I believe that a trial can be contained, to test the agronomic impact or performance in a certain area, to as small as half a hectare—maybe even less than that. This is seed breeding programs. What upsets me is that some of

the seed is also being commercially grown in Canada. We are already moving into questions and answers and Jason wants to put some points. I needed to get this one off my chest.

The issue today is regulation. This is what we are here for: primary producers accessing gene technology. Forget about selling it to the consumers. I am sorry. I do not think that is your job. Your job is regulation. With respect to Dr Dalling, who gave a very good presentation, it is not his job to sell it to the consumers either. His job is to produce a good product.

CHAIR—We are interested in your views. Rather than tell everyone what their role should or should not be, we are interested in hearing from you.

Mr Alexandra—I want to deal with this from the landscape scale or the ecosystem scale. I have a background in ecological research as well as organic farming.

The first point is that gene technology is about solving problems at a minute scale, whereas many of those problems are in fact at a landscape scale, ecological scale or in fact as a result of the economic relationships around the world. In effect, the promises cannot be met or are unlikely to be met by trying to solve problems at that scale.

There are some direct analogies to, for example, traditional plant breeding, where we have seen, over the last several centuries, particularly in the twentieth century, great increases in the productivity of major crops. A recent review done in Western Australia showed that there was still a major investment in traditional plant breeding in the grain crops that was likely to yield something less than a one or two per cent increase in productivity, whereas, in trying to deal with improving the productivity of grain crops in Australia, you could get increases in the order of 10 or 15 per cent by adopting relatively simple technology such as the application of windbreaks on our farms.

CHAIR—Who conducted the review you mentioned?

Mr Alexandra—I will look through my records. I am operating from memory. I think it was Ted Lefroy who works in one of the CRCs over there.

CHAIR—Could you provide us with a copy of that.

Mr Alexandra—Yes. Whether the figures are in that order or not is really not the issue. The point is whether we are trying to solve these problems at the right scale. I would argue that the increase in productivity in Australian agriculture can be achieved by a better understanding of both ecological relationships and market relationships, rather than focusing on how to increase commodity production per se.

Scott mentioned the world demand for GE free products. I refer to Sainsburys, which is the biggest supermarket company in the Northern Hemisphere. Their fresh produce buyer purchases more produce per year than the entire output of Australian agriculture. They have a very stringent policy now in order to meet the demands of their consumers that agricultural products are either labelled and certified as organic or they meet very strict protocols for integrated pest management or high quality pest management systems on the production side.

They will not come to Australia, for example, and buy off the floor of one of our wholesale markets or buy undifferentiated product.

That is an emerging trend around the world in the high value markets that the consumers and the traders that are meeting those needs are looking to guarantee quality and all aspects of quality. In order to do that, they are looking to have verification systems that go from paddock to plate. They are saying they can implement those.

Scott mentioned that the real issue for government is to ensure a proper or a prudent regulatory framework. In Australia we know that there are potential risks from gene technology in agriculture. We do not know how big those potential risks are. We have to ask: do they form unacceptable risks or can we in fact create a regulatory framework which minimises those risks or, as Scott pointed out, protects innocent third parties?

History shows that all new technology applied in agriculture in Australia has had a downside. That often takes decades to show up. One of the classics is the postwar expansion of superphosphate and clover pastures. We now see across the whole of south-eastern Australia massive areas of acidification as a result of that. There was certainly increased productivity for several decades as a result. There is now potentially decreased productivity for a long time into the future.

With genetic technology, we really have to ask whether the promises can be met in actual performance. From Australia's point of view, we really need to ask: what is the appropriate research and development investment? I would argue that we are far better served as a country looking at the ecological scale research and development rather than genetic scale research and development.

Mr Kinnear—As an example of European interest in organics, Denmark has been planning for 10 years. They are into stage 2 of their organic conversion for the whole country. Their spending is in the nature of $100 million per year of assistance.

CHAIR—I think you mentioned that in your submission.

Firstly, obviously you have identified one of the key areas that we are vitally interested in, which is the whole system of regulation. You mentioned the figure of $250 million for products that are organically grown. How many organic farmers do we have in Australia?

Mr Kinnear—We have certified approximately 2,000. Of course, there are other farmers who are not certified organic.

CHAIR—What regulatory process exists that goes through that certification process for organic farming?

Mr Alexandra—There is an international federation which basically sets an international standard for the quality of the verification system. In Australia, we have several organisations that are acceptable to those international standards, and we guarantee to our export markets through AQIS that the certification system is an appropriate system, that it has the various checks and so on.

It is very similar to an ISO quality assurance standard system. You have independent auditors. It also relies on civil law. A grower has to sign a contract and can in fact be in breach of that contract. We have had at least one case where there has been fraudulent activity that has been prosecuted through the courts in Australia. You have protection to various degrees from a self-regulatory system that is backed by civil law.

Mr Kinnear—Certified organic in Australia is a total quality management system. We are also looking for some domestic regulation whereby we can go from paddock to plate through production, processing and retailing. Labelling is also an issue for us. There has been talk about how we do this. We know the health ministers are pondering at the moment what is appropriate labelling for GMOs. It is obvious that what they will require is a similar paddock to plate certification, auditing and quality management system. I am taking you back to regulation again when I talk about this. It is essential that your job is to address the production, auditing and through to processing side of that.

This is a big issue. We do not have anything at the moment to even control the field trials—as I have indicated, for canola. Even less than that, we do not have something to control the general release. I should mention good agricultural practice guidelines which have been developed by a SCARM subcommittee, with a view to GMAC being able to offer general release of, for example, the canola. Those guidelines are hopelessly inadequate because all the way through it is a matter of saying, 'You should do this. You should do that. You are advised to do this. You are advised to do that.' There is also no mechanism for independent verification, monitoring, follow-up and deciding who is going to be responsible if an ecological hazard occurs. How do we address this issue of contamination? It is not clear.

CHAIR—In developing the regulatory process at present, are you as an organisation taking part in the consultation process?

Mr Kinnear—I am trying to think whether we have even been formally approached. I do not believe we have. I had an informal meeting for the first time last week with a member of the Bureau of Rural Sciences who is involved with this issue. That was an informal meeting. I have still had no formal invitation. When I spoke to AgrEvo on the phone two days ago, they said, 'Look, we would like to sit down with you.' That is the first I have heard from a biotech company, but it was when I rang them.

Mr Alexandra—Can I go back to the certification system. Earlier this year, I completed a review for the Rural Industries Research and Development Corporation on the use of certification systems in agriculture. I would be happy to submit that as an additional paper. That looked at certification in use in fisheries, forestry and agriculture around the world.

One of the key issues identified is that governments can play a key role in ensuring the competitiveness of industries by setting the regulatory framework that sits behind the certification system. Many certification systems specify, like the ISO 14000 series, that a company or enterprise must comply with the minimum regulated standards that exist in that country. That is their minimum obligation. Australia can achieve competitive advantage in world markets by ensuring that we lift the performance by having a higher standard through our regulatory system rather than a lower standard. That paper is quite relevant to this.

Dr WASHER—Mr Kinnear, on the assumption of encouraging further expansion of canola type crops, you would like to see them planted out in the field where it is sterile—in other words, it cannot pollinate, or has terminated gene type sequences in it. Is that what you would feel happy with from a safety point of view?

Mr Kinnear—You are asking a very good question, because you are obviously wanting to avoid contamination, as we are, or questions on that issue.

Dr WASHER—You must have thought about that.

Mr Kinnear—Notwithstanding our philosophical belief that there are alternative methods of growing food, which is what we do, something of that nature may solve contamination issues. Again, as far as I know, no-one has terminated a gene. I notice Mr Blowes from Monsanto is in the audience. I have heard him say a number of times that there is no terminator gene there. I am not sure whether that can be done. If it can be done, it may solve that problem. The issue is that the gene is out there now.

Associate Professor Mark Bergman from Melbourne University, who I spoke to about this, said the gene is there and he is quite happy to go on the public record. In fact, he was going to appear with us today, but was unable to break a previous appointment. His comment to me was, very simply, 'It is not a matter of if we get contamination. When we get contamination from the existing trials that are out there now will be more than enough.' Contamination is already under way for our canola growing region.

Mr Alexandra—The real issue is that the onus of responsibility for that risk management, in whatever form, should be on the proponent. In a sense, governments have to be very careful that they do not accept the responsibility that should fall on the private sector. You have existing industries and, as we have pointed out, they may be at risk or we would have environmental risk.

One of the points that Scott made in the paper is that environmental impact statements need to be done on any proposed commercial releases of gene technology. Unless they are done in a dispassionate and objective way to meet thorough standards set down by Australian governments, we will continually be wondering what the magnitude of the risk is and we will only be finding out about the nature of the risk after the event.

CHAIR—Now that you seem to be being included in the loop, both by industry and by government in discussing at any rate—

Mr ADAMS—I do not think that has been established yet. I think it is a bit presumptuous to say that.

CHAIR—They have mentioned that industry has at least started talking and you have had some discussions. I am not being sarcastic when I say that. This is in its very early stages. There will be a number of people who are in exactly your position, which we are trying to establish. Are they, as stakeholders in this whole debate, being included in the discussions about developing the regulatory process? Having now got yourselves one foot in

the door, what are the sorts of arrangements that you would be wanting to see developed in the regulatory process that is going to be looking at this whole question?

Mr Kinnear—I have written in this document that we need a total quality management system approach. With respect to the meeting I had last week—and I have to be careful how far I go on the public record today in terms of what the subject of that meeting was—essentially there is a view within SCARM and within the federal government that protocols need to be developed because the good agricultural practice guidelines may not be sufficient. The suggestion at the meeting last week was for an October meeting of 200 people from around Australia to develop protocols. My initial response to that is October is too soon when this is such a complex issue and that April would be more appropriate.

Our next issue is that we would like to have input into the discussion paper. When we asked if that was possible, the answer was no, there was no time to have a round of input consultation in developing that discussion paper. To get the guidelines developed, the process should be such that there is appropriate time for stakeholder consultation, which includes all industry groups, such as organic. We have not seen a formal GE-free industry group developed.

I am involved in some negotiations with the people overseas who are providing the GMO free certification to the Sainsburys consortium. You may have heard that it is an agreement called Cert ID. I am involved in discussions with Cert ID of the United States. They are talking with us and others in Australia about GMO free produce, and I believe we will see quite soon a formal structure for GMO free. They have to be included.

The consumers have to be included. I have suggested in my submission to you that an appropriate way of including consumers and other stakeholders would be a round of consultation in every shire council around Australia. I say this with good heart to the GMO people, too. If there are good products to be developed and used, I want to see them on the market. I do not want to see them not there. I am interested in a better world for all of us. I am very concerned about chemical use. Do not get me wrong here: we are using too many chemicals. It is a terrible problem.

CHAIR—At these consultations around the country, you would see representatives of all key groups providing information to local communities.

Mr Kinnear—When I say consultation in the communities, that would have to feed back to a central debate which has to be had, and which is what they are suggesting in October, but it is too soon.

CHAIR—You would have heard this morning that we have already had one suggestion, as a means of getting information to the public so they can make informed decisions, of a roadshow. Would you like to be part of the roadshow that goes to all the different local government authorities?

Mr Kinnear—No, I do not want to be part of a roadshow. I think the roadshow that was done was a shameful exercise. I do not have the resources to do that. Monsanto does and AgrEvo do. They are in 100 countries around the world. The federal government can. What

we need is open consultation, not where we have people going along and saying, 'Public meeting here at such and such a time. Come and learn about biotechnology.' That is an education program. I am talking about an opportunity for people to come and put their views on the table and have them recorded and have feedback. Open it up.

Mr Alexandra—There would be a process that the Commonwealth government could initiate which would be putting forward a set of options or alternatives in terms of the degrees of regulation—risk assessment, environmental impact and so on. There should be a very informed discussion paper about what would be in the interests of Australia, what would optimise Australia's interest in this whole arena. Then a process of consultation should be resourced so that there are on the table options and implications of different regulatory systems for managing gene technology in Australia. That process would need a minimum of 18 months, combined with an education campaign, to make sure that those most directly affected have a chance to contribute, respond to the proposal and so on.

The paper I referred to before documents this but, in Australia, the regulation of agriculture has mostly been minimal by world standards. It relies very largely on voluntary guidelines. We have a poor record in terms of our regulation of agriculture as an industry. There are various reasons for that. I will not go into them. I think once we are dealing with novel technology with a new risk profile, historical precedents set on a voluntary basis to meet agricultural standards are not a sufficient basis for the new risk profile.

Mr SIDEBOTTOM—Moving from the process to a product, I notice in your submission in the section on environment impacts that you made it quite clear you objected to pest and disease resistant modified crops in first generation GM crops. Do you have the same fears about second generation genetically modified crops, even though they may have obvious consumer benefits like containing vaccines against human diseases or being more nutritious or being more flavoursome? If you do, why do you object to them?

Mr Kinnear—Concerning second generation, I would refute some of what Dr Dalling said in terms of there being no evidence. We have done a huge amount of research overseas. The research has mostly been done by the biotech industry. Even though they sometimes subcontract that out, it still filters back through them.

The research that has been done does not take into account the precautionary principle. For example, pharmaceutical drugs are tested according to the precautionary principle which states that we look before we leap and we want to know its range of side effects before we put it on the market. It is about 10 years if not longer. GMOs have not been through that. There is the opportunity for proteins to be produced in these plants which we do not understand or may not know existed before.

The Roundup Ready soya beans by Monsanto have gone through 400 tests, but there are thousands of chemical compounds that exist in soya beans. I think a tomato has 12,000 chemicals present in it. Those 400 tests have not covered all of the chemicals present. Therefore, what is appropriate testing, if we go down the pathway you are suggesting, is to have generational testing.

The rats issue has not come up so far. The soya beans were fed to 20 rats in each control group for four weeks. Any scientist will tell you that is nonsense. I was a student of Dr Mike Dalling when he was a lecturer at Melbourne University. I studied agricultural science. Twenty rats in a control group is a joke. We need to feed thousands of rats soya beans, let them breed, let the offspring breed and then let the offspring of them breed. Then we need to measure against control groups foetal abnormalities, liver function—all of the things that we need to look at. Then we need to go through human trials. It is standard practice in pharmaceuticals to go through human testing trials. People sign an agreement and they volunteer to take a risk.

There may be no risk. Mike may be right. He cannot possibly sign a contract or a document to say, 'There is no risk.' No-one can offer that guarantee. The public are getting increasingly wise to what is going on in our food supply. They are being able to determine a different product. This is what is happening around the world today. The inquiry into retail access had some very good evidence put forward that said 50 per cent of people do not shop on price. They shop on an ability to differentiate a product and to seek that product out. They are looking for green products. They are looking for tasty products. They may look for GMO products; I do not know. I guess at the moment they will not. Certainly, they are being smart.

In Japan, research says that when a person picks a product off the supermarket shelf—and I am paraphrasing Libby Blackett-Smith of Austrade, Australia's trade commissioner to Japan—in excess of 90 per cent of them read every bit of writing on the label. They have watched people in supermarkets. This is the ability of consumers these days. They are very interested. I do not know the answer.

Mr Alexandra—Sainsburys monitors its inquiry line and it has had more inquiries concerning GMOs than it did about mad cow disease. It took that very seriously as an indication of consumer sentiment.

Mr SIDEBOTTOM—I notice in your submission you proposed that testing of GM foods and crops be carried out for 20 to 50 years. Why would GM crops and food be treated differently from crops and food produced by conventional breeding techniques?

Mr Alexandra—If we look at the history of food production, you are dealing with a cultural history that in most of our food crops goes back thousands of years. The earliest estimates of agriculture are 10,000 years old. We can trace most of our significant crops over that period.

CHAIR—But they have not all been grown with pesticides and herbicides for that period of time.

Mr Alexandra—That is true. That is another example of a novel technology that has been introduced without an adequate assessment of risk. I was recently searching some of the medical literature from the US on the web and from very conservative medical establishments. They were documenting the increased rates of lymphoma, which is the fastest growing form of cancer. Several very respectable medical sources said that increased use of

pesticides was considered a major component of that increase. We are dealing with that now, almost a generation later.

Mr Kinnear—In 1996, the US began a program of investigating the effect of their 9,000 pesticides on children. You may have heard about this. This is a move before Congress at the moment. It was due to begin in 1999, and there is a big move in Congress to say, 'Look, we cannot do it now because we need the economic benefit of these pesticides. We should delay this for a few more years.'

Warren Porter's study that I mentioned in our submission shows the synergistic effect of pesticides. Your issue is one of substantial equivalence. That is the term that is bandied about. If these products are exactly the same, why should we worry about them? They are not the same. This soya bean is resistant to Roundup while this other one is not. If we do mineral testing, vitamin testing and so on, we may find there is no difference, but clearly there is a difference. It is not showing up in our biochemical analysis. If we keep going further and further into biochemical analysis, I am sure you will find a difference. It is there. It has to be there. Different proteins have to be produced for one to be resistant to Roundup and the other one not to be.

That is why the insertion of a brazil nut gene into a soya bean is very interesting. There are type 1 and type 2 errors. A type 1 error is the first thing you learn when you study science. A type 1 error is when you know there may be an impact and you look for that impact. The brazil nut gene was a type 1 error. They said, 'People in the community are allergic to nuts. We are putting a nut gene into a soya bean. We had better test the soya bean for people who are allergic to nuts.' They did skin tests. The people who were allergic to nuts were allergic to the soya bean.

The type 2 errors are the ones we do not know how to look for. It could be something we have never had happen before to us. You cannot predict it. It is this sort of thing. We know from feeding these foods to rats we will not see mass deaths. There will be no terrible mass problem. If there was, Monsanto and AgrEvo would be out of business tomorrow and they would have common law cases against them. That will not happen. It will be a very slow move in society. The epidemiological evidence may take 50 years to show up as we start to eat these foods. The issue is: how do you trace epidemiological evidence back to the cause of it?

Mr Alexandra—Scott should be able to submit this report, but I saw a copy of it recently. There was a prominent British surgeon whose daughter was showing an allergic reaction to soya milk. The reaction was an outbreak of herpes-like sores on her face. A nutritionist suggested she test the difference between GE soy and non-GE soy. She did that. The outbreak subsided. She went back to the GE soya milk and it came back again. She did not want to be named for various reasons, but there is a one- or two-page report. I am sure Scott can submit that to you.

Mr Kinnear—That report has already been put in the scientific literature.

Dr WASHER—That is a trial we could not validate with one person. You have not done a proper study, so that trial would not stand up scientifically or substantially.

The problem I have is that if we take gene technology which is fairly specific and compare it with traditional breeding technology, where we are mixing multiple genes together—true, of the same variety—we know historically we can get toxic products as a result of that—bi-axamasm potatoes in America are very toxic—from so-called natural breeding techniques.

Knowing that, if we were to apply this rigour of testing to all foods and all breeding techniques, we would have a major problem, because we would have to apply that to naturally bred processes as well. Any new variety would need to be subjected to careful testing. The FDA did pick up the fact that so-called naturally bred potatoes did contain high levels of toxins. There is no exception to this. Again I agree we have to have good scientific studies, but case studies of one person outbreaking with herpes simplex would not be a scientific study.

Mr Kinnear—I have had this question put to me by the media. Why should organic not be tested in the same way as we are suggesting for GMOs? There is no reason it should not be. I think this is the dilemma that we are coming to in the world. We are seeing increases in disease.

I do not know if the Public Health Association have put a submission before your committee. They held a conference recently in Adelaide. Every doctor will tell you that cancers and allergies are on the increase worldwide. It is finding the causes that is one of our big tasks ahead. We may have to start doing what you are suggesting. It will be expensive and time consuming, but we may have to do that. I have some degree of concern about some of the plant breeding techniques we have used since the 1960s where we apply radiation treatment and quite a strong chemical treatment to seeds prior to planting. What this does is cause genetic alterations in those seeds. This is classic breeding programs. Then we plant them and we select the particular plants that grow from those seeds that have a trait that we want.

As Naomi Stevens from AgrEvo mentioned, there is plenty of canola that is herbicide resistant that has been bred through traditional techniques—we call it traditional, but it is modern plant breeding techniques—that are not genetic engineering. I agree with your comment.

Dr WASHER—We are well aware that pesticides potentially create a problem for people. We all generally agree with that. Also, probably some herbicides are safer than others. One of the aims of genetic modification is to reduce the requirement for these two components: pesticide and herbicide usage.

Mr Alexandra—I am involved in some current research looking at organic farming systems around Australia. In southern Australia virtually every major commodity is now produced on a commercial scale with very minimal or safe pesticide applications. In many cases, by modifying the farming system, the farmers have been able to reduce the need for any insecticide. This is organic farmers. Classic innovators have been able to do this off their own bat. They have done it with absolutely limited support from the research community or from government agencies. They have basically had a go at it. They have been able to achieve it.

If we were to redirect a significant proportion of agricultural research, either in Australia or around the world, into looking at how we create viable agricultural ecosystems where the checks and balances—there will always be pests, insects, weeds and so on—are built into the system, we may find we can reduce most pesticide use relatively easily. There may be all sorts of exceptions to it. In Australia, we have some of what are regarded as more difficult crops. We have some very good producers of them. We have a huge demand for organic wine being exported from Australia and so on. Perhaps the toughest challenge is where you have an intensive horticultural crop where you are not shifting or rotating and so on.

In most examples—citrus, home fruits, viticulture—we have proponents who have basically been able to reduce all insecticide application. If we can do it for those industries or on those sites, we could do it for most industries. We have not been looking. We have not applied this very powerful collective intelligence through research and development into trying to solve that problem.

Mr Kinnear—We have a very strong working relationship with government around Australia. You asked me if we have been involved in GMO issues. The answer is no. In terms of government relationships, we have excellent relationships with the federal and state governments around Australia. There are many bureaucrats in the state departments of natural resources or agriculture that are absolutely keen to see organic flourish because of the environmental benefits, the trade advantages and the export opportunities for organic. New Zealand has increased its organic exports by 4,000 per cent in a number of years. It has a very active federal government or government funded program there called the Organic Producers Export Group.

We are at the moment in a dilemma in negotiation with government as to how do we apply what Jason is saying to organic in Australia. The mechanisms are simply not there in the bureaucratic funding structure in Australia to do this.

We have an R&D committee, but it has $270,000 a year worth of funding. What happens is that mainly state departments apply to that committee to get funding to do work back in those states. If you add up the number of people employed by governments around Australia legislated to support agriculture, it is probably in excess of 15,000 staff. It is a significant number of employees. We have identified one full-time employee in New South Wales; there were one and a half in agriculture recently, and they have a program to get organic exports to 100 million within the next eight years. It is peanuts. This is why we say to you: do not put all your eggs in one basket. By all means, do more research in biotechnology. I do not have a problem with that. There may be some benefits. Let us also start to see some meaningful research and structures. You might have to sit down with the bureaucrats and think of ways to break through that bureaucratic funding circle that we do not seem to able to get into.

Mr Alexandra—If I could give you a nice handle, the research I would be talking about I would call applied ecology. If we can start developing systems of applied ecology for Australian agriculture, we could make great leaps and bounds.

Mr ADAMS—I would like to ask a couple of questions. I wanted to get back to your difficulty with organic farmers having a problem with pollution and therefore having no

recourse other than common law. You would like to see a regime that would give you that opportunity of being able to get some compensation if that were the case? I am interested in your having an environmental impact statement or such done. How would you envisage that would work? We do it for other industries.

Mr Kinnear—That is a very good point. I will address the first question of compensation. Government must understand that, in allowing through GMAC the release of the canola that I mentioned, there will be contamination. I do not know how we are going to resolve that one. We may already be down the path of legal action. We may have to take legal action against the government. The government is obviously a difficult target. It has a very deep pocket. That may have to happen.

It seems to me essential that compensation is addressed by the government. Why should any farmer be entitled to engage in a production technology that crosses his farm boundary and takes away another farmer's livelihood? It is a simple question. You cannot do it in the city. If you are producing a product, there are a wealth of controls to stop you from doing that. It is straightforward.

Farmers have been getting away with the environmental effects. We know that in Australia we have a limited agricultural resource. Only 17 per cent of our country is arable. Our water resources are under severe threat because of agriculture. Land clearing in Australia has caused an enormous drop in biodiversity in this country. The head of the Australian Museum recently in Melbourne, on a video presentation at the Age Vision 21 series, has said that we need an area 10 times larger than Kakadu to protect our biodiversity. We do not have that available.

Compensation is something the government will have to address. If these people want to grow these crops, they should be clearly identified by government to be liable and mechanisms put in place for compensation. It will then make them think more carefully about which products they put on the market.

We have already seen in Canada that canola is out of control. Monsanto is suing a farmer in Canada for growing its seed unauthorised. The farmer has responded by counter-suing Monsanto saying, 'I did not grow your seed, thank you very much. It is pollen contamination into my crop. How dare you invade my crop with your pollen.' I think this is the single biggest issue that the committee is going to face and I do not think it has been put on the table in terms of public debate and government debate.

CHAIR—I can assure you that it has.

Mr Kinnear—I am very pleased to hear that. This is the single biggest issue. I was angry at the start because I had no idea that these trials were as widespread as they are. The question needs to be asked: why did we allow them to go into all of Australia's canola growing regions? It is extraordinary.

CHAIR—Are you aware of what is happening in overseas countries in regard to this? Does the regulatory system in other countries deal with this problem of contamination?

Mr Kinnear—Yes, it does. In Switzerland they have disallowed any plantings of corn, which is one of the crops that is very popular in Europe, because of this issue. They have said, 'We cannot guarantee pollen transfer.' Corn is like canola. Corn pollen travels on the wind. They have said, 'No, we won't plant it.'

The European environment ministers you may have heard have recently imposed a pseudo freeze pending the introduction of strict environmental controls which they estimate will take 18 months to two or three years to put in place to protect their environment and also to stop this contamination issue. That is how they are handling it. They are saying, 'Stop. We have to go back. We have to draft these regulations and seriously consult with people.'

In Brazil, the soya bean issue has been frozen by the Supreme Court pending environmental impact statements. In Japan they have also frozen any plantings of Bt crops pending environmental impact statements.

Mr ADAMS—I have picked up in this inquiry that there is a haste. We keep being told that we have to have haste; otherwise we will be left behind. There are certainly two debates in the world: the American-Canadian direction and the European direction, which you have just described. We are receiving lots of evidence from the people within the industry that we have to do this quickly, we have to get everything done; otherwise we will miss the boat. Would you like to comment on that?

Mr Alexandra—I think the first issue is that the ethical dilemma has advanced beyond the regulatory framework. I think the Europeans are saying, 'We will put it on hold now, deal with the ethical and regulatory issues and when we have that in place, we will consider the commercialisation.'

Mr ADAMS—Do you think we have had an ethical debate in Australia?

Mr Alexandra—No, quite clearly. What debate there has been has been not well informed. First of all, you have to deal with the question about general knowledge of biological processes and so on. That needs to be lifted in order to have an informed debate.

In terms of the haste, there is a very strong argument for actually holding back from the point of view of national competitive advantage. If the technology proves to be wonderful technology with no risks or no downside, then we can apply it in a few years time. We are talking about a commercial application of technology, not the innovation process.

In terms of investment in the innovation process, there is an issue of, as I said before, having a balanced investment in innovation across the spectrum. As Scott pointed out, that is something that the Commonwealth, as the major funder of research and development, has a real role in—at looking at whether we have signed up to particular kinds of technologies or focused our attention in one area at the expense of others and so on, so we can get that balance. There seems to be no reason to be hasty in terms of commercialisation. Quite the contrary. There is good reason to be very cautious.

CHAIR—You do not think the way things are moving overseas and given than we export 80 per cent of our agriculture, there is no need for any—

Mr Alexandra—As we have pointed out, there is potential for expansion in the organic area and for the GE-free area. At the moment, the jury is still out as to which way the world markets will go. The move in the European Community in the last six months has been so profound that that in itself would represent a reason for Australia to be cautious.

There are parallels with the debate about growth hormones in cattle. I do not know if any of you are cattle producers, but every cattle producer in Australia now has to ID every livestock. In Victoria, you have to sign a statutory declaration to say you have not used hormones. That is in order to protect our market in European countries. That demonstrates that we can have again a paddock to plate thing. Why rush into it if some of our major commercial trading partners are wary or are already on hold themselves.

Mr Kinnear—Under WTO—and this has not been mentioned much this morning—you cannot stop these crops unless you have a good scientific reason. That is what the Europeans are saying: we need to draft environmental legislation to make sure we do not have an ecological hazard develop. What has gone on in Europe is a gift to the federal government in Australia.

Our GE-free canola industry is potentially harmed by the information I have tabled this morning. I can assure you that when this gets out the Europeans will demand testing of our canola exports. If they find contamination, we have lost markets already.

This is a gift to you. If you draft some sort of cautionary approach and say, 'Okay, we will do what Europe is doing. We will put in place environmental impact legislation.' That may take us two or three years. It gives you time to take breath. It does not mean that you are committed one way or the other. We can see what happens with the Sainsburys consortium. It will happen. We will see GMO free labelled stuff on supermarket shelves.

Mr ADAMS—With canola, do you think there may be a possibility of trying to pollute all the areas so we do not have an area—

Mr Kinnear—Are you suggesting there is a conspiracy going on?

Mr ADAMS—No, I am just asking a question.

Mr Kinnear—It had crossed my mind why they needed to be so widespread. I will table this document I have here. It is quite alarming when you read the shire councils this is in. It is about 30 areas in Western Australia and 20 in Victoria, New South Wales and South Australia. It is widespread. Why did they need to do that? Because they are growing seed.

Mr Alexandra—With your resources, you have the capacity to seriously ask that question. We are underresourced. We make our living out of either undertaking research jobs or running commercial businesses. Perhaps you would like to investigate that.

Mr Kinnear—We have called for an inquiry in our three-page submission today.

CHAIR—I am aware that the representative from AgrEvo is still in the audience. Given the points that Mr Kinnear has made, we will offer you the opportunity to make a written reply to us on that. I could see from your expression that you have been caught unawares. We will encourage you to make a written response to the committee on that matter that Mr Kinnear has raised.

Mr Kinnear—May we have the opportunity to view that response and further respond?

CHAIR—Anything that we receive is tabled and becomes part of a public submission.

Mr Kinnear—We could respond to that?

CHAIR—Absolutely. We are in the business of getting as much information as we can. Is it the wish of the committee that the submission from the Organic Federation of Australia be accepted as evidence and be authorised for publication? There being no objection, it is so ordered.

[12.40 p.m.]

PHELPS, Mr Robert Errol, Director, Australian GeneEthics Network

CHAIR—Mr Phelps, I understand that you have now provided us with a submission. Up until today, you had provided us with a series of papers and a pamphlet that you wanted us to read. You would appreciate that none of the committee members have had the opportunity to read your submission. If you would like to summarise the main points of your submission to us and we can then proceed to questions.

Mr Phelps—I would like first to direct your attention to the three dot points on page 3. It seems that you have broadened the scope of your inquiry anyway, but we felt that the terms of reference made the assumption that gene technology would proceed and that it undoubtedly had benefits. We simply wanted to make the points that, in the highly monopolised genetic engineering industry, we should not assume there would be benefits to society as a whole; that the benefits would principally accrue to transnational genetic engineering and chemical industrial companies; and that the rules on which this technology was going to be accessible to primary producers would be potentially so restrictive that it might reap them no benefits at all.

We wanted to direct your attention to the very large potential externalities like environmental damage and the very considerable licensing fee which Monsanto, for example, charged in the first year of the Bt Bacillus thuringiensis in Australia, which was $245 per hectare.

There are both direct and indirect issues that we felt you should cover and the benefits should not be assumed. Secondly, all of the real costs—that is, the costs that are generally not counted and that are run down in the capital resource, soils, water quality and the other kinds of things that Jason and Scott have just covered—should also be taken into account. These are very real considerations.

Australia is in an agricultural crisis. We are losing land out of production. We are seeing farmers walk off the land and a concentration of ownership. It is our view that genetic engineering technology will intensify those trends rather than stabilise or reverse them. As a society, we should be very aware that, within the foreseeable feature, Australia may become a net importer rather than exporter of food if we continue on the path on which we are set. Gene technology will do nothing to contribute to making us any more sustainable or internationally competitive.

For example, we have the comments of Professor Harry Recher from Edith Cowan University in public. Professor John Lovett, the head of GRDC, has also expressed grave concerns about monopolisation. We have heard Mike Dalling describe to us a very monopolised situation of supply for the future of genetically engineered crop plants. We should be very wary of putting ourselves into the hands of corporations which run monopolies and can therefore reap monopoly profits.

For example, we think of the now very concentrated monopolised ownership of seed stocks worldwide, particularly as a result of these same corporations—Monsanto, Novartis, AgrEvo and others—buying up seed companies. Once the genetically engineered seed stocks are available, we think there is every reason to believe that other stocks of seeds now available may become unavailable. That is of considerable concern. We would like those kinds of considerations, all arising out of the patenting of living organisms, to be a major focus of your attention.

Without going into detail because my colleagues have just covered it, we want a very substantial realignment of research and development priorities in Australia in the agricultural area. The alternatives to genetic engineering are quite simply being starved of resources. It is absolutely critical that we recover our degraded environments. That will be done through research and development as well as practical effort on the ground. The genuinely clean green sustainable alternatives for the future must get a fair share of research and development resources if we are to have real alternatives and options. At the moment all we are being offered is the illusory and unsubstantiated benefits of gene technology. It is a technical fix. It is not sustainable. Moreover, it will monopolise ownership of our agriculture even further.

I also refer your attention to the dot points on page 2. These are the threshold conditions which we believe need to be met before any further genetically engineered organisms are released to the Australian environment or any further genetically engineered foods come into the Australian food supply. They form the basis for our just launched campaign for a five-year freeze on genetic engineering in Australia.

The first two concern the regulation of gene technology. Until the Office of the Gene Technology Regulator is agreed to and the laws are put in place to run that office effectively, we do not believe that gene tech should proceed in Australia. We have been advocating for more than 10 years the establishment of proper gene tech regulation in Australia. It was recommended in no uncertain terms in 1992 by a House of Representatives Standing Committee report, *Genetic manipulation: The threat or the glory*. It was a very comprehensive report. Quite simply, industry and some state governments have stalled the efforts to set up a regulator in the hope that we could continue with voluntary regulation and that there would ultimately be no legally based regulation of genetic engineering.

I think now they have seen that is untenable. We do not see that as a reason to fast track genetic engineering. We must wait until our regulator is in place because, quite frankly, the Genetic Manipulation Advisory Committee is loaded with proponents of this technology and they have not performed. The 122 trials of canola around the country is an example of one failure.

I also direct your attention to pages 12 and 13 of the paper, which are the 12 unauthorised releases of genetically engineered organisms in Australia during the regulatory tenure of the Genetic Manipulation Advisory Committee. Its track record is not a good one and it needs to be replaced before this industry is commercialised and not afterwards.

The setting up of an agreement and the public processes that must take place in order to establish the new regulator's office will take at least two years, probably three, and

potentially much longer, given that it already has been going on for 10 years. This we feel is a very good basis for a five-year freeze. The comprehensive and mandatory labelling of all genetically engineered foods coming into the food supply and the establishment of zones where the organic industry can be assured of continuing its activities without becoming contaminated by genes from transgenic crops.

A biosafety protocol is being negotiated internationally under the biodiversity convention. That protocol must be in place before we start transferring internationally the products of genetic engineering. The biosafety protocol has been halted momentarily because six countries, including Australia, earlier this year in Colombia took the view that commodities like soya beans, corn, canola, cotton seeds, potatoes and sugarbeet which are currently coming into our food supply, need not be covered by a biosafety protocol.

A biosafety protocol for the safe international transfer, handling and use of living modified organisms—such as the commodities we are talking about which are viable seeds, and if spilt into the environment will contaminate it and will grow—needs to be covered. We very strongly urge the federal government to take the view that the biosafety protocol should cover all international transfers, including food commodities.

We oppose the patenting of living organisms for a number of reasons, but especially for its conferring monopoly control over the food supply globally and handing it over to private companies. We want to see much better evidence from overseas, validated by independent local research, that genetically engineered organisms are not going to have unacceptable impacts, both on the environment and public health. There is emerging evidence worldwide of impacts. We need to evaluate it for the Australian situation because we have a unique environment here.

At the moment the benefit to Australia very clearly is to remain GE free. We should, as a nation, willingly accept and adopt that benefit, and keep genetic engineering out at least for five years, to see what emerges in world markets. We want strong enforceable liability regimes. Spain, for example, has already said it wants a fidelity bond on any crop plants grown in Spain. That is a good precedent for taking a precautionary approach here. On liability, a Swiss reinsurance company has said it does not think that gene technology is insurable. That is a major issue which needs to be resolved for the insurance industry. Do we want our insurance industry to go down the tubes? I do not think so.

Public debate and discussion, funded in the last budget, needs to happen before, not after, commercialisation. Finally, we and several members of the medical community want an adverse reactions register established, so if people do eat products that are labelled genetically engineered and they experience an adverse health impact, we have an early warning mechanism for recording that that has happened.

All novel foods, including genetically engineered, irradiated, and a whole lot of other novel foods that are coming into the food supply, must be treated in this precautionary fashion. The assumption that ANZFA makes, that all foods are safe until proven otherwise, has to now be turned on its head. The onus of proof of safety of novel foods which have never been in the food supply and have no history of safe use, must fall on the companies that are proposing these foods before, not after, they are commercialised.

Mr ADAMS—Does your group feel the ethical debate has not happened in Australia? We have not had a debate about this. Some things are already going in. We have heard today of canola and other things. I see in your submission here what has been unauthorised and released. Is it your opinion that there has been no ethical debate on this subject in Australia or very little?

Mr Phelps—There has not but, more importantly, there has not been any real debate or discussion about the practical questions that we want to raise of what will happen to the environment.

Mr ADAMS—There must be a cost. Some of these large multinational companies are spending enormous amounts of money in this research. There must be a return. Someone said it was 10 or 40 per cent above the ordinary rate. How will they get a return on that? Over and above normal agriculture today, if there is a reduction in pesticides and other things, there is an opportunity there. That is good for the environment as well. Some people are telling me that this is, as I said, 10 or 40 per cent above what present costs are. With all this research going on, which is an enormous cost, there must be a return somewhere.

Mr Phelps—It will be returned through monopoly profits because this is a monopolised industry and a monopolised technology. There was a very good article in the *Age* on Friday, 6 August in the business section, 'Monsanto Engineers' Healthier Image'. It reports that Monsanto spent $9 billion on this technology, it shed 2,500 staff recently and it has had takeover negotiations with American Home Products and DuPont. It spent the money on agronomic characteristics. Most of them do not work. The promises for the future of better, healthier food remain to be seen.

I do not know where they think they will get the money to change the profile of major food commodities as they promise. They have done their dash on what they have already done. They are not at the moment able to get the money back because food buyers are simply rejecting products of this technology.

Mr ADAMS—You said change the profile of the food.

Mr Phelps—The nutritional value of the food. For example, nutriceuticals and so on.

CHAIR—Firstly, tell us what the Australian GeneEthics Network is.

Mr Phelps—It is a network of concerned citizens. We have been going since the beginning of 1988. We are based at the Australian Conservation Foundation. We do not have any formal structure. We simply ask people to be active in raising public education issues around genetic engineering technologies in their own lives and in their own circle of friends. We communicate through documents like this, for example, which you all now have. We have had 50,000 of these printed. We are getting another 50,000 printed.

We have extensive email lists of people we keep posted about what is happening on the gene tech scene. We began with a small grant from Midnight Oil, the rock band, in 1988. We had money from them for three years from royalties from their CD album, 'Species

Deceases', which is quite relevant. Their concerns were for the biodiversity of the planet which is being lost and will be increasingly lost through genetic engineering.

CHAIR—You are a national organisation?

Mr Phelps—We are. We then had money from the federal government, from the Department of Administrative Services which was then running the Genetic Manipulation Advisory Committee. We received just over $50,000 a year for four years to do public education, debate and discussion. We held forums, produced these kinds of materials, a newsletter and so on. When the Howard government was elected, we were not given any more money. We are now dependent on individual contributions from our subscribers and supporters, who number in excess of 5,000 at the moment.

CHAIR—I refer you to the pamphlet you provided us with a copy of. As we are moving further into this inquiry, we are finding that it is very hard to check; in fact, that is what a lot of our role will involve. We will be checking and double-checking and verifying what people are saying to us. One of the things that obviously is coming out of this debate, and you and many others have raised this point, is that there is a need for, firstly, producers to have access to information—and certainly consumers to have access to accurate information—in order to make informed decisions. When I first picked this up—it says, "Say 'no!' to gene tech's bitter harvest"—I thought that you were referring to all of these products on the front. I thought that was very misleading.

Mr Phelps—I am sorry.

CHAIR—What is your response to my suggestion? As well as being a member of parliament, I am a housewife. I have to go to the supermarket and do all the shopping the same as any other mother of any family does. If I were to walk through a supermarket and, in my hurry to get my goods, have picked that up, I would think that was advertising that those goods were genetically engineered and that you were advertising to say no to them, when in fact you and I both know that none of those products have been genetically engineered.

Mr Phelps—That is right. This is a debate that I lost, unfortunately, with the editor of *Habitat* magazine. This is an educational supplement from the Australian Conservation Foundation.

CHAIR—Do you think that is being honest?

Mr Phelps—Louise's point—and I do not happen to agree with her—was that we wanted also to show the alternatives. She felt that there was no ambiguity about it, but I do not agree with her. I think it is ambiguous.

CHAIR—Especially when you are representing the GeneEthics Network and you are wanting an ethical debate on this issue, that struck me as being blatantly dishonest.

Mr GRIFFIN—As politicians, we probably should not go too much into the question of what advertising revenue is all about.

Mr Phelps—The view of the editor of the magazine was that—

CHAIR—I accept that.

Mr Phelps—This is clearly a young woman who is in a situation where she has clean green fresh produce, which looks good and you would want to eat it.

CHAIR—That is my point. It does look good, but you have 'bitter harvest' there.

Mr Phelps—She is giving the message, 'Say 'no!' to gene tech's bitter harvest', and then you read what is inside. You accept this, but you do not accept what is in the covers.

CHAIR—I can assure you that I have read the whole pamphlet, but I thought it was very misleading.

Mr Phelps—I must say that nobody else has raised this issue with us. There are 50,000 copies out there so far, not including the 20,000 that were inside the magazine originally.

Mr GRIFFIN—Scott and Jason did a bit of this as well before, but one of the things that I am keen to get some more information on is trying to address the issue of what are the alternative markets for Australia. There is a development of a view. It has come through fairly clearly that the GM approach is that we have to be in that situation. It is almost like it is an agricultural arms race and we have to take part.

I am not sure if that is the case, but I am not sure it is not the case either. We talk about the size of the GE-free market, the prospect of that either growing or not growing and the circumstances of how Australia in itself is a significant agricultural producer, but in an overall sense a small one in terms of the world market. Where do we fit into all that?

Mr Phelps—I do not know if you caught the *Insight* program on SBS last night. It was instructive to see the Austrade representative, Libby Blackett-Smith, who is based here in Melbourne, saying that there are markets galore and that we cannot fill the demand for non-genetically engineered and conventional and organic food. I am sure you could get a copy of it. It was a very instructive debate.

Mr GRIFFIN—Have you been able to have discussions with some of the peak bodies in the agricultural field about the question of where they see it and whether they have addressed or thought about that particular approach?

Mr Phelps—I have been to see Wendy Craik and had discussions with her advisors. Their view is that we have to have it. However, the farming community is clearly massively divided. The Western Australian Farmers Federation have passed a motion of opposition to genetic engineering and said that research and development resources should be put instead into the conventional and sustainable alternatives.

At the New South Wales farmers annual conference two or three weeks ago, following a seminar held specifically to discuss these issues, the meeting was not able to make a decision on policy on genetic engineering. I am getting countless calls from all over the

country from farmers saying, 'I am a conventional or an organic grower and I do not want genetic engineering.'

CHAIR—What are the reasons they give to you for that?

Mr Phelps—One of the main reasons is that they see the market at the moment for their produce as being definitely not genetically engineered. They know about the record levels of canola sales to Europe, for example, which we would not be able to do if we were not GE free. Of course, the Canadians have lost that market to us precisely because they are now growing GE canola.

They are eager to capture the opportunities that exist at the moment and I think very much take a wait and see attitude on the technology. They generally feel that the onus of proof should be on the companies. Many of them have been disappointed over the years with the advice they have had from those same companies, which are chemical companies, about how to use chemicals. They see this as more of the same kind of advice that, in the end, may not serve their interests.

Mr GRIFFIN—On the question of the development of the GE industry across the world, it is getting better developed in the US and Canada in terms of the operation of genetically modified industries. In Europe at the moment a lot of it is on hold. Can you give me a thumbnail sketch where things are up to in a general sense around the world?

Mr Phelps—Another piece of information I will give you is from the 1996-97 season. There are essentially only three agronomic characteristics of crops on offer. I do not have it in front of me. What is coming into our food supply is the same. These are herbicide tolerant, particularly to Roundup, which offers some benefits to the North American farmer, although many of them are now having second thoughts about it as well, particularly over the issue of seed saving.

In Monsanto's Roundup Ready contract, it says, 'You may not save seed.' They have had private investigators looking into farmers' affairs to see whether or not seed is being saved. Some farmers are in court; others have settled out of court over seed saving. Indeed, it has even come to the point where a farmer says, 'I definitely did not get your seed. I have not accepted the seed from anybody else.' But genetic pollution from neighbouring crops is suspected. It has become very complicated.

As one spin-off from this innovation which offers no benefits to food buyers, the Australia New Zealand Food Authority will shortly consider a 200-fold increase in allowable Roundup residue levels in imported soya beans. This is a definite downside. It is a cost and risk which accrues to Australian food buyers for no benefit at all.

The second main area is the Bt crops and we do have the cotton here which is about a third of the total. Insect resistance is clearly going to be a problem. There are secondary ecological impacts on the monarch butterfly, recently reported from laboratory research, and impacts on lacewings and ladybugs in research in the UK and Scotland.

These kinds of externalities impact on the environment for society as a whole and offer very little benefit to farmers. Bt toxins have no history of safe use in the food supply. If they are now to be introduced through these foods, a very precautionary approach has to be taken.

The last and main area is virus resistance. That is done by introducing part of these pathogenic viruses into the crop plant to vaccinate it against viruses in the environment. Some virologists are saying that recombination of those particles, either in the environment or in the alimentary tract of animals or humans with pathogenic microorganisms might create new diseases. This is a serious concern and one that should be taken very seriously.

The sum of all that is that while farmers in North America may get some marginal benefit from these things, the risks, hazards and costs are being transferred on to the people to whom the food is being sold. That is an unacceptable equation.

Mr GRIFFIN—In terms of coverage, if we say we have X continents, in North America there is a large gene tech industry in operation producing crops. In Europe, the situation is that it is on hold or it is partially in or partially out.

Mr Phelps—The figures which I have now found and which I will submit are contained in a table from International Biotechnology Monitor of 1997. They show that the USA had 64 per cent of the transgenic crops at that point; China, 14 per cent; Argentina, 11 per cent; Canada, 10 per cent; Australia, less than one per cent; and Mexico, less than one per cent. I do not believe that profile has substantially changed since then.

Mr GRIFFIN—On the question of outcome, we look at agricultural markets and producers who are our competitors—how much they are into the GM area versus they are not. For example, we talk about the fact that the non-GE area is a potential growth area and somewhere we can move into, but I guess there are also demand and supply arguments in all of this. There is a question of what we produce and where we can sell it to. There is also what our competitors are producing and what they can sell. It depends on the question of whether we are directly competing with them in those areas. If most of our competitors are going the GM way, that could improve our opportunities. Has anything been looked at in terms of that?

Mr Phelps—This is something that ABARE and also the Productivity Commission are doing studies on. These are the kinds of things they would want to look at in detail, I hope. Let us say that Brazil has decided—certainly some states within Brazil and I believe the whole country will shortly decide—that it wants to stay GE free precisely because it is a small producer, like Australia, that can find a niche market for its total production of non-genetically engineered product.

As you say, our major competitor—but it is of course a mega competitor—is the USA. Our buyers in Japan especially and also in Europe are saying to us, 'We will buy from you if you are GE free.' We are small compared with the demand for non-genetically engineered produce at this point. As Libby Blackett-Smith said on the show last night—and others confirmed this—we could sell all the produce that we could make, at a premium price, by not going down the GE route.

Mr GRIFFIN—Michael Dalling was here before, and I think you were here at the time. I asked a question about the issue—given that there had been a range of different examples of individual problems in the gene tech area, whether that is when they have been on general release or whether they have still been in some stage of a trial period. He said that he was not aware of any examples where once a product was on general release there had been a significant problem at all, but most of the examples, some of which you have in your paper, have occurred in a process whereby they have been developed, a problem has been found and development has stopped. I equate it to the pharmaceutical industry. Often as drugs are being developed, problems occur. If the problem is big enough, you stop that drug and it never gets out. Can you comment on that?

Mr Phelps—It is what Scott Kinnear said. If you are not expecting a problem, you cannot be expected to look for it. In 1989, a company called Showa Denko started producing a food supplement called L-Tryptophan using genetically engineered organisms. The organisms produced more tryptophan. It was obviously an economically attractive thing to do. Showa Denko did not know to look for a toxin in the new production process and changed its filtration process concurrently. As a result, 37 Americans died and some 1,500 were permanently maimed.

Mr GRIFFIN—It was obviously on general release then, was it?

Mr Phelps—It did not require regulation because it was a food. It was allowed in. It was not identified as being any different. It was not labelled. It came in as part of the tryptophan supply. It took four to six months to figure out what was making people extremely sick. About 5,000 people were affected. Because it was not labelled, the medicos who were seeing this sudden new disease, EMS, did not know what was causing it and had to then go back through the food chain and find out what all these people had in common and finally pinned it down. There has been that real example.

This is one of the reasons for extreme precaution, and why we believe the rules—or the assumptions—on the safety of the food supply need to be changed with novel foods. That should be an early warning to us, that with things like irradiation, which will produce new substances in food, so-called functional foods, nutriceuticals, the one you mentioned with the vaccine in the foodstuffs and so on, need pre-market human testing which is not required at all of the food supply at the moment.

As to the environmental precaution which I think is just as critical, there have already been agronomic failures with these crops. In Mississippi in the 1997 season, the bolls simply fell off the cotton in many cases or they became very hooked and withered. That was an extreme downside.

Monsanto in Canada released a large quantity of seed which was subsequently identified as not being the seed which had been approved. It somehow had a wrong gene in it and had to be withdrawn. That involved withdrawing quite a bit of seed, but also ripping up a fairly significant amount of crop which Monsanto could give you the details about.

In addition to the unauthorised releases in Australia, we had a report of one Monsanto trial in Eastern Europe which involved potatoes, without any assessment by regulatory

authorities and with insufficient notice to potato growers in the area that this was a transgenic crop. We have this current canola seed increase for re-export to Canada, which is a breach of the GMAC guidelines in Australia. There are many things going wrong.

Mr GRIFFIN—On that example, the GMAC guidelines are legal? There is a legal requirement to meet those guidelines or is it a voluntary code of practice?

Mr Phelps—It is totally voluntary. We have made representations to GMAC constantly that the product from field trials not be commercialised. They shared our view in relation to the pigs which went to market in Adelaide in the late 1980s without authorisation. They wrote an extensive report about that. In other cases, the product is sold.

Mr GRIFFIN—They have no sanctions other than to say, 'You are naughty'?

Mr Phelps—The only sanctions they have is criticism in the parliament through the minister, or the withdrawal of funds from research projects, if they are government researchers.

Dr WASHER—I agree that the products that are produced by genetic modification should be policed very carefully and looked at in a well received way. If you look at medicine from a safety point of view, all of our insulins have been genetically modified for in excess of a decade now. Most of the new vaccines coming out, with high standards of safety, are genetically modified. They go through rigorous testings. As yet, they have proved to be very safe. Certainly they have been major so far as medicine goes in terms of human treatment and safety. Look at genetically modified vaccines which we inject into people or give intravenously, et cetera. I say that as a comment. We need to look at new food on the same basis with that level of safety. There are environmental risks to some degree in this too. We need to address what we do particularly with live vaccines which are coming on in medicine. I want you to make a comment on this. There seems to be much less sensationalism when we use it in medicine, where we inject it or give it intravenously, than if we do these things with food.

Mr Phelps—There are a couple of things to say about it. Firstly, and rather surprisingly, people seem to be more willing to accept innovation in medicine and go along with it much longer and perhaps less critically than for foodstuffs, because they accept that if there are going to be benefits for people who are sick, we should give it a go at least. People do want incurable diseases to be cured.

The vaccines and drugs you have mentioned—and I think you have implied—are at this point products of genetically engineered organisms. They are not genetically engineered organisms themselves. They do not contain anything that is alive. As products harvested from fermenters in factories, they pose different kinds of problems. As there is no release to the environment, the community has taken a different view about them. By implication, we have as well.

For example, we have known that cymasin, the cheese starter, which comes from genetically engineered micro-organisms, has been in the food supply for some time. It appears to have no adverse effects. We still say it should be labelled. At the moment, it is

very ambiguously labelled, if at all. Certainly, when live vaccines are proposed, things like a banana with the polio vaccine in them, these things would need to be treated in a very different fashion from what we have at the moment.

As to the existing drugs, there has been controversy about some of the negative impacts of the genetically engineered insulin, for example. That has not been the subject of sufficient public discussion or debate in our view, particularly now that the other forms of insulin are being gradually withdrawn from the market, so choice in a monopoly situation is being withdrawn from people. Some people do still find that the pig-derived insulins are much better for them in that they give an early warning of a catastrophic drop in sugar levels and so on. The monopolisation that this gives is a key issue as well in the health area. The kind of drug testing that goes on makes it a different point for discussion as to human therapies like—

Mr GRIFFIN—If the foods were tested as much as the drugs, there may not be as many problems with the foods.

Mr Phelps—Yes, if food went through the trials that drugs do, we would feel more comfortable about it. The community at large would, too.

CHAIR—On that note, I have been scanning your submission and the other papers you sent for us to read. What are the positive benefits that you would see from genetically engineered products? Most of this is obviously your concern about the negative impact, but what would be the positive benefits you would see?

Mr Phelps—None of the current propositions offer any benefits. The onus rests with the companies to come up with some new products, like the more nutritious grains or maybe grains that fix their own nitrogen from the air, which may be potentially a boon to broadacre agriculture. Those are the kinds of things that possibly might have some potential benefits, but none of these projects show any signs of producing anything at this point. It remains very academic.

One of the projects that I know about, being on the advisory committee also, is marsupial bio-control, which is a land management tool being developed by the marsupial CRC at Macquarie University in conjunction with New Zealanders. It is being driven mostly by New Zealand's need to eliminate 600 million possums which are doing tremendous damage to their environment. What they want to do is control the fertility of marsupials through a system of modified viruses which would be not alive and not released to the environment. That is why we feel moderately comfortable at least to allow this research to proceed and see if it can produce some useful results as a tool for wildlife management.

In contrast to that, the project for feral animal control in Canberra proposes to modify live viruses and release those to the environment for the control of mice, foxes, rabbits and other feral animals in Australia. Live viruses will undoubtedly transmit themselves in the environment, potentially go overseas and impact on animals in the environments where they are native. We have grave concerns about that project because of its capacity to self-generate and spread once released.

These are the kinds of things that need to be discussed to see whether, firstly, public money is wisely spent on such things and, secondly, whether the public contribution can capture some benefits and rewards for the input. As we know, our experience in Australia is that mostly it is corporations that benefit from public research in these things.

To give another example, the entomology research in Australia done by CSIRO over the last 70 years has been disposed of for $1.5 million. That is a scandal of major proportions which we are going to have further to say about and which I will send you some evidence about if you wish.

CHAIR—Thank you very much indeed.

Mr Phelps—Thank you very much for the opportunity. May I also submit the documents to which I referred.

CHAIR—Yes.

Mr Phelps—I would also like to have that group of documents incorporated into the evidence, if I may.

Resolved (on motion by **Mr Sidebottom)**:

That, pursuant to the power conferred by paragraph (a) of standing order 346, this committee authorises publication of the evidence given before it at public hearing this day.

CHAIR—Thank you very much, ladies and gentlemen, for attending.

Committee adjourned at 1.24 p.m.