LEGISLATIVE ASSEMBLY FOR THE AUSTRALIAN CAPITAL TERRITORY

STANDING COMMITTEE ON HEALTH

(Reference: Gene Technology Bill 2002)

Members:

MS K TUCKER (The Chair)
MR B SMYTH
MS K MacDONALD

TRANSCRIPT OF EVIDENCE

CANBERRA

THURSDAY, 7 NOVEMBER 2002

Secretary to the committee:
Ms S Leyne (Ph: 62050490)

By authority of the Legislative Assembly for the Australian Capital Territory

The committee met at 1.37 pm.

CHARLES STUART GUEST was called.

THE CHAIR: I declare open this hearing of the Standing Committee on Health looking at the Gene Technology Bill. I welcome our first witness, Dr Charles Guest. I need to read you some formal requirements that you need to understand as a witness to a committee of the Assembly.

You should understand that these hearings are legal proceedings of the Legislative Assembly protected by parliamentary privilege. That gives you certain protections but also certain responsibilities. It means that you are protected from certain legal action such as being sued for defamation for what you say at this public hearing. It also means you have a responsibility to tell the committee the truth. Giving false or misleading evidence will be treated by the Assembly as a serious matter.

Could you state your name and capacity in which you appear, please.

Dr Guest: My name is Charles Stuart Guest. I'm the Medical Director of the Health Protection Service in the ACT Department of Health. I am the jurisdictional representative on the Gene Technology Standing Committee.

THE CHAIR: Thank you. We have a government submission. Do you want to speak to that submission?

Dr Guest: I'm happy to go through it. The submission sets out a reasonably comprehensive explanation of how the government sees the Gene Technology Bill and an act working. I'm happy to discuss any part of it.

THE CHAIR: We can go through it and ask questions. I have a couple of general questions that have come out of the work we've done in this committee. I'm trying to think how best to do it. I might do it by going through what you've written. I won't miss anything then. Have you got your submission?

Dr Guest: I have.

THE CHAIR: Go to the executive summary, section 4. I'm interested to know how consultation is occurring. The regulator has a responsibility to consult. I'm interested to know what consultation has occurred at a local level with people of the ACT, apart from this inquiry which is occurring now. I'm interested in releases and the development of the government's position on the agreement as well.

Dr Guest: I should say that I only joined the department in March of this year, so I'm not able to speak knowledgeably about consultation that might have occurred before that time. My understanding is that the government is relying on the National Gene Technology Community Consultative Committee for consultation on this matter. There has been consultation about the bill by public servants within government, of course.

MR SMYTH: Is it possible to find out what the government has done in advertising public meetings? Has the government received any submissions?

Dr Guest: I could certainly take that on notice. I can tell you, though, that there hasn't been very much at all since I've been here.

THE CHAIR: I don't think there has either. National agreements go through the Assembly, so you could argue—not that you would, but someone might—that we could have done that. Individual members could have. I'm interested to know just how well consultation works in going through the different levels of government. Your answer is what most states would say. They're leaving it to the national regulator to do the consultation through the bodies they have. They think that's it.

Dr Guest: I believe that's true.

THE CHAIR: By having a committee inquiry, we're opening it up at a local level. Other states have done that, too. You say in the summary, and I know you say it in more detail later, that the ACT government believes that the national system is both robust and flexible and the necessary checks and balances are provided in the regulatory system to allow for thorough and rigorous assessment, while considering the views of the government stakeholders and other members of the community.

There are some fundamental things about that the processes as they exist now which, to me, don't appear to allow for good checks and balances. I'd like your comment on, for example, who can appeal against a decision of the regulator. Only the proponent can appeal. What is your view of that? Is it fair that third parties can't appeal? If it's true that the regulator hears its own appeals, that's not normally seen to be a very good process. I'm interested in why you think that's a robust system in terms of checks and balances.

Dr Guest: The ministerial council and the standing committee are quite separate administratively from the community consultative committee, the ethics committee and the technical advisory committee. There's a formal separation.

THE CHAIR: So where does the appeal go? Doesn't it go to the regulator?

Dr Guest: That's my understanding. But the point I'm leading to in terms of checks and balances is that, through the community consultative committee and the ethics committee—and the technical committee, for that matter—it is possible for any party to bring a matter about an application and its outcome.

THE CHAIR: It's not a formal appeal process, though, which is available to a proponent.

Dr Guest: I don't know whether that's the case or not.

THE CHAIR: I understand that it is.

Dr Guest: I'd be happy to comment on it, but I'd need to go back to the bill. So I'm not confirming that.

THE CHAIR: Fair enough. You can get back to us on any of these questions. Take them on notice if you're not ready at this point. I'm interested in insurance. I'd like your analysis of that. That's going to be a problem. As I understand it, insurance companies are running a mile from it. Even if they weren't, who is liable? We know that in the United States there was a charge against a farmer who was accidentally in possession of genetic material owned by Monsanto because of pollution that went across to his crop. He was sued. Now there's another case trying to reverse that onus of liability. What's your take on that whole question?

Dr Guest: My understanding is that the onus of liability lies with the applicant. The responsibility lies with the applicant. Applicants would be taking out their own insurance, and they would be required to do so.

THE CHAIR: So they're insuring against what—accidental contamination of non-GE crops by their GE crops?

Dr Guest: For example.

THE CHAIR: So that's the Australian situation? Any applicant is going to have to insure themselves to deal with accidental contamination?

Dr Guest: That is my understanding, yes.

THE CHAIR: A submission we received commented that the location of GE crop trials is not published until planting is imminent, so neighbouring farmers cannot avoid genetic contamination by planting alternative unrelated crops. The point being made is that neighbours should have a right to be adequately notified well in advance so they can take evasive action, for example, by planting another crop. Why is the onus on those people to defend themselves from this crop? Why isn't the responsibility with the proponent or the person who's using it or the person who owns the technology. As I understand it, the responsibility lies there now. Why doesn't the responsibility lie there to make sure they don't inflict their GE material on non-GE growers?

Dr Guest: Again, you're making a statement which I think is assuming a position. I think the importance of the precautionary principle in all of this activity is stated and explained in the government statement. The community consultative committee has mechanisms in place to allow for consultation about applications as they come forward.

THE CHAIR: So you're saying this evidence is wrong—that they are given plenty of notice to plant protective crops?

Dr Guest: "Plenty of notice" would require definition. My understanding is that there are—

THE CHAIR: Time to plant a crop. That's how much time is needed to take evasive action. To have a crop there that is able to protect—that's the time that's needed.

Dr Guest: I don't know what the time interval for all applications will be from the time of application to consultation to approval. I can take that on notice. The community consultative committee, though, is there for that kind of purpose.

MR SMYTH: The point is that it's beyond that part of the process. What's the process between approval and planting of the GM crop? If I'm living next door and I want to plant GM, and I don't have to tell Karin until two or three days before, in effect she has no opportunity to interact. We have evidence in one of the submissions that that timeframe is way too short. Perhaps you could take on notice the questions about what the timeframe is and whether that statement is correct.

Dr Guest: Certainly.

THE CHAIR: I'm interested to understand how you support the statements that you are confident that checks and balances are in place and confident to leave the present regulatory framework in the hands of the regulator as it's working well. These concerns have been raised in other submissions. Can you please explain to us how you justify those statements and why you have that confidence? To any person who reads them they look to be serious issues.

Dr Guest: Yes.

MR SMYTH: The government submission talks about rigorous assessment. I think paragraph 7 is aimed at the assessment period. I do not want to paraphrase you, Madam Chair, but I think you're talking about the period after the licence is granted and the implementation or the use of the licence. I think it's unclear in the bill how that works.

THE CHAIR: I wasn't still with 7. I'd moved sideways. I started off with 7; you're right. Then I moved on, because I was interested in general concerns that have come up.

MR SMYTH: But I don't think the application is covered by the bill.

THE CHAIR: Or the implementation.

MR SMYTH: I think Dr Guest is talking about the assessment process, if I'm hearing him right.

Dr Guest: Yes.

MR SMYTH: When I've got my licence to plant a GM crop, what happens then?

Dr Guest: The fact that the licence has been granted is information that will be in the public domain. What you're asking me is how long it is between that information becoming available and somebody—

THE CHAIR: It's about taking into account hazard reduction in the use of genetically altered crops.

MS MacDONALD: Once the licence is granted and it's in the public domain, will neighbours be notified that that licence to plant genetically modified crops has been granted so they can take this into consideration? How much lead time will they have?

Dr Guest: I understand that is the question. The time interval is something I need to take on notice.

MS MacDONALD: Can you also take on notice whether or not neighbours would be notified that a licence had been granted rather than it being, for example, published in the *Canberra Times* public notices section?. Would a letter be sent directly to the neighbouring properties?

THE CHAIR: It's about giving them time to take evasive action if that's necessary. That shouldn't be their responsibility anyway. It's a question of what's fair and who takes responsibility. That's a huge cost that's imposed on the non-GE farmer to protect themselves from a genetically altered crop.

On page 6 you say it provides the necessary framework to ensure that environmental and public health issues and community concerns are considered and addressed. I'm interested in your comment on community concern including economic impact. As I'm sure you're well aware, a lot of farmers are very concerned that they will lose a competitive advantage if they lose the potential to have GE-free crops, because there is a market for them.

There's a very strong argument coming from producers on the land that there will be a severe economic impact on them if they can't be sure that they can sell their product as GE free. But the regulator doesn't have the brief to look at economic impact. So I'm interested to know your view of a regulatory framework for a regulator meant to be making these very important decisions.

Dr Guest: In the application to undertake an activity there is requirement for economic impacts to be established.

THE CHAIR: By the proponents?

Dr Guest: Given that the process is set up so that a neighbour trying to be GE-free should remain GE-free through this process, I don't believe there is any formal mechanism at present for establishing what the economic impact on neighbouring producers would be.

THE CHAIR: Is that a problem?

Dr Guest: It could be.

THE CHAIR: When you say that you support this scheme because you think it does deal with the issues, if I'm understanding you correctly, you're saying it doesn't necessarily deal with the issues if it doesn't address the economic impact.

Dr Guest: It doesn't deal necessarily with all the economic impacts perceived by neighbouring farmers, for example, no.

THE CHAIR: What economic impact does it address?

Dr Guest: The more direct impacts on the proponent.

THE CHAIR: Is that fair?

Dr Guest: Could you direct me to the paragraph you're reading from?

THE CHAIR: I'm looking at ACT government position 15.

MR SMYTH: Paragraph 15 on page 6.

Dr Guest: Thank you.

THE CHAIR: It mentions community concerns. Evidence we're receiving makes the point—and I was interested in your reaction to it—that there is community concern about economic impact on the viability of many farms not only because they feel they're losing a comparative advantage in the market because they do have a GE-free product, but also because there is an economic impact on them from having to take responsibility to ensure their crops are not contaminated by GE crops. For example, canola, is a very small seed, as I'm sure you're aware. I'm sure you're also aware that headers move from property to property. So the notion that you can clean a header is laughable, if you know what a header looks like and what a canola seed looks like. Does the GE-free producer have to take responsibility for cleaning that header, or do they have to buy their own header? They're not going to be able to do that, most likely. A whole lot of concerns are coming up. It isn't clear who bears the cost, and the economic impact is seen to be serious.

Dr Guest: As I understand it, those costs you've mentioned would be borne by the proponent. If we work on the precautionary principle, the proponent is responsible for non-contamination.

THE CHAIR: That's interesting. In your understanding the proponent will ensure that the header is cleaned properly.

Dr Guest: That is my understanding.

THE CHAIR: This comes back to implementation, I guess. Who checks on this? That's a general question I would like a detailed answer to. You can take it on notice if you like. With all the regulatory framework that exists under the regulator and the responsibilities that they hold, I'm interested to know how often these licence, field trials or whatever activities are occurring will be monitored. I'm sure you're aware of the Mount Gambier example in 2000 when plants were ripped up and put in the municipal tip. Hopefully things have improved since then, but I would like to know whether they have improved and how activities are monitored. What are the resources? How often are they checked? The header is a good example. What's the process for checking whether there's a canola seed in the header?

Dr Guest: Those responsibilities are administered through the Office of the Gene Technology Regulator.

THE CHAIR: I understand that, but you said you have confidence in them. I want to have confidence in them. So I've got to know from you why you've got confidence in them. These things are being brought to the committee as issues, and people in the community don't have confidence. I need to know why you have confidence.

Dr Guest: The OGTR has resources. How the OGTR is going to be resourced and how it's going to recover its cost is being debated.

THE CHAIR: What's the government's view on that if it is to become self-funded? What do you think the implications of that will be?

Dr Guest: That the costs of this regulation will be passed back to the proponent.

THE CHAIR: Do you see any implications for the quality of service with a self-funding regulator?

Dr Guest: There are possible risks with that.

THE CHAIR: But you support the self-funding model?

Dr Guest: I don't express a view for the government on that at this point. That's for the minister.

MR SMYTH: Could you inquire as to whether the government expresses a view? Could you take that on notice?

Dr Guest: Yes, I can. I think we have to go back to the committee structure of the OGTR and the independence of community consultation, ethics and technical advice.

MS MacDONALD: This is in relation to your level of confidence in the OGTR. Is that what you're saying?

Dr Guest: I'm saying that the OGTR has, and will have, I believe, the resources, for example, to clean the canola off the header or to insist that that's done and to ensure compliance with that. And the independence of those other committees serves as a check and a balance on that.

THE CHAIR: On the question of protecting non-GE producers, the recent dust storms blew a virus from Western Australia to Queensland. Are you aware of that?

Dr Guest: Which virus was that?

THE CHAIR: The smut virus. I'm not a scientist so you can explain why that wouldn't be of concern in accepting that we can protect non-GE products from GE products.

Dr Guest: Was the particular example you are talking about a genetically modified—

THE CHAIR: No, it wasn't, but that's not the point.

Dr Guest: I think it's important we stick with genetically modified gene technology issues. A virus can blow from—

THE CHAIR: That was from a plant, though. That's why I'm raising it.

Dr Guest: Across the room to across the country.

THE CHAIR: Yes, it's a plant thing. It's a part of a plant.

Dr Guest: Was it traced to be the very same genotype in Western Australia as over here? I'm not sure I can take that at face value.

THE CHAIR: Maybe I can ask the next witness. I'm trying to look for the detail of it. I can't answer those questions.

MR SMYTH: Are you aware of where the other states are in regard to this? Have they all passed their bills?

Dr Guest: No, they haven't. Three or four of them have. I can provide that information. Two states or territories are considering it. I think it's Western Australia and us. Tasmania has gone GE free.

THE CHAIR: Do you want to have a little look at that? I don't know if it's enough information for you.

Dr Guest: This news story relates to the movement of a virus around the country. That's perfectly understandable. Viruses do move around the country. This is just a natural occurrence. This is just movement of biologicals through natural forces, as I understand it. The movement of gene technology products with the assistance of natural forces may also occur. But the proponent of that experiment or technology will be accountable for contamination that might occur in this way.

THE CHAIR: In what way are they accountable? They'd be insured so they'd pay compensation for the loss of GE-free crops?

Dr Guest: That's my understanding as to how it would work.

THE CHAIR: Released into the environment and not able to be brought back?

MR SMYTH: That's in the trial phase. If the gene-modified crop is approved for general sale, what happens then?

Dr Guest: Once it's completely out in the public domain and commercialised, that would move, I believe, from the responsibility of the original proponent to the responsibility of manufacturers, vendors and so on down the chain. That is a different, later stage of responsibility. Whether or not the OGTR has responsibility for those later transactions, I rather doubt, but I'm not certain.

THE CHAIR: I have so many more questions. I will have put them in writing. What will be the cost to the ACT government of the cost-sharing arrangement with the Commonwealth regarding the funding for the regulator?

Dr Guest: The figure that has been calculated so far is, I think, 1.4 per cent of the $8 million—$64,000 per annum.

THE CHAIR: Clause 58 of the bill provides for the suitability of companies to hold a licence to be taken into consideration when determining applications. Does the ACT or the public have any input into that?

Dr Guest: Absolutely. The ACT can—

THE CHAIR: Through the ministerial council?

Dr Guest: Through the ministerial council, through the three independent committees.

THE CHAIR: I think we'll need to put the rest in writing, because I'm aware that there are other people waiting. We need to close. Thank you.

JULIE GLOVER was called.

THE CHAIR: Welcome to the committee. Thanks for coming. I need to read you the formal requirements of a witness to a committee of the Assembly.

You should understand that these hearings are legal proceedings of the Assembly protected by parliamentary privilege. That gives you certain protections but also certain responsibilities. It means that you are protected from certain legal actions such as being sued for defamation for what you say at this public hearing. It also means that you have a responsibility to tell the committee the truth. Giving false or misleading evidence will be treated by the Assembly as a serious matter.

Would you like to address the committee generally on the terms of reference?

Dr Glover: My name is Dr Julie Glover. I work at the Bureau of Rural Sciences, which is a scientific agency attached to the Commonwealth Department of Agriculture, Fisheries and Forestry Australia. I've been invited to come and talk on a scientific study that we did at the bureau on gene flow. This gene flow study has been published. It's called *Gene flow study implications for the release of genetically modified crops in Australia*. So this is a scientific review of the literature on gene flow—that is, the cross-pollination between genetically modified crops and other plant species. I'm here to talk on the science of these issues.

THE CHAIR: So we'll go into questions?

Dr Glover: Yes, if you like.

THE CHAIR: You've just described what gene flow is in simple terms. Can you explain the impact of gene flow between GE and non-GE crops?

Dr Glover: That's a good question. Gene flow has come into public domain interest recently because of the issue of genetically modified crops. Gene flow is a natural process. The sort of gene flow I talked about and concentrated on in the report is gene flow that occurs through pollen from one plant moving to another plant and fertilising the flower of that plant. That is a very natural process.

People are more concerned about genetically modified genes moving from one population into another. That is why it's an issue, and that's why scientists are studying the movement of genes in this manner.

THE CHAIR: Can you comment on the news article about the smut disease moving across from Western Australia? Is that relevant to the work you're doing?

Dr Glover: I don't know of this exact example, but with the recent dust storms I think there has been talk about pollen movement. I can comment more on pollen movement.

THE CHAIR: Sure, yes.

Dr Glover: These are really rare events. I can't claim to be an expert on dust storms and how far up the dust goes into the atmosphere. I think dust is much lighter than pollen, so whether pollen is going to be carried with dust is difficult for me to comment on. Most pollen falls very close to the source plant, within metres of the source plant. But there is some longer distance pollen travel.

What's significant about the dust storm is whether the pollen is going to be viable or alive when it gets to wherever it's going and whether there is going to be a closely related plant flowering at the same time to allow that gene flow to occur.

THE CHAIR: There are a lot of variables.

Dr Glover: Just because you see pollen it doesn't mean that it's going to be viable and it's going to have a gene flow effect. The significant thing is the effect of that gene flow, the impact. As I've said, gene flow is a natural process. More important is whether it's going to have an impact. That differs, depending on the crop, the gene, the plant it lands in, the plant's environment and whether it is fertilised.

THE CHAIR: I'm trying to understand how that fits with risk assessment. Where is a decision made about whether that risk is worth taking. You said that you need various factors to be there. It's the same time of year, so maybe the flowers are all flowering at the same time, but there's movement; there's a risk. From what you've said, there seems to me to be a risk that it could have an impact. You can't say what that would be. But is that a risk we need to take into account when we are releasing environmentally modified or engineered plants into the environment?

Dr Glover: This doesn't come back to the science so much. I think this would be something that the Office of the Gene Technology Regulator would look at as part of their risk assessment process. They wouldn't necessarily monitor this. These are such rare events and so low risk. It's also very difficult to test.

MS MacDONALD: This is not your field of expertise, but are you aware of any studies which would give us answers that would help in that area. Do you know where we could find that information?

Dr Glover: That's a good question. I guess studies specifically on rare dust movements or rare—

MS MacDONALD: Ms Tucker's question is related to pollen movement rather than dust movement. You said that you believe that dust is lighter than pollen anyway. We'd be looking at how far the pollen would move.

Dr Glover: Pollen is heavier. I didn't look into that in the gene flow study, but there may well be literature on long distance pollen dispersal. To date, I don't know whether people have been that interested in this issue, because it comes down to implications of pollen movement.

THE CHAIR: Does that mean that you think that research field trials can be properly segregated?

Dr Glover: By "properly segregated" you mean—

THE CHAIR: To ensure that there isn't cross-pollution.

Dr Glover: That would depend on the field trial and the crop. Again, this isn't talking about the science, but I know that for some of their field trials OGTR don't allow the plants to flower whereas for others they do. I think they do take this into consideration and look at related plants around the field trial site and the likelihood of gene flow to them. More significantly, what is the impact of gene flow for human health or for the environment if it does occur?

THE CHAIR: The barriers or buffer have to be determined according to the nature of the plant?

Dr Glover: Definitely.

THE CHAIR: And its characteristics?

Dr Glover: Yes.

THE CHAIR: If New South Wales, for example, released canola into the environment, what would we need to do in the ACT if we wanted to ensure that we were segregated?

Dr Glover: Again, in the report I mainly talked about gene flow issues. There is a whole suite of other issues to do with segregation. That involves thing you were mentioning previously, like cleaning harvesters.

I did a small case study on canola. I should stress that these case studies are really limited and much less than what OGTR would require as a risk assessment process. I raised some of the issues that would need to be looked at, but I didn't look at them in a great deal of detail. Most canola pollen falls within metres of the canola plant, and only very low levels travel any distance.

The Reiger study was done recently in three or four different states of Australia. It wasn't with a GM crop. It was with a conventionally bred herbicide tolerant canola crop. It was the first time that crop had been introduced into Australia, so they were able to look at where the genes had moved or where pollen had moved from this crop. They did that in a lot of different states.

I think the maximum percentage of gene flow they found was 0.07 per cent, which is well below some of the thresholds people are talking about. Most of it was very close. Even in a lot of the paddocks right next door to this herbicide tolerant crop, they didn't detect any gene flow, but they detected some two to 2½ kilometres away.

THE CHAIR: But when you say they detected gene flow, that doesn't mean that pollen moved; that it moved into another plant, does it?

Dr Glover: That's right.

THE CHAIR: What did it move into?

Dr Glover: Canola plants.

THE CHAIR: Into other canola plants.

Dr Glover: Into other canola plants. They were able to score this because the genes they were looking at were herbicide tolerant. They sprayed the crops with collected seed from the neighbouring paddocks and then grew those plants and sprayed them with herbicide. Any that survived were potentially gene flow candidates.

MS MacDONALD: You said it was very low in the case of canola, but while it hadn't necessarily flowed to the next door property, in some cases it had gone as far as two kilometres.

Dr Glover: That's right, yes.

THE CHAIR: By pollen.

Dr Glover: Yes, presumably by pollen. That's the presumption of the study, but maybe they can do further analysis. There is some natural herbicide tolerance in conventionally bred canola that would come up, at much lower levels.

MS MacDONALD: So the levels were high enough for them to think that it had been spread. If it wasn't spread by pollen, what else would it have been spread by?

Dr Glover: I'd just be guessing. I would like to see a little bit of an extension from that. But even if it wasn't spread by pollen, it might have been a natural level of resistance in that particular paddock, or it could have been seed movement if the same harvesters were used—I don't know.

MS MacDONALD: If we suppose that pollen had been the cause of finding those higher levels two kilometres away—

Dr Glover: That's the assumption.

MS MacDONALD: You're saying that it's quite possible that it skipped a property?

Dr Glover: Yes.

MS MacDONALD: Once somebody has made the application to plan a genetically modified crop, their neighbours are notified, but it might not be just their immediate neighbours but people in a certain radius that need to be notified.

Dr Glover: This would be for marketing reasons or—

MS MacDONALD: On the basis that surrounding people with crops may wish to take action and plant other crops. A canola farmer who didn't want gene flow going to their crop could plant something other than canola.

Dr Glover: I guess the other issue, which is scientific related, is the testing for GM gene flow. That wasn't a GM example, but what you're talking would be a GM example. This is something we looked at a little bit in the report. It is very difficult to scientifically test whether something is GM free. The only way to show that something is GM free is to sample 100 per cent of your sample, in which case often the tests are destructive, so that's just not viable.

Depending on which tests you use, they have different sensitivity levels. They'll only go down to a certain per cent detectability. The more sensitive the test, usually the more unreliable they are or the more chance of false positives. That's an issue as well.

I mentioned in the report a UK organic certifying agency that's talking about a .01 parts per million threshold, which is completely irrelevant, because there's no way of testing. The testing methods can't go down to that level, so that's not really a level to be talked about. That's from a scientific point of view.

MR SMYTH: You said on page 7 of your report that the risk of a gene flow from some GM crops is considered too high for current release developing technological methods suitable for use in agriculture. If the risk is so high, why wouldn't you consider not using the GM food?

Dr Glover: I guess I probably should have specified this better. What I was possibly talking about more was some of the newer applications that scientists are studying—not GM food crops but introducing other genes into plants to produce industrial chemicals, vaccines or pharmaceuticals. Those sorts of things would require a totally different attitude towards gene flow. In most cases gene flow from that sort of crop into a food crop would be totally unacceptable.

For those sorts of applications, scientists are working on ways of reducing or eliminating gene flow. That can be by even something as simple as using a crop that doesn't produce pollen or planting a crop that has no related food crops regionally or even in the same country, so there's no risk of gene flow happening. That's something the OGTR would look at very carefully under human health issues. That's definitely the case.

MR SMYTH: In the Australian context, what's the likelihood of gene flow from a genetically modified crop to a native plant?

Dr Glover: That's a good question. This has come up in other countries. You've probably heard about the GM maize in Mexico. There are concerns there because maize originated in Mexico, so there are a lot of native maizes growing there and that's the centre of biodiversity.

In Australia that's obviously less of a problem, because most of our crop species are exotics. On page 7 of the report I've included a table showing crops in Australia that have a related Australian native species. Again, it would involve too much scientific study to look at each one of these crops and work out their native relatives and how close they are. Just because they're related doesn't mean that there's a likelihood of gene flow.

Gene flow is very rare, except between plants of the same species. It can occasionally occur with different species. Again, the OGTR would look at this really carefully as part of their risk assessment process, as part of the effect on the natural environment. They would look at whether that gene flow is likely and the possible impact of that gene flow.

We did a case study on cotton. Australia has quite a lot of native cotton relatives. The CSIRO looked at this really carefully, for other reasons as well. They wanted to see if they could introduce some new genes into cotton by cross-breeding. They wanted to see if cottons could cross with native cottons. They found that the likelihood of the two crossing was very rare.

MS MacDONALD: Do you believe the OGTR would need to do tests on each species?

Dr Glover: I think in a lot of cases most of this work would have been done, for the reason that I mentioned before. Plant breeders are always looking for new areas of diversity so that they can cross related plants to get new disease resistance markers. A lot of that work would have already been done. It's just a matter of going to the right expert in Australia and talking to them about it.

THE CHAIR: Are you saying that the OGTR has the responsibility to get independent scientific peer assessment of proposals for releases? I understood that the proponents gave the assessment of the risk.

Dr Glover: I probably shouldn't talk about what OGTR does, but my understanding and my involvement with the risk assessment so far is that if the OGTR feel that the proponent hasn't supplied enough detail on a particular topic they will go back to them and say, "Does this crop cross with this species, and what are the possible effects?"

THE CHAIR: If you don't want to comment on those processes, I won't pursue it.

Dr Glover: I'm not really qualified.

THE CHAIR: Some submissions have said that you need an independent review of proposals and the risk assessment produced by proponents. It is not a good process to have a proponent telling you whether it's going to be a good idea or not. A lot of the scientific studies they use to support their applications were done overseas, where there are different standards. They haven't had independent peer review of the work. That's a criticism that has been levelled at the processes of the OGTR and how rigorous the scientific analysis is. It's not the issue you're here to talk about, so I won't pursue it.

MR SMYTH: You said that gene flow can be limited by adopting stricter regulations in order to guarantee seed purity. What sort of regulations have you got in mind?

Dr Glover: I think I said at the beginning that people haven't really been worried about gene flow until now, until GM crops. But I think that's not quite true, because in the seed certification industry, when people are producing crops for seed, they need high purity of seed. For example, canola, is just one variety, and it does not have other varieties crossing in.

For that reason—and these are developed for each particular species—there are seed certification regulations. In Australia each state has a different set of regulations, but they're basically all the same. Depending on the crop, there's a lot of different agricultural mechanisms that can limit gene flow, but the main one is separation distances. That's used in the majority of cases for limiting gene flow.

On pages 20 and 21 of the report I've included examples of some of the separation distances that are required in Australia, the OECD and the US. These separation distances also come with threshold levels of contamination of other varieties that are permitted and within which you can still sell your seed as certified seed. For example, for field peas, when they're producing a certain level of certified seed they can have a 1 per cent threshold of other varieties in that certified seed and the seed won't be rejected. Those distances and those threshold levels give us a bit of an idea of what sort of gene flow is occurring.

THE CHAIR: One government participant on a Victorian government interdepartmental working group said, among other things, that it is assumed and accepted that once you release a GM crop there will be contamination and admixtures throughout the supply chain; that there will be widespread contamination and that is accepted; and that pure seed is not practical. Do you agree with that? The new organic standards need to allow for inadvertent contamination. No companies can take responsibility for what farmers will do. No governments will ever regulate a zero threshold for organics. So we've just got to give up?

Dr Glover: That really gets on to policy. I can't talk about that except to say that I think the Australian government has agreed that they're supportive of coexistence, so that we can have GM and non-GM. But as I said, on a scientific basis, it is very difficult to quantify GM free, so I think there has to be some qualification of what we mean by that.

MR SMYTH: Currently Australia would be GM free for most crops because we haven't released them for commercial use. I'm a canola farmer. She's a canola farmer. I go GM. She wants to stay GM free. She doesn't have a choice, because there will be contamination from my GM crop. There must be gene flow between the two crops.

Dr Glover: I guess it would depend on how closely they were planted together, whether they were flowering at exactly the same time, whether it's tested and at what point it's tested, and whether you can test. If you're testing at the seed level, that's okay, but at the oil level you can't test the product. It's difficult to quantify something as GM free if you can't test for it.

MS MacDONALD: You have said that in a trial it has shown up two kilometres away, so how closely the crops are planted is an issue if they both flower at the same time. Obviously they have to flower at the same time for there to be cross-pollination. Having a buffer zone of more than two kilometres may not be possible.

Dr Glover: Sure, but the significant thing about that study was that the level was so low that it would be difficult to detect using the normal detection mechanisms. It was only because they collected seed from those paddocks and then planted out the individual seeds and tested them that they picked that up. It was 0.07 per cent. That's very significant. Would you detect it?

MR SMYTH: If it's 0.07 per cent this time, you save your seed and replant it next year. Some of that flowers. You're planting genetically modified food in the crop. It flowers closer. It drops its pollen on other plants. The 0.07 per cent multiplied and multiplied must eventually lead to greater contamination. It just doesn't stay at 0.07.

Dr Glover: The farmer-saved seed thing is a whole different kettle of fish. I guess it's not really pollen related. Speaking scientifically about that, I don't see why the ratio would change. If it's 0.07 per cent in that initial crop and you harvest all the seed and plant out, unless you're selecting for that 0.07 per cent, the ratio should stay—

MS MacDONALD: So you're saying that there won't be a multiplying effect?

Dr Glover: Unless you're selecting for that—for example, spraying with a particular herbicide, although you wouldn't because you would lose the 90 per cent or whatever of the rest of your crop, because it would be herbicide sensitive.

In saying that, I think the seed industry is currently looking at issues on threshold levels. That would be important for them, for guaranteeing that their seed has only a content of a certain level.

THE CHAIR: But the implications of a GE-free farm getting GE canola are significant if they're using it in crop rotation. You get the volunteers coming up the next year which are herbicide resistant, which is a problem when you don't want to use too much spray. You've got to stop those volunteers coming up. Obviously that's going to have an economic impact as well as an environmental impact on that farm. They're going to have to stop using canola to rotate crops. There are serious issues there.

Dr Glover: I guess that's something that will come under some of the crop management plans that people are looking at.

THE CHAIR: Economic impact on non-GE farmers. We need to wrap up. I don't know whether you know about the use of antibiotic resistance marker genes. Do you know about that?

Dr Glover: We didn't go into that in the gene flow report, mainly because antibiotic resistant genes, if you're talking about gene flow, are more of an issue if you're talking about gene flow from, say, a plant into a bacteria, which is horizontal gene flow.

THE CHAIR: Yes and then someone eats it or an animal eats it? Is that how it works?

Dr Glover: Yes, that's the issue. I didn't touch on that. I mainly looked at gene flow from one plant to another.

THE CHAIR: I understand that. I just wondered if you would be prepared to comment on whether or not that's a health concern. Have you seen scientific work on that, or do you have a comment?

Dr Glover: I guess it's outside what I looked at in the report. I do have some other knowledge on the topic, but I guess I would just say at this point that the OGTR looks at this issue. I think Foods Standards Australia New Zealand also look at this issue very carefully.

THE CHAIR: Is that ANZFA?

Dr Glover: Yes, it was ANZFA but it's now FSANZ. They look at that issue very carefully. In the introduction I talked about this difference of gene flow from plant to plant and from plant to bacteria. Gene flow from plant to bacteria is a very rare event. It has only ever been detected in a laboratory. The reason that it has only ever been detected in the laboratory is that there's too much background antibiotic resistance in the soil bacteria in natural environments to detect it. That has to be balanced. Bacteria develop resistance to antibiotics naturally.

THE CHAIR: I guess if it was a clinically important antibiotic we would have an interest in understanding the implication and risks.

Dr Glover: Yes, and I think OGTR look at that very carefully.

THE CHAIR: Thank you very much for your time

WENDY CRAIK was called.

THE CHAIR: Could you state your name and the capacity in which you appear today, please.

Dr Craik: I'm Wendy Craik. I'm a director of the Life Sciences Network.

THE CHAIR: I need to read to you your responsibilities as a witness to an Assembly committee. You should understand that these hearings are legal proceedings of the Legislative Assembly protected by parliamentary privilege. That gives you certain protections but also certain responsibilities. It means you are protected from certain legal action such as being sued for defamation for what you say at this public hearing. It also means you have a responsibility to tell the committee the truth. Giving false or misleading evidence will be treated by the Assembly as a serious matter.

Thank you for your submission. Would you like to address the committee or go straight into questions?

Dr Craik: I have a few brief words to start. The Life Sciences Network is a reasonably new institution in Australia. It's an umbrella network that has grown out of New Zealand. It started in New Zealand just before the royal commission on genetic modification was put in place. It has representatives throughout the supply chain who have an interest in genetic modification. It has research institutions right through to retailers.

THE CHAIR: Do you have a list?

Dr Craik: There is a list at the back of the submission. There should be an appendix at the back of the submission. They are mostly New Zealand organisations. They arrived in Australia late last year. We've had a few hiccups getting going here, but the idea is to set up a similar range of members throughout Australia which goes throughout the supply chain—research, growers, producers, processors, retailers and covering both agriculture and medicine. It's not just agriculture.

THE CHAIR: Where is Mulligan Medical Research Institute?

Dr Craik: They're a private research institute in New Zealand. Most of these are New Zealand members. Most of them come from New Zealand, and we're trying to gather members here in Australia. People know about us, but we haven't approached them yet for money.

The aim of the Life Sciences Network is to disseminate information on genetic modification and to have an advocacy role to ensure that genetic modification remains available as one of the technologies that people can choose to use throughout the supply chain.

THE CHAIR: I will pick you up on "choose to use". I'm interested to know what you think the impact of the full release of GE farming would have on organic farms? Tell me about the choice.

Dr Craik: The Office of the Gene Technology Regulator approaches things in this country in a legislative environment where there is a very prescribed approval system. There's a very thorough system of consultation with the community, with a technical advisory committee and ethical committees. The Gene Technology Grains Committee has been set up to look at the release of canola into this country as a genetic modified crop and what you do about buffer zones and boundaries to try to reduce the risks of gene flow between GM and non-GM populations to the lowest possible level. It works not only on the potential effect of GM crops on organic or traditional crops but also on the potential issues of what can spread from organic crops to genetically modified crops if bugs aren't being controlled on organic crops and are spreading to traditional or GM crops.

THE CHAIR: Do you agree with the claim made by a Victorian bureaucrat on the interdepartmental working group on GE that it is assumed and accepted that once you release a GE crop there will be contamination and admixture throughout the supply chain.

Dr Craik: I would put it that there's always going to be a minimal risk. You can reduce the risk to a very low level, but there will always be a risk that that will happen. You can manage it to the best of your ability, using the best information. But as with everything else in life, there will always be a risk. If we wanted to make sure that we didn't get pests and diseases into this country, we wouldn't have any tourists coming in; we wouldn't have any mail coming in; we wouldn't have any imports into this country. It's a matter of managing risk. For farmers and everybody else in the supply chain, I guess this is another risk that has to be managed if GM crops are introduced.

THE CHAIR: What's your understanding in the current regulatory framework of responsibility for ensuring that there isn't contamination? Is the onus on the GE farmer or the non-GE farmer?

Dr Craik: I think the onus will be on everybody in the supply chain. The only GM crops we have at the moment are cotton and carnations. I don't think GM farmers in general would see any particular benefit in contamination occurring, nor would any people in the supply chain, if the aim is to market your product as either GM or non-GM or whatever it might be. Everybody in the sector would see that they have a responsibility to try to ensure that it doesn't happen, to minimise the risk.

THE CHAIR: Are you aware that in Canada a non-GE crop was contaminated and Monsanto sued the non-GE farmer for having their—

Dr Craik: You're talking about Percy Schmeiser?

THE CHAIR: Yes.

Dr Craik: I'm aware that the Percy Schmeiser case occurred. I forget the precise details, but as I understand it there is no way—and this was evidence given at the court and the court agreed with it—that his non-GM crop could have been accidentally contaminated by the GE crop. They accepted that there was no way that it could have just blown across

or there could have been an inadvertent contamination and that he must have known that he was planting GM seed. I gather he appealed that and lost all the appeals.

THE CHAIR: Are you saying that if it was accidental contamination it would have had a different outcome; that Monsanto wouldn't have sued?

Dr Craik: I don't know what Monsanto would have done. I wouldn't care to speculate.

THE CHAIR: Where is the responsibility for ensuring that a non-GE crop is not contaminated? For example, as I understand it from submissions here—and correct me if I'm wrong—right now it is unclear to people. For example, if a release is approved there's no requirement that the person planting the GE crop give neighbours the opportunity to protect their crops through planting buffer crops or tall crops or in other way. No advance notice is given so that they have time to plant such a crop and take evasive action. Is that your understanding of the situation now?

Dr Craik: Given that there are only two crops being produced right now—and I don't believe that contamination is an issue with cotton or—

THE CHAIR: No, but it could happen in February. What do you think is happening now?

Dr Craik: If I can get to the answer, the Gene Technology Grains Committee, say in canola, is set up for precisely that purpose. Guidelines and/or whatever else that committee recommends, I imagine, will be put in place to deal with that issue. So risks of contamination will be reduced to the lowest possible level. There is an organic person on that Gene Technology Grains Committee, as I understand it, participating in those discussions.

As far as I'm aware, nobody, whether they're enthusiastic about GM or not, says that GM is the only way to go. Everybody recognises that organic has a role. I think everybody sees that it's in their interest to make sure that whatever guidelines or recommendations are put in place people adhere to them.

THE CHAIR: You think it's possible to keep them separate?

Dr Craik: No. I said I think there's always going to be some risk. That's inevitable with life because you have human beings involved. There's always a chance, but I think you can minimise it to the greatest possible extent, yes.

THE CHAIR: So it's reduced then?

Dr Craik: Yes. You're really managing the risk as best you can.

THE CHAIR: What's your organisation's view of insurance?

Dr Craik: In what respect?

THE CHAIR: Who insures against contamination? Who has the responsibility to take the insurance out? We were told by a witness this afternoon that it would be the responsibility of the applicant to insure themselves.

Dr Craik: The grower?

THE CHAIR: Yes, the GM grower to insure themselves against the potential for them being sued for accidental contamination of non-GE crops. What's your knowledge of that?

Dr Craik: My understanding would be that it would be up to the grower to take out their own insurance, but as far as I'm aware nobody in the United States or Canada has been sued. That's my understanding of the situation. I might be wrong. If the grower were sued, then I guess it would be up to the grower to decide whether they wanted to join their supplying company as well to the case.

THE CHAIR: I beg your pardon. I didn't understand that. The GM grower?

Dr Craik: Yes, it would be up to them to decide whether they wanted to join the company supplying the seeds to the case so that they weren't the only defendant. That would be up to them.

THE CHAIR: So you're saying Monsanto, the supplier—

Dr Craik: I'm saying it would be up to the person being sued to decide whether they wanted to say, "Monsanto supplied the seed. We want you to be a defendant in the case as well."

THE CHAIR: I thought the supplier did have to take liability, but I'm not sure if that's right.

Dr Craik: I would think that a person who believed that their crop had been contaminated by GM and wanted to take action to deal with that would be perfectly free, under common law, to sue the grower whose crop they believed had led to the contamination.

THE CHAIR: And the grower may not have any money to compensate for loss of business by the non-GE farmer. For that reason, it would most likely have to be Monsanto that would need the insurance.

Dr Craik: That would depend on the particular circumstances.

THE CHAIR: Yes, it would.

Dr Craik: And if they've taken out insurance, if such a thing is available. I don't know.

THE CHAIR: That's the question I'm asking you. I thought you might know about that.

Dr Craik: No, I don't know.

THE CHAIR: So you haven't followed that up?

Dr Craik: I don't know whether an insurance product is available or not.

THE CHAIR: I've been told it isn't and that no insurance company will cover them, so it's an issue for the industry. I wondered if you had a view or had done any work on that.

Dr Craik: No, we haven't. The Life Sciences Network doesn't have a particular view on it.

THE CHAIR: It hasn't looked into it?

Dr Craik: No. But I imagine that it might be something the Gene Technology Grains Committee has looked into.

THE CHAIR: Maybe—I don't know.

MR SMYTH: Have you compared the ACT legislation to the legislation passed by other jurisdictions? Is it exactly the same? Is there anything we need to be aware of?

Dr Craik: I haven't personally, but certainly the author of the submission, I understand, looked at this and the federal legislation and felt that this legislation supported the national legislation in a way that was supportive of the national regime but obviously gave the ACT a say where it needs to have a say.

MR SMYTH: You spoke at the start of your presentation about the possible use of buffer zones. Does the network have a view on how they would be arranged and organised?

Dr Craik: No, we don't have a view. We would leave that up to the people who are involved in the process. It seems to me that that is something that comes out of scientific information. In the case of canola, I guess the Gene Technology Grains Committee will have some advice on that. The Office of Gene Technology Regulator will make recommendations about that. I imagine they will be based on a combination of practicality and scientific information.

MS MacDONALD: And presumably based on the information on the likelihood of cross—

Dr Craik: That's right, the sort of thing the CIC for weed research has done. They looked at the possibility of the crossing of canola, which was incredibly low. They believed that with reasonable buffer zones you could probably deal with the vast majority of it. I imagine that it will be a combination of that sort of information and practical hands-on farming information, the two together. If canola is approved, I'd be very surprised if there aren't a series of guidelines that deal with those issues.

THE CHAIR: You make the statement that the cross-pollination between some GM crops and non-GM crops can occur at low levels; that any transfer of transgenic traits from crops currently approved or under trial will have no detrimental effect on pollinated plants or the environment; that cross-pollination is managed and well controlled. What

do you base that statement on—the fact that you think it's not very much? It's a low risk?

Dr Craik: Things like its low risk and the investigations the CIC for weed research undertook in relation to canola. They showed an incredibly low rate. I can't remember the precise figure, but it was an incredibly low rate of travel to other canola. So it is an incredibly low risk. As far as we're aware, there's no recorded threat to the environment or health from those issues.

THE CHAIR: Farmers are concerned, because canola is often used as an alternate crop. If you have a GM pesticide resistant crop that has volunteers coming up in the next year, then you have an issue about pesticide use, because you're going to have to use more to get rid of the pesticide resistant crops. So there's a concern there. You seem to be saying you don't think the amount that's possible through pollination would be enough to worry about. But they're also worried because the headers move from farm to farm. Canola seed is very small and, according to the farmers, it's laughable to suggest that you're not going to have seed contamination occurring in that way and movements as well, even if you put them through a car wash and pull the whole thing to bits. What would you say to those concerns?

Dr Craik: I guess my response to that is that it is a risk. Again, I imagine that's the sort of issue that is being dealt with by the Gene Technology Grains Committee—how they handle seeds throughout the supply chain to try to minimise the risk of cross-contamination. Whatever processes are put in place, there will still be a risk, but the risk will be managed to the greatest possible degree.

THE CHAIR: Another issue that has been raised about the general process of the regulator is that only a proponent can appeal a regulator's decision. Do you have a comment to make on the checks and balances and fairness not only of the fact that it's only the proponent that can appeal but also of the decision-maker reviewing their own decision?

Dr Craik: You think that third parties should have standing to appeal? Is that the message?

THE CHAIR: It's not what I think. It's what concerns have been brought up through the submissions. There is a concern that you need to have a third party. That's normally what would happen in an appeal. You don't go back to the person who made the decision originally. I wondered if you had a comment on that.

Dr Craik: I guess my view on that would be that the consultation process for approval under the Office of the Gene Technology Regulator is incredibly comprehensive, with three advisory committees and with the periods for public comment. That would seem to me to be an incredibly comprehensive process. Under federal legislation, the process is appealable under the AD(JR). The merits of the decision may not be, but I'd be surprised if the process of a decision weren't appealable under the AD(JR).

THE CHAIR: Thank you.

MIKAEL HIRSCH

ALAN RICHARDSON and

WILLIAM MARK LONSDALE

were called.

THE CHAIR: Thank you for coming along to address the committee. I will read to you a statement about your responsibilities as witnesses at this Assembly committee meeting. You should understand that these hearings are legal proceedings of the Legislative Assembly, protected by parliamentary privilege. That gives you certain protections, but also certain responsibilities. It means that you are protected from certain legal action, such as being sued for defamation for what you say at this public hearing. It also means that you have a responsibility to tell the committee the truth. Giving false or misleading evidence will be treated by the Assembly as a serious matter. Please state your name and the capacity in which you are appearing today.

Dr Hirsch: My name is Dr Mikael Hirsch. I am CSIRO's biotechnology coordinator.

Dr Richardson: I am Dr Alan Richardson. I am a principal research scientist at CSIRO Plant Industry and I am the chairman of the institutional biosafety committee at CSIRO Plant Industry.

Dr Lonsdale: I am Mark Lonsdale. I am with CSIRO Entomology. I am strategy director and I also coordinate the project on the ecological implications of GMOs for CSIRO.

THE CHAIR: Would you like to address the committee first on the terms of reference?

Dr Hirsch: Thank you very much and thank you for the indulgence and also the privilege, given that I was stuffing around with the agenda as well. We have given you a fairly short submission, but we have been fairly active in this field and we would like to table some additional documents which the committee might find helpful as they are of relevance to your inquiry. I have four copies, one for each of you and one for the secretariat. I will briefly explain what they are.

In here is the CSIRO's biotechnology strategy, which has just been released and which talks about what CSIRO does. I will briefly mention what it is. There is also a disk of some 55 examples of CSIRO's biotechnology research which you might find helpful just to understand a bit about the technology and what we do and give you a flavour for what might be in the pipeline. I understand that you were out to see Pestat today or yesterday. They also appear on the disk. We have also included the submission that we put into the Senate inquiry into the Commonwealth bill because it addresses in many ways the same issues you have in front of you. We have also provided you with a list of the dealings that CSIRO have in the ACT which are now regulated under the Gene Technology Act so that you will have a feel for the scope of activities that we have. I would like to table these documents for the committee.

I might, if I can take some time, just give you an overview of what CSIRO is doing in biotechnology, in particular on gene technology, and the roles that we have, and also of the importance of the Commonwealth Act and the ACT bill and, in particular, why we would strongly support it if the ACT would care to pass this bill in the fullness of time. I should also say that we appeared before the Commonwealth inquiry. We have not appeared before any of the state inquiries going on at present, but we thought we would make an exception for the ACT, given that we live here.

CSIRO's biotechnology role is quite large. It is a bit of a well-kept secret that we conduct in the order of $110 million a year of biotechnology research. That means that we constitute about 29 per cent of all public R&D expenditure on biotechnology, all up. It is spread across 12 divisions of CSIRO, in every capital city and in many of the other smaller parts. We are also seeing biotechnology as a major part of strategic investment for CSIRO for the future. That is the reason we created the position that I now hold to put CSIRO's biotechnology strategy together and try to address the many and varied areas that we are in. We spread into every aspect of biotechnology.

Gene technology is a subset of biotechnology but a very important one, obviously one which captures the public's mind. It has two major roles for us. One, of course, is that it is what leads to genetically modified organisms which would end up being a modified crop, a modified animal, medications or even industrial use and so on, and that is what captures people's imagination and what the legislation, to an extent, is drafted towards. But it is also extremely important for us as a tool in straight research, in understanding genetics and in understanding—and we have put in the document what we call the biodiscovery pipeline—how genes actually function.

As you will know, the CSIRO Division of Plant Industry, of which Alan is chairman of the institutional biosafety committee, do a lot of research on a model plant called arabidopsis. It is about that tall and there are lots of dealings regulated in the Gene Technology Act for arabidopsis, but there will never be a commercial arabidopsis plant or commercial arabidopsis crop. It is a tool that we use to understand basic biology.

We have also put in the submission we put to the Commonwealth inquiry, but not in the strategy document itself, a position document for gene technology, how we see it. We see it very much as a part of the future. Gene technology is really a great window of opportunity for Australia to move forward in understanding science and so on. We don't provide unfettered support for gene technology, but we need a balanced approach for this. We fully recognise public concerns addressing the risk and the benefit of gene technology research. For that matter, we have also put in a research program to look at the risk of gene technology to ecology and the environment.

We also see genetically modified organisms as a part of life. Many people will try to suggest that in the future we may not need it, certainly may not need it in agriculture. There is already now a document on the significant benefit for cotton in Australia, a lot of the medications are increasingly made from gene technology and a lot of the food technology which is coming through. If you look at the research pipeline in the list of dealings that we have given you, you will see a number of products are coming through. Certainly in the research environment, gene technology is here to stay. We then need to figure out as a society how we want to deal with that.

As a result of that, we established a biotechnology strategy group early last year; hence my role in putting the document together. From my office, we also deal with CSIRO's regulatory and policy issues with gene technology. We are looking into new science investment into certain public components or policy components of particular research programs. We are looking at business development and the promotion of that, and also relationships with government.

For that matter, I have an extensive relationship with Biotechnology Australia, with the Office of the Gene Technology Regulator, and with the states and the territories. I sit on a number of these committees and also the CSIRO is putting together a course for government officials to understand gene technology from a technical point of view, so we bring them into our research environment and isolate DNA, talk about the science, like you did yesterday, and look at what we actually do. Just for the record, we don't deal very much in stem cell research. We have a small research program on adult stem cells only and we are not really taking part in the quite large debate right now about embryonic stem cells.

I would like now to briefly cover how we manage genetic modification research in CSIRO. CSIRO is the only research organisation in Australia that has more than one institutional biosafety committee or IBC. In fact, we have 12. That means that we have an issue about how we provide consistency across them. As I said, Alan Richardson is the chair of Plant Industry's IBC. It is the largest IBC in CSIRO and has quite an extensive grip and detail on how we manage that. Alan has a number of examples of what we do internally in terms of how we manage that.

We also use other organisations' institutional biosafety committees for some of the smaller places of CSIRO, like in Hobart and in Darwin; we are using university IBCs there. If you can imagine an accreditation system that is geared for one, we have 12. That also means that internally we are putting lots of QA processes in place to make sure that that is now coordinated. In fact, we have an IBC liaison group which meets about twice a year and looks at the best practice for managing our part of the regulatory framework. We coordinate responses to submissions and we deal with ethics and the like.

We also have a system in CSIRO for how we sign off submissions to the OGTR. Given the amount of traffic we have, we are about 25 per cent of the OGTR's business. You can imagine the time that we spend just dealing with the paper warfare. We have a system based on risks and different officers are entitled to sign for different things, depending on the level of risk attached to particular submissions. We also have two members of CSIRO on the Gene Technology Technical Advisory Committee, GTTAC. They are John Oakeshott from CSIRO Entomology and Gary Booth from Molecular Science, so we have several different interactions with the OGTR.

Dr Lonsdale is managing a research program which looks at ecological risks and impacts of genetically modified organisms. We can perhaps cover that in more depth when we get into the question part. It is really seen mostly as capacity building both inside CSIRO and for Environment Australia and the Office of the Gene Technology Regulator how to actually deal with the risk to the ecology of having GMOs in the landscape.

We are having a number of crops coming out, but if you look in the pipeline there is potentially a lot coming to Australia in five, 10 or 15 years and we need to better understand how to deal with this issue. The fact that CSIRO is building that research capability is now recognised globally. Dr Lonsdale and I, for instance, went to an OECD conference last year and we have also been across to the UK to look at the large farm scale trials for GMOs.

It is actually a very important research area that we are now starting to look into. It is pretty hard to sell, if you like, because it is really the regulatory office which need to get better in their dealings with how to actually do a risk assessment on ecology. You have to look at not just the impact of a GMO on direct organisms but down in the feeding chain and the whole ecosystem, so it is actually a very important area of research. I should say that this particular work is totally separate from any other piece of research, so there is no conflict of interest from any commercial relationships we have somewhere else.

As I mentioned, in the ACT we have genetic modification and research going on at Black Mountain, at Ginninderra, you have just been out to Gungahlin, and also at Yarralumla at forestry and forest products. There are four major divisions of CSIRO, three of them headquartered here. They are all headquartered here, but they have also got major research activities here. With the exception of the large-scale field trials—we don't have much space for field trials in the ACT, obviously; a lot of that happens in Narrabri—about nearly half of the regulator dealings in terms of the contained research and the lab research takes place in the ACT, so it is quite a significant set of activity we have just on our doorstep.

Let us look briefly at the Commonwealth's piece of legislation. When that was developed, you would appreciate, there was about 10 years research or effort just to get the Commonwealth act in place. There was very strong involvement in the science community to get that act created. There were several false attempts back to 1994, which was the last one. Indeed, I was actually seconded to the industry department at the time, about 1998, to start putting together the strategies for how the whole regulatory system should be developed.

It is actually a very important component, not just as a piece of regulation but in the total strategy of the states and the Commonwealth for biotechnology. It is very important and really essential to have a strong and rigorous regulatory system in place that provides public assurance in an area like gene technology which is moving extremely fast indeed and tends to be more complex than the general person on the street would really understand.

I should also say that the national scheme which is being put in place, like any piece of legislation, is not ideal but it is miles better than anywhere else we have seen. For instance, I was part of a workshop for the last three days looking at the potential for industrial crops and, lo and behold, the US cannot really handle industrial crops because their coordinated frameworks are really built around existing legislation. In Australia, we can do that. In fact, a lot of work potentially will happen there.

We also have had a very significant engagement with the former GMAC, which was the precursor to the Office of the Gene Technology Regulator. We have had strong involvement in developing both the acts and regulations in providing a lot of technical advice back to the systems. If you look at the various reports, as I said, we are about 25 per cent of the OGTR's business; so we are, in fact, a very large customer, if you like. We are ahead of any commercial company and we are more than all the universities combined.

Because we are so large, we also get a lot of the regulator's attention. We suspect that about 25 per cent on a pro rata basis of the inspections that the OGTR would do would fall on CSIRO. Therefore, we are fully aware that we will be and are in the searchlight, and so we should be. Obviously, it is very important for us that we do everything according to the book and more beyond that, which indeed we do. It is also important that CSIRO maintain the trust that we have in the general community.

Every survey which has been done in biotechnology tends to illustrate that the last one you would want to trust would be a government official or a company representative, but CSIRO scores high in the public trust. Obviously, it is very important for our general resume in the community that we maintain that trust. Therefore, we are a very strong supporter of legislation. We are a strong supporter of the transparency and the public awareness and engagement that the whole legislative framework provides.

The experience we have so far with the OGTR is that, indeed, they are diligent, and so they have to be. They are also very approachable whenever we are dealing with specific issues in either the way that we construct laboratories or the way the research is conducted. We have had several visits from officers of the OGTR to our laboratories to give them a general understanding of the conditions under which scientific discovery takes place.

I should also say that, as you know, in both the Commonwealth act and your act sections 192(b) to (d) are dealing with human cloning. We do not do any human cloning in CSIRO—to my knowledge, at least—and therefore they are fairly irrelevant for us. When it comes to the ACT's piece of legislation, it is indeed extremely important for us as a national organisation to have a national or consistent framework in place. As I said, the ACT is rather significant for our operations. Therefore, we strongly believe it is commendable for the ACT government to sign the IGA and we therefore also commend you to put the bill in its present form in front of your Legislative Assembly.

I would like to stop there and leave room for questions. There are, obviously, lots of specifics we can dig into either now or before you make your final report.

THE CHAIR: Thank you. Are you going to give a presentation, too?

Dr Richardson: Not a formal presentation, no. I will take questions.

THE CHAIR: Do you have any comments in terms of how the regulator could be improved? Do you think it is working well or do you think that there are some areas that could be tightened up?

Dr Hirsch: The experience we have had so far is that the regulator is a new operator and therefore there are mechanical issues in terms of logistics, in terms of how they are getting on with the business. It is purely an administrative experience we have had so far. We are yet to get into more exciting things. A lot of what they have been doing so far has been carried over from the old GMAC into the current systems. Really, when we are getting into the more exciting things which might be in the pipeline, that is when the real test of the regulatory system will come. I wonder, Alan, whether you would care to comment, because you have been closer to them in lots of day-to-day fashions than I have.

Dr Richardson: As Mikael said, there has been quite an extensive effort over the last 18 months in moving our project registrations and our facility certifications from the GMAC system to the OGTR system. That has been quite an extensive effort. As Mikael said, we are now just approaching the stage where we are starting to put formal applications through the OGTR process in its own right. We have had a number of licences issued under the new regulation system. Five licences have been issued so far and we have two licences under application.

We have found that the OGTR has been very much more detailed in terms of the assessment of our proposals and the interaction with the IBCs in terms of providing further information and there is a very much more detailed risk assessment and risk management and compliance plan when we take applications of gene technology out to the field. At the level of our laboratory-based work, our contained research which can be laboratory-based and glasshouse-based, we are finding that the level of compliance and monitoring is certainly very much greater than what we experienced under GMAC, but to this stage it is working quite well in terms of how an organisation like CSIRO Plant Industry interacts with the OGTR.

THE CHAIR: How do they monitor?

Dr Richardson: They actually have a unit within the OGTR called a monitoring and compliance unit. They have a specified plan; for instance, they nominate that they intend to inspect a minimum of 20 per cent of field trials on an annual basis, with an objective of inspecting 50 per cent of all field trials. Inspections can be conducted by the OGTR without notice; they will just inform CSIRO that they want to inspect one of our trials at a given location, very often at short notice, and the types of things that they are concerned with are buffer zones and separation distances, that all of the conditions specified in the licence application are being adhered to in the operation of that particular trial.

THE CHAIR: Under GMAC, you had that Mount Gambier incident with the crop just being thrown on the local tip. Are you saying that it has significantly improved since then in terms of monitoring?

Dr Richardson: It certainly has. That trial was actually conducted by another party, and it was not a CSIRO trial.

THE CHAIR: No, I know that. You wouldn't do that.

Dr Richardson: In that particular case, that trial was a GMAC approved trial. Under the GMAC approved system, it was actually the responsibility of the organisation to monitor their own trials and GMAC didn't have a monitoring compliance unit. Under the OGTR, they have this formal monitoring compliance unit and very severe penalties can be issued by the OGTR in response to non-compliance. Utmost is the retraction of a licence, so it then disallows you to continue the work, or financial penalties or whatever it deems fit for the act, which you may know something about.

Dr Hirsch: You may appreciate that potentially the worse thing that the OGTR can do to any organisation is to revoke their accreditation, much worse than anything else. In the case of CSIRO, if anyone does something nasty and their accreditation goes, 12 IBCs come to a grinding halt and somewhere in the order of $75 million of research stops, basically.

THE CHAIR: Twelve what?

Dr Hirsch: IBCs. There is one accreditation covering the entire organisation. In the old GMAC system, there was one connection between the GMAC and division by division, but it is now on the organisation itself, so the total research effort of CSIRO can be brought to a grinding halt. Obviously, that is not in our interests, in anyone's interests. Therefore, it is quite significant that we actually do our utmost to comply with any requirements put forward by the OTGR.

THE CHAIR: In terms of the monitoring and the capability of the regulator to do this very important work, are you aware that there is a proposal to make it self-funding?

Dr Hirsch: I am fully aware of that.

THE CHAIR: I am interested to know whether you think there are implications for the capacity of that organisation, if it is self-funded, to ensure the public risk is not there.

Dr Hirsch: That is, in fact, an issue that we have had quite significant interest in from CSIRO's point of view. As I said, we are about 25 per cent of the business, which means that, if the budget has got $8 million, there will be $2 million per year that CSIRO does with the OGTR. It is not for us a matter of what the cost would be, because ultimately it is a cost for our research which is just put on top of that. There are implications for the $2 million in CSIRO, but it is much more than that, which is quite important for us.

A lot of what we do is public good research. You are seeing the stuff that Pestat is doing. A lot of what we do is really driven by generating knowledge on a specific piece of plant metabolism, animals and so on, and sometimes testing that in field trials. If, all of a sudden, there is a significant cost to CSIRO to do that, or to any research organisation, it means that there might be hesitation in doing just an extra piece of research or it would change the nature by which research is being conducted into becoming far more cost-efficiency driven and not knowledge driven.

We are concerned that the cost recovery proposed will change the nature of research. It would change it from being driven on discovery into being driven by commercial interests. Any organisation will try to pass on costs to a commercial partner, which

means a lot of the current research may not be done. To us, that is one of the bigger risks that Australia will face by the OTGR coming into full cost recovery.

To our knowledge, there are no other places in the world that users are paying for this type of regulation, because it is inherently different from a lot of the product regulations which are happening in chemicals, food or whatever. It is a pretty regulating research process. Obviously, it is a concern that we have raised repeatedly, not from the point of view of saying that it is going to be a cost on our research. In some respects, in principle, we have no real problem with including that in our costs and if that becomes the end result we will, of course, comply. But we are concerned about how it would affect the whole research system in Australia should that be introduced.

THE CHAIR: You are from the biosafety committee, Dr Richardson.

Dr Richardson: That is correct.

THE CHAIR: I was interested in the explanation in the government submission of what I think were called low risk activities.

Dr Richardson: Notifiable low risk dealings, NLRDs.

THE CHAIR: Yes. They are actually monitored or regulated by institutional biosafety committees. I am interested to know—I do not know whether you can tell me; maybe we can find out later if you do not know but, because you are on one, I thought you might know—whether there is a standard way that such committees work in terms of representation, membership standards.

Dr Richardson: It is very prescriptive how an IBC can be set up, firstly by the OGTR, in that we have to have representation of microbiologists, plant molecular biologists, agronomists, ecologists, and weed specialists. We also have two external members sitting on each IBC. For instance, on the IBC that I represent, we have an external member who represents non-technical interests. He is actually retired from the banking sector. We also have an external expert on the committee that has some technical expertise. That structure of the IBC is specified by the OGTR and we have to satisfy the OGTR that our IBC meets those criteria.

In terms of assessing the safety of individual projects, and you mentioned notifiable low risk dealings, or NLRDs, you are correct, they are self-assessed by institutional biosafety committees, and we assess that against criteria specified by the OGTR. It is an extensive list of the types of vectors, hosts, genetic manipulations which they consider as low risk dealings. If we meet that criteria, they are satisfied that we can assess that as a notifiable low risk dealing. In doing that, the self-assessment by the IBC, we then sign off that the proposal has been assessed by the entire IBC, including the external members, and we notify the OGTR within 14 days of that assessment. They then re-review our assessment to satisfy themselves that our assessment as a notifiable low risk dealing is, in fact, appropriate.

In cases where it is not and we do not meet the criteria specified by the OGTR, we would refer the proposal and do an assessment as a higher risk project, which is actually a DNIR, which is a licence dealing without intentional release, and in that particular case

we assess the project in a very similar manner to an NLRD. The work does not commence until we notify the OGTR and the OGTR have done a risk assessment in their own right, and they will then inform us that the work can commence.

MR SMYTH: You said earlier that the national scheme is not ideal, but it is better than anywhere else. Why is it not ideal and how do we improve it?

Dr Hirsch: I don't think any regulation necessarily is ideal, because it is always the balance between how much assessment you do, where it starts and where it stops. I listened in to the previous person giving evidence and to the debate you had about what is called contamination or whatever, and that is really an issue of where the regulatory system stops.

It looks at public health and environmental risks, but there are other risks that some regulatory systems are looking at, and there has been an extensive debate on where that line has been drawn. I am not in a position to comment on whether it is right or wrong, but it is certainly something which needs to be resolved about issues which might be outside the regulator and how Australia deals with risks which are not clearly within the system.

It is also an issue, I suspect, of how much you regulate and how you regulate. The current regulations, in particular, are extremely detailed, but, as with any piece of technology, it moves. What capacity do the regulators have to move their regulations across as new discoveries are being made, new systems are put in place. Because they are prescriptive by nature and very detailed, how well are they kept up-to-date? Certainly, at present we are working very hard to make sure that they are up-to-date and it is then a matter of to what extent the regulator does that.

They have been equipped with GTTAC and other committees which would allow that to be dealt with, but it is always a concern one has in terms of whether it gets out of sync. If you look at the regulatory systems for pesticides, which I have had some personal experience of in my past, the regulatory system was out-of-date with where the pesticide industry was but, because it was moving incrementally, perhaps it did not matter so much.

Here you are talking about a powerful technology which can really break paradigms, something with which we can develop crops or animals which have capabilities which nowhere else has ever been found. They are actually quite powerful and you need to ensure that the regulator is across the technical aspects of these things. That is a real challenge, but a challenge which is well understood by the OGTR at present, and that is something which needs to be looked at.

We mentioned the issue of cost recovery. That is unresolved and it has not been resolved ever since the OGTR came into being, partly because there is a government policy position sitting there. Therefore, until that is resolved, there is a lot of anxiety within the research community over that very issue. We also mentioned the issue of environmental risks. Dr Lonsdale can explain in much more detail than I can. Our current knowledge about the environment is always something which we are expanding on, but we know much more about that than we did just a few years ago. But to what extent do we actually know how, when we are having different crops with BT genes inside, in different

backgrounds, they interact with the total ecosystem? Lots of modelling skills are being developed for that. Again, it is a matter of whether we have got enough capability and so on. It is moving fast.

The other issue, I suppose, is that it is a new field to regulate in. In the case of pesticides, companies and research establishments wanted to have certainty for the route to market and you have that because the way that we regulate toxicology is prescribed, so you know before you start that to take a product to market you need to have all these trials done, you need to prove that it is safe for human beings, experimental animals and the like. We are not there yet with genetic modification. Therefore, when we are taking a new technology forward, we need to have a feel for how many regulatory experiments we need to conduct. If there is the issue of cost recovery, it starts to drive the choices that one makes in terms of experimentation and so on. Obviously, that is significant. Also, it is hard for us to predict.

If we want to produce, which is on the cards, a carp which we can release into the River Murray and therefore get rid of the European carp by sterile feral technologies—and part of that you would have seen in Gungahlin—how much do we need to do to satisfy the regulatory processes? Because it is a brand new technology, we do not know what the regulator needs to know. Therefore, it is hard for us to say whether it will take five years or 15 years. That is important when we are going out to get venture capital for a piece of research. Obviously, with these things it is hard to do and it is hard to adjust for these things but, as I said, it is miles better than anywhere else. There is a much better appreciation of environmental issues, input of the public and ethical issues in this piece of legislation than anywhere else I have seen.

MR SMYTH: Does the territory bill need any modification?

Dr Hirsch: I haven't found any. I have been going through it and I haven't found any deviation from the Commonwealth bill.

THE CHAIR: Do you think the precautionary principle should be put into the legislation?

Dr Hirsch: Would you like to comment, Dr Lonsdale? This is a favourite subject of yours.

Dr Lonsdale: I don't know the legal implications of your question but, as I understand it, it is government policy, isn't it—in Australia anyway, I think? The states and territories and the federal government actually adopted the precautionary principle in 1992, but it doesn't actually seem to necessarily be directly enshrined in any of the relevant legislation; so how you would interpret it if it were specifically put in there, I am not sure.

But the modern thinking on the precautionary principle, there is tension around that, with the pro-development people saying that if we adopt the precautionary principle we will never do anything and you have proponents of the precautionary principle saying that it should be adopted nevertheless and we should take a risk-weighted approach to the adoption of technology.

I think that the modern synthesis would say that it is a reasonable thing to adopt and enshrine. The modern way of thinking about it just says that if you adopt it you take a very broad approach to the framing of your risk questions. What tends to happen, if you don't have the precautionary principle in the backs of people's minds, is that the risk thinking tends to be quite narrowly constrained right from the start.

People are just thinking about the risks that they have already seen, that the hazards have already been identified in the past, and they are not tending to think more widely about the potential wider implications, which is, in fact, why we set up this new research program. It was to try to the thinking on a much longer-term timeframe and thinking about the implications of GMOs and of biotechnology away from the immediate site of release and through the ecosystem, through the various levels of interaction of the ecosystem. It was wise that we adopted the precautionary principle back in 1992. It won't be nice to see it regularly invoked in development forums.

Dr Hirsch: It is more or less in the act, anyway. Section 4 (a) talks about the precautionary approach. It says that the object of the act is to achieve the regulatory framework through the precautionary principle approach; therefore, it is fully recognised.

THE CHAIR: But it is not defined. Is there a definition?.

Dr Hirsch: It is not defined as such.

THE CHAIR: No, it is not defined.

Dr Hirsch: The issue is that the precautionary principle is defined in so many different ways, depending sometimes on the purpose.

THE CHAIR: I guess the question is: do we do that work? Do we decide we would in this particular act think that we needed to define it, because it is a very particular new technology which has the potential for particular ramifications? I suppose that is why I asked the question.

Dr Lonsdsale: The statement from 1992 is quite a succinct one, isn't it? I couldn't quote it to you directly, but I can send that through to you. It has a fairly succinct statement which talks about taking—

THE CHAIR: The committee has it. I have another question. I would like your opinion on criticisms that have been put to the committee in terms of the rigour with which the regulator actually looks at applications that have scientific studies to support them which were undertaken in other countries quite some time ago and which haven't been subjected to any independent or peer review. There is criticism of the rigour in terms of the Gene Technology Regulator's analysis of—I don't know what the scientific term is—how good it is, basically, and that we are accepting studies that would not necessarily be of the standard we would want here and that you would have here with all the processes that the CSIRO goes through. Do you have a comment on that criticism?

Dr Hirsch: I can start with a comment and perhaps Dr Lonsdale will comment as well. In general, particularly when it comes to environmental risks, you cannot take them from one part of the world and transpose them to another part of the world; therefore, you

have to have studies which are specific to the environment in which you are conducting experiments. There are other regulatory systems where there is a greater use of overseas data than there might be in Australia. Secondly, of course, the Australian biota is quite different to other parts of the world so, obviously, the way that the regulator needs to assess that is to put quite a lot of rigour into ensuring that the data actually makes sense in the Australian environment. I interpret your question to say that there are people who are saying that the regulator could make shortcuts by using other countries' data.

THE CHAIR: They are using other countries' data.

Dr Hirsch: They are using that to an extent, but they are also using that back into validating that against Australian backgrounds. In fact, there is a growing body of knowledge on ecology which we are doing for our GMO component which has been drawn into that. Would you like to comment further?

Dr Lonsdale: Sure. What Mikael said is absolutely right; when you introduce a new organism to a new environment it is an interaction between that organism and the new environment that produces the hazard or the risk that we are concerned about. So, to some extent, studies of an organism in environment A can't be directly transposed to that same organism in environment B; there is a whole new set of interactions that can come into play.

But what we can say is that there will be certain commonalties of fact. When we set up this new program on environmental risk, a lot of our ideas came out of the areas of research that we were looking at, non-GMO introductions to the Australian environment, of which there are far more than there are GMOs. We introduce thousands of species every year as new ornamental plants, for example. We are already taking a bit of an unknown risk with the environment without GMOs, and I used to work in that sort of area.

Organisms do have certain characteristics that transpose from one environment to another, but you do need to factor in the new environment. What that means is that the OGTR needs, amongst its complement of people, to have people who have an understanding of Australian biodiversity, but also Australian farming systems. They need that sort of expertise because, again, that is part of the environment and the way that farmers take up the technology will have an impact on the potential for the technology to go awry or to have undesired long-term effects.

I am quite heartened to see through my contacts with the OGTR that they have really broadened their discipline base in terms of getting the kind of people involved who can look at a thing from a biodiversity point of view, can look at it from a farming systems point of view, and can look at it from a microbiological point of view.

The point about it, going back to the precautionary principle, is that you need a range of different approaches, a range of different perspectives to be brought to bear, to think about risks in a precautionary sort of way. The risk if you don't have a precautionary approach is that you end up with a very narrow framing of the risk and you just think about it narrowly, as a risk simply of gene flow or something like that. There are other, broader scale, kinds of implications from uptake of technology. The OGTR, I think, have

recognised that with the gamut of people that they have employed and the vast array of expertise they call on through GTTAC.

THE CHAIR: If I understood correctly, Dr Glover was saying that this is, in fact, a fairly new area. I don't quite understand something. Maybe you can explain it to me. Take, for example, the release of canola, which is imminent, apparently. One of the submissions has said that the work on those studies was actually done on conventional canola. Apparently there is a question anyway about whether that is valid because we are not talking about conventional canola.

If it is a new field and you have Monsanto saying that it is fine, and they have done their studies overseas, where is the capacity in the regulator to actually do that research to see if they agree with that? The committees that are set up aren't actually doing the research. If it is a new area of research, where are they finding out this relevant Australian data and does it exist? Longitudinal studies? I can't imagine how that could exist.

Dr Hirsch: Would you like to respond?

Dr Lonsdale: I am not sure if it is one for me. As far as I can see, it is about how OGTR come back to the research community and say, "We need more data."

THE CHAIR: Yes.

Dr Hirsch: Perhaps I can make a start and my colleagues can consider it as well. Within the legislative framework and within the funding for the OGTR, money is put aside for risk research; so they have the capacity themselves to go and conduct the search on their own. Obviously, you may not necessarily expect or, indeed, desire essentially public servants to do the research, so they do come to research providers such as CSIRO. In fact, we have been doing some environmental risk research for Environment Australia for that particular purpose.

THE CHAIR: On canola?

Dr Hirsch: On canola. Also, in broad terms, you need to appreciate that a lot can be done with model studies. A canola plant is a canola plant whether genetically modified or not. Therefore, you can study gene flow without actually having a GM canola in there, like you can study other gene flows using model systems. Therefore, by doing that, you can generate a lot of knowledge which is important in the final risk assessment. That is one aspect of it.

Certainly, there is a strong capacity within Australia to look at environmental risks and that, as I said, is growing because it is an emerging field as well. I don't think that there are any shortcuts being made, but would you like to comment as well on, say, the stuff that we did on cotton?

Dr Richardson:. If I could say a few words on that. It is probably best to look at some case studies in that particular instance. As Mikael correctly said, a plant is a plant whether it is genetically modified or not in terms of pollen flow, and we can learn a lot from the literature in knowing the dispersal distances of pollen into particular crops. Also, as part of many of our submissions, we actually verify that type of data. For

example, in BT cotton we would deliberately plant buffer crops at set distances away from the transgenic crop, perhaps one metre, 20 metres, 40 metres, 50 metres, and monitor gene flow into those. We actually do gain a lot of that data by collection to verify questions that are raised by the regulator at any point in time.

The regulator may also say in the very early stages of a field trial that a licence will be granted to conduct that particular trial but, in the event of a commercial release occurring, we would need to see evidence that A, B, C, D have been attended to. To give you an example on that, BT cotton is the bacillus thuringiensis toxin expressed in cotton, which is a commercialised crop now in Australia. We developed that at CSIRO over a period of about eight years of individual field trials and on each field trial we gathered more information for the regulator in terms of its potential to outcross the proximity of related species.

We have undertaken a fairly detailed study in both eastern Australia and northern Australia of the potential of cultivated cotton to cross over into native gossypium species. That work is still being undertaken in northern Australia. We don't have approval for general release of cotton in northern Australia at the present time because the regulator is not satisfied that we have enough evidence on the potential for cultivated cotton either to cross into these native species or be contained if it is eventually released as a commercial product.

MR SMYTH: I assume that you have seen this document from Dr Glover. She lists cotton on the level of outcross as high, medium or low and then in the final column, "Significant potential for impact on farm or local environments" she lists canola. So it has a medium level of outcrossing but it has significant potential for impact on farm or local environments. What would we do to minimise that? Should we be worried about canola sitting there, given the widespread plantings of canola round the country?

Dr Richardson: Can I just verify that. Is cotton in the same category as canola? I haven't read the document.

MR SMYTH: No, the level of outcrossing for cotton is medium, with a low potential for impact on farm or local environments, but there are lots canola plantings between here and Young and further north. Is having canola in that category something that we should be worried about? It says, "Canola has some close relatives that are weeds in the Australian environment and there is some potential"—"some" is a hard word to define—"for gene flow into these weedy species."

Dr Hirsch: The concept has altered the way that it disperses the pollen in the first place. Secondly, whether there are crops around then when they are susceptible to be fertilised by that particular pollen. As the previous evidence given by Wendy Craik also suggested in terms of the studies done at a university and in CSC weed management, the pollen can spread for a long distance, but what does it actually do when it is being spread? That is, of course, an issue, depending on what canola crops you have around.

Keep in mind that we have been growing canola for many, many years in Australia and all over the world. Some has been used for food crops; before that it was for industrial purposes until they bred it without glucosinolates in it. For all that, we have always managed to have separations done. It is then a matter of how much integration do you

have of any kind in that. That is a risk and the regulator needs to determine whether that risk is acceptable or not to the Australian environment. As a research provider, we provide as much data as we can and we believe is sufficient to support a particular claim. If that is not accepted, we will go and do some more.

Dr Lonsdale: My argument in that context would be that if the regulator felt that it was acceptable to release canola, I would assume that it would be on the basis of a compliance and monitoring regime that would look for untoward impacts crossing with weedy relatives and so on. The monitoring compliance regime should be looking for that and I guess that would be the case here.

MR SMYTH: If the regulator gives the licence, the crop is put out and we do find there is some crossover into the weedy species, what would happen then? Once it is in the environment, how do you get it back out?

Dr Hirsch: There used to be a technology called a terminator technology which would stop seeds from germinating. Perhaps we could achieve that so that once a plant is growing it doesn't actually generate any seed in the first place. The second thing is, I suspect, it is a choice of how much is acceptable and how much is not. Canola is a plant which is very promiscuous in the first place and you would always have spreads on the gene pool. That is the very basis of evolution in the first place. How much takes place? We grow commercially seed for canola and manage to keep separate varieties apart and it doesn't present a problem. In Australia, we are only at the very start of thinking about growing GM canola. Canada grows two-thirds or about that and seems not to have a problem with it.

THE CHAIR: That is not what some of the farmers say.

Dr Hirsch: I am fully aware of that and I also heard the previous evidence and I see the television programs. But they wouldn't be growing it if there wasn't any money in it, at the end of the day.

THE CHAIR: We do not need to get in that discussion; we do not have time.

MR SMYTH: Just to follow on with that, it comes down to the level of risk and what is acceptable and you make a judgement based on all the evidence to hand.

Dr Hirsch: The regulator makes a judgment on the risk, yes.

Dr Richardson: And the regulator may impose restrictions in terms of separation distances, based on the evidence that it has gathered at this point in time, so it may be issued with these conditions.

MR SMYTH: But this is for a trial.

Dr Hirsch: And also for commercial release.

MR SMYTH: How can the regulator set a buffer distance in regard to commercial usage? How does he or she do that?

Dr Hirsch: It works quite well in cotton. In cotton they are regulated. Before the OGTR was in place, cotton was regulated by the national registration authority and there were regulations requiring them to set aside areas for growing non-GM cotton and that was policed.

MR SMYTH: And that has worked well?

Dr Hirsch: So far, it has worked extremely well.

MR SMYTH: And the crossover has been minimal or nil?

Dr Richardson: There is regulation within the cotton industry at the present time that only a certain percentage of the crop can be grown as GM and there are management practices that come with those conditions that have to be implemented in growing transgenic cotton.

MR SMYTH: So the lessons from the cotton industry could then be lifted and applied to canola or any other GM crop.

Dr Richardson: They can but the lessons will be different because of the nature of the crop and the risk associated with it.

MR SMYTH: But the ability to actually enforce the conditions of the licence and the release we know from cotton can actually work.

Dr Hirsch: Yes. And a lot of work is being done by the grains industry as well for highly segregating and identity preserving different batches of canola or any seed, for that matter.

MR SMYTH: How long have they been growing GM cotton in Australia?

Dr Richardson: Since 1992.

MR SMYTH: Okay. And is there any evidence of its moving across into the native cottons?

Dr Richardson: No. CSIRO has been looking at that and, as far as I am aware, there has been one case of anecdotal evidence. That has been investigated by CSIRO and it is certainly not clear-cut that there has been movement of a transgene into that particular crop.

THE CHAIR: With canola, you mentioned you need to take into account the Australian conditions and the social condition as well in terms of farming methods. Despite what the NFF says, a lot of the farmers on the ground are saying that this is unworkable because headers move from farm to farm and crops have a very tiny seed. There are lots of questions being raised by those farmers about where the onus lies in terms of the protection of their GE free crops. It is not just about pollen contamination. It is also, obviously, about seed movement, spills of seed and breeding up of a particular area, on the side of a road or wherever, where you then have a real problem because these farmers are using it as an alternative crop. Then they had volunteers coming up every year which

are resistant to pesticide, so there is an impact on the environment because they have to use more pesticides for the volunteers. The sorts of arguments being put by them are about the economic impact on the Australian GE free product being huge and the regulator does not have a brief to look at that. That is a huge community concern that is actually falling through a crack. It is not exactly a science issue, but, if you want to comment, I would be happy to hear what you have to say.

Dr Hirsch: You probably would be aware that a lot of work is being done by the grains industry to address that very issue, and that is probably as far as I can go. There has also been raised with us in the last few, before as well, the likelihood that you can grow a highly valuable crop with GM. If you have a crop which expresses a protein, a very desirable oil or whatever, there is a lot of economy in keeping that separate and making sure that the grain hygiene is kept very high, because there is a premium attached to growing a GM product. It is always economics in all that. If the canola, at the end of the day, ends up as margarine, how big is the issue?

THE CHAIR: But the cost of separation, it is being argued, can be greater than the benefits of doing that.

Dr Hirsch: Could be, yes.

Dr Lonsdale: A really important question which, worldwide, isn't dealt with in regulatory processes for introductions of anything, GMOs or whatever, is the benefit of the introduction. I argued about this in a paper about eight years ago. It was nothing to do with GMOs; it was about the introduction of pasture species—these were introductions of species from Africa and South America into tropical Australia. I argued then that we should be thinking, not about potential risks, which are quite small as most of them just arrive and are harmless and there is a tiny proportion that become weedy, but about the potential benefit to the industry or to the environment, and that we should weigh up the risks and the benefits.

The whole regulatory process is about regulating risk; it is not about benefits. I raised that question with the OGTR as they were discussing their new act, when they were still the interim office, and they said that they had canvassed this idea, but it had actually been the environmentalists who had said that they did not want that to be factored in, because there is the risk that, if you start to think about weighing the benefits against the potential risks to the environment, the benefits will win out, the dollars gained will override the potential damage to the environment. I think it was a lost opportunity, but that, I guess, is bigger than me. It is an issue that is probably societal.

THE CHAIR: Yes, but this one is just about economic costs and benefits. It is not even getting into the problem of how to deal with so-called externalities like the environment when we are assessing costs. This is actually just about costs, the profit and loss for people who are farming in different ways. I would like you to make a quick comment on a remark that was in one submission. There was a request that the terms of reference of the $3 million study that CSIRO is doing on the environmental impacts should be extended to include an analysis of commercial GE experience in North America. It goes on to say, "Study leader, Dr Mark Lonsdale, said, 'In reality, people are trying to make decisions and discuss environmental risk in a largely data free environment.'"

MR SMYTH: It is rough when it is quoted back to you.

Dr Lonsdale: Yes, that's right. I would still stand by that statement, which I think I made about two years ago. It was in the context of discussions about the impact of GMOs on the wider environment, on ecosystems, farming systems and that kind of thing, and it was in a situation where people were posing this, that or the other risk or hazard, but there was really very little then to actually draw upon. This was the reason that the UK had just set up the farm scale trial which you may have heard about. It is a fairly large-scale thing. Mikael and I had a look at it earlier this year.

It extends right across the British Isles. They plant out the crops at a realistic scale. The farmers actually plant the crops in GM and non-GM paired comparisons and then people go through and look at the biodiversity implications right across the country, so there are hundreds of sites. I think six crops are used and they are running it across three years. There are all sorts of different disciplines being brought to bear to look at the potential hazards.

When I made that statement, it had only just been set up. Even now it still hasn't reported and ecological research is long term, so it is still a true statement. I think that, in reality, in Australia what we have done is actually recognise that because we have actually moved forward very slowly with this technology. CSIRO Plant Industry, in particular, has developed some of the world-first enabling technologies for biotechnology, so we are actually in there at the forefront of the science; but in terms of the uptake, when you look at the graphs worldwide, we are just trailing along behind places like the US, Canada, Argentina and China. In our own way, we are actually taking a very slow and precautionary approach. We are perhaps not calling it that, but that is the way it has transpired.

THE CHAIR: Thank you very much. If we have further questions, would you mind if we put them to you in writing to help the committee?

Dr Hirsch: Absolutely.

The committee adjourned at 4.37 pm.