

**BEFORE THE AUCKLAND UNITARY PLAN INDEPENDENT HEARINGS PANEL**

**IN THE MATTER** of the Resource Management Act  
1991 and the Local Government  
(Auckland Transitional Provisions)  
Act 2010

**AND**

**IN THE MATTER** of Topic 024 - Genetically Modified  
Organisms.

**AND**

**IN THE MATTER** of the submissions and further  
submissions set out in the Parties  
and Issues Report

---

**STATEMENT OF REBUTTAL EVIDENCE OF JOHN SMALL  
ON BEHALF OF AUCKLAND COUNCIL**

**10 SEPTEMBER 2015**

---

## Contents

<b>1. Summary of Evidence</b>	<b>1</b>
<b>2. Pastoral Genomics</b>	<b>2</b>
<b>3. Scion</b>	<b>3</b>
3.1 Dr MacRae	3
3.2 Mr Mackie	5
<b>4. Federated Farmers</b>	<b>6</b>
4.1 Mr Cooper	6
4.2 Dr Bellingham	10
<b>5. NZBio</b>	<b>11</b>

# 1. Summary of Evidence

---

1. This is my statement of rebuttal evidence on the Proposal to prohibit the outdoor release of genetically modified organisms (GMOs) and assign discretionary status to GMO field trials along with provisions for strict liability conditions in the Auckland Unitary Plan.
2. I respond to statements filed by
  - a. Dr Michael Dunbier for Pastoral Genomics
  - b. Dr Elspeth MacRae for Scion
  - c. Mr Glen Mackie for Scion
  - d. Mr David Cooper for Federated Farmers
  - e. Dr Mark Bellingham for Federated Farmers; and
  - f. Dr Will Barker for NZBIO
3. My original analysis was heavily influenced by four facts.
  - a. There is considerable scientific uncertainty over the costs and benefits arising from outdoor cultivation of GMOs.
  - b. At this point there are no GMOs that are both ready for commercial release and experiencing demand from growers in this part of New Zealand.
  - c. Major exporters of primary products in New Zealand perceive a market benefit from this country's GM-free status and view the potential for GM contamination arising from a food-related release as a serious commercial risk, and are therefore opposed to the outdoor release of GMOs.
  - d. The proposed measures are time-limited and can be changed in the event that a cost-benefit analysis supports change.
4. Since nothing in the submissions cited above contradicts these facts I remain of the view contained in my primary evidence that that the Proposal offers net benefits to the region.

## 2. Pastoral Genomics

---

5. Dr Michael Dunbier is a scientist employed by Pastoral Genomics, an investor in GMO and Marker Assisted Selection (MAS) techniques for GMO and non-GM production respectively. Dr Dunbier does not refer to the code of conduct for expert witnesses embodied in Practice Note 2014 of the Environment Court of New Zealand or claim to be an independent witness.
6. I believe that Michael Dunbier's submission for Pastoral Genomics references my original work twice: once in paragraph 26 and again in paragraph 59 where he calls me "Dr Hall".
7. The first reference is to my inclusion of MAS in section 3.3.2 of my original evidence (titled: Alternatives to GMOs). In that section I noted that the publically funded research consortium chaired by Dr Dunbier divides its efforts between GMOs and MAS, with a slight preference towards MAS in terms of its research spending.
8. As an economist, I am therefore puzzled by Dr Dunbier's statement that "*those who advocate marker assisted selection (as does Small in his economic evidence for the Council)...as alternative(s) for GM options are in error*". Based on the revealed preference<sup>1</sup> of Dr Dunbier's consortium's spending and on Figure 1 of his statement it appears to me that MAS is indeed an alternative to GMOs. In particular, the consortium's former general manager estimated that each of the two approaches held identical potential for increasing biomass in grasses – a key target objective for the consortium.<sup>2</sup> If GMOs were clearly a better commercial prospect than MAS, I would expect that Pastoral Genomics would allocate its resources (which include public funds) materially in favour of GMOs rather than slightly in favour of MAS.
9. The second reference to my evidence is at paragraph 59 of Dr Dunbier's statement and concerns the potential for co-existence of GM and non-GM agriculture. Dr Dunbier reproduces the quotes I cited from EU documents but then claims that they "*do not accurately represent the EU position*". Since he does not claim that I have misrepresented the EU, it seems that Dr Dunbier is claiming that the EU is misrepresenting itself. Yet he does not cite any official EU documents to support that position.
10. On the topic of EU attitudes towards GMOs I note that Germany has recently given notice that it intends to ban outdoor GMO cultivation<sup>3</sup> as has Scotland. These are the first two countries to declare their stance since the EU devolved such decisions to its member states.

---

<sup>1</sup> see paragraph 41 below for more detail on "revealed preference"

<sup>2</sup> Sustainability Council, *Betting the Farm*, June 2011, p 16.

<sup>3</sup> <http://www.reuters.com/article/2015/08/24/us-grain-germany-gmo-idUSKCN0QT11D20150824>

### 3. Scion

---

11. I have reviewed two statements prepared for Scion and discuss them separately in this section.

#### 3.1 Dr MacRae

12. Dr Elspeth MacRae is a plant scientist employed by Scion. I have reviewed two of Dr MacRae's three statements: one concerning "vision" and the other about the "benefits, economics and necessity of genetic modification". I note that the Vision statement does not refer to the code of conduct for expert witnesses embodied in Practice Note 2014 of the Environment Court of New Zealand, but the Economics statement does refer to the code of conduct.
13. In her Vision statement (at paragraph 10) Dr MacRae expresses the view of Scion that there are "*fundamental errors and misunderstandings embedded in the proposed plan change and the materials and documents on which the plan change is based create false impressions*". I did not find any particularisation of these views in either of Dr MacRae's statements that I have reviewed.
14. Moreover, I consider that readers of Dr MacRae's Vision statement may be left with a false impression from the section titled Global Challenges (MacRae ¶20 – 34). Local authorities in New Zealand are legally obliged to have regard to the wellbeing of the populations they serve directly, being the people residing in their jurisdiction.<sup>4</sup> Global issues are only relevant to the extent they affect local wellbeing. Even if it had been established that GMOs were the only solution to global hunger and climate change (which is far from the case), local authorities in New Zealand would still be justified in controlling GMOs if doing so would enhance the wellbeing of their local populations.
15. I read both of Dr MacRae's statements carefully in search of evidence of GMOs that would benefit the region and are ready or almost ready to be commercialised because such commercialisation would be more difficult and costly under the Proposal and that would be relevant to my economic assessment. It seems to me that Dr MacRae must be ideally placed to provide such evidence if it existed, given her extensive scientific background and distinguished career at Scion. However while the statements provide a lot of information about conventional and GMO tree breeding, they fall notably short on this crucial economic question. The closest Dr MacRae comes to providing relevant evidence on this point in her Vision statement is that

*"...It may be necessary in the very near future to use this [GMO] technology to Auckland and New Zealand's benefit."<sup>5</sup>*

---

<sup>4</sup> See the Local Government Act 2002 at sections 10 and 11.

<sup>5</sup> Macrae, Vision statement at paragraph 47

16. I note that this conclusion makes no reference to the existence of any particular GMO, the novel features of that GMO, the extent to which the GMO is market ready, the likely timing of its deployment in the field or the resulting benefits, or critically the alternatives that could deliver similar benefits without the risks attending GMOs. As a result, it does not change any of the four facts on which my economic analysis relies.
17. In her Economics statement, the closest Dr MacRae comes to providing evidence of a near-term opportunity cost is at paragraph 51 which concerns one or more of the genetically modified pines that Scion hopes will be commercially successful. We are told that *"under the current controls Scion cannot grow these trees to maturity"* which is apparently a major roadblock to commercialisation. This is clearly a reference to national level EPA regulation (since it refers to "current controls") and is therefore not an opportunity cost of the Proposal. On the contrary, it is evidence of the absence of an opportunity cost. That is, the Proposal is not presenting an additional restriction in this respect.
18. Similarly, Dr MacRae's discussion of Kauri die back (MacRae, Economics ¶¶54 – 70) reveals by omission that there is no existing GMO solution to this problem, only speculation that it might be a successful approach. The strongest statement Dr MacRae makes is that *"there is a distinct possibility that genetic modification may prove to be the only means of introducing resistance into Kauri"*. If there was actually a programme for development of a GMO solution to this problem it seems very likely that Dr MacRae would have discussed it, and if she were aware of evidence that it was a superior prospect to non-GM alternatives, then it also seems likely that Dr MacRae would have referred to this.
19. Regarding wilding pines (MacRae, Economics ¶¶74 – 77), and noting that I am only a scientist in the sense that Dr MacRae is an economist, I find it difficult to accept the idea that *"the only solution to the wilding problem is sterility by genetic modification"*. An obvious alternative is to hire people to cut them down with chainsaws, as is the targeted spraying with herbicide that DOC currently practices in certain areas.
20. From reading Dr MacRae's comments on the proposed plan (MacRae, Vision ¶¶48 – 51) I infer that she has not read my original evidence which analysed the potential costs and benefits of the Proposal bearing in mind the timing of each. For the reasons described in my original evidence I disagree with Dr MacRae's view (at ¶51) that the Proposal *"blocks the next generation of technology"*. On the contrary, the Proposal is sufficiently flexible to enable the next generation of technology if and when it can be demonstrated that it will deliver net benefits.
21. I was unable to locate any cogent supporting evidence in Dr MacRae's statement for the view (also at ¶51 of her Vision statement) that the Proposal would *"increase the environmental and economic threat to New Zealand's primary industries"* or that it would *"likely drive Kauri or other taonga species to extinction"*. These are strong claims. If they were accurate it would have been possible to clearly describe facts and argument that at least point strongly towards their validity. Moreover, if leading primary

producers shared Dr McRae's opinion on the commercial benefits of GMOs, they would not be opposing their release on the grounds of commercial risk.<sup>6</sup>

### 3.2 Mr Mackie

22. Mr Mackie is Technical Manager for the New Zealand Forest Owner's Association. He does not refer to the Code of Conduct or explain his relationship with Scion.
23. I inspected Mr Mackie's statement closely for evidence that would affect the main elements of my economic analysis. It seemed to me that, as a specialist in the forestry industry Mr Mackie might well know of a new GMO tree that was close to commercialisation and would therefore constitute relevant evidence in respect of potential opportunity costs arising from the council's Proposal.
24. There is no actual evidence of such a GMO tree in Mr Mackie's evidence. Instead, it seemed to me that Mr Mackie is quite hesitant about near term prospects for GMO trees in New Zealand. He suggests (Mackie, ¶9) that GMOs "*may offer win-win benefits*", and that it "*is possible...there will be options*" for the forestry sector. In paragraph 15 Mr Mackie says "*GMO options may offer the ability to respond*" to threats.
25. I therefore do not consider that Mr Mackie's evidence provides information that changes my views on the Proposal.

---

<sup>6</sup> See paragraphs 39 and 116 of my primary evidence.

## 4. Federated Farmers

---

26. I respond to two late submissions from Federated Farmers, from David Cooper and Mark Bellingham.

### 4.1 Mr Cooper

27. David Cooper is employed by Federated Farmers. Mr Cooper's statement does not refer to the code of conduct for expert witnesses embodied in Practice Note 2014 of the Environment Court of New Zealand and he does not claim to be an independent expert witness or an economist, but the aim of his statement is to "review and comment on" my primary evidence.
28. Mr Cooper agrees with much of my evidence (Cooper ¶12, 15, 17, 19, 21, 30, 32, 35 – 37, 41- 43). His core argument in opposition seems to be in paragraph 11 which states

*"...if the key concern driving the need for additional, regional or pan regional level of regulation, is that local concerns are not appropriately reflected in national regulation, a more rigorous assessment would focus on the marginal costs and benefits of providing better processes for input at that national level, or providing the EPA with tools to reflect different regional requirements or preferences, against those expected from the additional level of regulation."*

29. This is Mr Cooper's main reason for challenging my conclusion that the costs of the Proposal are low. He says (Cooper ¶15) that he does not consider my "economic assessment is sufficient" to support that conclusion and that this was "largely a foregone conclusion" because (in his view) I have "not appropriately considered the marginal transaction costs resulting from the additional level of regulation to that provided by the EPA". I believe this to be Mr Cooper's main argument because he returns to it frequently including in paragraphs 17, 19, 20, 22, 25, 26, 27, 28, 32, 33, 34, 36, 39, 44, 46, 48, 49, 53, 59, 61, 81, and 86. My analysis did not omit analysis of transaction costs; indeed the (transaction) cost of a plan change played an important role in my analysis.
30. Mr Cooper also makes other arguments and I will comment on the following claims.
- a. That I deliberately contrived my analysis to deceive the Panel. This claim is clear from Mr Cooper's paragraph 86 which claims that my analysis was "largely designed to arrive at a pre-determined destination, without a robust assessment of the impacts".<sup>7</sup> A similar slur on my objectivity appears in paragraph 66 of Mr Cooper's statement. I reject entirely these claims and am disappointed Mr Cooper would present them without reasonable evidence in support.

---

<sup>7</sup> I do not know whose page 15 Mr Cooper is referring to in this paragraph.



- b. That a cost-benefit analysis under the RMA should consider costs and benefits beyond the jurisdiction of the relevant local or regional council. This claim appears in paragraph 38 of Mr Cooper's statement.
31. In addition, I feel obliged to correct some errors of economics in Mr Cooper's statement.

### Local vs National

32. Early in his statement (paragraph 9), Mr Cooper states my evidence inherently acknowledges that "*regulation of GMOs may occur at either the national or regional level*" (emphasis added). This dichotomy omits the potential for a two-tier system in which the EPA (operating under the HSNO Act) performs a national level gatekeeper role and Councils (operating under the RMA) manage the risk of adverse effects on an ongoing and localised basis.
33. Mr Cooper then states (at paragraph 11) that a relevant alternative to the current Proposal is that some un-named party could or should start "*providing better processes for input at that national level, or providing the EPA with tools to reflect different regional requirements or preferences*". I do not consider this a realistic alternative to the current Proposal because it lacks any supporting detail and begs several important questions including:
- a. How could Councils effectively discharge their responsibilities to local residents in respect of GMOs merely by seeking "*better processes for input*" into EPA decisions? In particular, how could "*better processes for input*" to the regulator for the provision of information be expected to meaningfully address community concerns about how decisions will be made, given the lack of assurance that relevant regional policies will be respected?
  - b. What specific legislative amendments would be required in "*providing the EPA with tools to reflect different regional requirements or preferences*" beyond those already contained in the HSNO Act? I note that s38D of the HSNO Act allows the EPA to regulate the "*extent and purpose*" of a release and "*limiting the proximity of the organism to other organisms*".<sup>8</sup>
34. These views rely in part on section 3.2 of my original evidence which analysed the legal context for the proposal, particularly paragraph 26 which discussed the EPA's role as gatekeeper and paragraphs 32 – 34 which considered the complementary roles of national and local provisions. They also rely on timing and certainty

---

<sup>8</sup> Section 38D of the HSNO Act allows controls to be set for matters including:

"a) controlling the extent and purposes for which organisms could be used:

(b) requiring any monitoring, auditing, reporting, and record-keeping:

(e) limiting the dissemination or persistence of the organism or its genetic material in the environment:

(g) limiting the proximity of the organism to other organisms, including those that could be at risk from the conditionally released organism:"

considerations which were discussed in my original evidence, particularly in section 3.4 and section 5.

35. Based on the analysis presented in my original evidence, Mr Cooper's alternative strategy of lobbying the EPA or Parliament on behalf of local interests would be less certain to be effective, take far longer to implement and be less flexible than the Proposal. All of these factors would weigh heavily against it in an economic analysis.
36. Although this is not what Mr Cooper has proposed, I concede that it would (at least in theory) be possible to devise a single system for regulatory approval of a GMO release that fully incorporated all relevant council policies, and so met the needs of constituents in another way. This would involve a change of legislation to require the EPA to not simply "*take into account*" the submissions of a council in the same manner as it would consider a submission from any member of the public. Instead, the EPA would need to be required to control any release, so as to conform to council policy when taking place within that jurisdiction. Such an approach to regulation is precisely what the Inter-Council Working Party on GMOs proposed to the then Minister for the Environment in 2006.<sup>9</sup> Given the minister's rejection of that potential remedy in a letter dated March 2007 and the current minister's parallel rejection in August 2010 it is not clear that councils have any other option but to pursue local regulation that is additional to HSNO in order to meet their Local Government Act and RMA responsibilities.<sup>10</sup> I reject any suggestion that my analysis of Mr Cooper's proposed approach or regulation through the EPA alone was insufficient.

## Other Matters

37. For the reasons explained above, I deny Mr Cooper's allegation that I designed my analysis with the aim of deliberately misleading the Panel.
38. In paragraph 38 of his statement Mr Cooper reveals the view that "*an economic cost benefit assessment of the Proposal should consider the total costs and benefits of that proposal*". This is precisely how analysis was structured. Mr Cooper however is arguing in this paragraph that government policy analysis should include effects beyond the government's jurisdictional boundary. This is a radical concept and inconsistent with Federated Farmers' views on climate change policy.<sup>11</sup> In my opinion local authorities should care about local preferences. For the reasons discussed in paragraph 14 above, I also consider that local authorities are legally

---

<sup>9</sup> The proposal was contained in: *Community Management of GMOs: Issues, Options and Partnership with Government*, report to Whangarei District Council by Simon Terry Associates Ltd, March 2004.

<sup>10</sup> Statement of Primary Evidence by Dr Kerry James Grundy, 13 August 2015, paras 36 to 38.

<sup>11</sup> <http://www.fedfarm.org.nz/advocacy/National-Policy/Climate-Change-and-Emissions-Trading.asp>

bound to limit their analysis to the costs and benefits experienced by their local communities.

39. One might nevertheless speculate on how the alternative approach proposed by Mr Cooper would alter a cost benefit analysis if it were legally permitted. I would not expect material changes on the cost side of the analysis because GMO developers seeking outdoor release would have no extra constraint in seeking to release in other jurisdictions. If anything, costs would tend to fall because the opportunity cost of prohibiting outdoor release in one region may be mitigated by the ability to release GMOs in other regions. The benefit side effects are more complex but one effect would be that any employment or productivity lost to the region prohibiting outdoor GMO release would be offset by the benefit received by another region.
40. In paragraph 40 of his statement Mr Cooper disagrees with my *“use of the word ‘perceived’ in respect to net costs and benefits”* on the basis that *“perception is difficult, if not impossible, to quantify in any meaningful sense”*. Value is indeed subjective but that is no reason to ignore the methods that can be used to assess it. Economists recognise the subjectivity and develop/use methods to analyse the relative value of alternative strategies. Two of these methods warrant further discussion:
  - a. Stated and revealed preferences; and
  - b. Price and quality trade-offs.

#### ***Stated vs Revealed Preference***

41. There is an important division between “stated preference” analysis which relies on what people say in response to survey questions, and “revealed preference” analysis which relies on actual purchasing decisions. As a general matter, the latter is more reliable. When it comes to assessments of value, economists place more weight on actions than words.
42. This difference in reliability is relevant to paragraph 69 of Mr Cooper’s statement which cites Mr Colegrave’s letter to argue that there is *“currently no evidence for premiums for GM fruit and veges other than soya beans and maize”*.<sup>12</sup> This claim is based on a survey of healthy eating trends, so it is derived from words (stated preference) rather than actions (revealed preference). By contrast, neither Mr Cooper nor Mr Colegrave have recognised the significance of the GM-free preference of Fonterra and Horticulture New Zealand which I discussed in my original evidence at paragraphs 111 - 116. Buyers and sellers in markets face up to the revealed (subjective) preferences of consumers on a daily basis and will generally be better informed than a market research survey of stated preferences. Further, it is not an upside premium for non-GM production that is of greatest interest to food producers: it is avoidance of the downside risk of GM contamination – both physical contamination and brand contamination.

---

<sup>12</sup> He meant to refer to premiums for GM-free, not premiums for GM.

### ***Price Quality Trade-Offs***

43. In his paragraphs 83 – 84 Mr Cooper insists that even if consumers do have negative perceptions of GMOs, *“price remains a factor that consumers will consider”*. This (correct) statement illustrates an important point which is that inferior products can still be sold if they are cheap enough.
44. Consumers are diverse though: some will prefer the cheap/inferior versions while others will be willing to pay more for higher actual or perceived quality. This is relevant to the Proposal because consumers in Auckland/Northland already have access to food products with a wide range of qualities and these may legally contain many varieties of GMOs should retailers care to stock them. The Proposal will have no impact on this choice because it is focussed on (outdoor) production rather than consumption.

## **4.2 Dr Bellingham**

45. Mark Bellingham is a planner contracted by Federated Farmers. Dr Bellingham acknowledges the Environment Court’s Expert Witness Code of Conduct.
46. Dr Bellingham says that my evidence does *“not appear to address GM issues that may be more relevant to pastoral farming in Auckland including the use of GM organisms in biosecurity”*. I examined Dr Bellingham’s statement for supporting argument but found none. I refer to my primary evidence and I confirm my view that I have sufficiently addressed the economic aspects of the GMO issues specifically to Auckland and the possible impacts of these organisms.

## 5. NZBio

---

47. Dr Will Barker is employed by NZBio, holds qualifications in chemistry and is a patent attorney. He does not refer to the code of conduct for expert witnesses embodied in Practice Note 2014 of the Environment Court of New Zealand or claim to be an independent witness or an economist. However he does refer to my evidence and comment on economic matters more generally in paragraphs 34 – 39, a section titled “Economic Benefits”.
48. In these few paragraphs Dr Barker refers to economic benefits of
- a. GMOs for farm income globally;
  - b. GMOs in New Zealand;
  - c. The Proposal under consideration; and
  - d. Banning GE crop production in Hastings in the opinion of someone not being made available for questioning by the Panel
49. None of this material has any bearing on the four facts underpinning my economic analysis and does not revise my advice to the Panel. I confirm my view that the Proposal will offer net economic benefits to the Auckland region.