

024 GMOs – John Small: Summary and Update

John Small

25 September 2015

1. I supplied two statements of evidence to the panel on this topic, one on 13 August and another on 10 September. The second statement replied to the submissions of relevance to my primary evidence that were available at the time of writing. Since then, further rebuttal has emerged.
2. My primary evidence contained an independent economic analysis. Economics is a social science, applications of which inevitably rely on facts and expertise from other domains. One of the main contributions of an economist is to organise these disparate pieces of information into a coherent framework for analysis. I was hoping that the parties opposed to the Proposal would secure expert independent economic advice to respond constructively to my analysis so that the Panel would be better informed.
3. While it is disappointing (to me) that none of the parties opposed have chosen to present independent economic evidence, I nevertheless feel obliged to provide the Panel with a brief response to the most recent criticism of my work by persons employed by opponents of the Proposal, some of which amounts to attacks on my credibility.
4. In this statement I summarise the main features of my economic analysis and refer to just a few opponent criticisms of those features. My main aims are to explain my analysis directly to the Panel and to show why I do not consider the most recent criticisms undermine it. Unfortunately, I also need to respond to at least some of a large number of incorrect claims that have been made in the most recent material. I will not read out those responses today: they are tabulated at the end of this statement so the panel can readily understand my position as it deliberates.
5. Both of my statements of evidence have been very clear about four facts that heavily influenced my analysis. This summary and update is again structured around those facts.
6. **Fact 1: Uncertainty.** I said that *"there is considerable scientific uncertainty over the costs and benefits arising from outdoor cultivation of GMOs"*. This is obviously true for those GMOs yet to be developed or commercialised for application under New Zealand conditions. However it also applies to existing commercial GMOs as the recent decisions to extend bans on GMO cultivation by Germany, France, Scotland, Latvia and Greece demonstrate.
7. Professor Heinemann has provided detailed evidence on scientific uncertainty regarding GMOs and I have relied on his work. However while genetics and more generally the biological sciences are obviously relevant to assessing the costs and benefits of outdoor GMO cultivation, economic factors are also relevant. Commercial growers of plants do not just care about the cost of production and the attributes of the plants they might choose to grow; they also care about the preferences of buyers,

because those preferences affect both the market value of the output and the ease with which it can be sold.

8. **Fact 2: Opportunity Cost.** I said that *"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"*. I have been noting this fact since the Hastings hearing on similar plan provisions in May and discussed it in detail in my primary evidence (section 5.1.2).
9. Those opposing the Proposal are ideally placed to provide documentary evidence of GMOs that are ready for commercial release and for which there is demand. None of them did so in their evidence statements filed two weeks after my primary evidence, though Mr Cooper from Federated Farmers was able to write a substantial response to my work in the time available. A further two weeks later, on the last date for submissions Dr MacRae filed another statement which (Reply evidence ¶14) has finally named some GMOs that are *"subject to regulatory approval"*, some that *"could be grown in the near future"* and others for which *"we don't have specific release dates"*. In my view, these claims fall well short of demonstrating a current opportunity cost because they offer no information on the EPA status of these plants, or demand by growers, or the value margins available, or the risks to growers of other plants in the Auckland region.
10. **Fact 3: Supplier Views.** I said that *"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"*. I could (and perhaps should) also have cited smaller scale producers on this point because *any* such preference by exporters is very telling indeed. Commercial suppliers have strong incentives to understand buyer preferences because buyers ultimately provide all of the money that keeps them in business.
11. From an economic standpoint, the views of those who might use or be affected by a GMO release are therefore very important and they are clearly aligned with the Proposal. Fonterra sells to customers all over the world and invests in the Pastoral Genomics research consortium. My primary evidence quoted Fonterra as saying *"Fonterra does not support field trials of GMOs in New Zealand at this time"* so we can safely assume that it would feel the same way about general outdoor release.
12. I note that Dr MacRae objects to my use of statements made by Fonterra and Horticulture New Zealand on the grounds that *"NZ does not have a GE free status"* (Reply ¶15). That may be the view of some scientists but the difficulty for Dr MacRae lies in the first part of my quote from Fonterra which reads: *"customers view New Zealand dairy as GM Free and the introduction of GM pasture would have a significant impact for some customers and New Zealand's reputation"*. As I have been emphasising, customer preferences are very important to food producers and exporters. If customers view New Zealand as GM free, food producers and exporters and policy makers need to work with that fact, even if some scientists say those customers are mistaken.
13. **Fact 4: Timing and Flexibility.** I said *"the proposed measures are time-limited and can be changed in the event that a cost-benefit analysis supports change"*. This is a critical point for

an economic analysis for two reasons. First, it places a limit on the time-horizon over which we need to consider costs and benefits. Since we expect that the plan will be revised within 10 years we should focus on events that will or might happen within that period of time. Secondly, the plan change process acts as a safety valve which places a limit on the total costs of the proposal.

14. This latter point is particularly important because of (a) ongoing scientific efforts to develop GMOs that could yet prove capable of delivering net benefits and (b) scientific and commercial uncertainty over the results of those efforts and particularly their timing. For example, if a new GMO was to emerge after say 4 years and it would deliver *net* benefits for Auckland if approved for outdoor release, then the plan change mechanism can be used to ensure those net benefits are received. In that situation, the cost of the proposal would be limited to the cost of changing the plan to accommodate the new discovery.
15. The reason I emphasise these four facts is that they permit one to draw quite clear conclusions about whether the Proposal is likely to offer net benefits to the Auckland region. In particular they tell us that:
 - a. The proposal does not impose material costs in the form of valuable opportunities foregone (opportunity costs);
 - b. The proposal is aligned with market preferences as interpreted by major customer-facing organisations (supplier views);
 - c. We don't know how the science will evolve and it might be that in the future a GMO can be shown to have net benefits for Auckland (uncertainty); but
 - d. In that event, the plan can be varied to avoid it blocking valuable developments and the costs of doing so are limited (timing and flexibility).
16. In my opinion, these are sufficient grounds to approve the Proposal.
17. My primary evidence canvassed a range of other issues including:
 - a. a review of crops grown in northern New Zealand for the purposes of comparing these with major international GMO crops and local research into GMO crops that could be of benefit in New Zealand;
 - b. the potential for the Proposal to avoid contamination risk and the related roles of buffer zone controls and liability arrangements to compensate for excursions beyond buffer zones; and
 - c. potential alternatives to GMOs including marker assisted selection and other aspects of agronomy noting that a 25year old world record for barley production was recently broken by Canterbury farmers;

18. While important for a complete analysis, none of these matters were eventually central to my conclusions. I am therefore not concerned, for example, by Dr Dunbier's insistence in rebuttal that some things are easier to achieve using GMO technology than marker assisted selection. GMO research will continue under the proposal, which also provides a well-understood channel through which genuinely beneficial GMOs can be commercialised.
19. Apart from the four facts discussed above, two aspects of my primary evidence are important.
- a. My analysis of the time required to develop GMOs. I adopted 10 years as a reasonable estimate (Small ¶45) while noting that variability around this would likely be high.
 - b. The section describing my economic approach (s3.4) which included discussion of discount rates, option values and the linkages between the modern economic theory of investment and the precautionary principle.
20. This material is relevant because the Panel is planning for the future. The likelihood, scale and timing of potential future events are obviously critical to the costs and benefits of the proposal¹ and I have tried to develop an economic framework within which these factors can be robustly compared. Any reliable economic framework for this purpose will place more weight on current factors, such as the current views of primary product exporters which are aligned with the proposal, than on future unknowns such as the hopes and fears that have been expressed by opponents.
21. My professional opinion about how to best manage this issue for the benefit of Auckland is that policy makers should seek to lock in the current benefits and provide for a flexible and adaptive response as new information arrives. I consider that the proposal meets these goals and recommend that the Panel supports it.
22. That finalises my comments this morning. In the event that the Panel wishes to seriously consider any aspects of Dr MacRae's late reply to my evidence, I request that it reads the written version of these comments which contain further material on this topic.

----- END VERBAL COMMENTS -----

23. Dr MacRae's eventual reply to my evidence leaves the reader in no doubt as to her opinion of my work. It opens by claiming (MacRae Reply at ¶9) that the four facts I have discussed above are "*false and unsupported by evidence thus rendering Dr Small's analysis inaccurate and redundant*". It also:
- a. says and implies that I said things which I did not say and cannot be reasonably inferred from my evidence (for example, MacRae Reply at ¶27, 28B, 32); and

¹ The Commerce Commission, which in merger applications is also obliged to contemplate possible futures, uses what it calls an LET framework: likelihood, extent and timing.

- b. falsely denies that my references say things that they do say (eg MacRae Reply at ¶51).

24. Dr MacRae's reply statement mis-represents my work. Coming from such a senior professional, this seems deliberate. I reject Dr MacRae's claims and offer the Panel the following short and non-exhaustive survey of responses to them.

Dr MacRae's claims in Reply	My Response
"GM crops already grown in the region ... subject to regulatory approval" (MacRae ¶14)	There are no crops in the NZ outdoors that have been approved by the EPA for cultivation as GMOs, or that our major trading partners regulate as GMOs
"New Zealand does not have a GE Free status" (MacRae ¶15)	There is no commercial cultivation of GMOs in NZ so the country remains a GM free food producer – and is GM Free in this sense
"Forestry is entirely absent despite the Northland forestry industry being substantially larger than the entire horticulture industry in Northland" (¶17)	Forestry is included in my table as "wood" and the Proposal does not cover Northland
I have ignored the fact that there is no legal "duty of care" (MacRae ¶23, 24)	On the contrary, this fact is pivotal to my analysis. The Council's duty of care makes an economic externality a policy issue
"Dr Small draws the conclusion that MAS and GM are equivalent" (MacRae ¶27)	I did not say that. Pastoral Genomics actions imply MAS has "at least as much potential value as GMO technology"
"The general direction of Dr Small's evidence is that GMOs provide no tangible or proven benefit" (¶28B)	I made no such statement. On the contrary, see ¶36 of my primary evidence. This is inserting new material into a rebuttal.
"Dr Small claims the effect of GMOs is irreversible" (¶32)	No, I said "can be" irreversible
"...it had nothing to do with interaction with insects as Dr Small implies" (¶32)	False, as a careful reading of my work will show.
"Nowhere does it mention such losses" (¶51)	It does actually say "caused losses of hundreds of millions"