

Friday, 22 May 2015

Anna Sanders
Hastings District Council
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Dear Anna,

Re: Preliminary Economic Analysis of GMOs

Purpose of this Memo

This memo was commissioned by Hastings District Council to assist its officers in preparing a section 42A report on proposed provisions for managing GMOs in the district. Specifically, this memo outlines our preliminary responses to four key research questions, namely:

- What are the key benefits of banning GE crop production in the district?
- Will the proposed plan change guarantee these over the longer term?
- What are the benefits of enabling some GE-based crop production in the district?
- Will the proposed plan change effectively preclude these?

What are the key benefits of banning GE crop production in the district?

- 1) The key benefit of banning GM crops is said to be the retention of a 'clean green image', which we understand enables some local producers to earn premia in certain world markets.
- 2) To test this hypothesis, we undertook a detailed review of the local and international literature and found clear evidence of premia for non-GMO foods. For example, a recent global report by Nielsen showed that 43% of respondents rated GMO-free as being very important to their purchasing decision, with 33% being very willing to pay a premium for GMO-free food.¹
- 3) However, these premia only existed for (i) whole foods that have some global GM production (such as maize), or (ii) processed products that may sometimes

¹ Interestingly, the figures for Europe revealed a significant difference between the importance of GMO-free and the willingness to pay for it. Specifically, 47% considered it very important, but only 29% were very willing to pay.

include GMO-ingredients, such as bread. Thus, we found no evidence of GM-specific premia for currently GM-free fruit and vegetables other than soya beans and maize.

- 4) Having said that, we acknowledge that *organic* fruit and vegetables often earn significant premia, but that this typically requires formal “identity preservation” and hence such premia can seldom be earned simply by growing a crop in a region that is GM-free.
- 5) To try and quantify the current monetary benefits of GM-specific premia to the region, we purchased customised export data for the Napier sea port, which covered all exports over the past 5 years. For the purpose of this exercise, we restricted the analysis to only products that have commercial quantities of global GM production, namely canola, cotton, soya beans and maize.
- 6) The analysis showed that, over the last 5 years, the region exported over \$130 million of products in these broad categories (40% of which was the export of corn seeds to the Netherlands). This represents 0.7% of total regional exports over that period.
- 7) According to our reviews, the average premium for GE-free maize, canola, cotton and soya beans is around 10%. Hence, assuming that all exports of these products earn premia, we estimate that the GE-free premium attached to exports from the Hawke’s Bay region was around \$13 million over the last 5 years. Assuming that roughly half of this represent additional costs, and the other half additional profits, the overall increase in profit is \$6.5 million, which is 0.04% of total exports over that period.
- 8) These premia are highly likely to understate the full premia being earned by local producers. However, other than the \$6.5 million premia identified above, it is unlikely that the premia attached to other products is a direct result of the district being GM-free. There is no evidence that products can earn a premium just for being GM-free when there is no GM global production of those crops.
- 9) Instead, such premia are more likely to reflect their formal organic status, or the perceived environmental image of the region itself. Such broader premia may be enhanced by the absence of GM crops in the region, but it does not appear to be a prerequisite.
- 10) For example, the Wall Street Journal has recently published articles describing maize farmers in the US who, after growing GM corn for 20 years, have recently

planted GM-free corn in the same fields and are still able to command a premium. Given that the soil will almost invariably be contaminated with the after effects of GM crop production and given that most neighbouring farms are still producing GM maize, the fact that these farmers can still earn a premium casts some doubt over the need to ban all GM crops in Hastings to retain the premia currently enjoyed by local growers.

- 11) Similarly, we note that parts of Australia grow GM canola but are still able to command a premium for non-GM canola too.
- 12) Most countries have set tolerances for GM-free and organic crops to reflect the fact that many are grown in proximity to GM or non-organic crops and hence are not 100% pure. For example, the European Union allows 0.9% of approved GM material to be in products that are described as GM free. In Japan, the threshold is 5%.
- 13) This was reflected in the evidence of Dr Hugh Campbell to the Royal Commission on Genetic Modification. Dr Campbell is a social geographer, who was called as a witness by the Organic Product Exporters Group (OPEG). He noted:

“It is important to note that a limited genetic modification industry operating as a minority aspect of some sectors would not destroy organic production through physical contamination by genetic modification crops and no members of the organic industry make such a claim. There are clearly extra costs that would be imposed but these would not be overwhelming to the majority of organic growers. The threats posed to organics only escalate dramatically if genetic modification production becomes widespread.”

- 14) Given these findings, the Council may wish to try and better understand the nature of the premia mentioned by local growers to understand exactly what drives them, and hence what factors may put them at risk. From our detailed reading of the literature, the growth of GM crops in the same district may not be the fatal blow that some submitters have portrayed.
- 15) It is also important to note that premia often reflect higher costs, and thus do not automatically translate into higher profits/GDP. Indeed, the cost of identity preservation (a prerequisite for organic premia) are very expensive, and the higher price of organic food largely reflects this. Accordingly, while organic producers may earn more for their produce, this does not necessarily mean they make higher profits. The situation is far more complex.

- 16) Indeed, the Royal Commission also received evidence from several prominent New Zealand economists who noted that it is highly unlikely GM-free or organic producers could continue to earn “super profits” over the longer run. For example, Adolf Stroombergen of Infometrics stated:

Very high premiums of 50% or more for organic products only occur in very small markets. As soon as the market expands, the price premium declines. This is nothing more than standard supply economics. There may always be a price premium for organic products simply because they tend to be more expensive to produce, but any supernormal profits will eventually be eroded as new organic farmers enter the industry. It is not credible to believe that New Zealand can secure high net returns through supplying organic products to world markets whilst competing countries (such as Denmark and the Netherlands which have significant organic sectors) do nothing. An entirely organic farming sector in New Zealand is thus not a plausible scenario, even if there were no conversion delays and even if biotechnology delivers no benefits other than lower production costs – both extremely unlikely

- 17) This was accepted by the Commission, who noted:

Economic reasoning suggests that it is not a realistic option for New Zealand to develop its organic sector at the expense of conventional farming and/or the use of genetic modification techniques, as in the long run it is unlikely that abnormal levels of profit would be made. We also note that while organic products may always sell at a price premium, one of the reasons for this is likely to be their higher production costs.

- 18) On the flipside, we note that a GM apple (artic apple) has recently been approved in the United States and will likely soon go into production. If and when it does, this could create a significant opportunity for local apple growers to market their GM-free status and start to earn a premium for their produce. While this would likely incur some additional costs (to prove that the product is GM-free) it is also likely to generate additional net returns, particularly given the region’s dominance in this particular industry.

- 19) In summary: our research indicates that local growers do earn premia for certain produce in high-end markets, and that the markets in which such premia may be available (such as for non-GM apples) are expanding. Having said that, we are not convinced that the entire district needs to remain GE free for this to occur. The presence of tolerances overseas and the successful co-existence of GM and GM-free production strongly suggests otherwise.

Will the proposed plan change guarantee those benefits over the longer term?

- 20) Next, we consider the extent to which the proposed policies will secure the benefits of being GE-free over the long run.
- 21) In short, defining GMO releases as prohibited activities is likely to be the strongest position that the Council can adopt to keep the district GM-free. Thus, by logical extension, it is likely to be the best method available to secure the benefits of being GM-free over the long run.
- 22) Having said that, a private plan change could be lodged at any time to try and overturn this activity status (although the Council could reject such a private plan change within 2 years of the District Plan becoming operative). If successful, the benefits of being GM-free will no longer be guaranteed.
- 23) Second, in our view, the value of the district remaining GM free is likely to depend (to some extent) on the rest of New Zealand adopting the same stance. We consider that part of Tasmania's success in being GM free reflects the fact that it is physically separated from the mainland and hence relatively free of contamination risk. The same cannot be guaranteed for the district unless all of the north island also remains GM free, but this is obviously beyond the district's control. This would reduce, though not necessarily negate, the benefits of the district being GM-free.
- 24) In a related vein, we are unsure whether the proposed policy (of making GMO releases prohibited activities) will have any effect on the potential importation of GMOs from other regions. If not, and other regions in the North Island allow GMOs, the effectiveness of the proposed policy may be reduced.
- 25) Finally, we note that global attitudes to GMOs are constantly evolving. If consumers gradually become more accepting of GM crops – as they appear to be – the long term benefits of the policy may be diminished regardless of what other Councils do.
- 26) In summary: While the proposed policy is likely to be the Council's strongest option for remaining GM-free, a number of external factors could affect its effectiveness over the longer term.

What are the benefits of enabling some GE-based crop production in the district?

- 27) The international literature is full of detailed (peer-reviewed) articles on the economic benefits of GM crops.
- 28) For so-called first generation GM crops (such as HT and BT maize), the key benefits are increased yields and reduced costs, which both lead to increased farmer profits.
- 29) For example, an independent study commissioned by the German Federal Ministry of Economic Cooperation and Development performed a meta-analysis of 147 studies on the farm-level impacts of GM crop production. It found that, on average, GM technology has:
 - i) reduced chemical pesticide use by 37%,
 - ii) increased crop yields by 22%, and
 - iii) increased farmer profits by 68%.
- 30) The clear economic benefits of GM crop production are also verified by the speed with which it has been adopted in the United States. Over 90% of maize and soya grown in the states is GM, with a recent UK report stating that global GM acreage is doubling every 5 years.
- 31) While most other studies were also focussed on farm-level effects, a 2014 study in the Journal of Economic Perspectives noted that the use of GM crops to produce soya beans and maize had saved 20 million hectares of land that would have been needed otherwise. They go on to note that the significantly reduced footprint has a number of broader environmental benefits, including reduced water and energy use, reduced greenhouse gas emissions and also increased biodiversity.
- 32) It is also useful to note that a second wave of GM products is starting to emerge. Unlike the first generation products, whose benefits largely accrued to farmers themselves, second generation products seek to benefit consumers by providing nutritionally-enhanced options. For example, there is a raft of vitamin- and omega-enriched products slowly coming to the market.
- 33) More generally, as GM research continues, new products are likely to become available, each of which will potentially generate significant benefits to stakeholders.

Will the proposed plan change effectively preclude these?

- 34) To the extent that GMO releases are made a prohibited activity, we expect that most of the benefits outlined above will largely be precluded for the life of the Plan. However, if the tide of public opinion changes, the activity statuses of GMOs could be altered to enable the benefits identified above to start accruing to the district.

Sincerely,



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