

## **Submission on the Third review of the Gene Technology Scheme (GTS)**

By RJR Agricultural Consultants.

### **Overall statement.**

GTS needs to be credible to have public and scientific respect and support.

The legislation and regulations should be commensurate with the risks to the environment, to food safety, and to public health of humans and naturally occurring fauna and flora.

Health concerns about Genetically Modified Organisms (GMO) for crop plants need to be considered separately from animals/humans, as there is very extensive and compelling evidence of no risks to food safety from GMO crops over at least 2 decades in the Americas, and more recently worldwide in both developed and developing countries, for 10% of world crops notably maize, soybean and cotton. [https://en.wikipedia.org/wiki/Genetically\\_modified\\_organism](https://en.wikipedia.org/wiki/Genetically_modified_organism)

(See also sections on history, use of GM crops for improved pest and disease resistance, abiotic stress tolerance, nutrition and herbicide resistance. GMO has protected papaya against the devastating ringspot disease)

(Fiona Sheean, The Weekly Times, May 23, 2018. In cotton country, facts beat fear factor in war against GM)

Food safety checks have provided confidence in the past on both GMO and non-GMO foods, e.g. prescribing upper limits for consumption of toxic cyanogenic glycosides & related compounds naturally occurring in crop varieties over a range of concentration levels. Both plant breeding for reduced levels and food preparation recommendations minimise these potential health dangers (e.g. for lima beans, papaya, cassava etc. In I.E. Liener 2003, Plant antinutritional factors detoxification. In Encyclopedia of Food Sciences and Nutrition (Second Edition).

Genetic diversity of plant flora has continually evolved over millions of years, forming new species via rare auto- and allo-polyploidy combining of plant genomes, and adaptive mutations with genetic response to changed environments under natural selection. This process has been accelerated over the last 12,000 years with crop domestication. Both the altered soil and management environments for adaptation selection and the manually directed selection for domestication traits (yield productivity, seed size, reduced dormancy and nutrition/cooking traits) have resulted in the current range of food crops. Expansion of crop genetic diversity is aided now by further scientific insights. Thus genetic modification is an endemic factor of plant evolution, which in crops was augmented by manually imposed phenotypic selection, and recently by direct intervention in DNA composition and function.

Both natural and induced mutations have been a standard part of plant breeding for up to a century, with public acceptance. The recent GMO procedures have provided specifically directed and more precise changes to plant genomes. Across a wide range of crops and over two or more human generations, there has been no evidentiary change in risk to either human health or the environment with the uses of GMO [https://en.wikipedia.org/wiki/Genetically\\_modified\\_organism](https://en.wikipedia.org/wiki/Genetically_modified_organism) Also the non-agricultural environment for plants is continually changing and with it the genetic composition of wild populations (Nevo E, Henry R. 2015. Global warming and the evolution of wild cereals. Ch 3 In 'Crop Wild Relatives and Climate Change', Eds. Redden R et al., Wiley Blackwell).

Since the initiation of GTS, the initial health and environmental concerns of anti-GMO proponents now appear to be groundless, and the risks involved to be very low and not greater than what

already occurs in the natural diversity of crops. Hence the applicable legislation and regulations of GTS ought to be correspondingly minimised.

Such deregulation in GTS for GMO crops would be highly beneficial in furthering crop management, nutrition and tolerances of biotic and abiotic stresses, especially for genetic variation not accessible within crop genomes. Removal of most GTS impediments of direct costs and of indirect compliance costs would facilitate innovation with GMO, interspecific gene transfer from both distant relatives and unrelated species, and enable access to the many gene technology tools that will be required for breeding crop resilience to climate change.

There is in fact a real risk that retention and further reinforcement of GTS will seriously retard scientific efforts to climate proof crops. There is only a historically short time frame available this century before the volatility and extremes of weather conditions shift crop environments toward extreme abiotic stresses unprecedented during the evolution of crops. This is a competing responsibility for GTS not to imperil food security on the basis of remote health risks. The consequences of inappropriate application of GTS is that both non-GMO and GMO agriculture will have existential threats.

Hence it is imperative to unwind GTS for crops as much as possible, to the minimum needed for the testing of food safety.

### **Specific concerns**

My concerns with phase 3 of GTS are:

1. No mechanism to consider whether some GMO legislation can now be considered unnecessary on the basis of not being a food risk to humans (extensive information from North America and other countries with a long history of GM crops - e.g. Brazil and Argentina).
2. Where food safety is not an issue (All GM food crops to be tested initially for safety on a case by case basis), there is no need for continued adventitious testing for contamination in non-GM crops, no need for safety containment of field test sites, no need to isolate GM from non-GM equipment / facilities; but a need to modify and simplify relevant legislation / regulation.
4. For GTS to be credible the philosophy needs to be re-framed, reversing the onus of proof on food and environmental safety, from need to prove non-harmful, to objectors needing to prove that the relevant GMO product is harmful. i.e. give recognition to the overwhelming evidence for absence of harm, versus objectors seeking a never ending extension of time frame for potential harm to include future generations. On the latter basis vaccines and blood transfusions would never be approved.
5. The environment has benefitted with the use of GM cotton (Reference above F Sheean 2018), since genetic resistance super-cedes the use of chemicals for disease and pest control. Novel gene introduction via GM from crop wild relatives has benefitted many crops against a range of pests and diseases.
6. Concerns with pollen escape from GM crops to related weeds in the wild should not be an issue. Human activity challenges the genetic composition of wild relatives all the time. However use of GMO needs to be skilfully managed to minimise undesirable consequences, such as chemically resistant weeds. Strategic management of GM cotton with refuge areas for the target pests is an example of successful management.

7. Keep application of the gene technology scheme very targeted to proven problems in order for the scheme to be credible, and not hinder innovation or unduly delay adoption of GMO and innovation (green agenda).

8. Recognise that GM usage has important applications for the future of agriculture in a changing world with increasing climate change.

**Specific items in the phase 3 review;**

A. the Scheme is not concerned with human genetics, but considers such a forum may be needed given new advances in Gene technology

B. Regulation of risks and appropriate triggers for the future. This is a scheme seeking to broaden its portfolio and entrench its importance, ever seeking an expanded agenda. Conversely GTS should be considering whether it is still necessary for crops, and seeking to reduce red tape.

C. The scheme is not considering benefits of GMO at present, saying thus is a matter for the future. This stance is strongly condemned, economic and environmental benefits must be considered as part of questioning the ongoing relevance of GTS for crops.

D. Market and international aspects can be managed for co-existence of both non-GMO and GMO markets. It is incorrect to hold up progress and restrict the use of GMO in agriculture (moratoriums etc.) and prevent potential benefits being realised.

E. Social and ethical considerations. Currently these are biased towards the anti-GM lobby, with an unreal onus of proof on the safe use of GM. potential harm needs to be proven. Note that in nature the genetic composition of organisms is ever changing with selection imposed by climate change.

**Findings on 3<sup>rd</sup> review of GTS.**

1. The claim that the Scheme is appropriate and should remain - I strongly contest this.

2. The claim that the Scheme is working well – I contest.

3. Agree that there is lack of clarity re advances in gene technology.

6. The claim that more work is needed re appropriate approval for release to the broader environment. – I oppose - This has scope to become an extreme application of the precautionary principle based on ideology rather than hard evidence i.e. Looking for potential problems and magnifying risk from remote to very high.

7. Regulation re gene drive and risk assessment, potentially relevant Acts, and development of guidelines - unnecessary if gene drive is dismissed as a risk.

8. Regulations should be commensurate with the risk. – This also applies in reverse; if there is no risk to food safety or the wider environment, then regulations are not needed.

9 & 10. I agree there are opportunities to streamline GTS and its application.

12 & 13. I agree flexibility needed for GTS, with advances in gene technology, and new definitions.

14. Oversight from Gene Technology standing committee, but only for demonstrable problems and stringently justified risks, otherwise with deregulation no further oversight is required.

15. GTS to include market access and international obligations, but without involving barriers to use of GMO in agriculture. Where needed suitable accommodation will needed to manage both GM and non-GM cropping without pseudo-quarantine regions.

**Theme 3. GTS needs to be credible and have legitimacy and integrity. I suggest that current Scheme has over reach, and needs extensive de-regulation to become credible.**

16 & 17. GTS has national oversight with legislation and a government Forum on Gene Technology. Each state can legislate areas for non-GM crops. I suggest a national agreement for use of GMO crops is needed, with any exceptions to be stringently justified.

19. Some submissions were concerned that GTS legislation extends beyond marketing - this warrants attention.

20 & 21. The claim that economic benefits should not be considered because this may be a problems to the operation of the scheme. Clearly a cop-out. All the more reason why we should insist that the economic benefits be considered. GTS should not stifle innovation nor prevent economic and health benefits. Therefore we should avoid unnecessary regulation.

23. Why should a wider range of topics be considered?

26 & 27. The proposal for full cost recovery is a large concern. It is potentially detrimental to innovation and to international competitiveness.

30. I agree that Scheme needs to be well designed. Suggest reduce scope, application, regulations and use of GTS for crops to justifiable food safety checks.

I suggest reverse the current use of cautionary principle, i.e. that GTS restrictions on use of GMO crops need to be justified.

Wide use of GM application from crop wide relatives will be needed in the future if agriculture is to adapt to climate change stresses of drought, unseasonal frosts and heat. This needs to be facilitated by keeping GTS regulation to a minimum.

With regards

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