

The National Gene Regulatory Scheme must be greatly strengthened and made far more rigorous with respect to new and existing gene technologies.

DNA is far more complex than was ever imagined and scientists are a considerable way off fully understanding it and all its interactions. For example, there are interactions between the strands of DNA inside the cell and the information in the cell wall itself. Therefore, any manipulation of DNA, whether it's inserting new genetic material in the cell or DNA editing or silencing is going to impact these interactions in ways that scientists cannot quantify.

DNA is multi-faceted. It must be able to be read both forward and backwards while producing different outcomes, different sections of DNA are selected and recombined, there's embedded DNA, encrypted DNA, 3D stacking of DNA and more. So even the slightest tampering with DNA is going to have unintended effects.

There also exists the potential for greater unintended consequences from manipulation of RNA because RNA is more powerful in determining gene expression than DNA. So, just like older DNA manipulation technology, new manipulation techniques such as CRISPR have the same potential to impact the entire genome of a plant, but to a greater extent. Therefore, all new manipulation techniques such as CRISPR must be strictly regulated and any products resulting from these techniques must be subject to rigorous, long-term, independent, peer-reviewed animal feeding and environmental impact safety studies.

In the last two decades there has been an exponential rise in diseases that you would expect to be associated with genetic manipulation technology, including dramatic increases in allergies and digestive illnesses, especially in the USA where most GM crops are grown. These health problems were almost unheard of when I was attending school a few decades ago. It is hard to believe GM crops and associated pesticides, whether produced with the GM crop or sprayed on the crop, have not played a major contributing role in the exponential rise in these diseases. Yet it is difficult to test for this because people do not live in a controlled environment. However, empirical evidence strongly suggests there are problems associated with GM crops because there are numerous reports of humans, farm animals and pets switching from diets containing GM ingredients to GM free diets that have seen dramatic improvements in their health.

Therefore, given what has been previously mentioned, all products from existing and new genetic technology must be subject to extremely strict standards including rigorous, long-term, independent, peer-reviewed animal feeding and environmental impact safety studies. Comprehensive profiling methods should be used to identify any unintentional mutations in GMOs. The precautionary principle in the Gene Technology Act needs to be strengthened, implemented and enforceable.

Furthermore, GM foods and their derivatives, such as an oil or additive in processed food, must be clearly labelled as containing GM ingredients so consumers, the vast majority whom want labelling, can be given the choice whether or not they want to consume a particular food.

Also, all Australian States must continue to be allowed to implement GM crop bans so they can protect their markets from GM contamination. The Gene Technology Act must be amended to ensure the GM companies are fully liable for any losses resulting from GM contamination. The public should be allowed to appeal decisions made under the Gene Technology Act in the same way industry is currently allowed to.