20/2/2018

To whom it may concern,

Letter in support of the OGTR not regulating new genetic technology

I wish to write to you to urge you not to regulate site directed genetic modification techniques as presented in the 2016 Discussion paper. In short I support option 1.

As you are no doubt aware these technologies offer great hope for medical advances as well as agricultural productivity. In regards to medicine debilitating genetic conditions such as haemophilia could potentially be corrected while experimentally mice and rats could be modified in ways as to provide new insight into diseases. I am in no doubt that ethics of such techniques should be considered by ethics committees however I believe that these should be considered on a case-by-case basis.

Personally I feel that agricultural industries will benefit greatly from the absence of regulation of these new technologies. First and foremost alterations to the genome occur naturally all the time through spontaneous mutation. Since the dawn of agriculture farmers have noted naturally occurring variations and have multiplied these plants or retained these animals as breeding stock if the mutation was beneficial. This has led to the unique features of the breeds of animals and varieties of crops that we have today.

Similarly, science has developed mutagenic (both radiation and chemical) techniques to induce random mutations. As of today the International Atomic Energy Agency (IAEA) lists 3,275 mutations which have been developed into commercial varieties (though many more would now have been bred from these). It should be noted that nine were developed in Australia

Variety Name	Latin Name	Common Name	Country	Registration
Chittick	Lupinus angustifolius L.	Blue lupin	Australia	1982
Dolphin	Avena sativa L.	Oat	Australia	1984
Echidna	Avena sativa L.	Oat	Australia	1984
Eregulla	Lupinus consentini Guss.	Lupin	Australia	1972
Kalgan	Avena sativa L.	Oat	Australia	1988
Nitrobean-60	Glycine max L.	Soybean	Australia	1995
Scope	Hordeum vulgare L.	Barley	Australia	2010
Uniserra	Ornithopus compressus L.	Serradella	Australia	1971
Uniwager	Trifolium subterraneum	Subterranean clover	Australia	1967

There are also many crop varieties that were developed outside Australia and have been brought into the country and are now cultivated here including ‘Rio Red’ and ‘Star Ruby’ grapefruit and ‘Calrose 76’ rice which is a cornerstone variety for the Australian rice industry. It should be noted that all of these 3,275 varieties can be grown anywhere in the world by organic growers. No country anywhere in the world prevents the growing or regulates these artificially mutated varieties.

Regulating of gene edited crops will ultimately place regulators in a bind; random mutagenesis varieties will be not be regulated, while precisely edited varieties will be. The act of random induced mutagenesis produces thousands of lines which have no commercial utility and are discarded by plant breeders. But all plant and animal breeding programs have always had that issue and just as many conventionally bred lines are discarded as mutagenic ones. Any variety or breed is assessed thoroughly for yield, grain quality, disease resistance etc before it is commercialised. It is bogus to suggest that gene editing would be done and the immediate lines would be released without testing. The trait would be studied and understood before the task of gene editing would be undertaken and the modification assessed under laboratory and field conditions before commercial release. It would be far better understood than any natural or induced mutation.

Multiple countries around the world are already supporting the concept that gene edited crops should not be regulated. The European Court of Justice has asked for the relaxing of the rules around regulation of gene edited crops[2]. Both the Netherlands[3] and Sweden[4] have indicated that they are not in favour of regulation gene edited crops as per GM crops. The US has already released gene edited mushrooms[5] and RNAi silencing in apples[6] while Sweden is producing gene edited cabbage[7]. It is important that Australia follows suit and has regulations consistent with the rest of the world going forward.

I would also like to raise the issue of gene editing versus gene addition. My understanding is that the OGTR is considering the option where if only base pairs could be exchanged the variety would not be regulated, whereas if additional genetic material was added then it would be considered as a GMO and need to be regulated. I would like the review panel to consider the following; there have been many situations in plant breeding where DNA translocations from other species have been incorporated. These include the wheat stem rust resistance genes Sr24 and Sr26 (derived from Agropyron elongatum) and SrR and Sr31 (derived from cereal rye)[8&9] as well as 1B1R translocation from rye for stripe rust resistance and Lr19 for leaf rust resistance[10]. This occurred as early as the 1950's and is certainly not new technology. For anti-science groups to protest that this technology is untested is ridiculous; hundreds of plant varieties containing foreign DNA have been developed and consumed and have been a huge benefit to food production globally. For this reason I urge the reviewers to be consistent in not regulating this technology.

Finally, I expect the group identified as 'Do gooders' will claim that there are off target mutations with CRISPR and other gene edited crops. Recent developments in the techniques have reduced the off target mutations to effectively zero[11]. It should also be noted that there have never been off-target mutations recorded in plants which have undergone gene editing[12].

I wish to thank the members of the review committee for taking the time to read my submission and wish you well with the review process. Regards

Dr Brian Duggan, Ph.D. (ANU 2000)

References

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[2] https://www.nature.com/articles/d41586-018-01013-5

[3]https://geneticliteracyproject.org/2017/09/13/netherlands-wants-crispr-gene-edited-crops-exempt-europes-gmo-laws/

[4]https://geneticliteracyproject.org/2017/09/11/sweden-doesnt-regulate-crispr-gene-edited-crops-gmos/

[5] https://www.nature.com/news/gene-edited-crispr-mushroom-escapes-us-regulation-1.19754

[6] https://www.arcticapples.com/how-did-we-make-nonbrowning-apple/

[7] https://phys.org/news/2016-09-vegetables-crispr-cas9-cultivated-harvested-cooked.html

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[11] https://www.nature.com/articles/nature16526

[12] Personal communication, Prof Karl-Heinz Kogel (Justus Leibig Universitat, Gießen, Germany), 23rd June, 2017