

Council Policy

Genetically Modified Crops



COUNCIL POLICY

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|  <p>Adelaide Hills COUNCIL</p> | GENETICALLY MODIFIED CROPS |
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| Policy Number: | ENV-01 |
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| Relevant Delegations: | None |
| Other Relevant Policies: | None |
| Relevant Procedure(s): | None |
| Relevant Legislation | <i>Genetically Modified Crops Management Act 2004</i> |
| Policies and Procedures Superseded by this policy on its Adoption: | 25 September 2012, Item 10.3, 242 9 December 2014, Item 14.5, 271 |
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| Minute Reference for Adoption: | 333/18 |
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GENETICALLY MODIFIED CROPS

1. INTRODUCTION

This policy has been prepared to state Council's position with regard to the growing of genetically modified (GM) crops within the Adelaide Hills Council area, and to the protection of existing agricultural activities and enterprises from the potential negative impacts and lost opportunities as a result of GM agriculture. The Policy also outlines the general principles that will be applied in an instance where a change to the Council's adopted policy position in this instance is being contemplated.

Council is seeking changes to its Development Plan as part of the transition to the State's Planning & Design Code. The intent of these changes is to increase the level of sustainable agriculture in the Adelaide Hills. These changes are linked to the Council wide planning policy initiatives to protect primary production land for this purpose, and other associated strategies as outlined in its Strategic Management Plan.

Council considers that genetically modified crops have the potential (until proven otherwise) for irreversible and unforeseen serious environmental and economic impacts. Given the possibility of the introduction of genetically modified crops into the Council Region, there is a need to state Council's precautionary position on this issue.

At this point in time, Council does not consider that the agricultural industry would be adversely affected by any restrictions on the cultivation of GM crops within the Adelaide Hills Region.

2. BACKGROUND

2.1 What are Genetically Modified Crops¹:

Genetically modified foods (crops & animals) derive from genetically modified organisms which have had specific changes introduced into their DNA through genetic engineering techniques. Genetically engineered plants are generated in a laboratory by altering their genetic makeup, usually by adding one or more genes of a plant's genome using genetic engineering techniques.

While it is theoretically possible to genetically modify all types of plants, in practice there are technical problems with inserting DNA into some plants, and some plants do not regenerate well under laboratory conditions. There are currently GM varieties of 13 different plants available worldwide which are commercially grown and used in the production of food and animal feeds. These include Canola, Corn, Papaya, Soybean, Tomato, Chicory, Flax/Linseed, Potato, Squash, Cotton, Melon (Cantaloupe), Rice, and Sugarbeet.

Currently only 6 of the above 13 plants have GM varieties approved for use in food for human consumption in Australia by Food Standards Australia New Zealand (refer to www.foodstandards.gov.au). Cotton, Canola and carnations are grown commercially in Australia.

¹ Sourced from various Wikipedia articles and **Introduction: GM Organisms**, John Pickrell, *New Scientist* 11:05 4/9/2006.

2.2 The Controversy

Genetic modification is promoted as a means to enhance food supply, by providing crops or animals with improved resistance to diseases, pests, herbicides, or drought, longer shelf life, better nutrition, flavour, colour, or texture, and higher yields.

Critics objections are based on “Frankenfood fears” due to *inadequate scientific understanding* of likely long-term physiological and health impacts on humans, and on surrounding crops, ecologies and related human and other food chains. The spread of GM crop genes into adjoining non-GM farms is also a major concern. A recent study² has indicated that claims of increased yields were not supported during a 13 year study showing that “increased yields” are “*reductions in crop losses*”. There are also concerns about economic impacts due to these products being subject to *intellectual property law*. This may be a major problem in poor countries where genetic modification has the potential to ensure seeds for future crops are sterile unless “unlocked” with expensive chemical keys. This technology has not been commercially deployed to date, however it is not actually required by the vendors as their clients are legally obliged to buy new seed at the beginning of every season by their purchase contracts from most (GM and non-GM) seed suppliers.

2.3 Plant Development Terms

Cisgenic – an organism where genetic material from the same species or a species that can naturally breed with the host is used.^[5]

Cloning and **stem cell research**, although not considered genetic engineering,^[2] are closely related and genetic engineering can be used within them.^[3]

Genetic engineering alters the genetic makeup of an organism using techniques that introduce heritable material prepared outside the organism either directly into the host or into a cell that is then fused or hybridized with the host.^[1] This involves using recombinant nucleic acid (DNA or RNA) techniques to form new combinations of heritable genetic material followed by the incorporation of that material either indirectly through a vector system or directly through micro-injection, macro-injection and micro-encapsulation techniques.

Genetic engineering does not include traditional animal and plant breeding, in vitro fertilisation, induction of polyploidy, mutagenesis and cell fusion techniques that do not use recombinant nucleic acids or a genetically modified organism in the process.^[1]

Mutagenesis is a process by which the genetic information of an organism is changed in a stable manner, resulting in a mutation. It may occur spontaneously in nature, or as a result of exposure to mutagens. It can also be achieved experimentally using laboratory procedures. In nature mutagenesis can lead to cancer and various heritable diseases, but it is also the driving force of evolution

Synthetic biology is an emerging discipline that takes genetic engineering a step further by introducing artificially synthesized genetic material from raw materials into an organism.^[4]

Transgenic – an organism where genetic material from another species is added to the host.

² **Failure to Yield: Evaluating the performance of genetically engineered crops**, Doug Gurian-Sherman, *Union of Concerned Scientists*, 2009 A response to this and similar research from Monsanto is at <http://www.monsanto.com/newsviews/pages/do-gm-crops-increase-yield.aspx> - and response to Monsanto by Dvinder Sharma is at <http://www.countercurrents.org/sharma210309.htm>.

Genetic engineering can also be used to remove genetic material from the target organism, creating a **gene knockout organism**.^[6]

In Europe genetic modification is synonymous with genetic engineering while within the United States of America it can also refer to conventional breeding methods.^[7]

Within the scientific community, the term *genetic engineering* is not commonly used; more specific terms such as *transgenic* are preferred.

Genetic modification techniques are much more precise than *mutagenesis* (mutation breeding), where an organism is exposed to radiation or chemicals to create a non-specific but stable change.

Other techniques by which humans modify food organisms include selective breeding; plant breeding, and animal breeding, and somaclonal variation (under sterile conditions on a nutrient culture medium of known composition).

Notes for section 2.3

1. The European Parliament and the council of the European Union (12 March 2001). *Directive on the release of genetically modified organisms (GMOs) Directive 2001/18/EC ANNEX I A*. Official Journal of the European Communities. p. page 17. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:106:0001:0038:EN:PDF>
 2. Van Eenennaam, Alison. "Is Livestock Cloning Another Form of Genetic Engineering?". agbiotech. <http://agribiotech.info/details/Alison%20-%20cloning%20March%208%20-%2003.pdf>.
 3. David M. Suter, Michel Dubois-Dauphin, Karl-Heinz Krause (2006). "Genetic engineering of embryonic stem cells". *Swiss Med Wkly* **136** (27–28): 413–415. PMID 16897894. <http://www.smw.ch/docs/pdf200x/2006/27/smw-11406.PDF>.
 4. Ernesto Andrianantoandro, Subhayu Basu, David K Kariga & Ron Weiss (16 May 2006). "Synthetic biology: new engineering rules for an emerging discipline". *Molecular Systems Biology* **2** (2006.0028): 2006.0028. doi:10.1038/msb4100073. PMC 1681505. PMID 16738572. <http://www.nature.com/msb/journal/v2/n1/full/msb4100073.html>.
 5. Jacobsen, E.; Schouten, H. J. (2008). "Cisgenesis, a New Tool for Traditional Plant Breeding, Should be Exempted from the Regulation on Genetically Modified Organisms in a Step by Step Approach". *Potato Research* **51**: 75–88. doi:10.1007/s11540-008-9097-y. edit
 6. Capecchi, M. R. (2001). "Generating mice with targeted mutations". *Nature Medicine* **7** (10): 1086–1090. doi:10.1038/nm1001-1086. PMID 11590420. edit
 7. James H. Maryanski (19 October 1999). "Genetically Engineered Foods". Center for Food Safety and Applied Nutrition at the [Food and Drug Administration](http://www.fda.gov/NewsEvents/Testimony/ucm115032.htm). <http://www.fda.gov/NewsEvents/Testimony/ucm115032.htm>.
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2.4 History

A hybrid cereal was first created in 1875, by crossing wheat and rye. The first field trials of genetically engineered plants occurred in France and the USA in 1986, when tobacco plants were engineered to be resistant to herbicides. The People's Republic of China was the first country to allow commercialized transgenic plants, introducing a virus-resistant tobacco in 1992. Developing countries grew 48% of genetically engineered crops in 2010.

GM foods were first put on the market in 1996. Typically, genetically modified foods are transgenic plant products, i.e. soybean, corn, canola, rice, and cotton seed oil. Animal products have also been developed, although as of July 2010 none are currently on the market. In 2006 a pig was controversially engineered to produce omega-3 fatty acids through the expression of a roundworm gene. Researchers have also developed a genetically-modified breed of pigs that are able to absorb plant phosphorus more efficiently, and as a consequence the phosphorus content of their manure is reduced by as much as 60%.

GM tomatoes, as puree, first appeared on British supermarket shelves in 1996. However, a consumer reaction to GM technology did not occur until February 1999, after a controversial study suggested that a few strains of GM potatoes might be toxic to laboratory rats. A European anti-GM food campaign of near religious fervour followed. Spearheaded in the UK by environmental groups and some newspapers, the campaign had far-reaching consequences, culminating in an unofficial moratorium on the growth and import of GM crops in Europe and a trade dispute with the US.

GM crops are today very rare in Europe. Strict labelling laws and regulations are in place for food (DNA bar codes), and public opinion towards the technology remains largely negative. Several UK government reports have offered qualified support for GM crops and produce, though they argue that the economic benefits of the technology are currently small. Some African nations have also opposed engineered crops, even to the point of rejecting international food aid containing them.

GM produce has been taken up with much less concern in the US (where it doesn't have to be label[ed]), India, China, Canada, Argentina, Australia and elsewhere. In the USA, controversy over a type of GM corn - only approved for animal feed - which turned up in taco shells and other products, has stirred opinion.

2.5 Genetically Modified Crops In South Australia (SA)

The *Genetically Modified Crops Management Act 2004* (hereafter referred to as the Act) is in place to control the cultivation of genetically modified crops in South Australia.

Section 5 of the Act enables, by regulation:

- the designation of areas in which genetically modified food crops of a specified class must not be cultivated
- the designation of areas in which no genetically modified food crops may be cultivated
- the designation of an area as an area in which a genetically modified food crop must not be cultivated unless it is a genetically modified food crop of a specified class
- the designation an area as the only part of the State in which genetically modified food crops of a specified class may be cultivated.

The *Genetically Modified Crops Management (Designation of Areas) Regulations 2008*, made under the Act, designate the whole of the state of South Australia as an area in which no genetically modified food crops may be cultivated. However, the Act enables the Minister to issue Exemption Notices for the limited scale cultivation of GM food crops, including experimental crops in areas where the cultivation of GM crops is otherwise prohibited under section 4 or 5 of the Act. Exemption Notices will have conditions attached for the thorough containment of the cultivated GM crop to ensure that local production and supply chains are unaffected.

2.6 GM Crop Trial Sites in SA³

There are currently no GM crops grown commercially in SA. However, there are field trials of GM canola being undertaken where licences are generally issued on an annual basis. There are currently 8 trial sites where GM crops are being grown in South Australia under exemption notices issued under section 6[2][a][ii] of the Act for canola (*Brassica napus*). Trials for GM canola varieties, cotton seed, Indian mustard, oilseed, wheat and barley were recently licensed by the Regulator to proceed over a 3 year period. The University of Adelaide are doing trials at their Waite Campus at Urrbrae and also at Glenthorne (O'Halloran Hill). However, there are no trials or other GM sites within the Adelaide Hills Council area. Field trials occur under strict licence conditions, set and monitored by the Gene Technology Regulator.

3. DEFINITIONS

crop *n* **1.** The cultivated produce of the ground, such as grain or fruit, while growing or gathered.

2. The yield of such produce for a particular season. **3.** The yield of some other product in a season: *the lamb crop*. **4.** A supply produced. ... *v.i.* **23.** To bear or yield a crop or crops. (Source: *Macquarie Dictionary 2009*)

environment includes:

- (a) ecosystems and their constituent parts; and
- (b) natural and physical resources; and
- (c) the qualities and characteristics of locations, places and areas. (Source: *Gene Technology Act 2000* (amended 2011)).

gene technology means any technique for the modification of genes or other genetic material, but does not include:

- (a) sexual reproduction; or
- (b) homologous recombination; or
- (c) any other technique specified in the regulations for the purposes of this paragraph. (Source: *Gene Technology Act 2000* (amended 2011)).

genetically modified crop (also referred to as genetically engineered [GE] crops or genetically modified organisms [GMO]) is a crop cultivar or variety that has been modified by a process of artificially inserting specific genes from a source organism into the gene sequence of another, with the purpose of producing specific traits in the resulting crop.

³ **Source:** Primary Industries & Regions South Australia (PIRSA) Website

genetically modified organism means:

- (a) an organism that has been modified by gene technology; or
- (b) an organism that has inherited particular traits from an organism (the initial organism), being traits that occurred in the initial organism because of gene technology; or
- (c) anything declared by the regulations to be a genetically modified organism, or that belongs to a class of things declared by the regulations to be genetically modified organisms;

but does not include:

- (d) a human being, if the human being is covered by paragraph (a) only because the human being has undergone somatic cell gene therapy; or
- (e) an organism declared by the regulations not to be a genetically modified organism, or that belongs to a class of organisms declared by the regulations not to be genetically modified organisms. (Source: *Gene Technology Act 2000* (amended 2011).

GMO means a genetically modified organism. (Source: *Gene Technology Act 2000* (amended 2011).

GM product means a thing (other than a GMO) derived or produced from a GMO. (Source: *Gene Technology Act 2000* (amended 2011).

Sustainable agriculture (1) is agriculture that contributes positively to the lives of rural people and their communities, to the region's productivity and economy, and which also protects the biological and physical resource base on which it depends. Sustainable agriculture is focused on ensuring the long-term viability of agricultural land for the purpose of agriculture and therefore integrates consideration of economic, social and environmental aspects to achieve balance, rather than emphasising the importance of one over the others.

Sustainable agriculture (2) n. farming systems which meet the needs of society now and into the future by maintaining or improving profitable food and fibre production while conserving natural resources. (Source: *Macquarie Dictionary 2009*)

Sustainable agriculture (3) is an integrated system of plant and animal production practices having a site-specific application that will last over the long term:

- satisfy human food and fiber needs
- enhance environmental quality and the natural resource base upon which the agricultural economy depends
- make the most efficient use of [non-renewable resources](#) and on-farm resources and integrate, where appropriate, natural biological cycles and controls
- sustain the economic viability of farm operations
- enhance the quality of life for farmers and society as a whole."

(Source: Gold, M. (July 2009). [What is Sustainable Agriculture?](#). United States Department of Agriculture, Alternative Farming Systems Information Center.

4. OBJECTIVES

- 4.1 To increase the level of sustainable agriculture within the Adelaide Hills Council area for current and future generations.
- 4.2 To state Council's position with regard to the growing of genetically modified crops within the Adelaide Hills Council area.
- 4.3 To protect existing agricultural activities and enterprises from potential negative impacts and lost opportunities as a result of GM agriculture.
- 4.4 To link agricultural activity more closely with the protection of biological diversity and the maintenance of essential ecological processes and life-support systems upon which agriculture and all other activities depend.

5. POLICY STATEMENT

- 5.1 Adelaide Hills Council **does not** support the growing of genetically modified crops within its District.
- 5.2 Council will work cooperatively with neighbouring councils to ensure that proposals or applications for approval to trial or to produce genetically modified crops within those areas are also referred to the Adelaide Hills Council for consultation before approval is obtained.

6. REVIEW OF THE POLICY

The following general principles will be applied in an instance where a change to the above stated Policy of the Adelaide Hills Council is being contemplated:

- 6.1 The area of Genetically Modified Crops/Organisms is very 'fluid' and can change very rapidly. It is noted that flexibility to review and change policy is required to enable individuals, the agricultural industry, the community and/or government to adapt to and adopt change where appropriate.
- 6.2 Public Consultation is paramount in this instance. Any changes to this Policy shall provide an opportunity for public input and debate/discussions before any changes are made.
- 6.3 Council is aware of the need for agricultural industry to remain internationally competitive and as a result Council considers that there should be flexibility to review this policy position in order for the industry to react to specific market forces and requirements. For example, if the South Australian Apple and Pear industry were to suffer the effects of the Fire Blight disease, the industry would be seeking immediate access to any products including rootstocks and varieties that were resistant to the disease and that would assist the industry in returning to a viable situation in the shortest possible time. It is noted that the industry wishes to ensure a flexible approach to deal with this type of scenario.
- 6.4 If any legislative changes are proposed, then Council considers that the widest possible public consultation be undertaken by the State Government. Council would seek to have the opportunity to consider all issues and then comment on those that are appropriate. Where a legislative change by the State Government relating to GM crops impacts on the Council's policy position, then the Policy shall be reviewed as expeditiously as possible.