Agribusiness Perspectives Papers 2002

Paper 51/1
ISSN 2209-6612

GENETIC MODIFICATION-FREE ZONES [1]

Government of Western Australia [2&3]

This paper is one of a collection of three related papers

[Paper **1** | 2 | 3]

[1] A consultation paper that the Government of Western Australia has released. The WA Government has called for responses to this paper.

[2]The Western Australian Department of Agriculture gratefully acknowledges the cooperation of the Victorian Department of Natural Resources and Environment in allowing the use of the contents of its consultation paper.

[3]This consultation paper draws on the following paper : Genetic Engineering-free Zones, Victorian Government Consultation Paper, March 2001. ISBN 0 7311 4769 3. Published by the Department of Natural Resources and Environment, PO Box 500, East Melbourne 3002

1 Introduction

Genetic modification or GM (also known as gene technology, genetic engineering, genetic manipulation) is a term used to describe a group of techniques which can alter the genetic material of a living organism (plant, animal or microbe) and thus modify its characteristics. The

technology has a wide variety of applications including research, agriculture, production of therapeutic goods (e.g. insulin), bio-remediation (e.g. use of micro-organisms to decompose toxic substances) and industrial uses.

In the agricultural sector, proponents of GM believe that advances in primary production, from the use of this technology, will allow Australia to improve existing production efficiency. This in turn will help to maintain or improve Australia's share of world markets.

Despite the promise of this relatively new technology, the public has been confronted with charges and counter charges concerned with the risks and benefits of using GM.

The State Government has declared that it will take a cautious approach to the introduction of GM crop varieties into farming systems, noting that a balance is required between opportunity and prudence. The Government considers that the utilisation of GM crops may be a critical element in the future competitiveness of the agricultural sector. It is also aware that some members of the community have concerns about using such crops.

The Government supports the recognition of designated areas as described in Section 21 of the Commonwealth Gene Technology Act 2000 (see below), and has introduced State legislation to enable GM-free and/or GM zones to be established.

Part of the Government's policy is a commitment to public consultation on GM-free and/or GM zones, on the form they might take, and how they might be managed. Views are also sought on processes to define needs for GM-free and/or GM zones. This paper has been prepared to assist in the consultation process.

This paper looks primarily at the potential role of GM-free zones in facilitating the production of crops that do not use genetic modification and supporting marketing programs for non-GM crops and crop products. This emphasis on GM-free zones reflects community interest, in particular by some local governments in Australia, to have local government areas declared GM-free.

The potential role of designated GM (as opposed to GM-free) zones is also considered. However, it should be noted that GM zones would not necessarily confine all GM crop production within their boundaries.

2 Regulation of gene technology in Australia

2.1 Commonwealth legislation

The Gene Technology Act 2000 (the Act) (Commonwealth) was passed in December 2000 and became operational on 21 June 2001. This Act establishes the Gene Technology Regulator (the Regulator) as an independent statutory office holder with responsibility for implementing the legislation. The Act is the Federal component of a national scheme for regulating certain dealings with genetically modified organisms (GMOs).

Each State and Territory has or will enact their own legislation to complement or apply the Commonwealth Act within their own jurisdiction.

A Gene Technology Inter-Government Agreement (IGA) has been negotiated to ensure the system remains consistent and uniform over time. The IGA will underpin the national system for the regulation of GMOs. It commits all Governments to:

- introduce substantially similar legislation in their jurisdiction;
- establish a Ministerial Council to be known as the Gene Technology Ministerial Council;
- provide for maintenance of a nationally consistent scheme, including a review of the scheme within four years; and
- describe the roles and responsibilities of each jurisdiction.

The object of the national regulatory system for gene technology is to protect public health and the safety of people, and to protect the environment from risks associated with gene technology. Essentially, the system will operate by identifying and assessing risks posed by, or as a result of, gene technology and by managing public health and environmental risks through regulation of dealings with GMOs.

The Ministerial Council (comprised of one Minister from each jurisdiction and the Commonwealth, with each member required to provide a 'whole of government' perspective on behalf of their jurisdiction) has, as one of its functions, the development of policy principles.

Section 21 of the Gene Technology Act 2000 (Commonwealth) allows the Ministerial Council to issue a policy principle as follows:

"recognising areas, if any, designated under State Law for the purpose of preserving the identity of one or both of the following:

(i) GM crops;

(ii) non-GM crops;

for marketing purposes;"

Before issuing a policy principle, the Ministerial Council must be satisfied that the principle was developed in consultation with a number of bodies. Amongst these are industry, environmental, consumer and other groups, as the Ministerial Council considers appropriate.

Once a policy principle has been issued by the Ministerial Council under Section 21 of the Act, the Regulator must not issue any licences that are inconsistent with this principle (Section 57 of the Act).

Under the regulatory scheme, licenses must be obtained for field trials and commercial releases of GM crops, as they both involve intentional release into the environment. Further, for applications to commercially release a GM crop, the Regulator must be satisfied that the safety of the GM crop has been adequately tested by field trials in Australia.

2.2 Western Australian legislation

Complementary State legislation has been introduced in Western Australia through the Gene Technology Bill 2001.

This Bill contains a consequential amendment to the Agriculture and Related Resources Protection Act 1976, to enable the making of regulations to designate certain areas for the purpose of Section 21 of the Gene Technology Acts of the State and Commonwealth.

2.3 Scope of genetic modification-free and genetic modification zones

It is important to note the following points in relation to any designated GM-free and GM areas (as recognised by a policy principle issued by the Ministerial Council).

· only areas designated for preserving product identity for marketing purposes can be recognised by policy principles. Under the Act, the Gene Technology Regulator is already empowered to address issues of human health and safety as well as environmental risks in relation to any request for a licence to deal with GMOs.

· a policy principle can only recognise designated areas relating to crops, not to other organisms which may or may not be genetically modified.

· areas can be designated for the purpose of preserving the identity of GM crops, non-GM crops or both.

· a policy principle will recognise State and Territory law only. Local governments are not recognised as regulators in this context. However, their ability to communicate with State governments or with the Gene Technology Regulator is not affected.

3 Issues and Options for Consideration

3.1 What are the risks and benefits from using genetic modification in agriculture?

The development of biotechnology has been accompanied by debate about the scientific, legal, ethical and social implications of the technology. The Government acknowledges the diverse opinions that exist in the community and will continue to consult widely on policy issues.

The Government is committed to ecologically sustainable development, recognising that care of the environment is a primary objective. The application of gene technology to agriculture presents opportunities for productivity gains to farmers, improved food and fibre products for consumers, and improved agricultural practices involving reduced environmental impacts and more efficient resource use, such as less use of water and nutrients. Research and development in all these areas is progressing in Australia and other countries (1,2).

Gene technology offers potential benefits, but is not without risks.

Potential environmental, public health, agricultural and trade risks may apply if the technology is not employed carefully in agricultural production.

Australia is putting in place a national gene technology regulatory scheme to provide safeguards against environmental and public health risks. Under the scheme, founded on the Commonwealth Gene Technology Act 2000, any genetically modified organism will be assessed for environmental and public health risks before environmental release is allowed.

The Australia New Zealand Food Authority assesses the safety of genetically modified food before the food is permitted on to the market, and labelling requirements are applied to provide consumer choice. All national regulatory processes are open and provide for extensive public consultation.

The national Primary Industries Standing Committee, which includes representatives from the Commonwealth and all States and Territories, is currently considering how best to address any potential agricultural risks from genetically modified crops and the agricultural management of all novel crops.

3.2 What is the current status of genetically modified crops in Western Australia?

There has been no commercial release of any GM crop in WA.

Two varieties of GM carnations have been approved for unrestricted release in Australia but they are not, at present, being grown in WA.

The Department of Agriculture is participating in two GM field evaluation trials in the Kimberleys.

Both of these are being undertaken in collaboration with commercial companies. One trial involves GM cotton on private properties in the

Ord River Irrigation Area and on the Department's Frank Wise Institute research station. The other is a GM poppy trial at the Frank Wise Institute. There have been other GM cotton trials (4 sites near Broome and 13 near Kununurra). These are no longer active but are in a post-trial monitoring phase in accordance with the conditions of licence.

Several field evaluation trials have been conducted in the South West with GM field peas (30 sites in the Avon Valley), GM lupins (7 sites) and GM canola (20 sites). All of these trials are in a post-trial monitoring phase, in accordance with licence conditions. This phase will be completed at most sites by 2002.

Information about GM trials is available on the Department of Agriculture website (http://www.agric.wa.gov.au/biotechnology).

3.3 Why have “genetic modification-free zones”?

Preventing GM crops being grown in an area would reduce chances of contamination from GM crops. A GM-free zone could:

1. help in maintaining a “clean, green” food marketing image for that area,

2. facilitate production of organic and other food products that do not utilise genetic modification, and

3. serve as a reference area for assessing the impacts of gene technology on the environment, public health or trade.

3.4 Why have “genetic modification zones”?

The Gene Technology Regulator is currently free to license GMOs for field trials and commercial release in any area of the State. Designation of an area as a GM-free zone under State legislation would restrict licensing of trial and commercial releases to areas outside the GM-free zone.

A GM zone, on the other hand, would give notice that GM crops can or will be grown in that area. A GM zone might be proposed to preserve the opportunity for licensed production of GMOs in a particular area, against the possibility that this area would be included in a GM-free zone at some time in the future.

GM zones could concentrate GM production, facilitating efficient segregation, handling and marketing of GM crops. This may also assist in reducing the incidence of cross-pollination with non-GM crops in adjacent areas. Concentration of GM crops and their associated production systems would make it easier to service GM producers' specialised information and technology requirements.

However, the fact that an area is designated for GM crops would not necessarily limit the growing of GM crops to that area. The growing of GM crops could only be prevented in areas specifically designated as GM-free zones. Areas designated for GM crops would not mean that only GM crops could be grown within these.

3.5 What might genetic modification-free or genetic modification zones look like?

There is no legislated limit on the size or means of definition of designated areas.

For example, a GM-free or a GM zone could be designated by reference to an administrative boundary such as a local government district, a port or shipping zone, being the entire catchment from which a particular crop may be drawn, or other specific geographical boundaries. Of course, even without the reference to designated areas in the Gene Technology legislation, GM-free or GM zones could be formed simply by individual producers, voluntary arrangements between adjacent producers, or through industry accreditation.

It is intended, under State law, that areas may be designated as GM-free or GM zones by regulations under the Agriculture and Related Resources Protection Act 1976.

3.5.1 Non-statutory arrangements

Non-statutory GM-free or GM zones might be established and managed under voluntary agreement between producers.

In the simplest case, a single landowner might establish a single land-holding as a GM-free zone. Alternatively, a group of land-holders could voluntarily form a GM-free zone on a local or regional basis for the purpose of jointly marketing their produce. Other supply chain participants might be involved in such voluntary local or regional arrangements, or might form the hub of a GM-free zone (e.g. a processing plant and its surrounding suppliers).

Voluntary arrangements for GM-free and GM zones would rely on the full and continuing participation of all producers within the voluntary zone.

3.5.2 Industry accreditation

A particular agricultural industry could accredit agricultural producers who meet a specified GM-free or GM production standard. Similar

mechanisms are currently applied for the accreditation of organic producers.

Particularly in the case of GM-free production, segregation and identity preservation systems would be required to ensure claims made on GM-free status were verifiable and underpin the credibility of the accreditation system.

3.5.3 Statutory arrangements

The national gene technology regulatory scheme in Australia is based on a comprehensive risk assessment of the impacts of genetically modified organisms on the environment and human health.

The national system does not regulate the use of GMOs and derived products for the purposes of marketing and trade. However, States may make their own laws to designate areas for the purpose of preserving the identity of GM or non-GM crops for marketing purposes.

As noted earlier, these laws may be recognised by a policy principle issued by the Ministerial Council. The Gene Technology Bill 2001 contains a clause that will make a consequential amendment to the Agriculture and Related Resources Protection Act 1976 to enable regulations to be made under that Act designating these areas.

Standards for good governance would require that any proposed statutory restrictions provide a positive net benefit to the zone and more widely in the community. Equity must also be sought; that is, the interests of all parties would need to be balanced.

3.6 What are the potential benefits or costs of genetic modification-free zones?

3.6.1 Potential marketing benefits of GM-free zones

A key marketing question is to what extent a market advantage will be gained from a claim that a crop product is produced in a GM-free zone, over and above any claim the product is not genetically modified.

There are examples of successful marketing campaigns built around regional labels (eg. wine regions), production system labels (eg. free-range eggs, organic products) and “ecological labels” (eg. dolphin-friendly tuna). In the same way, product differentiation in the market-place might be built around production in a GM-free zone.

It would be necessary to assess a proposed GM-free zone and particular crop products to determine whether marketing advantages and price benefits would accrue to producers in that zone.

3.6.2 Costs of GM-free zones

To support a stringent standard for “GM-free” claims, it may be necessary to enhance the reliability and integrity of segregation and identity preservation systems for non-GM crops. Costs would be incurred in the establishment and maintenance of infrastructure, equipment and facilities dedicated to non-GM production.

The costs of a marketing program to create awareness of the name of the zone and its status as “GM-free” would also need to be considered by proponents.

The Government believes that any additional costs faced by non-GM producers, particularly in terms of segregation and identity preservation, should be borne by GM producers.

The basis of this argument is that the need for costs of improved identity preservation systems for non-GM products might not arise unless GM production proceeds elsewhere. Furthermore, non-GM producers might reasonably expect GM producers to meet the full cost of any systems designed to ensure segregation of GM crops. Clustering of GM producers in a GM zone would certainly facilitate such investments.

However, where non-GM producers seek some additional marketing benefits from differentiating products produced within a GM-free zone, it may also be argued that they should be prepared to meet the costs of gaining such benefits. In practice, it may be difficult to make GM producers liable for costs incurred within GM-free zones when, by definition, GM production is excluded from such zones.

These costs might be shared within a GM-free zone on some equitable basis, or it may be possible to pass costs on to particular markets and consumers through product pricing. As discussed, the potential marketing advantages of being able to make GM-free claims should be assessed against likely costs when considering the desirability of GM-free zones.

Costs of foregoing the use of genetic modification technology

The cost of foregoing use of GM technologies may apply across all agricultural and food production enterprises within the GM-free zone. The costs may be measured in both environmental and economic terms.

Foregone benefits might, for example, include:

- any savings in agricultural inputs (water, fertiliser, herbicide use),
- yield improvements provided by production traits (insect resistance, disease resistance), or
- any price premiums provided by improved or novel product traits (longer shelf-life, enhanced appearance, higher vitamin content, specialised oil characteristics).

The indirect costs of foregoing the use of genetic modification technology may vary according to particular traits and agricultural or manufacturing enterprises over time, and also within or across regions.

The Economic Service of the US Department of Agriculture reported, in September 2000, that the economic impact of using GM technology for the small range of GM crops currently grown commercially in the USA varied according to the particular crop and GM trait (3).

Increased adoption of herbicide-tolerant cotton was associated with significant increases in yield and variable profits, but was not associated with changes in herbicide use. Increased adoption of herbicide-tolerant soybeans was associated with small increases in yield and variable profits, and significant decreases in herbicide use. Increased adoption of insect-resistant cotton in southeastern USA was associated with significant increases in yields and profits, and decreased insecticide use.

Based on research and development by the Department of Agriculture on GM cotton in the Kimberleys, such benefits would also be expected in a commercial cotton industry.

3.7 What are the key regulatory and market issues?

3.7.1 Current export markets for non-GM crop products

Globally, grower adoption of GM crops has been rapid and GM crop areas have expanded since 1996 (when GM crops were first grown in significant commercial quantities) to reach around 44.2 million hectares in 2000 (4,5). However, this still represents only 3% of the global area used for crop production.

Four crops account for more than 99 per cent of total global GM crop production. Of the 44.2 million hectares of GM crops sown in 2000, 58 per cent were soybeans, 23 per cent corn, 12 per cent cotton, and 6 per cent canola. Four countries grew 99% of the global GM crop area in 2000.

The American continent is the main producer of GM crops. The USA grew the largest crop hectarage, 30.3 million hectares, followed by Argentina with 10 million hectares, Canada with 3 million and China with 0.5 million. In Australia, cotton is currently the only GM crop grown commercially.

Close consideration needs to be given to whether crop producers would benefit from GM-free zones, either through increased access to non-GM markets or through price premiums for non-GM produce.

The Economics Research Service of the US Department of Agriculture, in a report on the corn and soybean markets, has observed that US producers are beginning to respond to the opportunities and risks arising from emerging markets for GM and non-GM commodities and other crop products. The ERS reports that many are benefiting from the lower production costs associated with GM varieties, while some are tailoring their production to benefit from the emerging markets and price premiums for non-GM products (6).

The report noted that market differentiation for GM and non-GM commodities is an extension of a small, but significant trend away from the marketing of general bulk commodities toward differentiated commodity or product marketing. It was concluded that increased demand from processors for specific quality attributes and increased availability of specialty crops will continue to reinforce this trend.

A qualitative investigation by the Victorian Department of Natural Resources and Environment, and an analysis by the Australian Bureau of Agricultural and Research Economics in 1999, have recently reported on world trade in canola and the anticipated market for non-GM canola in the short-term (7,8). In the Department of Natural Resources and Environment study, canola exporters generally did not report a market premium being paid for non-GM canola.

At this time, however, the continuing worldwide increases in canola production and sporadic European Union market are clouding any overall market trends.

The future impact of customer preferences on markets and prices for GM and non-GM canola is uncertain. The change in customer preferences in our export markets will need to be kept under constant review by the industry.

Attention is drawn to the Department of Agriculture paper:

“International market trends for Genetically Modified Organisms”, November 2001, which explores attitudes to GM crop products in our major export market destinations.

3.7.2 Consumer preferences

Consumers have been extensively surveyed worldwide to determine attitudes towards biotechnology generally, and GM foods in particular.

Attitudes are found to range widely among consumers, from acceptance of GM foods to strong rejection. Attitudes vary from nation to nation and are changing over time. See, for example, Hoban 1999 (9).

In Australia, a national phone survey (May 2000) commissioned by the Commonwealth Government supported these general conclusions (10). The survey found that over 90 per cent of those surveyed supported labelling of GM foods to enable consumers to make an informed choice and 65 per cent said they would eat genetically modified foods if there was a benefit. Some 46 per cent of respondents said they would not choose to buy GM foods, while 37 per cent said that labels on genetically modified foods would not change the type of food they would buy. A further 9 per cent said they would actively buy GM foods.

Findings in the survey are in accord with those from a more detailed benchmark survey commissioned by the Commonwealth Government in 1999 (11). Asked whether they would eat GM foods, 25 per cent of survey respondents agreed in 1999 and 32 per cent in the May 2000 survey.

Research commissioned by Commonwealth in June 2001 (12), following-up on the initial benchmarking study in 1999, found 49% surveyed would eat GM foods, with 60% reporting they would eat GM foods if they had been genetically modified to be healthier. However, the survey found a significant decline in the percentage of people who would eat foods genetically modified to taste better (43% in 2001 vs 51% in 1999). Perceptions about the usefulness of making plants more pest-resistant through gene technology seems to have improved since 1999 (37% in 2001 vs 31% in 1999).

The market research appears to indicate growing acceptance of GM foods. However, a general misunderstanding among the population of what is GM food clouds the results.

While current information does not allow for confident predictions of longer-term market trends, if current consumer preferences flowed through to product purchases, markets would emerge for non-GM crop products.

A variety of food attributes, including safety, nutrition, sensory qualities, function, process factors, price and value, may also influence consumer choice at the point of purchase. As well, the level of awareness and understanding of gene technology and level of confidence in regulatory systems may also influence consumer choice.

3.7.3 Regulatory approval requirements for genetically modified crop products

Comprehensive regulations for research, release of genetically modified organisms into the environment and marketing of genetically modified foods are in place in a number of countries, while many more countries are moving to introduce controls.

Market access for GM crop products will obviously depend on regulatory approvals in importing countries. Market opportunities for non-GM crop products may be expected to arise where GM traits do not have regulatory approval. Such markets may be temporary (pending approval of the GM trait) or more permanent (where a particular GM trait has been denied approval).

3.7.4 Labelling requirements for genetically modified foods

Many countries have introduced regulations that require labelling to identify that the food or a food ingredient is genetically modified.

Notably, food labelling regulations are in force in the European Union and will be introduced in Australia, Japan and Korea. Canada and the USA do not currently propose to regulate in this area.

In Australia, a new Food Standard (Food Standard A18 – Foods Produced using Gene Technology), approved by the Australia New Zealand Food Authority, will come into force in December 2001. This Standard requires the labelling of all GM food and food ingredients with altered characteristics.

It also requires the labelling of any food and food ingredients where novel DNA and/or novel protein is present in the final food. However, any one ingredient in a food may contain up to one per cent of genetically modified material where its presence in the ingredient is unintended.

Mandatory labelling schemes tend not to specify standards to support a “negative claim”, that is, a label claim that the product is “GM-free”. However, in Australia and many other countries, consumer laws require that a label must be truthful and not misleading. Thus, any claim that a product is “GM-free” will need to be made with reference to a verifiable standard.

3.7.5 What are the production requirements for non-GM crop products?

There is a growing trend, both globally and locally, towards the production of differentiated, value-added commodities and products, including the differentiation of products based on genetic modification, to create or take advantage of market opportunities.

Consumers can also choose eggs produced from free-range, barn-housed or caged hens. In the commodity sector, the wheat crop is divided into 70 or 80 different types on the basis of their suitability for different markets and end-uses such as bread and noodles.

In the processed food sector, otherwise similar breakfast cereals are differentiated by their use of organic ingredients. Margarines with similar flavour and “mouth feel” are marketed according to the levels of polyunsaturated and mono-unsaturated fatty acids they contain.

All these differentiated crop products depend on segregation and identity preservation systems that operate effectively throughout the supply chain. A crop segregation and identity preservation system is a system for:

- handling crop components through every stage of production, processing, manufacturing and distribution, in such a way as to avoid mixing with alternative components, and
- the demonstration of this by means of documentary evidence.

The effectiveness of segregation and identity preservation systems could be facilitated by industry-led accreditation systems and codes of conduct, and might be enhanced by Government endorsement.

Government regulation, through mandatory standards, GM-free zones or a combination of any of these approaches might also play a role.

Some industries have recognised the particular opportunities and challenges offered by value-added, differentiated commodity markets and are continuing to address the changes necessary to allow these opportunities to be realised. In Australia, the “Great Grain” and “Graincare” on-farm quality assurance programs are examples of industry initiatives in this area.

Rigorous and cost-effective segregation and identity preservation systems may well be required to attest the non-GM status of a non-GM crop product. Such a need may not arise until GM crops become well established in Western Australia.

Against this background, a key issue for consideration is whether the creation of GM-free zone would contribute to the effectiveness of segregation and identity preservation systems.

3.7.6 Crop separation distances and genetic modification-free zones

GM-free zones could potentially play a role in reducing the incidence of unintended cross-pollination between GM and non-GM crops, by facilitating separation distances between crops.

The physical and physiological characteristics of the plant will determine whether cross-pollination between crop plants will occur. For example, separation distances would most likely not be required for self-pollinating plants such as wheat.

Cross-pollination in plants is influenced by environmental factors and by the nature of the pollen carrier (wind, birds, bees or other pollinating insects). In general, increasing the distance between crops reduces the probability of cross-pollination occurring.

The establishment of GM-free zones would eliminate the need to maintain separation distances between crops within the zone, although not at the boundaries of the zone.

Cost savings within the GM-free zone could arise from:

- reduced logistical complexity,
- avoidance of unacceptable levels of out-crossing as a result of inadvertent breaches of separation distance requirements,
- more cost-effective use of separation areas that must otherwise be utilised for different crops or harvested with the GM crop.

The logistical difficulties and cost of maintaining separation distances would largely depend on their size.

A 10-metre separation distance, for example, might be readily established on-farm, while a 200-metre separation distance might require co-operation between adjacent landholders.

Preventing cross-pollination of adjacent crops may be addressed by conditions on licences for GM production. However, the national regulatory system is aimed at managing public health and environmental risks. Controlling any potential production, sustainability and trade risks to agriculture may require the development of some other statutory or non-statutory arrangements for managing GM crops.

3.8. Options to statutory genetic modification-free zones

While GM-free zones may create potential marketing advantages, there are a number of complex issues associated with them, including:

- their effectiveness in facilitating segregation and identity preservation systems,
- compliance and enforcement issues, and
- uncertainty around market demand for GM or non-GM crop products.

Alternatives to statutory GM-free zones may be considered to ensure industries and consumers have choice between GM and non-GM products.

Options might include:

- voluntary (non-statutory) GM-free zones,

- voluntary agreements between GM and non-GM producers to maintain separation distances,
- industry accreditation systems and codes of conduct for GM and non-GM producers,
- appropriate Government endorsement of industry-led accreditation systems, or
- regulatory oversight to underpin industry-led arrangements.

Any of these options would need to have adequate flexibility to respond to changing market demands, and would need to ensure equity between growers.

3.9 Processes to propose and determine areas for designation as genetic modification-free and genetic modification zones

As outlined above, State legislation will enable the making of regulations to designate non-GM and GM crop areas. Such areas can only be designated for preserving product identity for marketing purposes.

In developing a case for designating an area as a GM-free zone for marketing purposes, proponents need to consider:

- What are the potential marketing benefits and costs?

This will require an assessment of price benefits to producers in the zone from having GM-freedom.

As indicated in Section 4.1, potential benefits may not be achievable without investment in a marketing program to promote the zone, its GM-free status and to differentiate the zone's GM-free products in the market-place. Proponents should take these anticipated costs into account.

Readers are referred to the recent ABARE publication (13):

“Genetically Modified Grains: Market Implications for Australian Grain Growers”, August 2001,

and the Department of Agriculture publication:

“International market trends for Genetically Modified Organisms”, November 2001.

- What are the potential production benefits and costs?

GM-free zones should simplify the segregation and identity preservation systems for non-GM crops within such zones.

This could reduce costs, enhance the reliability and integrity of the systems and support a more stringent standard for “GM-free” claims.

However, as discussed in Section 4.3, there may also be costs associated with of foregoing the use of genetic modification technology. These may include savings on inputs, yield improvements and price premiums provided by improved GM varieties.

Readers are referred the Department of Agriculture publication:

“Genetically Modified Canola in Western Australia – Industry Issues and Information”, November 2001.

Proponents should weigh up all the costs and benefits likely to be associated with GM-free or GM zones before requesting the Government to proceed to designate an area on their behalf.

They would be expected to provide the Government with a submission documenting evidence that farmers within the proposed GM-free or GM zone support the proposal. Proponents should also demonstrate that, based on the costs and benefits examined above, the proposal would contribute a positive net benefit to the zone.

In deciding upon the designation of an area as a GM-free or GM zone, the Minister would need to establish a process that ensured a consistent approach is taken in examining proposals and that adequate consultation is undertaken. From the viewpoint of good governance, the decision would need to balance the interests of all parties concerned and be made in the wider community interest.

The decision process would need to address:

- Do proposals satisfactorily address the ‘marketing purposes' criterion of Section 21 of the Gene Technology Act 2000?
- What is the proposed scope of the designated area?

The smaller the area proposed, the more likely it would be that proponents could demonstrate strong farmer support. However, where not many farmers are involved, proponents could be asked to consider if their objectives might be met by non-statutory arrangements, as outlined in Sections 3.1 and 6.

- What is the level of farmer support within a proposed designated area?

With large areas, the likelihood of less than unanimous farmer support is increased. Consideration may need to be given to excising sub-areas, to cater for dissenting farmers. For example, farmers wishing to retain the option of producing GM crops within a proposed GM-free

zone may argue strongly that they will suffer commercial disadvantage in the future if unable to grow GM crops.

- What processes should be undertaken to demonstrate farmer support?

One process would be a ballot of farmers in a particular area. Issues arise as to whether or not the process is conducted in a fair and reasonable manner, and what should comprise a “majority” vote – simple majority, two-thirds etc.?

A guideline would need to be established as to what level of support the Government should take as sufficient to justify designation of an area.

- Who should conduct the ballot and at whose cost?

To date, a number of local governments have expressed desires for GM-freedom within their administrative areas. Councils should have little difficulty in conducting a fair ballot of farmers within Shires.

- How should the views of other interest groups be taken into account?

The Minister inviting public comment on specific proposals could facilitate consultation with industry, environmental, consumer and other groups.

The Minister may find difficulty reconciling contrary views on specific proposals. Given an expectation that proponents would need to demonstrate strong farmer support (probably based on objective data), the question arises as to the relative weight that should be placed on submissions from other groups (which may not be based on polls or surveys).

The Minister could consider establishing an advisory body, representative of the producer organisations and other interest groups, to assist in the consultation process and to make recommendations on specific proposals to designate areas as GM-free or GM.

3.10 Genetic modification-free zones: Western Australian Government Consultation Process

What is the purpose of this Consultation?

The Western Australian Government is introducing State legislation that will allow the designation of areas for non-GM or GM crops.

The purpose of this public discussion paper is to obtain the views of a wide range of stakeholders on core issues including:

- the potential costs and benefits of GM-free zones;
- the form GM-free and/or GM zones might take and how they might be determined, implemented and managed; and
- other industry or government initiatives that might assist in cost-effective production of non-genetically modified products.

For information on biotechnology research in the Department of Agriculture and links to a range of information sources go to:

Website: http://www.agric.wa.gov.au/biotechnology

References

Biotechnology Australia, Developing Australia's Biotechnology Future - Discussion Paper, September 1999.

Thomas, S., J. Plazinski, G. Rawlin and C. Deane (2000) Agricultural Biotechnology: What is happening in Australia 2000. Bureau of Rural Sciences, Canberra.

Anon. (2000) Update: Impacts of Adopting Genetically Engineered Crops in the United States. Report of the US Department of Agriculture Economic Research Service, March 2000. Available at URL: www.ers.usda.gov/whatsnew/issues/gmo .

Economic Impacts of Genetically Modified Crops on the Agri-Food Sector: a Synthesis, Working document, Directorate-General for Agriculture, Brussels, 2000.

James, C. (2000) Global Status of Commercialised Transgenic Crops: 2000, ISAAA Briefs No.21 Preview. ISAAA: Ithica, New York.

Anon. (2000) Biotech Corn and Soybeans: Changing Markets and the Government's Role, Report of the US Department of Agriculture Economic Research Service, April 2000. Available at URL www.ers.usda.gov/whatsnew/issues/biotechmarkets/

Kearns, B. K. (2000) World Market Brief on Genetically Modified Canola, September 2000, Published report of the Department of Natural Resources and Environment, Melbourne.

Foster, M. (1999) Market Implications of Genetically Modified Food: ABARE Report to Agriculture, Fisheries and Forestry - Australia, December 1999, Australian Bureau of Agricultural and Resource Economics, Canberra.

Hoban, T. J. (1999) Public Perceptions and Understanding of Agricultural Biotechnology, Economic Perspectives Vol. 4, No. 4, October 1999, an electronic journal of the US Department of State.

Consumers after choice on GM foods, not rejecting GM foods, Media Release 00/300, Biotechnology Australia, 28 July 2000.

Public Attitudes Towards Biotechnology, research study by Yann Campbell Hoare Wheeler at Biotechnology Australia website http://www.isr.gov.au/ba/

Biotechnology Public Awareness Survey Final Report, research conducted by Milward Brown Australia for Biotechnology Australia, also at http://www.isr.gov.au/ba/

Foster, M. (2001) Genetically Modified Grains: Market Implications for Australian Grain Growers, ABARE Research Report 01.10, Canberra.

5 Abbreviations and Glossary

Table 1 Annual Cost to Establish and Manage a GMFZ

Cost Component	Costs	
	Initial or One Off	Ongoing (pa)
Project Manager (salary & on costs)	-	$100,000
4 Teams to mount border security (24hrs x 7 days x 8 persons x 4 teams @ $30k p.p.)	-	$960,000
Staff Office Accommodation	-	$100,000
Infrastructure (signage, vehicles, check points) costs	$200,000	$50,000
Sample Analysis	-	$50,000
Eradication / Recovery	$200,000	-
On-farm QA (per farm)	$2,500	$250
Segregation & Identity Preservation	$100,000	-
Contingencies for legal costs, liability, compensation		$500,000
Communication/education costs		$500,000
Total	$502,500	$2,260,250

Box 1

Biotechnology	Biotechnology is a broad term covering the use of biological discoveries for the development of industrial processes and the production of useful organisms and their products. Uses include the production of foods and medicines, the reduction of wastes and the creation of renewable energy sources. Modern biotechnology is the term used to describe a range of processes and techniques especially at the molecular genetic level. One of the techniques is genetic modification.

DNA	Deoxyribonucleic acid, the chemical of which genes are made (except for the genes of some viruses). DNA is a long, complex molecule that looks like a coiled thread.
Gene	All living things are made of tiny 'building blocks' called cells. Each cell contains inherited genes. A gene is made of a length of DNA that has a message encoded in its chemical structure. Genes are the instructions that give organisms their characteristics. Although the chemicals in DNA are the same for every living organism, the ordering or sequence of the chemicals varies and it is this variation that determines a plant's, animal's or an organism's physical make-up and features. By changing the sequence, turning off certain genes or inserting new sequences (a whole gene) changes can be made to an organism.
Gene technology	See “Genetic modification”
Genetic engineering	See “Genetic modification”
Genetic modification	A technology used to alter the genetic material of living cells in order to make them capable of producing new substances (eg. an insect toxin) or performing new functions (eg. resisting a particular herbicide).
Genetically modified organism	A living animal, plant, fungus, bacterium or other micro-organism that has been subject to genetic modification.
GMFZ	Genetic modification-free zone
GM	Genetically modified
GM-free	Meeting a specified standard for claiming that genetic modification has not been utilised.
GMO	Genetically modified organism
Government	Western Australian State Government
Non-GM	Not genetically modified

Date Created: 04 June 2005
Last Modified: (none)
Authorised By: Assoc. Prof. Bill Malcolm, Agriculture and Food Systems
Maintainer: Nanette Esparon, Agriculture and Food Systems
Email: webmaster@landfood.unimelb.edu.au